ANNUAL REPORT

OF THE

POMOLOGICAL AND FRUIT GROWING SOCIETY

OF THE

PROVINCE OF QUEBEC.

1898.

PRINTED BY
CHARLES PAGEAU, Printer to Her Most Excellent Majesty the Queen.
QUEBEC, 1899.

Hon. Sir Henry Joh

Hon. Sydney Fisher

Robert Brodie.....

R. Hamilton.....

Auguste Dupuis.....

C. P. Newman.....

W. W. Dunlop.....

District No. 1—Dr. Wo

" " 2—J. M. F

" " 3—J. H. C

" " 4—Dr. Rin

" " 5—J. C. Ch

" " 6—H. Bour

" " 7—E. A. Ba

" " 8—R. W. Sh

" " 9—Norman

LIST OF OFFICERS

FOR 1898.

HONORARY PRESIDENT

Hon. Sir Henry Joly de Lotbiniere.....Quebec

HONORARY VICE-PRESIDENT

Hon. Sydney Fisher.....Knowlton

HONORARY FIRST VICE-PRESIDENT

Robert Brodie.....St. Henri

HONORARY SECOND VICE-PRESIDENT

R. Hamilton.....Grenville

PRESIDENT

Auguste Dupuis.....Village des Aulnaies

VICE-PRESIDENT

C. P. Newman.....Lachine Locks

SECRETARY

W. W. Dunlop.....Outremont

DIRECTORS

District No. 1—Dr. Wood.....St. Johns
" " 2—J. M. Fisk.....Abbotsford
" " 3—J. H. Carter.....Massawippi
" " 4—Dr. Rinfret.....St. Croix, Lotbinière
" " 5—J. C. Chapais.....St. Denis
" " 6—H. Bourassa.....Montebello
" " 7—E. A. Barnard.....L'Ange-Gardien
" " 8—R. W. Shepherd.....Como
" " 9—Norman E. Jack.....Chateauguay Basin

LIST OF MEMBERS, 1898.

Arpin, C.....St. Johns.

Barnard, E. A.....L'Ange Gardien.
Brown, C. J.....St. Johns.
Brown, James.....Montreal.
Bamford, W.....Lachute.
Buzzell, G. W.....Abbotsford.
Bourque, Curé C. F.....St. Alexandre.
Brodie, R.....St. Henri.

Castel, E.....St. Hyacinthe.
Chapais, J. C.....St. Denis.
Carter, J. H.....Massawippi.
Crandall, W. T.....Ottawa.
Contant, J.....St. Johns.
Chadsey, E. M.....Cowansville.
Cooke, G. E.....Outremont.
Craig, W.....Abbotsford.

Dunlop, W. W.....Outremont.
Dupuis, A.....Village des Aulnaies.
Davidson, R.....St. Phillipe.
Davis, G. E.....Stanbridge East.
Douth, Curé L. E.....St. Leonard d'Aston.
Duggan, W. E.....Quebec.
Duggan, G. N.....Montreal.
Decarie, B. T.....Notre-Dame de Grace.

Edwards, G. B.....Covey Hill.

Fisk, J. M.....Abbotsford.
Frenette, Curé C. E.....St. Jean Port-Joli.
Fraser, Rev. James.....Cushing.
Fraser, John.....Coaticook.
FitzGibbon, Robert.....Dorval Station.

Grignon, Dr.....St. Adele.
Gareau, J. J.....St. Roch l'Achigan.
Gobeille, Rev. P.....West Farnham.
Gibb, J. J.....Como.

Hamilton, R.....Grenville.
Halcro, W. F.....Hudson.
Herrick, J. E. R.....Abbotsford.
Horsey, Rev. H. E.....Abbotsford.
Hardy, E.....St. Anne de la Pérade.
Hampson, R.....Montreal.
Heatly, W.....Stonefield.
Hammond, N. R.....Lachute.
Hutchison, J. N.....Westmount.

Jack, N. E.....Chateauguay Basin.
Johnston, A.....Cowansville.
Jackson, John.....Lachute.
Jones, Dr. C. R.....East Hatley.
Joyal, H.....St. Michel de Yamaska.
Joyal, E.....St. David de Yamaska.

Keegan, B. H.....Massawippi.
Knowlton, Luke L.....Cassville.

Macfarlane, W. G.....Cowansville.
Morris, W.....Sherbrooke.
Marshall, W.....Abbotsford.
Macaulay, T. R.....Montreal.
Macdonald, A.....St. Johns.
Moreau, Dr. N.....St. Johns.
Middleton, J.....Point Fortune.
McColl, W. N.....St. Joseph du Lac.
McGibbon, D. D.....Brownsburg.
McGowan, John.....Carillon.
McGinnis, W.....Iberville.
McNeil, F. C.....North Hatley.

Newman, C. P.....Lachine Locks.

O'Cain, James.....St. Johns.

Pattison, W. M.....Clarenceville.
Parkes, T. J.....Montreal.
Price, Herbert M.....Montmorency.
Park, James.....Hudson.
Paradis, C.....St. Denis.

Rugg, W. U.....Compton.
Robinson, R.....St. Amédée.
Rowell, W. L.....Ayers Flats.

Stevens, Rev. A. ..... East Hatley.
Smith, Malcolm ..... Lachute.
Shepherd, R. W. ..... Montreal.
Simpson, Mrs. G. W. ..... Montreal.
Savard, M. ..... Les Ecureuils.
Sicotte, E. ..... Boucherville.
Stevens, S. ..... Stanstead Plain.
St. Pierre, G. H. ..... Coaticook.

Tenney, C. E. ..... St. Johns.
Tomkins, E. F. ..... Coaticook.

Wood, Dr. ..... St. Johns.
Whyte, R. B. ..... Ottawa.
Wyman, W. N. ..... St. Johns.
Wilkinson, G. H. ..... St. Johns.
Wood, Hon. Thos. ..... Dunham.
Wintle, Gilbert ..... Como.
Wells, R. D. ..... Sweetsburg.
Wonham, Walter ..... Montreal.
Westover, D. ..... Frelighsburg.
Whitehead, Mrs. C. R. ..... Montmorency.

TABLE OF CONTENTS.

THE POM

The Fifth
Society of the
to-day. There
development of
production of th
trade of the Do
R. Brodie, of th
among those pr
Grenville; Gilb
L. A.; J. M. Fisl
of Agriculture o
Stantead; Percy
of Agriculture;
Ottawa; R. D.
England; W. F.
Ridge; John Ha
Calder, Chas. C
McGowan, Dr. G
E. Jack of Chate

Mr. Robert
said:—

GENTLEMEN,—

A year has fl
Following a year
growing is concer
tion, preceded by
to the fruit trees
regions of L'Islet
killed outright an
unable to resist th
have never tried
down their trees.

THE POMOLOGICAL AND FRUIT GROWING SOCIETY

OF THE

Province of Quebec.

LACHUTE, P. Q., January 25th, 1898.

The Fifth Annual Winter Meeting of the Pomological and Fruit Growing Society of the Province of Quebec was opened at the Victoria Hall, Lachute, to-day. There was a representative gathering of gentlemen interested in the development of the higher horticulture of the Province. Those engaged in the production of the best fruit, those interested in its commercial bearing on the trade of the Dominion, and the scientists of fruit growing, were present. Mr. R. Brodie, of the Lachine Road, President of the Society, occupied the chair, and among those present were: W. W. Dunlop, Secretary; Rev. Mr. Hamilton, Grenville; Gilbert Wintle, Como; Dr. H. A. Wood, St. Johns; W. A. Weir, M. L. A.; J. M. Fisk, Abbotsford; Auguste Dupuis, L'Islet, President of the Board of Agriculture of the Province of Quebec; C. P. Newman, Lachine; J. H. Carter, Stantead; Percy H. Selwyn, Ottawa: E. A. Barnard, Secretary of the Council of Agriculture; W. I. Simpson, ex-M. L. A.; R. W. Shepherd; Dr. Fletcher, Ottawa; R. D. Whyte, Ottawa; W. T. Crandall, Government Trade Agent in England; W. F. Halcro, Como; J. McGowan, Carillon; Malcolm Smith, Beech Ridge; John Hay, Walter Smith, John Jackson, Wm. Nichol, Wm. Rodger, Geo. Calder, Chas. Calder, James Patton, G. D. Boyce, G. E. Bampton, Q. C., W. McGowan, Dr. Grignon, J. C. Chapais, Assistant Dairy Commissioner, Norman E. Jack of Chateauguay, L. J. Farmer of Pulaski, N. Y.

Mr. Robert Brodie, President of the Society, in opening the proceedings said:—

GENTLEMEN,—

A year has flown since last we met at our Pomological meeting in Howick. Following a year of plenty, we have almost had a year of famine, as far as fruit growing is concerned. After a severe winter, without our usual snow protection, preceded by an exceptionally wet autumn, the results have been disastrous to the fruit trees throughout our Province, especially in the plum growing regions of L'Islet and Kamouraska. Around Montreal a great many trees were killed outright and a great many were in such a weak condition that they were unable to resist the attack of fungi and insect enemies. Several farmers who have never tried spraying systematically are discouraged and are chopping down their trees. What is wanted is that our Provincial Government should

follow the example of the Ontario Government and employ experts to go through the apple growing regions and instruct farmers how to spray and care for their trees in general. Since this society was first started, we have been indebted to the management and staff of the Central Experimental Farm, Ottawa, for their assistance at our meetings and also in our plant distribution. We must not be discouraged from the effect of our severe winter. I think the outlook is encouraging.

Too much cannot be said in praise of Hon. S. Fisher in the energy he has given to make the shipping of our perishable fruit in cold storage a success. Peaches, pears, plums and tomatoes have been shipped from the Niagara region with a profit to the shippers.

We in the Province of Quebec can ship our choice fall and early winter apples and deliver them in good condition, while without cold storage it was impossible to send them even in fair condition. If they can ship tomatoes from the Niagara region with profit, we should be able to ship them with greater profit nearer the port of Montreal.

My advice to beginners in fruit growing is, not to experiment and plant too many varieties, but to make use of the experience of those who have made it their life work. They should become members of our Pomological Society ; the fee is only $1.00 per annum, and the members get our annual report, full of good information, and they also have the choice of our plant distribution. We have pioneers in fruit growing who are members of this Society, who, I am sure, will be delighted to give all the information that is asked for. We have had meetings all over the Province, but this is the first time that we have been north of the Ottawa.

Mr. Auguste Dupuis, of Village des Aulnaies, read the following paper on

THE EFFECTS OF THE WINTER OF 1896-7 ON THE ORCHARDS OF THE EASTERN PART OF THE PROVINCE OF QUEBEC.

The winter of 1896-97 has been so disastrous to the orchards of both shores of the St. Lawrence, east and north-east of Quebec, that I think it my duty to lay before you this memorandum of our observations on the subject.

The oldest inhabitants do not remember that such general winter killing of the trees ever happened before in our region.

The L'Islet County Horticultural Society made careful inquiries in the surrounding districts and found out that about one-third of the apple orchards were killed or greatly weakened, and three quarters of the Damson blue and Reine Claude plum orchards were also destroyed in the districts of Montmagny and Kamouraska.

These plum trees on their own roots, cultivated since the first settlements of the Province, have kept reproducing themselves by suckers from the roots.

Unfortunately the sprouts from the roots were nearly all destroyed last

winter, leaving the farmers without means of renovating the old orchards or planting new ones.

The orchardists here do not like to plant grafted plum trees of the varieties named, because it is easier and cheaper to use the trees on own roots, and because their seeds supply them with plants, bearing plums generally or mostly alike to the parent tree.

Over a couple of centuries of this mode of plum culture proving its advantage and economy, particularly where the trees are kept in clumps or planted very close, the Horticultural Society of L'Islet County decided to make efforts to find plants of Damson and Reine Claude on own roots, for distribution amongst the farmers who had the misfortune of losing their trees.

I am sorry to say that its efforts were fruitless; very few plants could be obtained and generally they were covered with black knot, rendering their importation in our districts a very bad investment.

We found the orchards of Montmorency County infested with the black knot.

On the Island of Orleans, so renowned for its beautiful and delicious Damson plums, not more than one-fourth of the trees are alive. There, as elsewhere in the county, a want of union exists among the orchardists to fight this plague in the month of July, which is the right time.

I visited the orchards around Stanstead and Montreal, Hemmingford, Covey Hill in Huntingdon County, and went as far as Plattsburg, New York, on the information that the plums named were still grown there, but I went from place to place without finding any.

At St. Henry, Montreal, in visiting the immense orchards of our worthy president, I was amazed at the rich crop of melons, acres of which are cultivated along with fields of onions, on his and the adjoining properties. Unfortunately Mr. Brodie was not at home.

Fruit dealers in Montreal informed me that the two varieties of plums I looked for, had disappeared; the fruit brought to the market came from Quebec and below, and not from the vicinity of Montreal.

Believing that further researches were useless, the Society informed the Honorable Minister of Agriculture, Mr. Fisher, of the great losses sustained by the apple and plum growers of our region, asking for assistance and advice. The Honorable Minister's answer to the Society indicates that we shall receive help from him.

Hon. Mr. Dechene, Commissioner of Agriculture, has acknowledged also the urgency of encouraging the farmers to replant their orchards. He has doubled the grant to the Society, which amount will permit it to distribute this spring three thousand trees amongst the farmers of the districts of Montmagny

and Kamouraska, in lots of 25 apple and plum trees to each person joining the Society and paying 8 cents for the apple and 12½ cents for the plum trees (5 to 7 feet high).

A few days after having advertised this offer of the Society, the secretary had received demands far over the amount of trees at his disposition.

I am convinced that these trees will fall into far better hands than if the Society had made a free distribution, and the Government grant will also benefit a greater number of farmers. If the assistance expected of Honorable Mr. Fisher equals the amount of trees already distributed, it will give a sensible impulse to fruit growing.

I am confident that such a winter as the last shall not happen again and that its costly lesson will teach us how to protect our trees for winters, when there shall be no snow on the ground in November. The greatest damage to trees was in low flat land, either sandy or loamy soil where drainage was deficient. Where the plow had been passed along the rows of trees in the fall, and where the trees were mulched no damage was experienced. On hillsides leaning north, south, east or west the winter killing was as bad in every position to apple and plum trees; but I saw orchards protected from the north on dry sandy hills which did not suffer except in the buds.

Trees on the border of ditches came out vigorous.

The damage where it occurred was by root killing; the trees kept their bark green till August and developed small leaves through the bark near the buds, a fact I remarked here for the first time.

Seedling apple trees of the most robust kinds of Calville jaune, and good bearers too, have given no sign of life last summer.

Not a tree is left of the thousands of Japanese plums planted lately in the county, and it is hoped that no more of this kind shall ever be planted here.

Trees headed low, with branches a couple of feet from the ground, fared better than high standard trees. European plums on Mirabelle and Mariana stocks did not fare better than the Damsons.

Those whip-grafted on the native wild plum of Chicoutimi resisted, except one-year plants whip-grafted low under ground; these were killed at the union of the stock and scion, the stock has survived and small shoots have sprung from the roots last summer.

I am not discouraged by the failure of these young trees grafted underground, because I believe I made a mistake by draining over ground too far from the rows.

Such varieties as the Reine Claude make stronger trees; they emit roots from the scions the first season, when grafted low underground and the soil kept moist by mulching.

Trees in nursery rows, well ridged, did not suffer. Cherry trees of the old French variety on own roots have shown much hardiness of roots. Currants and other small fruits had their fruit buds killed.

Alexander, Duchess, St. Lawrence and Wealthy apples, well protected, produced some fruit.

Pear trees, Louise Bonne, Doyenne d'Ete, Petite Marguerite and Flemish Beauty produced some fruit where the trees stood on high ground.

In the parishes near the shore the damages were greater than further inland on the hills and mountains where snow fell earlier. In these elevated grounds tree buds were preserved from the extreme cold and sudden change of temperature by the ice and sleet which covered the branches and buds on that fatal day of the 18th January, 1897. In the forenoon of that day it rained heavily; the ground was saturated with water to a great depth in the valley and near the St. Lawrence; the wind was warm and from the south. The rain ceased about noon; the water was shaken off the trees by the winds which suddenly blew from the north and northwest and it grew so bitterly cold that in a few hours 28° to 30° below zero was registered.

The ground froze to a depth of 5 feet and over, wells were frozen, springs of water came out of many of the crevasses in the ground, house cellars were flooded by water which could not follow its natural passage in the ground. On that memorable day our orchards, prairies and pastures were doomed.

As I said before, on the mountains 5 or 6 miles inland and from there to the boundary line (Aroostook County, United States) the temperature was cold enough on the morning of the 18th to freeze the rain on the trees and on the ground as fast as it fell, and with this favorable covering, the trees and the fields stood without the least injury the arctic cold which was destroying everything below.

What some people thought to be a mantle of death covering their trees were surprised in spring to see them full of life, budding and blooming nicely. Their meadows and pastures were as green as ever, producing an abundance of grass and forage, which was just the reverse in the valleys below, where the grass and hay failed; and, though farmers plowed their meadows for green fodder, the crop was short and they had to sacrifice many carloads of cattle, cows selling on board cars from $6 to $8 each—very few of the best at $10. The deplorable effects of the freeze shall long be felt by the farmers and fruit growers, and whilst they will work for the recuperation of their farm losses, their little orchards, which used to help them in the years of depression, I am afraid, will be neglected and abandoned.

This is what happened when the orchards of the North Shore were attacked by the Black Knot. The trees were left to themselves and the orchards annihilated.

But then we had no Pomological Society to watch the fruit growers' interests and to suggest means of fighting diseases and insects.

The subject was not even taken up in the Legislatures; hundreds of thousands of dollars worth of trees disappeared, and the people thought that no remedy existed to save them.

I am sorry to have taken so much of your precious time to lay the facts before you, but I do so because it is of importance, and in the discussion which will follow, I believe that practical suggestions from you, who possess science and experience, will greatly help the fruit growers of the East.

THE PLUM TREE.

(By Mr. Charles Baltet, Horticulturist at Troyes, France. Extract from the Treatise on Commercial and Family Fruit Culture.)

SOILS SUITED TO THE PLUM TREE.

The plum tree is one of the fruit trees which are the least particular as regards the quality of the soil. The majority of soils fit for cultivation suit it, provided always that they are neither too clayey nor too damp. Clay which is compact to excess hinders the ripening of its branches. The burning drought of light soil gives it jaundice Nevertheless, a combination of these two extremes would produce good soil for plum trees ; a mixture of lime and black soil would have the same effect. The plum tree has this much in common with other stone fruit trees, that it prefers to manure, light and salty fertilizers and those containing saltpetre Moderately damp soils suit plum trees. This condition, added to the climate, is the chief cause of the success met with in the northeast, west and southwest of France.

SITUATIONS SUITED TO THE PLUM TREE.

The climate of the plum tree is that suited to the growth of wheat and the vine ; its blossom, like that of the vine, dreads the frosts of spring and the fogs. Nevertheless, the plum tree is grown pretty far to the north, and succeeds even where the grape no longer ripens in the open air. In cold countries the delicate varieties suffer and require to be grown *en espalier* ; standards need a calcareous soil and a good elevation.

The plum tree is the tree of the plain ; but it may be also planted on the hill slopes, with good exposure to the sun and shelter from the wind, which might uproot it. In close spots, where the air does not freely circulate, and which are too warm or too cold, such as certain mountain gorges and yards, surrounded by high buildings, the plum tree grows badly or sets its fruit with difficulty—the blossom drops.

This tree is usually met with in gardens and orchards, along the roadsides or in the middle of the fields, in France, Belgium, Luxembourg, in Germany, in the Danubian principalities, in Asia, and America. It grows and bears fruit there to so marvellous an extent that it has become an important item of agricultural and commercial wealth.

VARIETIES PREFERRED FOR THE MARKET VALUE OF THE CROPS.

The Reine Claude and the Mirabelle are the varieties preferred for commercial planting. No other variety can compete with these in the quality of the fruit, either in the fresh state or for cooking or industrial purposes, except for drying ; other varieties are preferred for prune making. In the environs of the capital, among the market gardens, these excellent fruits are met with at every step, principally the Reine Claude, and the same fact may be observed around all the great centres of population.

The Paris market takes annually 2,500,000 kilogrammes of Reine Claudes and 1,500,000 kilogrammes of Mirabelles.

These supplies come from numerous sources. On the lands of several *Communes*, adjacent to Bar-sur-Aube, the Reine Claude trees, scattered among the vines, have yielded 60,000 francs worth in a single crop, while near Sainte-Menehould the figure has risen to 80,000 francs.

During the year 1872 the bourg of Vitry-le-Brule (Marne) made a sale of 100,000 francs worth of plums.

In Picardy, the *Commune* of Beaurieux (Aisne) is literally covered with plantations of ungrafted Reine Claude plum trees, and the inhabitants derive an extraordinary revenue from the sale of the fresh fruit and the distillation of the over-ripe fruit.

The valley of the Marne, on the heights between Nesles and Condé, at an elevation of 230 metres, is, so to speak, wooded with plum trees. In 1879 the trees were so loaded down with fruit that the crop amounted to 75 francs per tree, sold on the tree.

In La Brie, in 1882, a farmer of the neighborhood of Meaux valued at 4,000 francs the revenue of a hectare of Reine Claude's ten years after planting.

Ripe plums have been sold at 45 francs the quintal in Paris, expenses deducted.

Thanks to their climate, la Drome and the Eastern Pyrenees come in the first of the season, followed by La Girsnde. The domain of Taillefer, at Montussan, has 4.860 Reine Claude plum trees, which, while yet young in 1878, already yielded 4 francs per tree ; five years later this orchard supplied the railway station at Saint Loubès and furnished 7,000 francs worth of plums to one Parisian confectioner.

Mr. Barnard—Mr. Dupuis has evidently corresponded with Mr. Baltet, and from what Mr. Dupuis told us last summer it is likely we can get from France the same varieties of plums we used to have in the district of Quebec. Has Mr. Dupuis asked Mr. Baltet whether the varieties which were found so useful here are still in existence in France ?

Mr. Dupuis—The same variety of Damson is in existence. I may say that the Rambolt and Mirabelle have been found most profitable in France, Germany and Russia.

The President (Mr. Brodie)—Gentlemen, you have all heard with pleasure the very interesting and instructive paper read by Mr. Dupuis. It has been very disastrous to the plum growers in Kamarouska and L'Islet to meet with these losses, but I hope they will succeed in replenishing their orchards with some of those old varieties.

Mr. Barnard—Can we get them on their own roots from France?

Mr. Dunlop—I believe that last year, even though we had them on their own roots, they would freeze. We know that the wild native plum is hardier than any European variety, but not so good a grower. So far as hardiness is concerned, very few trees could stand a winter like that. The trouble with plum growing in this country is not so much want of hardiness in the tree as in the fruit buds. When a European plum tree bears a heavy crop here the tree becomes weakened and a severe winter kills it.

Mr. Newman—Did your trees suffer last winter?

Mr. Dunlop—I had trees of the "Yellow Transparent" and even "Wealthy" trees killed, and plum trees planted between them escaped all right. That is very strange, and one finds it difficult to account for it.

Mr. Hamilton—With regard to the "Reine Claude" plum, you can get the seed from France, and it is well known in France that the "Reine Claude" come from their seed. Most of the great French nursery men keep it for sale. I on one occasion bought some seeds. We did not get many plants, but what we did get bore Green Gage. It would be a comparatively easy matter to grow them by ordering the seed.

Mr. Barnard—If they are growing them in Canada we could easily get them.

Mr. Dunlop—Some seedling varieties of plums and other trees will reproduce themselves from seed, but it is a question if they will do so if they are not grown on their own roots. There is a great difference.

Mr. Hamilton—I have raised seedlings from the "Yellow Montmorenci," and they pretty fairly reproduced themselves; that is, from trees grown on their own roots. I have never succeeded in growing anything similar in fruit grown on grafted trees. We would stand a better chance of the fruit reproducing itself on its own roots than on grafted trees.

Mr. Dupuis—We could get those trees from France very cheaply.

Mr. Dunlop—We could get plum trees on their own roots from cuttings. I experimented once, and took a few cuttings and put them in a little green house and succeeded in getting several to root. I have got some good trees from them.

The President (Mr. Brodie)—What five best varieties would you recommend for a locality such as this?

Mr. Dunlop—I do not know that I would recommend any five varieties of European plums for commercial purposes in the district of Montreal.

Mr. Dupuis—How did you find the plum trees on your visit to L'Islet County?

Mr. Dunlop—I found them doing very well indeed, and I came to the conclusion that you have not such severe winters there as we have in Montreal.

Mr. Newman—Except last winter.

Mr. Dunlop—The large body of open water must affect your climate in L'Islet. We cannot grow plums in Montreal as well as you do in L'Islet.

Mr. Hamilton—My experience is that plum growing is impossible here. "De Soto" and "Forest Garden" do fairly well. The latter is a fine plum; the tree really bears very heavily, but it will not sell in the market with the "Gages" and "Orleans;" it will not fetch half the price. If we could grow a sufficient quantity of "Arctic," which is fairly hardy, grafted on our wild plum, it bears well, but from some cause I have never been able to discover they die off. I have had it in my mind for some years to have them root grafted and bent down after a year's growth so that they would root upon the graft. I have not done it, but if we did that I think the "Arctic" is sufficiently hardy to give us a good crop of plums. It is a very good plum and sells well, and we do not seem to care what else a plum or an apple is if it sells well.

Mr. Dunlop—There is no question about the Northwest varieties bearing well, and the fruit buds stand a greater degree of cold than the European varieties will. When the thermometer goes 25° below zero you will very seldom get anything from the European varieties.

Mr. Hamilton—I had some small crops from the European plums, but they succumbed and had not vitality enough to continue their growth.

Mr. Fisk—What do you think of the "Lombard"?

Mr. Hamilton—I have had a few ever since I came to Grenville and never got a plum.

Mr. Dupuis—Mr. Dunlop saw some "Lombard" plum trees bearing heavily. We had them for thirty years bearing well, and we have very often 25 degrees below zero in our part of the Province. The trouble is that the cold came too rapidly last year, but when it comes gradually it does not do so much damage. If, in the case of the "Lombard," you take off the leaves in August and bend the branches, you are sure to have a crop the following year.

Mr. Hamilton—The snow goes so high as to cover the telegraph poles down in L'Islet and that may account for your good crop of plums (laughter).

Mr. Fisk—Among the European varieties, I found that the "Lombard" has stood better than anything else, although it is not perfectly hardy. Anything you can get as hardy as the "De Soto" bears well. The Russians have been, so far, very shy bearers with me. The "Trabiche," which resembles the "Lombard" in color and flavour, is the best so far. It is about ten days later than Lombard. I have often questioned whether it was not a Russian Lombard.

Mr. Wood—I have a few Lombard plum trees and I have never had but a stray plum or half a dozen on a tree. They seem to be very healthy and the wood is as sound as could be desired. I know of three or four varieties of native plums that are grown in Knowlton. They grow from suckers, and, in my experience, they are a far better plum than the De Soto. If we could propagate some of our native plums we would have better success and more satisfaction.

Mr. Barnard—The suggestion of Mr. Dupuis about the bending of the Lombard branches in the previous August is worth remembering. If the trees grow too fast in the fall, of course the wood cannot mature, whereas, if the whole of the sap is brought down in August to succour the tree the result would be different. The trouble with me is that trees lately planted grow too much. I think Mr. Dupuis' suggestion should be taken a note of to see how it would work elsewhere. It seems to be a natural bend with Mr. Dupuis' trees; his trees were so heavily laden that they bent to the ground with fruit.

The President (Mr. Brodie)—The only Russian plums that ever bore with me was one time my market man let the horse go loose and bent the tree right over.

Mr. Malcolm Smith—I have been working a farm about four miles from Lachute and I tried the Lombard and some other varieties. I have had some good crops from them. I was advised to trench and we had a good crop of plums the following season. They tell me that in New Brunswick they do that and bend the tree every season. They lay the tree right down. I tried it and we had a fine crop.

Mr. Hamilton—I was in New Brunswick on the orchard of a very successful plum grower there. He had some thousands of plum trees, and they were all laid down in winter. As I saw them, they were lying with their heads upon the ground, and I think they were fastened down. They bend the trees to the southward and keep the roots on the south side and leave the roots entire on the east and west. They bend them down to the ground so that the snow covers them completely. Mr. Sharpe, of New Brunswick, told me of the great crop he had. I had corroborative evidence in Moncton where I saw 2,000 boxes of these plums, each box containing two gallons, sold there at 75 cents a box.

The Sharpes sold their plums for several thousand dollars in Boston. I believe this process helped to ripen the wood very early by the cutting of the roots. I believe they cut the roots before they laid them down, or, sufficiently early to check the growth. The crops they talked about were enough to make one's teeth water without seeing the fruit. As I saw the trees I should think

they were about 8 or 10 feet in height, with perhaps 6 feet separating them. I think they told me that some of the trees gave two and three boxes each.

Mr. Barnard—Is the tree erect after the bending ?

Mr. Hamilton—They raise them in the spring and stake them.

Mr. Selwyn—How would they be affected in a winter when there was very little snow ?

Mr. Hamilton—If they had such a winter it would be as it was in this part of the country last year.

Mr. Selwyn—Would not straw act as a good protector.

Mr. Hamilton—I prefer branches to straw. This experiment I speak of must have been carried on for several years.

Mr. Barnard—I think our secretary should correspond with Mr. Sharpe, of New Brunswick, to ascertain what his process is.

Mr. Carter—Mr. Hamilton says, that, barring one crop, his plum trees seem to die ; would not fertilizing help?

Mr. Hamilton—In this case when a few plums appeared it seemed to destroy the vitality of the tree. It might be assisted by the use of a fertilizer, but I do not think it. It seems to me that the tree has not vitality enough to carry it through in our district. It is a question that would require a considerable scientific insight into. They may determine something of that kind at the Experimental Farm, but with men situated as we are our time seems to be so taken up with necessary everyday work we cannot attend to it.

Mr. Dupuis—Years of experience in fertilizing plum trees teaches me that you cannot make wood and fruit buds in the same year and produce a crop the following year. If you do not feed the tree while it is producing the crop you will get nothing the following year. Last year was the eighth year we had good crops of plums.

Mr. Barnard—There is no question that Mr. Dupuis' trees were very highly fed. There was a heavy grass crop and four or five inches of wood shavings on the manure. That was the eighth crop for Mr. Dupuis and the trees were so laden that they came to the ground. The trees were much in the shape of umbrellas.

Mr. Dupuis—In France the farmers have a crop every year and they manure their trees.

The President (Mr. Brodie)—In visiting the Ottawa Experimental Farm last September, what impressed me was to see these seedlings, four or five years from seed, in the Northwest varieties heavily laden. There was the "De Soto," "Wolf" and "Rolling Stone," which I think Mr. Craig recommended.

Mr. Hamilton—I gather from what Mr. Dupuis has said that one of the chief things in plum-growing is to have the soil moist in addition to the trees

being well fertilized. He fertilized the ground with manure and then covered that with shavings. Mr. Dupuis' soil was cool and deep and rich and he had some of the finest crops I have ever seen. I remember that when I was a lad in Mr. Dunlop's neighbourhood, I saw some grand crops of plums in a cool soil near a fence It seems to me that a cool, deep, moist soil is the best for plums.

BEE-KEEPING.

A review of the bee-keeping industry in the Province of Quebec and the Eastern portion of the Province of Ontario, during the season of 1897, by Percy H. Selwyn, Ottawa :

In the section of Canada to which this paper more particularly relates, bee-keeping during the past season has not as a rule proved very remunerative, and reports from all quarters indicate that the yield of honey was a long way below the average, both as regards quality and quantity. It will, I think, be both interesting and instructive to follow the season throughout its course and thereby endeavor to investigate the "cause and effect" of certain conditions, climatic or otherwise, on this industry.

The spring of 1897 opened fairly early, and bees were placed on their summer stands soon after April 5th, and where proper precautions and care had been taken in the various methods of wintering they came out of winter quarters in good condition and with comparatively little loss. For some time after being put out everything progressed favourably; queens began laying rapidly and the bees gathered pollen freely from the opening blossoms of the soft maple and willow. Unfortunately, this state of affairs was not destined to continue, as a period of cold weather, accompanied with snow, followed, and just at the time when, under ordinary conditions, the bees would have been gathering their first harvest of nectar from the full blown flowers of the soft maple, several days and nights of severe frost occurred, which completely withered the blossoms and destroyed this source of supply. Then the bee-keepers' troubles began, and for several weeks it required the greatest watchfulness and care to prevent indiscriminate robbing, indeed, in my own apiary, the attempt was made with such determination that in the end I was obliged to move some half dozen colonies, which were the special objects of attack, to a distance of about a mile, and by this means, combined, perhaps, with feeding every night, the danger for the time being was overcome, but it was particularly noticeable that at no time during last spring, even up to the middle of June, was it safe to offer the very slightest chance of robbing, as it would only too surely be taken advantage of by the bees, and, unless noticed in time, be certain to end disastrously to some one or more of the colonies.

I have since learned that the loss sustained from this cause alone was very considerable in a number of apiaries. No one appreciates more fully than I do the absolute necessity for observing every precaution to prevent robbing in an apiary, but at the same time, after taking into consideration the extraordinary dearth of nectar which prevailed for such a long period last spring, I believe that in the case of bee-keepers who never even thought of feeding their bees

(and I am convinced there were many such), the destruction of a few, probably weak colonies, by robbing, and the dividing up of the spoils amongst the remainder, was perhaps the best thing under the circumstances, and was, at all events, carrying out the old law of nature in "the survival of the fittest." All through the month of May, and, indeed, a very considerable portion of June, it was a case of "hoping against hope" in so far as any honey flow was concerned. The white willow, or English willow, as it is often called, and which generally yields an abundant supply of nectar, came into bloom with great promise, but, alas, it, too, was scorched by several nights of frost, and the bees scarcely visited the flowers of this tree at all. Then followed the time of fruit blossom, such as apple, cherry, plum, etc., usually yielding a bountiful harvest of nectar, not forgetting our bright-faced flowers, the dandelions, which, as a rule, prove true friends to the bees, both as regards pollen and honey, but all through that period I could not see that colonies in any of the apiaries visited were gaining an ounce in the way of new honey, but only making sad inroads into the then small supply left over from the winter store, and in addition to this, in my own and several other instances noted, they were using up in brood rearing the allowance which was regularly being supplied to them by means of feeding just before dark. I think most bee-keepers about that time were feeling pretty blue, and there really seemed to be only one gleam of sunshine in the otherwise most decidedly gloomy outlook, and that was that in the case of those who were feeding systematically brood-rearing was progressing at a tremendous rate, and there was the satisfaction of knowing that if a flow of honey did come the bees would be on hand in thousands to gather it. Never before have I seen hives so full of brood in all stages as mine were about the second week of June and I feel convinced that this resulted from the stimulative feeding.

It is well known that in seasons when the early flows of honey are at all abundant, the bees almost invariably reserve the two outside frames in each hive for storing honey, in addition to a narrow half-moon shaped strip at the top and sides of the other frames, but owing to the scarcity last spring the queens had it all their own way, and no sooner was any of the old honey uncapped and used than the empty cells were cut down to the requisite length, and eggs deposited in them until at last eggs and larvæ occupied the entire eight frames of the Langstroth hives, and in the case of young and prolific queens it seems quite probable that they could have used even more space had the hives been sufficiently large to accommodate a greater number of frames. It must be understood that this condition of affairs existed only in apiaries where the bees had plenty of honey to keep the larvæ well supplied with food and not much to spare, and this is where beekeepers, or perhaps I should say *bee masters*, who kept a close watch on the requirements of their respective hives and fed steadily and systematically as required, would be almost certain to reap a well merited reward, not only in surplus honey when the flow came, as it did, to a certain extent, early in July, but also in plenty of strong and vigorous swarms. There were no doubt some colonies, more particularly in the old fashioned "box hives," which went into winter quarters in the autumn of 1896 with far more honey than they could possibly use during the ensuing winter; these would probably pass through the period of scarcity without much if any

injury, but at the same time it is very doubtful if brood rearing would be carried on under these conditions at anything like the rapidity with which it would had the bees been able to supplement the old store of honey with a fair supply of new, either from the flowers or by means of being artificially fed. It is a somewhat strange fact that these interesting little insects have a decided objection to uncap and use for brood rearing the old honey in the hive during a period of scarcity, and although it is not to be supposed that they would allow existing larvæ to actually starve to death rather than do so, still it is almost certain that the queens would not begin to approach their full laying capabilities; and after all, this is but the prompting of a wonderful but at the same time very natural instinct on their part, because did they lavishly use up all the stores in the hives in excessive brood rearing, when no fresh supply of any consequence was to be obtained from the flowers, it could only ultimately result in the destruction by starvation of the whole population.

In order to give some idea of the exceedingly heavy demand there was last spring and early summer on the previous season's supply of honey, I will give the results of an experiment made in this connection. In the summer of 1896, I purchased, partly for the purpose of observation, a colony of bees in an exceedingly large and primitive looking box hive; its dimensions were about 18 x 18 x 24, outside measurement. This hive, if it could be called such, was all nailed up hard and fast, had a large V shaped notch cut near the bottom board as a means of entrance, and certainly looked as if it might have been in use for many years. Before putting away my bees for the winter I weighed all the hives and found to my surprise that this particular "jumbo" weighed 150 lbs. gross. The following spring it was again weighed with a loss of 15¾ lbs.; this of course was occasioned chiefly by the consumption of honey during the winter. Although strong in bees, to prevent any possibility of robbery last spring, the entrance was reduced considerably, and there is no reason to suppose that any honey was taken out of it in this way. The swarm which issued from this hive early in July was not a particularly large one, and yet on weighing the box about 21 days after the swarm issued it was found to have decreased in weight just 74 lbs. Subsequently on investigating the interior I noticed that there was certainly not more than 4 lbs. of the old honey left, and a small quantity of new, evidently gathered shortly before the swarm issued. From this it will be seen that over 70 lbs. were consumed in about 10 weeks. I think all beekeepers will admit that the most profitable colonies, in so far as actual yield of honey is concerned, are those which by skillful management are kept continually at the point of swarming during the honey season, but at the same time are deterred from actually swarming. During the past season this was a most difficult thing to accomplish. I must admit that many of the old established rules in regard to beekeeping were completely set at naught by the bees themselves. Apart from my own experience I have heard of many instances where last summer they swarmed out of new hives after having been apparently comfortably settled in them for perhaps a week or ten days. On opening a hive so deserted, no good reason was perceptible, as the work of the hive had evidently been going on in the ordinary course, that is to say, that the eight sheets of wax foundation in the brood chambers were all drawn out into cells, many of which

in the middle frames held both eggs and larvæ in considerable numbers; there was also some honey, though as a rule not much, and of course the inevitable queen cells containing larvæ in a more or less advanced stage, without which the bees would certainly not have left the hive after having remained in it long enough for both eggs and larvæ to be present. It is doubtful if the question as to what caused the bees to build queen cells so early in the life of their new home is one which can be answered with any degree of certainty, but the idea suggests itself that possibly two or more causes may have produced this undesirable and fortunately most unusual result, viz.: 1st, a very irregular and intermittent flow of honey; 2nd, a period of abnormal heat; and 3rd, exceedingly strong swarms. With an intermittent flow of honey the bees are busy one day and perhaps idle the next, or in other words, as long as there is any secretion of nectar in the particular kind of flower from which the supply is being derived, the bees are continually passing in and out of the hive in thousands, but should the flow suddenly cease, as there is no doubt it did several times last summer, they simply return to their respective homes and the great majority stay there until another flow is heralded. Under these conditions and with intense heat such as prevailed in July last, it can easily be imagined that the hives during the day were most uncomfortably warm, and the bees, having nothing in particular to do, soon became restless, the swarming fever took possession of them again, queen cells were started, and as soon as these were sufficiently advanced, away the swarm would go, leaving the hive in a miserably weak condition. Bees appear to be not unlike human beings in some respects, and particularly as regards getting into mischief when idle, but there is always this difference, that with them idleness during the summer is rarely if ever a voluntary condition. It is worth mentioning that swarms leaving a hive in the way I have just described appear to be particularly prone to fly a long distance before clustering and not unfrequently abscond altogether.

Reports were most conflicting as regards swarming. I heard of quite a number of instances where from apiaries of 20 to 30 colonies not more than one or two swarms issued; then, again, other cases where swarming was excessive, and extended over a most unusually long period, and I know that in my own apiary swarming was going on merrily) for the bees, but not for the beekeepers) from the 5th of June until the middle of September. In my case, the swarms which issued early in June were from Carneolan and Italian stocks, and a peculiar feature was that they swarmed when there appeared to be absolutely no honey available, except what I was feeding, apart from the small supply they took with them into the new hives. I could not see that they were able to gather any, and I was obliged to feed them for some little time, in fact more or less till the end of June. As regards this overabundance of swarms in some apiaries and practically none in others, where the prevailing conditions seemed otherwise to be similar, it may reasonably be supposed that such entirely different results were not simply the outcome of chance, but were occasioned on the one hand by care and watchfulness in providing a steady supply of food when required, and on the other hand by neglect or lack of observation, possibly both, and perhaps placing too implicit trust in Providence. There is no doubt that an impression quite commonly prevails to the effect that when there are flowers in abundance

there must be food for bees. However often this may be the case it certainly was not so last spring, and the climatic and atmospheric condition appeared to be all opposed to the secretion of nectar in flowers which, under other conditions, would have yielded an abundant supply. Had there been more sunshine, and particularly warmth, in May and June, and not such abnormally cool, cloudy weather, followed by intense heat in July, our bees in the Province of Quebec and the eastern portion of Ontario would, I feel sure, have been able to give as good an account of themselves as did their relations in Western Ontario.

In the district to which this paper relates, it is probable that there was a good deal more white clover honey gathered during the early part of July than is generally supposed, but on account of the exceedingly small quantity of honey in the brood chambers at the time, all, or nearly all of this light colored and best quality of honey was stored in them, and is now being used by the bees themselves. Had there been much linden or basswood honey following the white clover this would probably have appeared in the sections or extracting supers as surplus, but, unfortunately, although the linden trees produced plenty of flower buds, two-thirds of these never matured, and it is almost certain that this is mainly to be accounted for by the enormous number of caterpillars of two distinct species which devoured so much of the foliage of this and many other trees during the early part of last summer. In addition to these pests, I also noticed a large aphis or plant louse which further mutilated the leaves of the basswood by raising large blisters on them. I am not sufficiently versed in entomology to correctly identify these various pests, but think I am correct in stating that the caterpillar which did the most damage is commonly known as the "tent caterpillar" from the resemblance to a tent of the web in which the young caterpillars pass their early days. In concluding it occurs to me to say that although the past season has not given very satisfactory results to bee-keepers as regards actual dollars and cents, in consequence of the fact that the comparatively small quantity of surplus honey obtained was all more or less dark and gathered late in the season, probably from buckwheat and golden rod or a mixture of both. It has, nevertheless, been the means of teaching many interesting if somewhat costly lessons in apiculture, and there is, after all, much to be thankful for, if only in the fact that even moderately strong colonies were able to gather sufficient honey of one kind or another before the close of the season to carry them safely through the long winter months, and to start them on a new, and, let us hope, more prosperous career next summer.

The President (Mr. Brodie)—I think we had better hear Mr. Wintle's address on Bees and Bee-keeping, and then we can discuss the two papers together.

Mr. Gilbert Wintle, of Como, read the following paper on

BEES AND BEE-KEEPING.

Up till now, that is to say, in the two former papers which I have had the honour to read at these meetings, I have thought it right to remember that this Society is first and foremost a society of fruit growers, and consequently that, in dealing with bees, I should take the line, not as a bee-keeper addressing his

fellows, but rather as of one who would explain to non-bee-keepers, or, at best, to box-hive bee-keepers, what sort of a thing scientific apiculture by modern methods really is.

But as this is the third successive meeting at which bee-keeping has figured on the programme, it seems fair to conclude that the Society has decided to consider this industry no longer as an outside subject, but as coming hence-forward definitely within its scope. If I am right in this conjecture a mere descriptive paper would be out of place. I have, therefore, brought, as my contribution this afternoon, a few simple hints on practical bee-work, and I wish to preface them by explaining that they are chiefly addressed to the small bee-keeper, the man with anything between one hive and a dozen. When he gets to keeping more than the latter number with success he probably wants no hints from me.

My first hint is on the rendering of wax.

Though there are many differently named wax extractors on the market, for practical consideration all these are reducible to two main patterns, the "solar," in which the wax is melted by the agency of the sun's rays acting through glass, and the "steam" wax extractor, which works over a stove. Whichever pattern the man with a large apiary decides to adopt, speaking loosely, all he will have to do will be to feed in his dirty old combs at the top, and draw off bright yellow wax at the bottom. Now that I have worked my apiary up to fifty hives, I intend to treat myself to a "solar" wax extractor this coming season. Hitherto I have contented myself with doing what the small bee-keeper will always do—namely, melting my wax in an open vessel over boiling water. There is a certain amount of work attendant on this method; but I have had no reason to be dissatisfied with the result. My implements have been an iron pail, coated with tin, a yard of cheesecloth, and two flat pieces of lath; my *modus operandi* as follows: Fill the pail one-third full with pure rainwater, and place it on the fire; then as the water gets hot—though not necessarily waiting until it boils—begin to crumble in your comb, which continue, a little and a little, as it melts in the hot water, until the pail is full; that is to say, one-third full of boiling water, and two-thirds full of wax and sediment. Then pour it holus bolus onto the cheesecloth, which is spread over the mouth of a crock, or of a second pail. If wax was not a substance which cooled rapidly, it might now be left to drain; as it is, some quicker process has to be sought. I gather up the four corners of the cheesecloth, and hitch them to a cord, which hangs ready from a beam. Supposing the water to have already drained through, we have now a kind of bag of hot wax and sediment hanging over the crock or pail. This bag is much too hot to squeeze with the hand; and this is where the sticks of lath come into play. If I am working alone I tie them together at one end, and so use them like a gigantic pair of nut crackers; but I generally get help in this operation; in either case my method is to begin squeezing at the top, and gradually work down, until all the wax is expressed, and nothing remains in the cloth but a caked mass of sediment chiefly old cocoons. This I throw away. In a few hours the wax in the crock or pail will have cooled into a cake, which may be lifted out, and the water

poured away, ready for a fresh lot. If any impurities have forced their way through the cheesecloth, they will be found on the underside of the wax, where they may readily be scraped off.

And my plan is never to let old combs accumulate to breed maggots and moths, and even worse evil; but, as soon as I have a pailful, to melt them down in this fashion. Then at the end of the season I have a single remelting (without straining) of all my wax, and it is ready for the market.

And now for the point of all this. To begin with, let me say that I claim no especial virtue for my bag of cheesecloth and two sticks. Some people sew their old combs up in sacking, tie a weight to the bundle, and sink it in the kitchen boiler; then as it melts, prod it with a stick, with the result that the wax works out and floats on the top of the water, but the impurities remain held by the sacking. There is another plan, with a farmer's big iron kettle and a sort of improvised press. I have no doubt but that either of these ways is just as good as mine. But what I do lay stress on, is the use of nothing but pure rain water. River water *may* deteriorate wax, and well water is almost certain to do so. The chemistry of the matter is simple, and turns on the fact that if the water contains lime (which well water practically always does) that lime combines with one of the constituents of the wax, so that the cake which cools is not really wax at all. A very slight trace of lime will injure the quality, and if the water contains much lime, the wax will be practically worthless. And I do not think that this fact is sufficiently known. At all events when two neighbours of my own told me that they get less than half the price per pound for their wax that I got, I found, as I had expected, that they were in the habit of melting it in a farmer's big kettle of well-water. From the appearance of the resulting product my only surprise was that they were able to sell it at all.

On this subject one word more. In books you will see it stated that limy water may be used without harm if, before the comb is put in, a little acid is added. Chemically this is correct enough; and might be valuable in a country where it never rained. But where rainwater is obtainable, I can scarcely imagine that anyone would wish to bother with acid; it is an extra expense, an extra thing to think of. If you put in too much you are apt to damage your boiler bucket, kettle, or what not; last, but not least, it means keeping a poison about the place. Rainwater is just as good and twice as simple.

My second hint is with regard to unfinished sections.

Few things are more annoying to a bee-keeper than to find, at the end of the honey season, that he has a lot of half filled sections on his hands. He cannot sell them, to extract from them is but a messy job at best, and there is no way to employ them for the bees' use in winter. A plan which I have adopted with great success is as follows:

Although most of my bees are in home-made chaff hives, last season I had one colony in a "simplicity." Towards the end of the clover harvest I packed two crates full of half filled sections, and put one above, and one below the "simplicity." On removing them at the end of a week I found nearly every

section in the top crate beautifully completed, and most of those underneath thoroughly cleaned, ready for bait sections the following year. At the end of the autumn harvest I repeated the experiment with the same success as before. For neatness, for small trouble, and for general effectiveness, I never heard of any plan which beats this.

The third and last point on which I wish to touch is that of the size of entrances, and notably of the new idea of making the bottom boards so that they give a deep entrance on one side, and a shallow on the other. When I say new idea I mean only that it is new to me; and more or less new, I fancy, to the generality of the rank and file of bee-keepers.

As to the utility of a good big entrance for summer, say three-quarters of an inch by the full width of the hive, to be used from the opening of clover till the closing of buckwheat, and above all things, as to having a good space under the frames during the same period, I can say that I have found it a very good and useful thing, especially in preventing outside clustering, so heart-breaking for the bee-keeper to see, while he knows that a harvest of honey is going to waste for want of labourers. However, all this has been said before by men who have tested the matter far more thoroughly than myself. What is, perhaps, of still greater importance, the big supply dealers seem to be coming round to the plan, and making hives with reversible bottom boards, one side giving about three-quarters of an inch under the frames, the other only three-eighths. I, making from fifty to seventy hives for my own use, am making the bottom-boards entirely on this plan.

And here is the point which I wish to make. Has it ever struck anyone that in making a bottom-board of this pattern one has at the same time a very good autumn feeder. Even with plain bottom-boards, one hears of quick autumn feeding by wedging up the front and pouring syrup through the entrance; but with plain bottom-boards I do not recommend the practice; my own experience being leakage of syrup and drowned bees. But where the bottom-board is practically a tray with raised sides, it should be another story. Even with bad carpentry a few months' use would propolize everything syrup tight, and as for drowned bees, there would be room to lay some sticks under the frames, which would avoid that disaster. Or a light grating might be constructed and placed in the hollow of the bottom-board. Then, with a piece of shingle under the front, autumn feeding should be a very quick business.

I hope I have made it clear that while on the first two subjects, namely wax rendering and completing half filled sections, I speak from personal experience; on this third matter, of using the new kind of bottom-boards as feeders, I am only suggesting that others should try it—as I intend to do myself.

Mr. Wintle—In America and all over this continent you use the frames from back to front, but in England we do it either way. I have always used them transversely. Is there any reason against that, Mr. Selwyn?

Mr. Selwyn—I have a few of the others to experiment with, and I cannot see that there is any difference. Perhaps sometimes in the spring brood is more

likely to get chilled in the frames unless they run crossways, but I never suffered from any chilled brood.

Mr. Wintle—If that is so, the cross-way frame is the best. Because in the spring whenever you are doing stimulative feeding you can have at the back part of the hive an arrangement to keep the feeder in.

Mr. Selwyn—I do not know why the Langstroth hive has come so much to the front, except that honey produced in these hives is usually first-class if the bee-keeper understands his business.

Mr. Wintle—It is the first frame that has been made with the frame not too deep. I think myself the frame is a great deal too long. I use a frame adopted by the British Bee-keepers' Association which is the same depth as the Langstroth but not so long.

Mr. Selwyn—I never used a shorter frame, but I have used them deeper. I do not like the deep frames because the bees are prone to put more honey than they should down below before they go above.

Mr. Wintle—Mr. Selwyn has a good deal of Canadian experience as to the amount of stores actually required for the winter, and also as to the amount necessary to carry on the brood.

Mr. Selwyn—In no instance should bees be left with less than 25 lbs. net weight of honey. I never let them go into the cellar in the autumn unless they weigh 55 pounds gross; if there is more honey than that 25 lbs., so much the better, so long as there is not a great deal more than they need. If they have much more than is necessary, in the following spring, should there happen to be a heavy flow of honey, there will be a lot of honey in the brood chamber which should be occupied by the brood. This decreases the queen's laying capability, because there is not sufficient room. Often when that happens she will lay four, five or six eggs in the same cell, all packed in, one on top of the other.

Mr. Dupuis—How do you winter your bees?

Mr. Selwyn—I have always wintered them in the cellar. I simply carry them into the cellar exactly as they are on the summer stands and remove the heavy covering and leave the light, unpainted cover or honey board, which is not quite three-eighths of an inch thick, and which is to a certain extent porous. It is porous enough to allow of a certain amount of moisture passing through and also to absorb somewhat of the moisture from below. It allows in the Langstroth hive a complete passage way over the frames, so that the bees do not require to go round the bottom or over the ends. After I put them in the cellar I go round with a screw-driver and loosen the bottom of the hive. In the autumn when I carry them in I have nothing to do but unhook the bottoms and break them loose from the propolis, and then put in a block which slightly raises them up. Any time in the winter I can walk along with a lamp and by looking see the cluster hanging to the frames, and it does not disturb the bees in the least. You can just see the gentle movements of their bodies as they are hanging in the cluster. They all hang tails down, and there they hang from

the time you put them in until the spring. Often when you pay them a visit you will find a bunch of bees moved. They do not go in a grand march to any part of the hive, but they move gradually, following the food. I never disturb the bees more than I can possibly help, because as soon as the bees are frightened they immediately fill themselves with honey, and the less they consume the better for themselves Bees are very cleanly during the winter, unless they get dysentery, and there is nothing which injures them more than putting out excrement into the hive in winter. During the whole period of wintering, say for five months, if they are in good health, they never put out any excrement. It will be easily understood that if they go on eating food rapidly they are compelled to eject the excrement, and that means dysentery, which is most fatal to bees because it fouls both the hive and the honey. Colonies will come through in the spring after having had dysentery, but they will probably be very weak. As soon as their bodies become distended with this excrement, they become restless and keep wandering about the hive hoping to be able to fly, and they do sometimes fly in the cellar and fall on the floor. When the bees are wintered under perfect conditions, the hives are as clean in the spring as in the fall, with the exception of some little particles of wax from the cappings of the cells. Apart from that and a few dead bees there should be nothing more in the hives than when you put them away in the fall. I do not think I have ever seen such a small death rate as this year. I have yet to see the first sign of excrement in any one of my whole sixty-five colonies.

Mr. Dupuis—At what temperature do you keep them?

Mr. Selwyn—The cellar has never gone below 42 and has never exceeded 48. I think the very finest temperature is 47. It has varied very little this year, possibly because of the normal temperature we have had. I have no heat in the cellar at all.

The President (Mr. Brodie)—Have you no means of heating the cellar if there is intense cold?

Mr. Selwyn—It would never touch freezing point in the cellar. The increase in temperature from so many colonies of bees in the cellar is considerable. They are wonderfully warm little things, apart from their business ends, which are particularly warm. (Laughter.) Frequently when they have been swarming I have run my bare hands into the middle of the cluster and you would be perfectly astonished at the heat. It is exactly as if you put your hand into a warm oven, and yet there is nothing but the natural heat of their bodies.

Mr. Fisk—Do you stack one hive above the other?

Mr. Selwyn—There is no reason why you should not, if there is a strip placed between the hives and a space of four or five inches between each tier. My hives are almost touching each other, but the bees never mix in winter time and never seem to break their respective clusters at all.

The President (Mr. Brodie)—I got a present of one of these old-fashioned hives you mention and I bought two Langstroth hives. I had two swarms. I

put those small sections above, but we could not get the bees to go up and make any honey.

Mr. Selwyn—That was last summer.

Mr. Brodie—Yes.

Mr. Selwyn—Yours was not a unique instance in that respect.

Mr. Brodie—They would hang below and would not go up.

Mr. Selwyn—That was probably because the honey flow was not heavy enough, or else the swarms were not big enough to gather at the time. There were hundreds of bee-keepers in the same position. I know of one with ninety colonies and he never took a pound of surplus away. The bees came through the winter all right, but they had no honey on hand to feed them in the spring. They went into winter quarters with plenty of stores, but in the spring the new supply stopped and the queen stopped laying. There were plenty of fair-sized colonies which did not give any surplus. If a man wants surplus honey he must have his colonies strong.

Mr. Dunlop—What are the causes of diarrhœa or dysentery in bees?

Mr. Selwyn—Excessive changes in temperature will do it. For instance, if your furnace goes out and the cellar becomes extremely cold, and you light it again and make the place warm. I do not think that, with plenty of ventilation, moisture affects them so much as changes of temperature. The reason is that when it gets very cold the bees draw into a small space; as soon as the temperature goes up to 70° or 80° they think summer has come and they run about the hive, breaking the cluster and eating a lot more honey than they would do otherwise. In excessive changes of temperature they start brood raising, which is also a bad thing. They try to feed the young larvæ with honey and pollen, which, if carried on to any great extent, will invariably give the bees dysentery. I am sure that excessive changes of temperature has more to do with it than anything else.

Mr. Dupuis—What do you think of wintering them out of doors?

Mr. Selwyn—I have no objection if we could be certain that we would not have these extremes of warmth and cold, particularly the cold. I do not think that bees will come through many days of 30 below zero without heavy loss, particularly so if the supply of food gives out, as they will break the cluster and then become chilled and will drop down and die.

Mr. Dupuis—When I was a boy we had straw hives and we wonld cover them with snow in the winter and the bees came out all right in the spring.

Mr. Selwyn—I do not think that in those days people knew what "all right' meant.

Mr. Dupuis—We got them out alive.

Mr. Selwyn—There is a great difference between taking them out alive and in taking them out in the same condition as you put them in in the fall. You

would have a great many dead bees under that system. It is not that the queen cannot lay enough eggs to bring the hive up to a strong colony, but she will not lay more eggs than she has got bees to cover the eggs.

Mr. Dupuis—I think the reason was that the straw hives were warmer than those we use now.

Mr. Selwyn—We never heard in the old days of the phenomenal yields of honey that we do now with modern appliances. It was then a case of the survival of the fittest. Nowadays a man thinks he is doing badly if he does not get eighty pounds surplus, and the summer before last I got an average of over 105 pounds to the colony. In the old days every time you took the honey you destroyed the colony, but I can get $6.50 a colony for my bees now.

Mr. Barnard—How do you arrange your bees in the cellar?

Mr. Selwyn—I raise them about two feet from the floor on trestles.

Mr. Wintle—Of course I am only in my second year in Canada, but I winter my bees outside, and so far this winter my bees are doing splendidly. There is Mr. Jones, who is about the biggest bee-keeper in this Province, and I have corresponded with him about it, my previous experience being English. He tells me that so far he has done about half in the cellar and half outside. But now he is starting a new apiary of 25 colonies, all to winter outside. It has always been acknowledged, both in Canada and the United States, that there are some bee-keepers who always believe in the cellar and you cannot make them believe in anything else, and there are others who believe in winter-ing outside. I hope never to have any more in the cellar after this year if everything goes as it promises. You must have more expensive hives to winter outside, but you will have a great deal less trouble. The thing that outweighs everything else is that if you have a cold spell in the spring you do not have your breeding thrown aside. If you have your chaff hives well prepared the bees will hardly feel a cold spell. It may be that in years to come, I shall find it advisable to have a few of the weak ones in the cellar. My experience is, that for the spring, chaff hives are the best.

Mr. Selwyn—Bees ought to come through well this winter outside, if they ever did, but last winter was, I fancy, particularly hard on account of the excessive changes from mild days to cold. I do not oppose wintering out of doors altogether, but I have heard of a great many men who have carried it on successfully for a few years, and then suddenly an unfavourable winter comes, and they lose their whole apiary on account of excessive changes in the temperature. If a week of 30 below zero were to come I do not believe that one colony in twenty would come through unless there was a tremendous amount of chaff packing and every precaution taken. It is known to nearly all the bee-keepers in the northern States that the risk of wintering out of doors is great.

Mr. Wintle—In Root's Ohio Catalogue instructions are given how to pack your hives, and if the bees have twenty-five pounds of store they will come

through whether the winter is mild or exceedingly cold. Of course that is in Ohio.

Mr. Barnard—It is difficult to get a cellar that is not too damp

Mr. Selwyn—I do not think much of whatever dampness may occur in the cellar if the place is well ventilated. I run a three-inch pipe from the cellar into the stove-pipe for the purposes of ventilation, and if you hold a piece of paper under that it will draw up. It seems to keep the cellar in splendid condition. The cellar has a stone foundation covered with earth, the floor being shale. In one part of the cellar the floor is dry and in another it is not. I do not lose any bees from mildew. I have heard of farmers who winter their bees in a cellar in which there was a stream of running water.

Mr. Barnard—There would be no harm in that if the water is running.

Mr. Selwyn—I have only lost one colony of bees in winter since I started bee-keeping, and that is a good many years ago.

The President (Mr. Brodie)—Do Italian bees take honey out of red clover?

Mr. Selwyn—I believe they do from the second crop of red clover, but I do not think they do from the first crop. I know it was advocated that they would take honey out of red clover, but in point of fact I do not think they do, except on the second growth. In the second growth the petals of the flower seem to be shallower and easier to get at.

The President (Mr. Brodie)—Is there any difference between the white clover honey and the alsike clover?

Mr. Selwyn—It is quite as good as the white clover, if not better, and there is a longer season.

Mr. Barnard—Last year nearly all the clover was killed, and do not you think it would be well for farmers and bee-keepers to sow the clover in the early spring?

Mr. Selwyn—I wish they would do it.

Mr. Barnard—The meadows and clover were killed in Quebec last year, and there came about August a new clover which was very like alsike, and it covered entirely as if it had been seeded very thick.

Mr. Selwyn—How did that seed come there

Mr. Barnard—It is very difficult to tell.

Mr. Brodie (President)—Was there alsike clover in that district?

Mr. Barnard—No; and in that district very little clover of any kind is sown, It is a most extraordinary thing.

Mr. Hamilton—In view of the scarcity of food for bees at certain seasons, would you recommend the sowing of anything?

Mr. Selwyn—If I were a farmer I would, but I am living in a house with a very small garden at the back and it would be impossible for me to do anything of the kind.

Mr. Hamilton--What would you sow ?

Mr. Selwyn—It would depend on the district. Buckwheat, in certain seasons, gives the greatest amount of honey of any known plant. Buckwheat gives a big return in honey and you get a crop of grain as well, but it gives a low grade of honey which would command only about six cents a pound in the market.

Mr. Hamilton—Could you suggest anything else that would give us as good honey as buckwheat?

Mr. Selwyn—I do not know of anything.

The President (Mr. Brodie)—When on the Experimental Farm the last week in July the horticulturist had sown some clover as a summer crop, and in September some of it was ten or twelve inches high. If that had been sown early in the spring, by July it should have been in bloom.

Mr. Barnard—It might be sown on the snow and it has every chance of coming up sooner. Where the winter was so bad as last year it would be well if a quantity of clover, especially alsike, had been sown in the early spring.

Mr. Selwyn—The fruit growers should remember the good that bees do as hybridizers, and on account of this bee-keepers and fruit growers have interests in common.

Mr. Barnard--How many pounds of honey can be made out of an acre of buckwheat ?

Mr. Selwyn—That cannot be told. It depends upon the atmospheric conditions at the time the plant comes into bloom. Honey is altogether dependent upon atmospheric conditions and if these are suitable the flow from some plants is incredible. I have seen Linden trees that would seem to be dripping with honey and the gain in the hives would be nine or ten pounds a day, but at other times the bees would have to make hard travelling to get a pound a day out of the trees. I fancy, however, that a ten-acre field of buckwheat would give honey for two or three hundred colonies. Buckwheat only secretes honey up to a certain time in the day. If it is dry it will secrete honey up to 11 o'clock and then the bees leave it. And some days it will have honey all the afternoon.

Mr. Barnard—Mignonette has a great advantage because it will keep in flower the whole season through.

Mr. Selwyn—That is one great advantage, but it is rather an expensive seed to buy, although nothing is easier than to save the seed yourself.

Mr. Selwyn—A beekeeper should never have poppies about his place. They give a nasty taste to the honey and the bees are passionately fond of them.

I have seen five bees in one head of poppy and they seemed to be absolutely drunk with the opium.

The President (Mr. Brodie)—I have some wild grape vines at my house and when it is in bloom the bees are very fond of it.

Mr. Selwyn—There is a great deal of honey in that. In fact all fruit blossoms yield honey and that and the dandelion is what we depend upon for the first flows. The sugar maple is also good occasionally.

The President (Mr. Brodie)—I have large willow trees near my house and every spring there is a swarm of bees in them.

Mr. Selwyn—In the early spring in Ottawa that is also the case. It really looks as if there was a swarm of bees in these trees.

Mr. Fisk—There is one question which we ought to consider, and that is that the bee is a very great assistance to the fruit grower. Bees undoubtedly assist fertilization to a great extent in our orchards, and as far as I am aware there never has been any legislation in this Province in regard to the protection of bees during the blossom period of our fruit trees. In Ontario they have a law which subjects the fruit grower to a fine if he sprays during the blossom season and uses Paris green. I think that it is a very useful law to have in a country where we grow fruit. The man who sprays during the blossom season not only injures the bee-keepers, but the fruit interests. I think it would be a wise measure if we petitioned our Provincial Government to pass a law to protect the bee-keepers during the blossom period of our fruit trees.

Mr. Barnard—I do not see why it should not be a Federal law.

Mr. Selwyn—It would be much in the interests of bee-keepers in the Province of Quebec if such an Act were passed.

The President (Mr. Brodie)—I think it would be wise for us to pass a resolution petitioning the Government; it would be well for us to instruct our Secretary to write a motion to that effect.

The following resolution was then adopted by the meeting :—

"That this meeting of the Pomological and Fruit Growing Society of the Province of Quebec respectfully urge on the Local Government of the Province of Quebec that they should pass a law similar to the law in the Province of Ontario which prohibits fruit growers from spraying their trees with Paris Green or other injurious and poisonous chemicals during the period that the trees are in blossom."

On the motion of Mr Barnard it was resolved that Mr. Baltet, the eminent French horticulturist, should be elected an honorary member of the Pomological and Fruit Growing Society of the Province of Quebec.

GENERAL DISCUSSION.

The President (Mr. Brodie)—Now that we have disposed of the discussion of the questions on the programme up to the present, we might take up any questions which may be asked.

Mr. Dupuis—What is the best winter protection for young trees for the preservation of the roots ?

Mr. Dunlop—Snow, when you can get it.

The President (Mr. Brodie)—But when we have a winter like last winter what are we to do ? I was very much impressed to see the growth of clover on the Experimental Farm last year. And it would be a great protection to fruit trees in winter. They sowed fourteen pounds of seed to the acre and it made a fine growth. It occurred to me that in localities around Montreal where land is valuable we could take a crop of early potatoes off the land early in July, then seed this ground with clover in our young orchards and have a growth sufficient to protect our young trees during the following winter.

Mr. Barnard—It is possible that clover would be killed by such a winter as we had last winter. I think the danger comes from the thaw rather than the frost. Last winter the rain went right through, and the frost followed the rain and the ground was frozen four or five feet deep.

Some questions were then put by Mr. Dupuis to be answered by the members.

Q.—What kind of drainage of the land is used in the West where thaws occur in the winter ?

Mr. Barnard.—Throwing up the earth before you plant your trees, or if you have space enough bring up the earth as close as possible to the trees, and arrange the centre between the rows to be certain of an open ditch, would be the best system. If you have no drainage you have to be careful that there is no running water into those drains. Some people would not underdrain in an orchard because they consider the roots would fill up the drains, but it has been found by experience that the roots would never do that where the drain is dry. The drain, if properly made, is the driest part of the field until a rainstorm comes. In the State of New York an orchard, which was most successful, had been drained. In another case half of the orchard was drained, and the half that was left undrained and which was the best part of the field, never gave such a crop as the place that was drained. It was shown that as long as there were no running springs into the drains the roots would not go there.

The President (Mr. Brodie)—My experience, and that of most of the orchard growers around Montreal, is that generally in the spring of the year we plough away from the tree, and in the valley we plough up to the tree. That leaves a deep furrow half way between the rows of trees. I would advise to plant orchards only on land that has good natural drainage. I would not advise an orchard on land that is in any way hard to drain.

Mr. Barnard—I do not speak of commercial orchards ; my reference was to the case of some people who want to have a few apple trees.

Mr. Dupuis—Is the planting of apple trees amongst forest trees advisable ?

Mr. Barnard—The trouble would be that the forest trees would give too much shade to the fruit trees.

Mr. Dupuis—In Russia there are immense forests and they have fruit trees amongst them.

Mr. Barnard—In that case there must be a great deal of space given to the fruit trees.

Mr. Dupuis—In Russia abundance of fruit trees grow in the forest. In some parts of the country here, we see hills with apple trees in abundance, and you see the forest trees all round them.

Mr. Barnard—You could not have a forest tree fifty or sixty feet high with a thirty foot apple tree close to it.

Mr. Dupuis—My object in asking the question is to know if it can be done?

Mr. Barnard—Mr. Chapais has proved that unless the fruit trees have good ventilation they would be killed. I myself saw a vine growing among elm trees. One elm must have been 100 feet high and there were five or six vines around it the size of my wrist, and on them there were as many grapes as you wanted. The boys brought home forty-eight pounds of grapes from the vines on the elm trees. This was in a forest that had no cultivation, but it so happened that this elm tree was on a sunny spot and had no shade. It shows that fruit may be cultivated in the forest, provided the fruit has sun and air and all conditions that will mature it. Abbé Provencher asserted in the most positive manner that grapes could not be made a success of in the Province of Quebec, but when I came to this elm with grapes growing on it I thought he should drop that from his book. I had the grapes photographed and people in France wanted it, it being the time of the phyloxera. It was not a wild grape.

The President (Mr. Brodie)—Dr. Robertson says that the only way they can ever grow fruit in the North-West is in the forests. Probably the climate in Russia is the same as that of the North-West Territories, and when they encourage forest trees there they may grow fruit.

Mr. Hamilton—If you plant apples and pears amongst forest trees you not only want the light and the sun, but you want the whole productive power of the soil. So far as nut trees are concerned that is all right. Twenty years ago Mr. Charles Gibb and I made two or three journeys around the orchards of Montreal; and it was about that time we began to notice the small blight on certain varieties of apple trees. We found that wherever there was a good deal of forest protection the trees were very much more blighted than where there was no forest protection whatever. The trees most free from blight were those that had no shelter whatever. Under the lee of the Montreal mountain, we

found the trees in some orchards almost completely blighted. There seemed to be a lack of movement in the atmosphere, and in my experience this blight always occurs immediately after thunder, when the air is dead. In other districts where there was no protection, there was not the least show of blight. Mr. Gibb and I also remarked that where there was a good deal of low growth the trees seemed to be free from blight also. The presence of moisture in the soil seemed to be one of the things in favor of trees as against blight. I think we cannot do too much in the way of growing something like currants, gooseberries and raspberries amongst our apple trees, provided you will fertilize the soil sufficiently to allow them to grow and to allow the apple to grow too. On my own place, where I have a few raspberries and currants and gooseberries amongst the trees, the trees are better and the fruit is better also.

Mr. Barnard—Different rules govern different districts. I saw fine orchards along the St. Lawrence facing the east on the hill.

The President (Mr. Brodie)—That is the way mine are situated and I succeed.

Mr. Barnard—There cannot be any general rule laid down. At one time Mr. Dupuis was the only one that had courage to grow a certain kind of fruit in his district. What might be useful in the district of Quebec, might be useless in the district of Montreal.

Mr. Dupuis—If we have done some good work in fruit growing in our district, we have only been following the example set us by our ancestors. I want to preserve the old orchards as they exist to-day.

————————Are there orchards of Damson plums in the Province of Quebec; what profits are derived therefrom, and is it possible to plant some on their own roots?

Mr. Dunlop—If trees of these varieties on their own roots could be procured in France it would be the quickest means of getting them. Surely the original trees are not killed so badly here that you cannot produce suckers.

Mr. Dupuis—We still have some. I know some places where not a tree has been killed. They are on hills on a dry sandy soil and the slope is pretty steep. We need however a great deal of these Damson trees at the present time.

Mr. Dupuis—Is the Shropshire Damson cultivated in this province?

Mr. Dunlop—I have one tree growing well, but it has only borne a few plums.

The President (Mr. Brodie)—I think a tree like the German prune grown on its own roots would be suitable? I could supply some of these kinds.

Mr. Dunlop—They are the best of the European plums with me, but they are not as hardy as the northwest varieties in buds.

Mr. Dupuis—Is it better to heel trees or plant early in the fall in the Ottawa valley?

Mr. Dunlop—Mr. Shepherd gave us a paper last year and he held that to heel them was the best way.

The President (Mr. Brodie)—That question can be discussed later on on Mr. Shepherd's paper.

Mr. Dupuis—What nurseries are most likely to give good results in stock suitable for our climate ?

Mr. Fisk—Those nearest the place where you want to plant them, if you can get the variety you want.

Mr. Dupuis—Although I am selling some trees myself, I must say that I bought trees from elsewhere that were just as hardy as those I grow. They were very successful, except those that were forced too much by very rich manure. Those trees suffered a great deal when we came to put them in ordinary soil. You take the sugar maple from the south and plant it here and it is just as hardy as our own.

The President (Mr. Brodie)—You believe in the variety and not in the locality.

Mr. Dupuis—Yes; we cannot force our trees here.

Mr. Barnard—I asked the same question from Dr. Hoskins and he said that he got his plants from the Western States, but was very careful of them.

Mr. Fisk—I still adhere to the opinion that you should get your trees from the nearest nursery to the place you want to plant them. There are two or three advantages to the planter in doing that. In the first place his trees will be nearer home and they will be to some extent acclimatized. If they are not true to name he can go back to the man who sold them. Another point which is very important is that you know or ought to know whether these trees are affected with any insects which are not desirable to this country. In the importation of trees from the south and west we get pests which we knew nothing about before, whereas if we get our trees at home we know what we are doing. The advantages are on the side of patronizing home nurseries if possible.

Mr. Wood—The better plan is for every one to grow his own stock after he has started. I believe that the nearer home you get your trees, the safer you are and the better chance you have of success, for your trees are likely to arrive in better condition. No matter how well packed they are they are liable to damage, and it will be better to get them near home.

Mr. Malcolm Smith—I would like to hear as to the best mode of planting trees. I have a little experience myself, and I think a great many of us plant too deep. The worst success I ever had with trees were those I got near home. In getting trees from the Island of Montreal I found that the soil was too mellow there and that the root went right down with us. We have a limestone gravel here, and I find the tree that does best with us is the tree that we get from the nursery where the root separates. I plant as shallow as I can and mound up to the trees, and I find I have better results when doing that.

Mr. Hamilton—I have an orchard of about four thousand trees planted out. We planted three or four hundred a year until we had the ground filled up. My neighbors thought I planted exceedingly carelessly. I took about a minute to a tree and I do not think I ever lost one. When my neighbors saw me do it they came to the conclusion that I did not know anything about it, but the fact is I rarely lost a tree. At this moment if I were put on oath I cannot say that I ever lost a tree that died immediately. We ploughed our ground as deep as we could plough it and then made a small hole of perhaps 15 inches diameter. The soil being loose we put it in the form of a cone, so that the top of the cone was about level with the top of the field. We spread our roots a little, put them on top of that cone, pressed them down and then dug in around them. The whole operation in many cases did not take over a minute. Sometimes after we planted them we went around with a digging fork and dug perhaps two feet around them, but that was an afterthought. Another thing is that we always plant late in the spring. I lived for several years in Montreal, and I never came to the country until our spring work was over, after the Queen's Birthday. We always took precaution to pick out our trees in the fall and heel them in. By the Queen's Birthday the ground is generally pretty warm, which I consider a good point, and I noticed that the trees began to grow almost instantly and in a short time seemed to make up to those that had not been moved. They had the advantage of a fresh soil newly stirred up. When I began to plant trees first I brought 1,500 from Wisconsin, and I do not think I have a solitary one of them left.

The President (Mr. Brodie)—That is my experience, too. If there is one of these trees left with me it is one that came up after having been killed to the ground. I cannot account for it, but I know they had the carrot root referred to by Mr. Smith. I think there is a good deal in the trees being planted reasonably near the surface, and in fact in some parts of my ground I plant right on the surface. I made the ground pretty firm up to the surface and then brought in earth from some little distance and laid it on them. I am not a nursery man, but I sell a surplus of a couple of hundred a year to my neighbors, and I have always had them with opening fibres, and it seems to me that that is very important. That seems to be reasonable, because the tree comes immediately in contact with the warm earth and gets a good deal of nourishment right away, whereas with the carrot root the tree is slow to take possession of the virtues in the soil.

Mr. Barnard—Was your ground prepared the previous fall, Mr. Hamilton?

Mr. Hamilton—Yes, and re-ploughed in the spring.

Mr. Brodie—In planting a large orchard I prepare the land in the fall and take my double drill plough and make a drill 30 inches apart, and then leave the marks crossways. I like to set out the trees in the spring as soon as the ground is dry enough to work it. I like to cut the taproot from the trees I get from nursery men, so that we can lay the cut sideways on the ground. Then I believe in mulching after the trees are planted, and I mulch about the size of a cart wheel around each tree. Then, if it is a very dry season, I water around

this mulching, and when you do water, water charily. The poorest trees I ever got were from some of those nursery men in Wisconsin. The best success I have had was with trees I grew myself and took out of the ground and planted. If you get trees in good condition in the spring of the year it is safer than having them heeled in during the winter.

Mr. Calder—Is it possible to grow apple trees on any soil. Can the natural conditions of the locality be so changed by cultivation as to grow apple trees? I have heard the statement that it was impossible to grow apple trees in Lachute.

The President (Mr. Brodie)—In looking around the village this afternoon we thought that these hills yonder would be suitable to grow apple trees.

Mr. Wood—If the sugar maple grows here the apple trees will grow.

Mr. Barnard—I have seen some of the Russian trees grown on sand banks. It is a question of selecting a hardy tree and making the soil rich enough to produce a heavy crop. You have to feed the tree and protect it against the extremes of heat and cold. If you plant a tree on sand, make sure you have made your soil so that it will keep water, and a very little clay or mould will do that.

Mr. Fisk—I have been growing trees from childhood and have had considerable experience in growing them in the nursery. There is a great difference in the varieties of the apple trees regarding the places they will grow. Some will grow on one soil and some on another. As a rule there are some varieties of apples that will do well on most any soil, provided you have either natural or artificial drainage If the soil has any depth and there is a circulation of moisture throughout, your tree is pretty apt to grow. There are some places where the soil apparently is all right, but there are atmospheric influences against the trees. One place I have in my mind is the St. Francis Valley, near Richmond, and for some reason or other along the river shore the trees are very short-lived. In my opinion, that is undoubtedly due to the atmospheric influence.

Mr. Barnard—Another trouble with apple trees is that there may be springs underneath the ground. A good deal depends upon the sub-soil.

EVENING SESSION.

The evening session was held at 8 o'clock, Mr. Brodie, the President, presiding. There was a large attendance.

The Hon. Sydney Fisher, Minister of Agriculture, was unable to be present, owing to his having to attend to Ministerial business at Ottawa. As he was expected to give an address, Mr. Fisher telegraphed to the President apologizing for not being able to attend.

Mr. Brodie regretted the absence of Hon. Mr. Fisher, because if the Minister of Agriculture had been present he was sure his address would have been most

instructive. He called upon Dr. Christie, M.P., of Lachute, to address the meeting.

Dr. Christie—I thank you, Mr. Chairman, for calling upon me to address the meeting. The question in which your Society takes an interest is one of great interest to us all, for as we know the industry of fruit-growing is one of great benefit to this Dominion. I can assure you, Mr. Chairman, that the people of Lachute and neighborhood are deeply grateful that so many distinguished gentlemen have come from long distances to instruct us in fruit-growing and apiculture. I have no doubt that the lessons which will be given us will be of great benefit to this part of Canada, Your meeting will stir up an interest in fruit-growing in this district. We have had some workers in this field who have been laboring dilgently, notably the Rev. Mr. Hamilton, but few have taken up the work so fully as it deserves to be taken up. It gives me great pleasure, Mr. Chairman and gentlemen, to extend you a warm and hearty welcome to Lachute. (Applause.)

The President (Mr. Brodie)—I beg to thank Dr. Christie for his hearty welcome to us. I shall now ask Mr. Weir, the member for the county in the Quebec Legislature, to address the meeting.

Mr. Weir—Mr. Chairman, Ladies and Gentlemen: It is a real and unexpected pleasure for me to have the opportunity of addressing this meeting, and especially in joining in the welcome so heartily extended by my hon. friend Dr. Christie, to the members of this Association. I am sorry that the wretched state of the roads has prevented many people from being present who were anxious to attend. I regret that I know but little about the Pomological Society and its work, but what I have heard has always been of the good that it has done. There is no doubt that these gentlemen meeting together and discussing the fruit-growing industry of the Province, as well as apicculture, are actuated by the highest of motives. They are desirous that these industries should progress in the Province of Quebec, and that the enterprise and intelligence of our people should go to build up the national wealth in this direction. Wherever we can develop national industry and national wealth by our labor and by our intelligent study, we are conferring not only a benefit upon ourselves and on the immediate community in which we dwell, but we become national benefactors. Take for example the good work done by the present Minister of Agriculture in the matter of cold storage. A few years ago we had nothing of the kind, but Mr. Fisher, through his intelligent study, his patriotic devotion to the cause of agriculture, and his wish for the welfare of the farmers, has established cold storage warehouses through the Dominion and on the ocean steamers, so that fruit and all other agricultural products can be delivered in the great markets of the world in almost as good condition as when they left our shores. This is a matter which has tended much to develop trade in the Motherland and Canada, and will tend much to increase our national wealth. I trust that those present will carry away thoughtfully the words that will be spoken to them here, and that they will seek to propagate an interest in the Society. I know that the people of Argenteuil County are a progressive people

and that they will seize this opportunity of getting new ideas and putting them into practical operation.

Mr. Brodie (the President)—We are very thankful to Mr. Weir for his address. It is a pity he was not here this afternoon when the motion was passed about spraying fruit trees at the blossoming period, but I have no doubt he will do good work for us in the Quebec Legislature in connection with this matter.

INSECTS INJURIOUS TO FRUITS IN 1897.

Dr. J. Fletcher, of the Experimental Farm, Ottawa, delivered an address on "Insects Injurious to Fruits in 1897." Dr. Fletcher said:—Mr. Chairman, Ladies and Gentlemen,—The subject on which I am to address you is of very great interest to fruit growers, and to bring the question before you in a definite way I have selected some of the most injurious insects which have attacked fruit trees during the past year. When I first came to Lachute I enquired what fruits you grew in the neighborhood, and I received the somewhat remarkable answer that you grew no fruits at all. As I do not think that need be the case, if it actually is so, I would advise you all to read the reports of this Society carefully, to digest them, and to consult with the members of this Association, because you will find that there are some fruits which you can grow here with very great advantage to yourselves, and not only the larger fruits, but many of the smaller. This Association was formed only a few years ago, and at that time there were misgivings as to whether it would be a success, because we were told that there were not enough people who took an interest in growing fruit. We now find that we have some of the very best men in the province who are keenly interested in the work, and that both the Local and the Federal Governments are anxious to assist the Association in every way they can.

Let me say at the beginning that fruit growers will be wise to carry out the spraying operations that have been recommended here, and to avoid the very great mistake which is so common, of spraying in a sort of rule of thumb fashion, interpreting the word "spraying" according to their laziness, and neglecting to get proper implements to carry it on. Spraying is recognized as a method of practical horticulture, which, if men wish to get the best results from fruit growing, must be conducted in an intelligent manner. One of the chief injuries to our fruit, as has been pointed out frequently, is the "Black Spot of the Apple," caused by a fungous disease. Now, there is a practical remedy for this disease which causes so much loss to Canadian fruit growers, and that remedy is spraying with the Bordeaux mixture. After 12 years' experience I maintain that if this practical, easily applied and cheap remedy which has been advised is resorted to by all fruit growers throughout Canada, they will get as good results as Mr Craig and I have obtained at Ottawa, where we have grown a crop of fruit perfectly clean from this injurious and fatal disease, which so often blights our hopes of making profits from our orchards.

One of the most injurious insects of the apple is the "Codling moth," which year after year destroys large quantities of fruit. The Codling moth is also known as the "apple worm," and is a small caterpillar found in the apple during

the summer and also during the winter. In this part of Canada there is only one brood of this insect during the year and there should be no difficulty in keeping apples perfectly clear from it. Further west in Ontario there are two broods, and further west of Toronto again there are three broods in the year. In those parts of Canada it is a very difficult insect to fight against, but in Quebec where there is only one brood I certainly think that all fruit growers should control it, as well as some of them have done in the past. The remedy is spraying. I might stop for a moment to say that by spraying I do not mean drenching. The general idea seems to be that any method of drenching a tree by shooting at it with a fire hose is spraying. Spraying does not mean covering a tree with a coating of liquid and then washing off all that you have put on. What is wanted is a proper spraying machine or force pump, with a good nozzle, by which the liquid will be broken up and fall on the tree like dew. The spraying implements are cheap and accessible to everybody, and one of the tenets of spraying is that when at work directly you begin to see the liquid drip from the leaves you must move to another place, or else you wash off much of what you have put on. What is necessary is to leave a deposit of liquid on a tree as nearly like dew as you can. Such spraying will result in very great benefit to your fruit. I do not think I am exaggerating in saying that at the Experimental Farm last year, where we had a large crop of apples, there was not a gallon of wormy fruit. That was simply the result of spraying. The remedy for the "spot disease" is to spray the trees first of all before the buds burst with sulphate of copper; one pound in twenty-five gallons of water. This is a cheap remedy and can be applied with very great ease. I will give you a recommendation as to dissolving this material. The solution of sulphate of copper being much heavier than water, if you put the crystals into a barrel and allow them to fall to the bottom only a certain portion will dissolve. It is very simple to put the sulphate of copper into a bag, hang it near the top of the barrel, and then as it dissolves it falls down through the water and the whole solution is of an equal degree of strength. It dissolves easily and if this plan is adopted there is no trouble about dissolving sulphate of copper. This solution is sprayed over the trees before the buds burst and the disease is checked; the reason is, the spot disease passes the winter not only upon the dead leaves which have fallen to the ground, but upon the twigs and all parts of the apple tree. The spot is a fungus disease. The fungus is a parasite of the apple tree living on the twigs and boughs and on the young fruit. After you have picked apples, sometimes in the fall you may notice only a small spot on the apple. Whether it afterwards increases in size or not is a matter of dispute, but it certainly increases in its injury to the apple. It destroys to a certain extent the tissues of the apple. The injury is not only the black spot on the outside of the apple, but the tissues beneath are destroyed, and in addition to the dry black spot on the surface, you have a rotten part beneath and that is the way the injury occurs.

The fungus has no taste and does not injure the flavour of the apple; but if they begin to spot they soon decay, the appearance is injured and the price consequently reduced. That was one of the great troubles with our fruit in England this year. The Codling moth can be treated very easily, and we can

put the paris green, which is necessary to destroy it, into the same solution which we apply for this other very injurious disease, the "black spot." We can make one solution first of all of sulphate of copper, or bluestone, and by spraying this over the trees a great many of the spores or seeds of the fungous disease are destroyed without injury to the fruit. Later on, when the foliage is expanded, if we use this strong material the fruit will be injured. We neutralize the effects of the sulphate of copper by adding some lime, for lime has the effect of destroying the corrosive effects of the sulphate of copper, but at the same time its noxious effects upon the fungous are not reduced. By mixing lime with sulphate of copper we get the mixture known as Bordeaux mixture, or Bouillie Bordelaise, which first originated in France, where the mixture was applied to grapes, not to destroy the fungous disease, but to keep boys from taking the grapes. It has a very unpleasant taste and to the amazement of those who owned the vineyards it was found that the grapes sprayed with this mixture were protected from the mildew which was devastating the vineyards of France. If these mixtures are employed at the proper time and early enough in the season before the fruit has colored, no harm results even to the appearance of the fruit, the mixture being washed off; thus no injury occurs to the fruit and it is protected against the fungous disease.

Mr. Dupuis—How many times must we spray, and when ?

Dr. Fletcher—I will say that where the black spot is prevalent you should spray with sulphate of copper before the buds burst ; then again after the buds have burst, but before the flowers have opened, if the season be a slow one. In some seasons the apple blossoms are in bloom as soon as the buds burst, and there is usually only a period of a few days between the first bursting of the buds and the opening of the flowers. There would be no use in spraying immediately afterwards, except on late flowering varieties, but if you spray for the second time with Bordeaux mixture, about a week or ten days after the first spraying with sulphate of copper, you will have that spraying after the flowers drop. You have passed a resolution at this meeting against spraying trees when the trees are in bloom, and I say most decidedly, as an entomologist, that for the destruction of insect pests there is no necessity for spraying when trees are in bloom.

There is no practice more absurd than spraying trees while in bloom, because there is no insect which cannot be treated far better at another time. I know of no insect pest for which spraying while the trees are in bloom is of any use. It has been proved that if you do spray apple trees while in bloom the bees will be injured, because they can be poisoned while taking the nectar from the flowers. Anyone who understands what he is doing will not spray while trees are in bloom. Although I urge you to spray your trees every year at the proper time, I urge you just as strongly not to do it while they are in flower. Do not spray until you understand why you are doing it. It costs you money, and if you do not know what you are aiming at you certainly will get no good results. I have found in my experience of advising fruit growers to spray, that it is just about as hard to get an ordinary fruit grower or farmer to apply the remedy as he is told, as it is to get a woman to make a pudding by a given receipt. They

always want to improve it a little. Do not make puddings of your trees, because if you do you will not get the same results as hundreds of people who after an experience of years have been successful in spraying. I know that in certain districts there will be a little variation in the application of remedies, and in a meeting like this I have no doubt some of you will say that you have sprayed and you did not get the results I speak about. Then I say, that you have not done it as you have been told or you would get the same results as those who make the recommendation. I know that frequently some recommendations are made in the newspapers which are not altogether trustworthy, but you have in Canada and in all parts of North America many sources of reference at which you can get with great ease trustworthy information from people who have tried this work so frequently that their experience can be relied upon. There is no association of half the size this one is now where you will not find many of your own members who have tried these remedies and have found them so successful as to repeat them year after year with the most paying results. I cannot do better than to refer to your President, Mr. Brodie, who has for years sprayed his orchard, and I am perfectly certain he would just as soon leave off spraying his orchard as stop fertilizing his trees, for one is just as important as the other. This year was a typical year when we could test the value of spraying. The enormous crops of fruit of all kinds right through Canada the previous year showed us that we must necessarily have a smaller crop this year. The vitality of the trees was reduced very largely by the enormous crop the previous year, and so we had a smaller crop this year. Now the small crop is really as paying a crop as the enormous crop if you can protect it against its enemies and have your crop a little better than that of your neighbors. Those people who sprayed this year realized good returns, and had a much more remunerative crop than the enormous crop of last year, when they handled a great deal more fruit and got less money. This year many orchard owners got more profit than they did out of the great crop of the previous year, and they got that profit because they looked after their fruit properly. Much of our fruit that was sent to England even this year was hardly worth the barrels it was put in, and last year we know that on account of the enormous crops some of the fruit did not realize the cost of packing and transport. I say that was entirely due to the fact that they did not take the proper care, first of all in keeping their fruit clean, secondly in packing it properly, and thirdly because of their business methods or want of business methods in putting it upon the market. Whenever anything does not go right, in most lines of business, there is something wrong with those who conduct the business, and they very often say, in view of their want of success, that the Government must help them. Now that is poor policy. It is good policy to get the Government to do all it can for you, but rely on yourselves first of all, and you will get far better results than if you get the Government to help you.

One of the legitimate helps that can be given by the Government is in regard to such a matter as cold storage. We have always known that we had as fine fruit in Canada as is to be found in the world; we knew that the people of England would pay any reasonable price for that fruit, but we did not know the best methods of getting that fruit to the markets, and the Government said: We

will find out anything that is to be known, and we will send test shipments to see how we can manage our Canadian fruit, and to see whether the California people are right in saying that their fruit in the northern parts of that State is so excellent that it will carry anywhere if it is properly cared for. The Californians told us that we could not grow fruit, but we now see that the very best fruit is grown in Canada. On the Pacific Coast, from San Francisco to Victoria, as you go toward the northern part of California, you find the fruit getting gradually better; in Oregon it is a little better still; in Washington a little better again, and you do not know what first class fruit is until you get to Vancouver Island. The further you go north the better the fruit is. The Government tried cold storage and they found that where Canadian fruit was packed properly and chosen properly, it was able to compete with any fruit in the world. Even some of the fruit sent by the Government was badly packed, and in other cases the fruit was a failure because that which was selected was not of the best quality. There is one apple grown in England, the "Ribston Pippin," which will perhaps fetch the highest price from some people of any in the world, but, put that aside, and I can show you fifteen or twenty varieties of Canadian apples that will take the highest prices of the market. Our climate produces whatever it grows at all in the greatest excellence. I sent home a barrel of Canadian apples to my father this year and he writes me that he never saw such fruit for color and flavor; they cannot grow them in England as we do in Canada. The people of England will pay anything we ask within reason for our fruits, and from the success of the late shipments we know that we have a tremendous market there. But we must send our best and cleanest fruit to England, and there is no use sending apples which are affected with the Codling worm. We must see that there are no spots on the apple, because we know if spotted apples are sent to England the spots will become covered with white mildew, which causes rot beneath and spoils the fruit. I am often asked what is the reason you cannot grow Green gages or Lombard plums here? Well all I can say is you could grow them a few years ago, and I knew there must be some local reason for your not being able to grow them now. After a little enquiry I found that the reason the Lombard plums and Green Gages had disappeared was because they were destroyed by the Black Knot. There is no reason why this disease should prevail, because most fungous diseases can be combated to a large extent and the reason they do prevail is that we do not fight them. A man may tell me, I tried your remedy and it did not give a good result. Well, let us see how that is. I ask him, Did you keep a record of what you had done? I did not, he answers Well, I tell him, that is a pity, because I did keep a record, and if you had one we could compare them. These remedies cannot be applied by rule of thumb methods. What is done must be done exactly, and you must follow the instructions exactly, or you cannot get exact results. Some people may tell you that they like spotted and wormy apples, but the people who buy them do not. As to the Codling Moth and the Black Spot, they can be fought successfully, and if you wish to write to the Experimental Farm at Ottawa you can get instructions in print so that you can apply the remedy yourselves. Another insect which causes loss in our orchards is the Canker-worm. This name is applied sometimes to one worm and sometimes to another, but the Canker-worm is a perfectly smooth worm, either brown or

green, and you can easily recognize it. This worm occurs in such vast numbers that it will strip trees entirely of their leaves, and the usual appearance of trees that it has attacked is as if a fire had run through the trees. When the Canker-worms hatch they are very small, but they increase rapidly. They eat all the green portions of the leaves and leave the ribs. Now, the leaves are the stomachs of plants, and plants cannot live without them The leaves are the part of the plant through which it takes in its food; it breathes food through minute openings in its leaves in the shape of gases, and mixes them with other gases which it takes up through the roots in the shape of water. These gases are mixed inside the leaves and elaborated into food for the plant and that food is the substance from which the tree and the fruit is built up. If the leaves are cut from plants the plants must die, and if you allow insects to eat the leaves of your trees you cannot have fruit. If you allow the Currant worm to eat the leaves of your bushes you get small, bitter and useless fruit the next year. Sometimes there is a good deal of carelessness shown about treating currant and gooseberry bushes, for people do not see that when they leave the worm alone for one year, they are losing the crop for the next year. If the Canker-worm or Tent Caterpillar eats the leaves of your trees, the crop of those trees will be reduced the next year, and therefore I advise you to spray. Insects are of two kinds: those which eat their food with jaws and those which suck it up in the shape of sap. Notwithstanding the large number of insects, they all may be divided into two classes One which has jaws to bite their food, and the other which sucks up the juice of the plant. These two classes of insects have to be treated in different ways. Those insects which have mandibles and consume the substance of their food can be poisoned by putting poison upon that substance, and on the other hand, those which suck up the sap must be treated in another way. One way is to use some substance which, running over their body suffocates them, or some caustic substance which destroys them. Plant lice were very prevalent this year, and I may remark that in some years certain insects are much more prevalent than in others. Along the C. P. R., between here and Ottawa, last summer miles of poplar wood were stripped by Tent Caterpillars. These insects feed on the leaves, and the trees were bare because the leaves were eaten. Now these caterpillars could have been destroyed by spraying the trees with Paris green. It is perfectly true that we cannot spray the forest, but if these caterpillars were on your orchard trees, it would be worth your while to spray them, and this is a perfectly practicable operation, because we know that it is done every year through miles of the fruit growing districts of Canada. The spraying of the trees when you have the implements and materials on hand is really a small matter compared with the very great results you get from it. Plant lice or green-flies are small insects which suck up their food by means of a hollow tube, which is driven through the back of the plant, and the plant dies without the surface of the leaf being injured in any way. The best remedies for these are the Kerosene Emulsion (a mixture of coal oil and soap suds) or a tobacco and soap wash. The tobacco plant is particularly useful to fruit growers for destroying many of those insects which can be reached by a direct application of poisons. About ten pounds of our ordinary home-grown tobacco and four or five pounds of whale oil soap in forty-five gallons of water is a good remedy. The apple tree is much attacked by the Apple Plant

louse, which is sometimes injurious, particularly in British Columbia; the latter simple remedy I have given destroys these plant lice as well as almost any remedy I know. The best remedy in my experience is a mixture of two gallons of coal oil and one gallon of soap suds. This, mixed together and churned vigorously for five minutes, makes it look like cream. When you want to use this stock kerosene emulsion, which can be kept for years, take one part of the emulsion and mix it with nine times its quantity of warm water, and it will destroy all insects upon which it is sprayed. It is particularly useful against all sucking insects. Some insects which are injurious to all fruit trees are the borers, so-called because when the eggs are laid these hatch into small grubs which eat through the bark into the soft layer of wood beneath the bark called the cambium layer. These borers are not easily detected but they do a great deal of harm to trees and in the end kill them. Many trees die when there is no apparent reason, and only when you raise the bark is the reason discovered. How are we to prevent insects which live beneath the bark and out of sight? That is done by finding out what is the life-history of these insects. There are two kinds of borers which attack our apple trees in this part of Canada. These come from eggs laid by beetles which appear during the month of June. There are certain substances which are particularly obnoxious to beetles of this kind, and therefore if you cover the trunks of the trees with some obnoxious wash the mother insects will not lay their eggs. Every year you should paint the bark of your trees with an alkaline solution, the easiest and cheapest being a solution of washing soda made so strong that water will not dissolve any more soda. Take half a pail of water and put in the washing soda, and soft soap enough to make it of the consistency of white wash; paint this on the apple trees with a large whitewash brush and it will have the effect of protecting the trees for that year from the attacks of these injurious insects which destroy thousands of trees in our Canadian orchards. Some people use different substances for painting their trees, but there is none simpler and more effective than the wash I have given you, which is soft soap weakened with a strong mixture of washing soda and water. We have about 1500 trees at the Experimental Farm, and I do not believe that fifteen trees have been destroyed by borers since we started ten years ago.

Mr. Brodie—Do you wash only once?

Dr. Fletcher—Yes, only once.

Mr. Shepherd—You do not say anything about the remedy when the borers are in the tree.

Dr. Fletcher—There are not very often many borers in our trees, but there are certain signs by which they can be detected if present. There is a dust-like sawdust pushed out of the holes made by the grubs, and as soon as that is detected probably the easiest way to destroy the borer is to take a piece of fine wire and run it into the insect through the hole. That seems difficult, but as a matter of fact it is easy when you have had a little experience. If you examine the mines of several borers you will find that nearly all of them are the same shape and method of construction, and in a short time you will know at

once the probable place where the insect is underneath the bark by tapping with some hard object. The same method is adopted by wood peckers, their purpose being to find out where the insect they are picking for is, and when they find it they then dig in and take it out. In a short time you will easily find out how to detect where the worm is. There are two kinds of borers of the apple, the flat-headed and the round-headed. The round-headed borer bores right into the wood, and for this kind it will be necessary for you to use a piece of wire, and you can tell when you kill your game by seeing if the wire is wet at the tip. It is a thing you have to practise and find out how to do. If you wash your trees as I have told you year after year, there will be no necessity to dig these borers out. If they are washed every year such insects as may be in the trees before you begin the practice will come out, and as no further eggs will be laid the tree will in time outgrow the injury. Whenever the tree is injured by any insect one of the first principles to adopt is to fertilize it. A tree which is in a vigorous state of growth is not so much attacked by insects as one less thrifty, and a tree which is noticed to be badly infested by insects shows that it requires more attention from the grower. I do not think many people now grow their orchard trees with grass beneath them. It is better to cultivate the land beneath the trees, and apply fertilizers at stated intervals as the land requires it. A tree in a vigorous state of growth will throw off the attack of disease in the same way that a strong person may go to an infected district and not take a disease, whereas a delicate person will catch the disease at once. Another class of insects which do a great deal of harm is known under the name of Cutworms. There are a great many different kinds of these, but their habits are so similar that we may consider them as one class. They are the caterpillars or a large class of moths, and their eggs are laid at different seasons, sometimes in the autumn and sometimes in the early spring. All the caterpillars come out at night and attack our young plants when they first begin to grow in the spring. Many a one who has a garden, or a cabbage plant, will recognize that they have had a great number of them destroyed early in the spring by these obscure looking caterpillars which when full grown are about an inch and a half in length, and which hide beneath the ground by day and attack our crops during the night. They bite off the plant, which tumbles over, and they then pull the end of the stem down into their burrows and eat it as they require it. These insects do more harm to early farm crops than any others. We have found recently that one very good method can be adopted for the destruction of these insects, and as it is rather an unexpected one I have tried it very carefully for the last three years and found remarkable success from it. First of all it was some years ago discovered in the United States by Professor Riley that by tying up bunches of any weeds or succulent vegetation, and dipping these into a pail of strong Paris Green and water and then placing these among the infested crops a large number of these caterpillars will eat these poisoned plants actually in preference to the young crop which is more scattered. These bunches should be put about twenty feet apart along the rows of the crop, and the caterpillars feed upon them and poison themselves. This gives excellent results; but we have found during the last three years—I think it was Mr. Sirrine of New York who discovered it—that by mixing Paris Green with common wheat bran or meal of any grain and wetting it with water until about as moist as

porridge, small piles of this mixture were applied in the same way as the bunches and had a remarkable attraction for all these cutworms. It seems so unlikely that insects would eat such food that I hesitated very much before recommending it, but during the last three years I have had the most remarkable results in applying the material to infested crops, and the caterpillars seemed to take to the poisoned bran in preference to the vegetation. In this way large numbers of these insects can be killed. Of course it would be difficult to apply such a mixture to a large crop in a field. But I have tried it dry in a field of onions. I filled the seed box of a Planet Junior seed-drill with the mixture of bran and Paris Green, ran this along the rows of onions and from that time there was no further injury.

THE SAN JOSÉ SCALE.

Now, there is one other matter I wish to refer to, namely, the San José scale. Twenty years ago this destructive insect was introduced by accident upon some nursery stock to the Pacific coast. It was first detected at San José, California. It is a scale-insect, a very small insect, the body of which is protected by a hardened scale over it. The San José Scale is particularly injurious and its destructive powers are so great that it has caused consternation in every part of the country where it has occurred. In ten years after it was first noticed it spread right through the States of California, Oregon and Washington. It was named *Aspidiotus perniciosus* by Professor Comstock on account of its injuries, and as we thought it was characteristically a Californian insect we were very sorry for the people of California, but we never dreamed then that we should have to be sorry for ourselves. Seven years ago this insect was noticed on some pears imported from California to New Jersey, and, from that New Jersey nursery, stock has been sent out in all directions, the scale has spread from new centres, until to-day this insect occurs in nearly all the fruit growing States of the Union. With the exception of Maine, Vermont, New Hampshire and Rhode Island, no fruit growing State of the United States is now free from this most injurious insect. It is without exception the most destructive insect we have ever had to deal with. Its effect upon the trees is so fatal that a large tree, once infested by this insect, is killed within three or four years. To-day there are in the United States hundreds of thousands of trees which have been killed by these insects within a few years. This pest is injurious, not because of its size, for it is so extremely small and inconspicuous that it can hardly be seen without a magnifying glass, and not one person in a dozen can recognize it, even when it is pointed out to them. But it has such a wonderful power of spreading that from one fertile female in the spring, the enormous family of three thousand millions can come in one year. These large numbers are perhaps unintelligible, but that is the number of young that can come from a single scale during a single season. These scale-insects winter in the half grown state, but in the spring they revive and are ready to begin bearing young, in this country about the middle of June. Every one of the females will bear five or six hundred young, and each of these six hundred in forty days will again be ready to produce its six hundred, and this process going on continually totals up to the enormous number of three thousand millions in a season. Any insect which has

this enormous power of increase will spread with great rapidity over trees. It is such a small insect that the largest females are only about one-twenty-fifth of an inch in diameter, and these are covered by flat scales, which lie so flat upon the bark of the tree they infest that they can hardly be seen, and would be overlooked except by those who have made a special study of the subject. To make a long story short, this insect has been introduced into the United States, and it has destroyed thousands of trees there. It has been introduced into Canada and in a few localities in Ontario it has spread. It was detected there about this time last year. The vast injury it does to trees has induced the Ontario Government to pass an Act providing that those whose trees are destroyed, so as to prevent the spread of the insect, shall be compensated to one-quarter the value of the trees. The danger to the whole industry of fruit growing in Ontario is so great from this insect, and as no other remedy but total destruction of the trees is so effective, the Government thought it wise to compensate the owners and destroy all trees found infested. The Hon. Mr. Fisher, Minister of Agriculture, hoped to be here this evening, and if he had been able to be present he would have laid this matter before you, for you to express an opinion upon it. There is at the present time a very urgent demand from fruit-growers, nurserymen, and others in all parts of Canada, that all nursery stock from the United States should be totally prohibited from entry into Canada. I have not up to the present seen my way to make such a recommendation; the interference with well-established lines of trade would be so great that the matter must be considered very carefully. The Minister of Agriculture would ask those of you who have studied the matter to express some opinion on it during this meeting, and he has deputed me to find out what is the sense of this meeting with regard to this legislation demanded from the Federal Government. The Province of Nova Scotia is now considering whether such legislation is necessary there; the Province of Ontario has considered it and has passed a law; the Province of British Columbia, three years ago, passed an Act preventing fruit of any description, which was found to be infested with the San José Scale and some other insects, from being imported into that Province, and several carloads of infested fruit have been sent back again over the railway, as well as trees which have been sent in by nursery men, or have been destroyed at the expense of the owners. All this was done sooner than run the risk of introducing into that country these injurious insects. It is no use my telling you whether I think this insect will live in your orchards or not. What the literature about this insect taught was, that it would not live east of the Rocky Mountains, but we now know that it does live and thrive most vigorously east of the Mountains, that, indeed, it has increased to such an extent that in many of the States whole nurseries have been devastated. On Catawba Island, part of Ohio, only twenty miles south of our boundary line in Lake Erie, which was one extensive orchard, large areas have been swept clean now so as to wipe out this insect. Hundreds of thousands of trees were destroyed in the States last year by the San José Scale, and it certainly is a danger to us. Whether or not it will spread in the Province of Quebec I do not know, and there would be no use my telling you that it would not. Nobody thought it would live in Ontario, but it has, and a mistake was made about

that. If I said it would not live here, you might take my word for it and neglect to take the necessary precaution. But I do say this; if you are buying new stock to fill up gaps in your orchards, you should remember that the northern United States, where we buy much of our nursery stock, is infested with this, the most dangerous insect ever discovered. I would remind you that you have in Canada nursery men who have stock far better for your purposes, the trees being well acclimatised, healthy and strong, and which in addition are not infested with this pest, as we know the stock in the United States is. Of course, every nursery man will declare that his stock is free from the scale, but the danger is so great that it is not worth while for Canadians to go outside their own country and buy stock which is not as good for their purposes. The further north you can get your trees, if they are the varieties you want, the much better chance you have of getting strong trees, and I hold that there is no necessity for your buying stock outside of your own country. Even if you had to go without trees altogether, it would be wise for you to do it, sooner than run any risk of bringing in this insect. I cannot tell whether the Canadian Government will pass any legislation in this respect or not, but I can tell you that during the last week the United States Government was waited upon by a large and representative deputation of nursery men, fruit growers, and scientific students of insects, demanding that Congress should pass a law refusing to allow the transport from State to State of nursery stock of any description without the most rigid scrutiny. The danger of this insect has been so widely recognized that this demand has been very general all over the States, and Congress is asked for $100,000 to carry out this measure when it passes. They want to have this legislation passed at once in the United States, so that they may not make the same mistake as in the case of the Gypsy moth which was introduced into Massachusetts thirty years ago, and has cost up to the present time no less than $700,000 to the State of Massachusetts in trying to control it. An enterprising citizen of that State imported from Europe an insect which he thought would be of interest as a silk worm. He allowed one of two nests of eggs, which he had imported from France in 1868, to blow out of his window. This was not found again, and the caterpillars hatched and spread. As a consequence, acres and acres of the most beautiful country in the State of Massachusetts have been devastated and the State of Massachusetts has been put to the expense of $700,000 up to the 30th of June last. Do not make any mistake about the San José Scale; it is the most injurious insect ever imported into this country. It is in the Province of Ontario; it has been found in the Province of British Columbia, but I believe if sufficient efforts be put forth this year it will be stamped out. I believe that every effort will be made this year both by the Federal Government and by the Provincial Governments in this direction. We do not want the San José Scale here, and if any one asks me if it will live in the Province of Quebec, I say I do not know, because it has shown that it can increase very much further north than we ever dreamt of. Only the day before yesterday I saw, a few miles out of Boston, one of the large nurseries in which hundreds of trees were infested with this scale. In that nursery six thousand apple trees ready for shipping were burned, and this spring there are quite as many more of young stock that are to be burned, because that nurseryman says that he will not run the risk of sending out

stock to infest the country and to ruin his own trade. If the San José scaal gets into your orchards there will be very few orchards in this district, or in any other district, in a few years. It is not a matter which has been exaggerated. We tried at first to allay any unnecessary alarm, but we have found that the destruction by this insect is so great that it is better that everyone should understand the matter. Recently in the Southern States I met an entomologist who had visited a large orchard where 28,000 trees had been killed by the scale. He showed me photographs of this orchard taken at different times. Four years ago the scale was introduced by accident, and to-day 28,000 trees have been destroyed, or will be destroyed before the spring opens.

Dr. Fletcher then produced specimens of the San José scale, which were examined by those present, so that they might be able to detect it. He continued:—

If we allow this San José scale to get into Canada we shall suffer for it. As to the action of the Government, I may say that no legislation is wise until the public demands it, and public opinion must back up any legislation, if it is to be effective. If you think it is worth while to express an opinion upon this matter, the Hon. Mr. Fisher will be glad to hear from you and will be happy to consider your recommendation with great care.

The President (Mr Brodie)—We, as fruit growers must take warning from the remarks of Professor Fletcher. We who are near the city will doubtless be in more danger than those further away because there are importations of California fruit into the city of Montreal every day. Might I ask Dr. Fletcher if the scale carries on the fruit as well as on the trees.

Dr. Fletcher—Whatever the injury might be, or whatever the danger might be, it is questionable whether the country at large would allow all imported fruit to be kept out. I may say, however, that fortunately for us there is not, in my opinion, any danger from fruit.

Mr. Shepherd—Is not the scale found on the fruit?

Dr. Fletcher—Yes, but there are certain facts about it which I think will show you that there is not much danger. When the scale occurs on the fruit, there is a purple discoloration which spoils the appearance of the fruit and makes it unsaleable. In the different countries from which we import fruit the law makes it a misdemeanor to send fruit out of the country with the scale on it. The fruit is so unsightly when infested by the scale that it would be easily detected by the inspectors. Then again the very handling of the fruit in picking it would rub off many scales, and it is fortunate that if fruit infested with the scale came to this country the very people likely to be injured by it are the least likely to buy it, because fruit-growers do not as a rule buy California fruit. Further, most of this fruit is peeled and the peelings dry up soon and then the scale dies at once.

Mr. Shepherd—Have any tests been made in this direction?

Dr. Fletcher—Yes. It takes forty-eight hours for a bough to dry up

sufficiently for the insect to die, but in the case of nursery stock the trees are of course living, and the scales live upon them longer.

Mr. Fisk—Is there not a parasite in the shape of a fungus which would destroy these insects?

Dr. Fletcher—There is in the State of Florida, but we have not been able to introduce it into Canada.

Mr. Shepherd—How did the scale come into the Eastern States?

Dr. Fletcher—It came in on stock from California. One of the Japanese plums was imported by a nursery man in St. Louis, Missouri, and he refused to receive it. When this was reported to the shippers, they sent it to New Jersey, and from that it spread.

Mr. Shepherd—What means have you of detecting it on the tree?

Dr. Fletcher—The first indication is that the tree begins to die. It can be recognized by anyone who has seen it, although it is so small.

Mr. Dupuis—You say there is no parasite which will kill it?

Dr. Fletcher—There are parasites but none of any practical value to us. The tropical fungus in Florida has been found useful. That has been tried in a great many States but has only succeeded in one, namely New Jersey. There are insects which feed on the scale, but these are not sufficient to destroy it to any extent.

Mr. Newman—Has the Government made any inspection of Canadian nurseries?

Dr. Fletcher—None of the nurseries in Canada are affected as yet. It is only at five points in this country: Chatham, Kingsville, Niagara, St. Catharines. It first came on trees bought in New Jersey.

Mr. Newman—What trees does it mostly affect in Canada?

Dr. Fletcher—Chiefly plum, pear and apple. It attacks every kind of tree except the pines and cedars, and not only every kind of tree, but almost every ornamental shrub, and it has been found even on Indian corn. It is a great blessing for the California people that it has not attacked the orange and the lemon trees, because it does attack these in Japan, and one kind of citrus tree had been attacked in New Jersey. It attacks every kind of ornamental shrub, and that is one of the chief reasons why the Minister of Agriculture hesitates to pass such legislation as has been demanded. It is not a matter for fruit growers and nurserymen alone, but it concerns every private individual who wants to import a rose tree or ornamental shrub of any kind. Not only fruit growers, but every one who has a garden will suffer if this insect gets into the country. It may even get into our forests. It is thought that it has spread into the forests in New Jersey and that their forest trees will be destroyed. Of course in the case of forests no treatment can be effective unless it be that nature supply an antidote in the shape of some parasite.

Mr. Barnard—Would it not be necessary to experiment on the San José scale in this part of Canada, and find out exactly what its effects are.

Dr. Fletcher—It might be advisable, but the experiment is so dangerous that I have hesitated to adopt it.

Mr. Barnard—If it is in Canada already there would not be so much danger.

Dr. Fletcher—It is liable to occur on all plants.

Mr. Barnard—Then the sooner we import no plants the safer we will be.

Dr. Fletcher—That is just what the Minister of Agriculture wants your opinion on.

Mr. Newman—Does the San José scale do as much damage in Ontario as it does in California.

Dr. Fletcher—In California it has done less damage for the last year or two than it did formerly. There is some check to its increase there that has not yet been discovered. In the Eastern States it is doing more injury to the south than to the north, and there is every probability that it spreads quicker in the Southern States than in Ontario. The climate of the Niagara Peninsula is, of course, very warm, and the conditions are evidently favorable to it. It has occurred in five places in Ontario all in the peach districts; it has occurred twice in British Columbia and it was found necessary to destroy the trees by burning them. It is at Chatham, and in Essex County, and near St. Catharines and Niagara-on-the-Lake. These are the only occurrences in Canada where the scale has been actually found, but in these centres it has spread very rapidly and it has done a great deal of harm. I do not want to take the responsibility of saying that it will not occur in Quebec, for I should not like to see any carelessness in introducing foreign stock here. I maintain that the fruit growers should now protect themselves by not buying from the nurseries in the United States. If you have not sent your orders to the United States for the spring, do not do so, and if you do, ask the nurseryman if he is willing to give a written guarantee that his stock does not bear the San José scale. If there is any doubt cancel your order and buy your stock at home. It may be said, as has been said to me, "Oh, you, as a Canadian, want the business for Canadian nurserymen." Well, I am not fool enough to say, "No, I do not." I say, "Yes, I do," and more than that, I say that our stock in Canada is better, and it is safer to buy it than to run any risk. Some people hold the theory that the further away things come from the better they are, and if they can get information from the people in Patagonia, they like it far better than the information they can get nearer home.

Mr. Fisk—What would you recommend in case an order has already been sent to the United States ?

Dr. Fletcher—Any nurseryman in the States will tell you that he is not prepared now to fight any cancellation of an order on the ground of fear of the San José Scale.

Mr. Fisk—What would you do in case you had received the United States stock ?

Dr. Fletcher—I would examine it, and if there was only one scale on the tree I would send it back or burn it. The remedy which has given the best results is washing the trees with a strong whale-oil soap solution, and this must be so strong that you have to put two pounds of the soap in one gallon of water. If you have to pay twenty cents a pound for the soap, it will be cheaper for you to follow out this remedy than to put two gallons of water to one pound of soap. If you have your trees from the States and you are not going to destroy them, I beg you to use the solution. As this question is too serious to have any sentimental nonsense about it, I am not afraid to give you here the name of the best soap and the man who makes it. Good's Caustic Potash Soap, No. 3, is the best soap, as I have been informed by the United States Entomologist. It sells wholesale in hundred pound barrels at 5½ cents per pound, and I cannot see where the 20 cents a pound comes in that is sometimes charged for it.

Mr. Whyte—Has it to be put on hot ? Will it not get thick when cold ?

Dr. Fletcher—Not if the soap is made with potash.

Mr. Shepherd—How do you apply it to the branches ?

Dr. Fletcher—With the ordinary spray pump. The universal opinion amongst entomologists is that if the tree is badly infested with San José Scale you should root it out and burn it.

Mr. Newman—How does the scale travel from one place to another ?

Dr. Fletcher—The full grown female is only one-twenty-fifth of an inch in diameter, and she lives beneath the scale and never moves. Her young are so small that they are like grains of ground sulphur, and when these young are running over the tree it looks as if the tree had been dusted with a yellow powder. They crawl all over the trees. Every little bird that lights on the tree, and every insect that crawls on it, carries the scale from tree to tree. The spread of this insect, from orchard to orchard and from tree to tree, is also effected by other means ; it is carried on horses that move about the orchard, and on the harness. Even a man walking about an orchard may help to spread the scale. One of the inspectors in California, that had been most strenuous in his efforts to have trees destroyed and to have the insect checked, was the means of carrying the scale into another man's orchard. These minute creatures were walking all over him while he was blowing up the orchard owner for having them in his orchard.

Mr. Barnard—We were told at one time that the potato bug would never come to the Province of Quebec, but now it is all over the province. If the potato bug has come here in defiance of the judgment of all scientific men, other insects are likely to come, and it is prudent for us to try at once and prevent them.

Dr. Fletcher—Certainly, therefore take every precaution against it.

Mr. Hamilton—We shall suffer no deprivation at all if every variety of tree in the United States is prohibited from coming in here. Since the civilization of the southern Republic has gone to the length of building Chinese walls against our produce, we should put a similar Chinese wall against allowing their trees into Canada, and we would be much the better of it. There is not a single tree in the United States which we can bring in here with any special advantage to ourselves. That is to say we can do perfectly well without them. If the United States nursery men can dump any rubbish in Canada they will do it.

Dr. Fletcher—I may tell Mr. Hamilton that it has been calculated that 80 per cent. of the surplus stock of the United States nurseries has been shipped into Canada, as I was lately informed by a gentleman in the United States who was in a position to know.

Mr. Hamilton—If we ship it out again it will not do us any great harm I may say that in making these statements I do not do so on the ground that I am a nursery man. I am not a nursery man. I do sell two or three hundred trees in the course of a year, but that amounts to nothing.

Mr. Fisk—Suppose we were to act on Mr. Hamilton's suggestion and pass a resolution that the Government should prohibit trees of any kind from coming into Canada from a foreign country, that would not stop southern fruit and California fruit from coming in here, and we are told that even the birds will carry this scale. How can we prevent that by legislation ?

Dr. Fletcher—With regard to the danger from fruit, careful enquiries were made, and it was stated at a meeting of entomologists lately held at Washington that not a single instance is known where the San José Scale has been carried on the fruit to an orchard.

The President (Mr. Brodie)—Dr. Fletcher has overlooked the bud moth which arrives before the fruit comes on. We found them very destructive, and one spring it looked as if a fire had gone through the orchard. I would ask Mr. Fletcher if he does not think that spraying with the Bordeaux mixture kills the plant lice on the leaves as well.

Dr. Fletcher—I thought I had spoken about adding Paris Green to the Bordeaux mixture for all foliage-eating caterpillars. The Paris Green for the bud moth must be applied with the sulphate of copper solution before the buds open. This insect passes the winter inslde a little silken case on the twigs, and directly the leaf buds begin to burst it comes out of that nest and attacks the buds. These are then large enough to catch enough of the poison to reduce the numbers of the bud moth caterpillars largely. I have never found that the caustic effect of the sulphate of copper in the Bordeaux mixture had a sufficient effect on plant lice to recommend it. I do not think that Paris Green has any effect on them either. The sulphate of copper merely affects the fungi parasitic on the tree.

Mr. Barnard—Adding the Paris Green to the Bordeaux mixture would kill the insects on the leaf.

Dr. Fletcher—When there are leaf-eating insects on the trees add the Paris Green. I wish to call attention to a poisonous material, a new remedy that was discovered in the Gypsy moth work. It is found that Paris Green affects the foliage of many plants, and there is a new material now used named arsneate of lead, which is a precipitate from sugar of lead and white arsenic. This is equally effective in destroying the insects but has no effect on foliage. It is seven cents a pound and thus cheaper than Paris Green. The only danger is that it is a white color and that is a serious matter. Anything that looks so much like powdered sugar as this does is a dangerous thing to have about a house. I have always recommended Paris Green on account of its green characteristic color. On peach trees and the delicate varieties of plums I would use arsenate of lead, but if used it must be used with the extremest caution because it is white like many other commodities used in household operations and therefore likely to be dangerous. I did not care on account of the white color to recommend it too much, but it may be employed if the persons using it will use it themselves. Paris Green is now so well known that people are on their guard against it, and there is a common idea that anything green is poisonous. There is a great difference as regards the quantity of poison in Paris Green, and it has been found that even Paris Green itself chemically pure may vary as much as from ten to fifteen per cent. in the quantity of arsenious acid in the poison. I consider that Paris Green is such a cheap remedy and so easily got that it is one of the best remedies that can be used for all these leaf-eating insects.

Mr. Hamilton—What proportion of the arsenate of lead do you use ?

Dr. Fletcher—It is used in about the same proportion as Paris Green, two pounds to the hundred gallons.

Mr. Barnard—Would there be any inconvenience in mixing Paris Green with this cheaper poison ?

Dr. Fletcher—There would be no inconvenience, as it dissolves easily in water.

Mr. Barnard—The nature of the poison would not be changed.

Dr. Fletcher—No.

The President (Mr. Brodie)—I like to use the Bordeaux mixture along with the Paris Green, because it prevents the Paris Green from injuring the foliage.

A member—I used six pounds of bluestone, four pounds of lime, and four ounces of Paris Green, to fifty gallons of water. What do you recommend ?

Dr. Fletcher—I have always recommended the six pounds in forty-five for potatoes, but Mr. Craig always recommended four pounds in forty-five for fruit trees.

Mr. Brodie—We are subject to fungous growth in Montreal, and for that reason I like the six pounds.

Dr. Fletcher—The original formula was six pounds of sulphate of copper, four pounds of lime, and 22 gallons of water. In spraying potatoes I found that the difference in the result was very small when you doubled the quantity of water, and that it paid better to use the six in forty-five. Mr. Craig tried a great many experiments, and found in ordinary seasons in Ottawa that 4-4-44 gave good results, and being all fours it was easy to remember. We know that in the island of Montreal, of late years, the fungous disease known as black spot has increased, and I think it might be wise to try this 6-4-44 remedy for apples. With the stronger effect of the fungous disease you will get occasionally a little rust on the apples, and that was the reason Mr. Craig reduced the quantity of the sulphate of copper. He approached the matter as a horticulturist, and I approached it as a mycologist. Mr. Craig wanted to grow the fruit and I wanted to destroy the fungus. He would run the risk of letting the fungus have its way so as to get large fruit, but I wanted to kill the fungus even at the expense of the size of the fruit. In the spring I would use a weaker solution, and in the season when the fungus is running over the surface I would use the stronger solution, even at the price of destroying to a small extent the appearance of the apples.

Mr. Barnard—Would there be any inconvenience in making it 6-6-44, as lime is a protection ?

Dr. Fletcher—You do not want to use more lime than you can help ; it is rather troublesome to spray the Bordeaux mixture, if too thick.

Mr. Brodie—The secret of spraying well is to get good spraying apparatus. There have been dozens of pumps sold around Montreal that have deterred people from spraying. Some people bought iron pumps that were only good for one year.

Mr. Hamilton—Do you think there is anything in the rust from spraying ? I notice some seasons that the apples that are perfectly smooth are generally half covered with rust, and I do not spray. Is it not possible that in some of Mr. Craig's experiments he would have found the apples rusty even if he did not spray ?

Mr. Brodie—It is a different kind of rust.

Mr. Fletcher—I believe that the apples were more rusty when a stronger solution was used.

Mr. Hamilton—And you will find one apple more rusty than another on the same tree.

Mr. Shepherd—There is no doubt that spraying with a strong solution produces rust. I discovered that on the Fameuse this year.

Mr. Hamilton—My Fameuse that were not sprayed were rusty, and in your case it was probably not on account of the spraying.

Dr. Fletcher—Definite experiments have shown that the rust may be due to different circumstances. Three years ago some beautiful pears were sold on the Ottawa market. Around the top was rusty, and the rest of the pear was per-

fectly clean and no one could understand it. However, they looked so particularly well that everyone wanted to buy them. Mr. Craig and I made many inquiries and the only thing we could trace it to, was that there was a rain, which was followed by a frost. Frequently a cold wind will rust apples of many varieties. We had a cold north-west wind once at the Experimental Farm and all the apples on that side were not only rusty, but there were little stripes, or blotches, of rust on them, which were caused, I think, because there was protection in some places.

Mr. Hamilton—I notice a great deal of rust in the form you mention, namely, in little stripes.

Dr. Fletcher—I think, perhaps, some of that is from bruises or scratches when the skin is delicate. We do know, however, that rusts do come from spraying.

Mr. Hamilton—About the bud moth, it attacks the buds but it does not seem to do any great damage so as to make it worth our while to prevent it.

Dr. Fletcher—If it were abundant with you, you would experience great difficulty. I have seen peach trees in the Niagara district with every bud destroyed, so that the orchard was ruined for a year by this worm.

Mr. Hamilton—The insect I refer to seems to be so minute as to be imperceptible. This is a brown caterpillar, about a quarter of an inch long, with a black head.

Mr. Newman—Is the Government at present inspecting stock to detect the San José Scale ?

Mr. Fletcher—All nursery stock since last fall is reported to us on arriving at the different Customs houses. They are kept catalogued, and we know where all consignments are going to and who gets them. If from infested States, the trees are followed up and examined.

Mr. Newman—They are not inspected tree by tree.

Dr. Fletcher—We have no power to interfere with them now. But every man who receives that stock is written to and asked to watch it, and they send us a report of anything that is suspicious.

Mr. Barnard—If the insect is so minute that it is almost beyond human power to discover it, the best way is not to allow it to come into the country.

Dr. Fletcher—The United States nurseries are having their stock inspected and fumigated with hydrocyanic acid gas.

This ended the discussion on the address of Professor Fletcher.

Mr. Weir, M.L.A.—I beg to move, seconded by Mr. Christie, M.P., a hearty vote of thanks to Prof. Fletcher for his lecture. It has been a rare intellectual treat for us all, and I for one never expected to experience so much delight from a lecture on an agricultural subject.

Dr. Christie, M. P.—I have great pleasure in seconding the motion. I have very much enjoyed the lecture delivered by the learned Doctor. I will remember that tobacco is a deadly poison to all these insects, and I would say to the gentlemen here that if we wish to live to be as old as Methuselah, we had better remember that tobacco is a poison. I have great pleasure indeed in seconding the vote of thanks to Dr. Fletcher.

Mr. Barnard—Such lectures as we have heard to-night are worth thousands of dollars to the country, and therefore I think that the Hon. Mr. Fisher, Minister of Agriculture, should provide for having them delivered throughout the country.

Mr. Shepherd—It is worth the while of every farmer to be present at these meetings, because they will get a good deal of instruction and benefit from them. They may take it for granted that where they can grow Indian corn they can grow apples.

Mr. Brodie—I might mention to those present that it only costs $1 a year to become a member of this Association, and they are entitled not only to the Annual Report, in which this lecture of Mr. Fletcher's will be published, but they will get a share in the plant distribution of rose bushes and flowers which are sent to all the members.

Mr. Malcolm Smith—I have been a member of the Association for years, and I can tell my brother farmers that it will be greatly to their advantage to join. The plants which are distributed are worth a dollar, without speaking of anything else.

The President (Mr. Brodie)—I appoint the following committee to nominate officers for the Board of Management to-morrow morning: Mr. Shepherd, Mr. Barnard and Mr. Fisk. I appoint as a committee to examine the fruits exhibited and to report on them: Mr. Brodie, Mr. Newman amd Mr. Fisk.

The proceedings of the meeting then concluded, to be resumed to-morrow morning at 10 o'clock.

SECOND DAY'S PROCEEDINGS.

LACHUTE, P. Q., January 26th, 1898.

The Fifth Annual Winter Meeting of the Pomological and Fruit Growing Society of the Province of Quebec was resumed at 10 o'clock this morning.

Mr. Brodie (the President) occupied the chair, and there was a large attendance.

Mr. W. W. Dunlop, Secretary of the Society, read the minutes of the last meeting, which was held at Howick, P. Q.

The Committee appointed to nominate officers of the Society for the ensuing year reported the result as follows:—

Hon. President—Sir Henry Joly de Lotbiniere.
Hon. Vice-President—Hon. Sydney Fisher, Minister of Agriculture.
Hon. First Vice-President—R. Brodie.
Hon. Second Vice-President—R. Hamilton.
President—Auguste Dupuis.
Vice-President—C. P. Newman.

District.	Directors.
1	Dr. Wood.
2	J. M. Fisk.
3	J. H. Carter.
4	Dr. Rinfret, St. Croix, Lotbiniere.
5	J. C. Chapais.
6	H. Bourassa.
7	E. A. Barnard.
8	R. W. Shepherd.
9	Norman E. Jack.

The report of the Nominating Committee was unanimously adopted by the meeting.

Mr. R. Brodie, the retiring President, left the chair.

Mr. Dupuis, the newly-elected President, assumed the chair, amidst applause.

Mr. Brodie congratulated Mr. Dupuis on his election to the presidency of the society.

The President (Mr. Dupuis)—I beg to thank Mr. Brodie, who presided last year, for the able manner in which he has done his duty by the Association, and I trust that I shall do as well in the office. I hope that during my term of office there will be experimental fruit stations established in the Province of Quebec. I may say that recently I have received a letter from Mr. Deschene, the Commissioner of Agriculture for the Province of Quebec, stating that he was sorry that he was not able to attend this meeting, but that experimental fruit stations would be established, as this society has asked. He wrote me that this would be done by Order-in-Council, and so we may be sure that the wishes of the society will be carried out by the Quebec Government in this respect.

It was moved by Mr. Barnard, seconded by Mr. Fisk, and unanimously resolved, that the Committee appointed to consider the question of establishing experimental fruit stations in the province should continue its work until the object was carried out.

Mr. Dupuis then called upon Mr. Crandall, who was Trade Agent for the Canadian Government in Great Britain, to address the meeting.

CANADIAN PRODUCTS IN BRITISH MARKETS.

Mr. Crandall addressed the meeting on this question. He said: I am pleased to attend the meeting of this Association and I hope to be able to show that the farmers and fruit growers of the Province of Quebec have an interest in meetings and associations of this kind. I have had an experience of twenty years and more of commercial life and in dealing in the products of the soil of Canada, and I know something of the joys and sorrows in connection with the commercial aspect of the question. Last spring, rather unexpectedly, I had the honor of being appointed by the Ottawa Government to go to England in order to develop as far as I could Canadian trade in that country. It was a new field of development and I felt the responsibility very much. Sometimes, when I first went to England, I had the blues, and I felt that I was able to do but little, but I had the satisfaction when I left England of realizing that my efforts had not been in vain. I was pleased to hear the lecture of Mr. Fletcher, for I know that the information which he and others impart is useful to the farmers and producers of Canada. I am glad that the Federal Government, as well as the Provincial Governments of Canada, have realized the fact that the great corner stone of the national wealth of this country is agriculture. Indeed, we have to-day in Canada the most paternal governments in the world. They send scientific men around to teach the farmers what they ought to do, and if we are to make farming a success nowadays we have got to understand the scientific side of it. There was a time, which I dare say some of you will remember, when, if there was a dull boy in the family, it was said that he was good enough for a farmer, and the bright boy was educated for a profession. That sentiment has changed. It now requires the bright boy to make the farmer and they can take the other fellow for professional life. I believe that the Government of Ontario was the pioneer in the work of educating the farmers, and of giving the young men a practical and scientific education in agriculture. Canada, I believe, has done more than any country in the world along this line. We have our agricultural colleges throughout the Dominion, our experimental farms, our dairy schools, our travelling dairies, our fruit growing associations, our farming institutes, and all of these have been most beneficial to the Canadian farmers. Much money has been spent by Canadian Governments in the direction of aiding the agriculturist to the knowledge of his profession. However, it is one thing to produce an article and to produce it well and cheaply, and another thing to dispose of it to good advantage. In Quebec and Ontario, where we are extensive barley growers, we regretted much the abrogation of the Reciprocity Treaty and we felt despondent; the great question for us was, where were we going to find a market? Well, good has come out of evil, and so far as Canada is concerned, I believe it was the best thing ever happened us. We felt, and the Government felt, the necessity of seeking for other markets. We felt, on account of the vacillating policy of the United States, and their hostile utterances against Canada and Great Britain, that we could not depend upon the market of the U. S. for anything. While the U. S. practically said to Canada We do not want to do any business with you, and while they have practically said to Great Britain, to whom they export over £106,000,000 sterling a year, we do not want to do business with you, yet the liberal heart of Great Britain

has said to the people of the United States and of other countries: Send us your products and we will admit them free into our country. When a man stands in England and sees the great and generous heart of Great Britain, and when he sees the products of the U. S. coming to that country free and untrammelled, he must necessarily wonder at the generosity of that country. I will not talk about our trade relations, but I want to state that there is a growing sentiment in England in favor of preferential trade with the British Colonies. I am glad of it, and there is no more favorable time than the present to take advantage of the boom that Canada as a colony of Great Britain is receiving to-day. In the Jubilee year, our Premier made a most favorable impression in that country, and he was highly honored and esteemed. Our colonial troops were feted all over England, and the discoveries of gold in Canada have now made the name of our country well known. The attention of Great Britain has been drawn to Canada in a very practical shape, and I believe that in consequence of this there will be a large immigration to this country and Englishmen with capital will invest it here? Now, as to the United States tariff. I might say that one morning in the Covent Garden Market I met Dr. Rae, a representative of the agricultural department of the United States located in Great Britain. I esteem Dr. Rae as a gentleman, but I thought to myself that he had a lot of cheek to come to the Covent Garden Market in London seeking a field for American products, when at the same time his country was declaring that they did not want to do any business with England. I want to impress upon the people of Canada the necessity of their looking sharply after Canadian trade with Great Britain. We must realize by this time that the market lying to the south of us is not open to Canadians, and while they are talking about lowering the tariff on some commodities, yet there is great uncertainty about it. We in Canada are increasing the products of our country, and we must go to Great Britain in the end with all our surplus products. While we might be able to sell our products or any portion of them in the United States, we are no better off than if we sell them to Great Britain, because to-day it is the great market of the world. The United States produces nearly everything we produce, but I hold that we can produce most things better than they can, and so we can establish a reputation for our products in Great Britain. At all events, it is not a matter of choice with us, but a matter of necessity, and if it is a matter of necessity, the question arises: What means are being taken in order to assist the producers of Canada in placing their goods upon the English market in first-class condition and fresh upon the tables of the consumers. The market of Great Britain reminds me of a great bottomless pit. It is open to the world; the surplus products of every country come there, and it seems as if they could never get enough to have that pit filled up. When we send our goods to Great Britain we must remember that we are competing with the United States, and I am proud to say that there is hardly a line of production to-day that we do not supersede the United States in, not only in quality, but in other respects. Take the cheese industry of Canada. We are supplying 70 per cent. of all the cheese that is imported into Great Britain, and the Canadian cheese has a reputation there which we have won by hard work. A great deal of that is due to Professor Robertson and to others in connection with the Experimental Farm. When we remember that England imported of

food products alone, including green fruits, $600,000,000 worth for the year 1896, we see the vast demands of that market, and the question arises, what proportion is Canada supplying. The value of fruit imported into Great Britain in 1896 was over $7,000,000 worth, and that is exclusive of oranges, lemons and dry fruits. There is no apple grown in the world that stands as high as the good Canadian apple. The further north we go and the colder the climate is, the finer flavored fruit we get, and the fruit which possesses the best keeping qualities. I notice this year that while fruit was scarce in Canada there was a large importation into England from the United States of the same varieties, and while in some respects the appearance of the apple was finer than that of ours, because it seemed to be free of spots, still, when you came to taste the apple it had not in any degree the flavor of the Canadian apple, and it did not keep as well. While we have the reputation of growing the best flavored fruits in the world, there is one thing we should be very careful about, and that is that we should act honestly with the British people and give them a first-class article. I stood upon the markets of Liverpool and London and attended fruit sales where thousands of barrels of apples were sold in an hour or two, and I saw Canadian fruit exhibited there that was no credit to us. I saw apples packed in barrels in which the nice fruit was placed at the bottom and the top, and in the centre of the barrel there would be half a bushel of culls. As representing Canadian trade interests I felt a humiliation at this, and I did not care if the people there did not know I was a Canadian for the time being. The man who puts up fruit in that kind of style may have a momentary gain, but he is making the greatest mistake in his life. He is not only injuring his own reputation but the reputation of every fruit grower in Canada as well. I believe it should be made a criminal offence for a man to be guilty of that kind of work. If you gain a reputation in England for putting up a first-class article, if you put your brand on goods and they are true to name, you have no trouble at all in doing business with the people of the Old Country. You have first to establish confidence, and when that is done you have no trouble so far as the future is concerned. There is one thing about the English character, and that is that if you deceive the British public once they won't touch you again. The English character is honest, perhaps more honest than ours, and if a man is not honest that country, in public or private life or in commercial pursuits, he is discredited at once. I want to impress upon the farmers of this country that in the future they should take more pains in catering to the wants of the English people. They should keep their goods in first-class condition, and place them on the market in that condition. There is wealth in the British market for the Canadian producer, but the Canadian producer must agree with the ideas of the English consumer. If you go to a retail store and you see two barrels there, one in which the apples are quite as good as the other, and perhaps a little better, but one barrel is clean and the other not, you will naturally take the clean barrel. The eye is the first thing that has to be pleased, and after that comes the taste and the quality I was at Covent Garden market a year or two before I left England, and I bought a box of Lady apples there to exhibit them in Canada.

Mr. Crandall then exhibited a box of Lady Apples which were packed in

France and sent to the English market. The apples were carefully arranged and neatly gotten up with artificial moss between.

Mr. Crandall continued: You can see from this box of apples the pains that the French people take to cater for the taste of the British public. That apple by itself would not realize five shillings a barrel, but on account of the tasty manner in which it is prepared, they get one shilling and six pence or two shillings for these thirty-two small apples.

Mr. Barnard—Would it not require cheap labor to prepare the apples in that way for the market?

Mr. Crandall—I am not going to say that it is not cheap labor, but it is labor that is certainly well paid for in the end. It is an object lesson for us Canadians to arrange our goods in nice form and to cater to the eye as well as to the taste of the people. The more tasteful the package is the more money it will bring. I believe we can make some improvement in the methods in which we ship our apples to the Old Country, although I do not say that it would be practicable to get apples up in this way for general shipments, yet we have made an experiment and we have the satisfaction of realizing what a little ornamental work will do in the direction of increasing the price obtained for Canadian fruits. When the department was sending over a consignment some of our Grimsby people put up Baldwins and Kings, very selected fruit, in fancy boxes. They looked very handsome upon the market and I was proud to say that was Canadian fruit. The fruit was sold at so much a case, forty-five pounds in the case, and it brought at the rate of two pounds sterling a barrel. You see there was a very large margin of profit in that, and I think we could ship some of our choicest fruit, specially selected, and put them up in boxes rather than in barrels, and make quite a success along that line. We are a pear growing country; I think in the Province of Quebec you grow pears quite successfully, and, of course, I know you do in Ontario. They raise quite a few pears in the British Islands, but the amount of pears imported into Great Britain in 1896 was 206,674 pounds sterling in value. France was the largest shipper, sending to the value of 125,300 pounds sterling, and the United States shipped to the value of 23,117 pounds sterling. The balance of the shipment was from other foreign countries, Canada furnishing but a very small quantity. As to grapes, Great Britain imported in 1896, 442,828 pounds sterling worth, and these grapes were principally grown in Spain. The Government of Canada shipped as an experiment quite a large quantity of grapes. If you ask me my impression as to the flavor of these grapes I should certainly prefer the Canadian or American grapes, but the English people, in their tastes and in their methods, are very conservative, and they are, perhaps, a little slower than we are to adopt new ways and methods. Now, the English people did not like the flavor of our grapes, and it is going to be a difficult problem for us to solve as to how we can educate the people of Great Britain to use the grapes grown in this country. The Spanish grape is not to be compared to the Canadian grape, for it has a tough skin and is not as sugary as the Canadian grape is. I think it is only a question of time when the English people will take to the Canadian grape, for I made a little experiment of my own and I found that the English people who

had been over in this country were fond of Canadian grapes. At my hotel in the city of London there were a great many American tourists and, of course, they were in favor of the Canadian or American grape, and I saw that the English people there were prejudiced against the flavor of our grape. They would taste them and lay them down again, and they would say that the taste was like paraffine. Another fellow said they smelt like cats, and I felt like saying "rats," but I kept down my indignation. I sent a box of our grapes to my hotel, and I told the landlady to put them in plenty on the table for dinner, cautioning her at the time not to tell where they came from. I saw that the American people, and that the English people who had been over in this country, relished them, and they wondered how they got over to England. I saw, occasionally, an Englishman or a Scotchman eating them, but they were few in comparison with those who did not. Now, it is for us to try and cultivate a taste for our grape with the English people. We must remember that tastes change and many of us will recollect that there was a time when we ourselves did not care for tomatoes, but now we use them in large numbers. I believe that by judicious management, and by putting a few of our Canadian grapes on the English market occasionally and selecting the very best fruit, we can cultivate a market in Great Britain for our Canadian product. The grapes grown in Great Britain are all hothouse varieties, beautiful to look at, but their flavor is not superior to our own. The price of these grapes places them beyond the reach of the working classes of England, and only the rich people can eat them, because they sell for twenty and thirty cents a pound. The Spanish grape, as I have said, has sold very abundantly on that market, and I must say has good keeping qualities, a characteristic which our grapes lack. At the price obtained for grapes in the English market, we could grow them with great profit. Now, as regards plums. If we can ship them to the English market in good condition they will be very profitable. England imported in 1895, 241,782 pounds sterling, worth of plums. France was the largest supplier, but the United States are now shipping plums from California and laying them down in first-class condition in that country. I saw one morning in Covent Garden market a consignment of 800 packages of plums from California; they were in fine condition, and they were sold in a few minutes and realized very handsome profit. I saw in that market also large weekly consignments of California pears. When I saw the fruits of California coming across the American continent for 3,000 miles in cold storage cars and then transferred at New York for a longer Atlantic voyage than from Montreal, I realized that we should be alive to this trade. When I saw the good condition in which the fruit arrived and the comparatively poor condition of the first shipments of our fruits, I saw there was something radically wrong, and I felt that if we could not do as well as the Californians the fault was ours. I believe that we have the pluck and the energy to overcome any difficulties, and I believe that in the near future we will place our fruits upon the English market in as fine or finer condition than do the people of California. In their experimental shipments from California they underwent the same difficulties we did this year. It cost the fruit growers of California a large amount of money before they made a success of their shipment of fruit to England, but they have the thing in such shape now, and they understand the methods of cold storage so well, that they have no fear as to the

result for the future. The Williams pear of California is similar to our Bartlett pear. Their pears are larger than the pears we grow in Canada, but when you come to the flavor, our Bartlett pears are immensely superior. As soon as the English people discovered the merits of the Canadian Bartlett pear over the Williams pear, they preferred our Bartlett pears at once. We have no fear of making large shipments of our pears to the English market, for if they arrive there in good condition they will sell well. We should try to cultivate in this country, and we can do it profitably, a large winter pear, and if we do we will have an unlimited market for it in England.

Mr. Hamilton—Can you say something about the most desirable packages in which to ship apples?

Mr. Crandall—It is generally considered that there is no package that will suit our Canadian apples better than barrels; but so far as some choice varieties are concerned, it is worth while for us to experiment along the lines of shipping in boxes or cases. We have now the advantage of cold storage, and we can ship them with perfect safety and I believe land them without being bruised or damaged.

Mr. Shepherd—How did the trial shipment turn out from Ontario?

Mr. Crandall—They turned out satisfactory towards the last, but our first shipments were a failure, while I supposed they were going to be a success, and had preliminary arrangements made for a big boom in reference to Canadian fruit. When they arrived I had to suppress everything, for I felt humiliated, and I saw there was something wrong. I had faith in the cold storage system, and I investigated the matter and the Department investigated it on this side and made great improvements. Consequently our last shipments came over in good condition. In the case of the first shipment the Grimsby people killed their fruits with kindness. The package was more expensive than was necessary, and it did not admit of the cold air getting to the fruit, and the result was that the fruit perished in transit. It was also packed in a warm condition, and I do not think they followed out the instructions of the Department of Agriculture, but perhaps they thought they could improve upon it a little better, and so they made a great mistake. We have a market in Great Britain capable of taking all our surplus products; we have the sympathies of the British people, and if we place our products in good condition on the market, I am satisfied that the British heart will give Canada and the colonies a preference. But we must be honest in our dealings with Great Britain. We must establish a reputation for honesty in that market, and it is only a question of time when we will see the practical results. We should cultivate a sentiment of loyalty to the Mother Country, a sentiment of loyalty to each other in this country, and a sentiment which will make us outrival the producers of other countries. We have a grand heritage in Canada, and we should rise up in our national manhood and show to the people of other countries that we have got the brain and the push and the pluck to cultivate fruits and other products in this country which will stand side by side with the products of any other country upon the British market.

Mr. Brodie—The growing of tomatoes is quite an important matter in the island of Montreal, and might I ask what kind of packages you would recommend to export them to England in.

Mr. Crandall—If the tomatoes arrive in good condition it does not matter so much what kind of package you put them in. The package most desirable is that which costs just as little money as possible and which answers the purpose. The English market wants a small tomato. Our Grimsby people ship big tomatoes ; I understand they went around collecting them, but it was a failure. The English people like a tomato about the size of a Baldwin apple. Tomatoes arrived in good condition in England this year and sold at a good margin of profit. The trouble is that a great deal of our fruit goes through in a damp condition, which is caused by our packing in warm weather, and because of the heated state of the hold of the vessel. We have to originate some method by which we can take the hot air out of the hold of the ship before the cargo goes in and bring in the cold air. It is utterly impossible that our earlier and perishable fruits can be landed in good condition if the hold of a vessel is heated.

Mr. Shepherd—It is most interesting to know that in the experiments of the Grimsby people first quality apples were sold at two pounds sterling per barrel of forty pounds in the season of 1897. Of course, in 1897, very high prices were obtained during the whole season, as there never was a glut in the market, but the prices obtained in 1896 were very different. I have had considerable experience in shipping apples in cases to England for the last fifteen years, and if Mr. Crandall were present when these prices were obtained of two pounds sterling per barrel, for apples shipped in boxes, perhaps his presence there had a good deal to do with the high price. What I mean to say is that probably there was a square deal in the selling of them. I have shipped in cases to the open market in England and I have not been altogether satisfied. My cases were somewhat different from those used by the Grimsby people. They held sixty-five or seventy pounds of fruit. I have been shipping Fameuse and the best eating apples we produce in the Province of Quebec in those cases for the last sixteen years. For the last three or four years I have not been shipping to the open commission market, and for the reason that I had no agent to watch the sale of my fruit. The first shipment arrived when the fruit was scarce, and realized a very good price, but the moment there was the slightest drop in the market, the prices declined so that the apples were sold at less than they cost me. I always pay the freight, and I made a complete loss in 1895, and did not ship that way in 1896. I lost as much as five shillings a box, shipping in that way, towards the end of the season. I wrote to the commission man and told him that he did not give me credit for my fine package and the fine condition in which the fruit arrived. He acknowledged that the fruit was fine, but he said the barrel weighs so much, and your boxes weigh a proportion of what is contained in the barrel, and they were sold on that basis and you must be satisfied with the price. That certainly was no encouragement for Canadians to put up our best fruit in the best manner for the open market. I had to seek some other system of selling my fruit in the Old Country, and after fifteen years I have established a connection in London whereby I can place in three or four con-

cerns my fruit, so as to reach the consumer as near as possible. I do not want to deal with any commission man if I can help it. If the producer can get as near the consumer as possible, then you obtain a very high price ; if you can reach the retailer, who sells direct to the consumer, then the London people will pay the highest price in the world for fine apples. That is the kind of market the Canadian shipper must reach to make a profit on his fruit. I maintain that the commission houses and the auction sales will not give you the credit for the extra fine package and careful picking.

Mr. Fisk—Mr. Crandall referred to a necessity for taking the cold air out of the hold of the vessel before the fruit is put in. Might I ask him if the American apples, shipped via the St. Lawrence route, were in as good, or better, condition than the apples shipped in barrels through the American lines.

Mr. Crandall—I sent a report to the Government of the condition of twenty or twenty-one steamers that landed fruit during the present fall, the condition in which the fruit arrived and the average sales, and I found in my investigations that Canadian fruit will outsell American fruit at any time, if the fruit arrives in good condition. They prefer our fruit. I did not notice so much the condition in which the American fruit arrived, because I was particularly looking after the interests of our own fruit.

Mr. Hamilton—I have had some experience in dealing with apples, and there is one thing that only came to my knowledge last season, and that is that the apples should be picked when they are cold. An apple picked early in the morning, when it is cold on the tree, will keep clean much longer than an apple picked in the heat of the day. I state that as a fact, and I am willing that my reputation should go on that statement. If the apples are picked in the cool weather they will give the best results.

NOTES ON PRUNING BY J. M. FISK, ABBOTSFORD.

How and when to prune an apple orchard is a problem to many, and there is more involved in the thrift and healthy conditions of an orchard, as to the manner and season in which this work is performed, than most of our growers realize.

A fruit tree should be looked upon as a live, sensitive thing ; and its beauty, profit or loss, to its owner will be more or less in proportion to the nourishment and judicious labor bestowed upon it.

Show me the farmer who has a fine looking team that can do a good day's work with no fear of leaving their load stuck in a bad bit of road, and I will answer for it that he not only understands horses, but sees to it that they are well fed and properly groomed at regular intervals ; and so, likewise, a thrifty orchard denotes care and labor, which is sure to bring to its owner fruit in its season of a satisfactory nature.

The grower who complains that he cannot sell his apples, that there are too many small and scabby ones, that he can never get any first prizes at the fall

exhibitions, and so on, is the man who neglects his orchard, and in nine cases out of ten if you were to visit his orchard you would find the trees looking scrubby, with plenty of sprouts and suckers at their bases; bushy tops, with the branches interlacing one another partly dead, and old caterpillars' nests here and there; that he never sprays, and if pruning has been attempted at all an axe has been used, and stubs left from three inches to a foot long; and yet he wonders that people claim that it pays to grow apples.

"What is worth doing at all is worth doing well;" and as there is a time to plough, a time to plant, and a time to reap, so there should be, and is, a time to prune; and undoubtedly the most important period for this work is during the first ten years of a tree's life.

The old proverb which admonishes us "To bring up a child in the way he should go, and when he is old he will not depart from it," is quite practical in the training and pruning of a tree.

If more labor and study were given to our young orchards in this respect during the period of their growth before fruiting, there would be less wounds upon our trees and more money in our pockets during the fruitful period.

When a tree is transplanted from the nursery to the orchard it is deprived of a portion of its roots, and the top should be cut back in proportion.

It is safe to remove from one-third to one-half of the last year's growth, and upon the manner of doing so depends to a large extent the future form and symmetry of the tree.

The operator should always keep in view a well balanced head, and as varieties differ in their natural growth, some tending towards a spreading head and others to an upright form, the cuts should be made at different angles; that is, the twigs of the upright form should be cut to buds on the *outside*, while those of the spreading form to buds on the *inside* of the twigs; and, if possible, always secure a good twig as leader or main stem of the tree.

Should the planting be done in the fall (which I consider a mistake in our climate), the cutting back should be deferred until spring, before the sap starts and the buds open.

Visit the trees periodically during the growing season, and rub or cut off all unnecessary growth as soon as it starts, as this is a tax upon the vitality of the tree. Follow up the pruning annually, and during the month of April remove all branches that are likely to interfere with the freedom of their neighbors; always cutting close to the main stem, and covering all wounds the size of a five cent bit and larger with thick paint.

To prune an old and neglected orchard is an operation attended with more or less risk, especially if done at an unseasonable time. I have known of orchards being almost ruined by heavy winter pruning. It is not desirable to prune heavily at any season, and fruit trees in our climate should never be pruned in the winter, when the wood is frozen or likely soon to be; therefore,

avoid pruning during the months of December, January and February, and often March is also unseasonable; but it is quite safe to commence as soon as the heavy frosts are over, even if there be snow on the ground, and continue until the buds are ready to open and the wounds give indication that they are likely to bleed from the flow of sap which is the most active at this season; and should there remain any portion of the orchard unpruned, it is best to defer the work until the sap is in a more gummy condition, and the extreme heat of the season is over, which is usually in August, when the work can be continued well into October if necessary. Dead wood can be removed at any time during the summer months.

In removing a large limb, or in fact any limb, care should be taken not to injure in any way the bark surrounding the wound, which in every case should be as small as possible, and always terminating close to the main stem or limb, especially on the upper side, and at such an angle as to make a perfect water-shed and to afford no rest for snow or ice in the winter; and these wounds should be kept covered with paint until healed over.

Scraping or keeping clean the trunks and large limbs of the rough bark which nature is trying to cast off should accompany pruning, as it affords shelter to insects and impedes the natural expansion of the inner or new bark. This work should also be done in the spring or early summer; on a damp day, when the bark is wet from recent rains, is the best time.

An ordinary hoe, a mason's trowel, or the back edge of a pruning saw, will make a good tool for this work.

Briefly, to sum up, pruning, in a variable climate like our own, covers a very important question in orchard cultivation; and my experience has taught me that the work should commence with the planting of an orchard, and special care be given during the first decade; that after a tree has come to full bearing there will be less growth, and less pruning required; that the work should be done in early spring before the buds start, which will afford the whole season's growth to cover the wounds made; that summer pruning is better than none, but winter pruning should never be indulged in.

Mr. Barnard—Do you find paint as good as wax for healing the wound on the trees?

Mr. Fisk—It is easy to apply, less expensive and better.

Mr. Newman—Did you ever try to keep the height of the tree down?

Mr. Fisk—I never did.

Mr. Shepherd—I found it a very good plan to cut off the tops of the shoots and make the tree stockier and stronger.

Mr. Hamilton—Chopping off the small growth is a very good preventive of the summer blight. When the growth is long and luscious there is great danger of summer blight. Of course, if the shoots are shortened, it would be a

heavy task in a large orchard, but it would serve in a great measure to prevent that sort of blight.

Mr. Chapais—If you cut a large limb of a plum tree there is considerable danger, but by clipping the small shoots you do not run much risk. If you are obliged to cut a large branch of a plum tree, I found that a good way to prevent the gum from coming out is to burn it with a hot iron. That is very important, especially for cherry and plum trees.

Mr. Dupuis—I would ask Mr. Fisk if his system of pruning applies to other trees ?

Mr. Fisk—No ; my system applies to the apple trees. The cherry and plum trees should not be pruned so much. I do not think any fruit trees should be pruned in winter.

The President (Mr. Dupuis)—When the branches are bent and covered with the snow the farmers never prune them.

Mr. Brodie—One advantage of severe pruning is to bring unfruitful trees into bearing. I had some Russian pears that were encumbering the ground, and I nearly cut half the wood from them, and this last summer I had heavy crops. I would like to try the same with some of my unfruitful trees, but I intend to wait a while.

The President (Mr. Dupuis)—It would be much better for you to prune the roots if your trees make too much wood.

Mr. McGowan—If the wild apple tree is pruned, you can get as nice an apple as you would wish. There is one advantage, that they will keep longer. I got a tree twenty-five years ago from the side of the road. It was 20 feet high, and I planted it and it grew, but that is all I got from it. I cut about half the trees, and from that day until now it has not ceased bearing every season. The apples keep very well. This present year they were extra large and fine in appearance, but of course they are not an extra good apple to eat. They are the most profitable apple you can get for keeping purposes. There is a great deal in pruning the wild apple tree, and I think there is a great deal lost by not cultivating it. It changes entirely the moment you commence to cultivate it.

Mr. Barnard—Since I began pruning my orchard, every year I have had considerably more fruit than formerly.

THE FAILURE OF THE APPLE CROP OF 1897.

R. W. SHEPHERD.

This is a subject that we are all much interested in, as it immediately affects our pockets.

No doubt, to a great extent at least, the phenomenally heavy crop of 1896 was the cause of the small crop of 1897. But we must look further for the bad

quality of this small crop. Excepting, perhaps, a few early varieties, the whole crop of this Province was undersized and ill-looking. Never in my experience have I seen such a miserable crop of Fameuse as that of the past season.

No district seems to have been more favored than another, and the proportion of number one fruit in the crop was not, I believe, more than five per cent., and in some cases even less than that. As a general rule, we orchardists of the Province of Quebec have the great advantage of snow protection to the roots of our trees; but the winter of 1896-7 was an exception to that rule, and consequently the roots of the trees were exposed to the very severe and continuous frosts of last January and February, which penetrated four and five feet below the surface of the ground. Those orchards in sod, although the trees were much shocked and injured, were able to survive and feebly develop their fruit.

The small size of the fruit, therefore, must, I think, be attributed to the injury the roots of the trees were subjected to during last winter, and the tremendous growth of fungus was no doubt promoted by the weak condition of the trees in consequence of the injury done to the trees by the frost.

The freezing of the roots was even more pronounced and noticeable in trees which were standing in ploughed or cultivated land, these trees being, with few exceptions, badly injured, or in fact killed outright, unless they had been protected by heavy mulching. These root-killed trees retained generally enough vitality in their trunks and branches to enable them to leaf out and perhaps endure for a month or two, but all, or nearly all, succumbed before the summer had expired.

One remarkable instance of the effect of frost on the roots of trees was particularly noticeable in one of the orchards of Mr. Robert Brodie, our President. This orchard, on a hill at Coteau St. Pierre, Montreal, contained perhaps 250 bearing trees, probably twenty-five years planted, all magnificent trees—one-half in sod, the other half in ploughed land—those in grass, which had been cut once during the season and the aftergrowth allowed to lie down, thus affording a good winter protection to the roots.

When I visited the orchard last October the trees in ploughed land were almost all dead or so weakened that I believe that they were beyond redemption, whereas those in sod were, seemingly, in very fair condition and bearing a good crop of apples.

It seems to me that the experience of last winter teaches us a severe lesson in orchard cultivation. We cannot afford to lose our well established bearing trees in that wholesale way.

We must either keep our bearing trees in sod, or if we cultivate the ground between the trees we shall have to mulch the ground very heavily under the branches of the trees, as far as the roots of the trees extend.

If sheep have been grazing in the orchard it will not do to trust only to the sod protection in such case, but I would recommend a mulching also on top of the sod.

But Mr. Brodie's plan to allow the *aftergrowth* of grass to become matted and die down is a most excellent system and affords the best possible protection.

With last year's experience before us we cannot trust only to the old fashioned snow mulch as our only protector, but it is better to be on the safe side and give more attention to winter protection to the roots of our orchard trees and thus discount any chance of root-killing.

Mr. Shepherd—My paper is brief as my object is to start a subject for discussion.

Mr. Brodie—I had a ten acre orchard at the back of my farm on light gravel soil and the trees wintered well there, but in the black sandy loam it was different. I think that when the ground was soaked with water and that was followed by an exceptionally severe frost without the snow protection, it was the means of killing these trees.

Mr. Barnard—We have a good authority from France, who is President of the National Pomological Society, and he stated that the orchards in Normandy were kept in the best condition by having a heavy crop of grass in the orchard, which meant an extra heavy crop of fertilizers. They did not pasture but had a good grass crop and they found that the greater the danger the better the protection from grass.

Mr. Brodie—The trouble with the grass in one of my orchards is, and I suppose others are in the same position, that the railway goes through and on one occasion the sparks set fire to the grass, and if it had not been for some cultivated land around my barn it would have gone.

Dr. Fletcher—The question raised by Mr. Shepherd as to the treatment of our orchards is one of great importance. I do not think that these orchards referred to by Mr. Barnard in France and Germany can quite compare with ours. There are some orchards over 100 years old in these countries.

Mr. Brodie—We have some orchards 50 years old here.

Dr. Fletcher—Our western experience is that they grow better fruit when the land is cultivated underneath. In Ottawa we find it advisable to grow a cover crop, such as clover, which remains on the ground in the winter and is ploughed in in the spring.

Mr. Brodie—That is mulching.

Dr. Fletcher—Yes, but it is much less trouble than putting on manure. There is no doubt that the trouble last year came from winter root killing.

Mr. Shepherd—All my bearing trees are in sod and I lost a few trees here and there, perhaps a half a dozen out of 1800. I lost over 2,000 in my nursery and some rows were completely killed, many of them being two and three year old trees. That is just because they had no snow protection. In young orchards until they begin to bear, I advocate cultivation as Prof. Fletcher does.

If we are going to have winters without snow, we must protect the roots either by a heavy mulching of manure around the tree or by backing up the earth. I have done it both ways.

Mr. Hamilton—Did you lose any of your trees that you had banked up?

Mr. Shepherd.—No, I gave my experience last summer of planting an orchard in the fall of 1896 and the spring of 1897. The trees planted in the fall of 1896 have done better than the trees planted in the spring of 1897, notwithstanding the very bad winter. We were very careful not to plant them too late in the season and we heaped up the earth for two feet against the trunk of the tree. When I saw in December that we were going to have a winter without snow, I had manure carted out and I heaped up the earth around them. The trees were weak and it was near the first of June before they showed signs of life, but after thinking over the matter I saw that the reason was that the effects of the sun had never come to the roots, on account of the earth packing and mulching. We spread the manure about the 20th of May and it was not until then that the sun had any effect on the roots. But when the sun got to the roots, they made better growth and were in much better condition than those planted in the spring. If fall planting is done properly, it is superior to spring planting. The trees are in better condition to grow immediately than if you took them out of the nursery in the spring and severed the roots. The shock is so great that, during the first season of spring planting, the trees make very little growth. I believe you gain a year's growth by planting in the fall, but you must take great precautions.

Mr. Farmer—The question of hardiness of trees is a very important one in this country, as it is in our country of northern New York. We find that the Northern Spy apple will stand the winter in our country better than any other, and, therefore, I think that the question of varieties is very important to us. At present, even though we grow varieties that are not so hardy as the Northern Spy, we plant Northern Spy almost altogether, and, as you know, the trunk of the tree influences the root. Therefore, I think that the Northern Spy root would be harder than a variety like the Baldwin or Greening. Would it not be a good plan to sow the seeds of Northern Spy apples, or plant Northern Spy trees, and graft your other varieties in the top?

Mr. Barnard—The question of fall planting is very important. I remember this subject was discussed forty years ago, and at that time it was entirely condemned to plant trees in the fall.

Mr. Hamilton—So it is yet.

Mr. Barnard—Many years ago a German came to Three Rivers, and when he planted trees in the fall we all said the man was mad, but one of the nicest places in Canada now is that spot in Three Rivers which was planted by him. In Quebec we have an Old Country Frenchman who plants in the fall, but he takes every precaution and keeps his trees in such a way that the wind will not disturb the roots.

Mr. Chapais—In all my experience, every time we have tried to plant in the fall at our place we never could succeed, even with the best attention and care.

Mr. Wood—The advice which we give here is for the benefit of the farmers, and the advice which we give, as regards fall or spring planting, should be given for the benefit of farmers and not for experts like Mr. Shepherd and others, who know the business and will do it properly. It is a mistake, in my opinion, to advise farmers in general to plant their trees in the fall. They are sure to make mistakes and lose the greater part of their trees, because they will not take all the care necessary to warrant their successful growing.

Mr. Smith—I have a small orchard out here and I did not know until yesterday how it was that I came to lose four middle rows. I cultivated the four middle rows last year and this spring half of them are dead. I shall benefit by what I have learned yesterday in the management of my trees. I would ask Mr. Shepherd if the Fameuse is a good apple to ship to the Old Country.

Mr. Shepherd—There is no doubt that the Fameuse is with me the most profitable apple to ship, but shipped in cases, not in barrels. You cannot ship Fameuse in barrels and expect to realize a first-class price in Englaud. The Fameuse is a delicate apple, and you cannot pack them in barrels to ship to the other side. The pressing down of the cover bruises every apple in the barrel and that bruise is the beginning of decay. I have been shipping in a compartment case something like an egg case. It is an expensive case and unless you can regulate your business on the other side so as to get a good price it is doubtful if it would be a success. The Fameuse keep as well in England as in Canada if they are shipped in cases. One of my brothers, living in England, wrote to me that in the month of February his Fameuse, kept in a shed, were just as good as he ever tasted in Canada at that time of the year.

Dr. Fletcher.—We have had a good deal of discussion now about fall planting and I do not know which is the better way yet. You have some of your trees over grass and some in cultivated ground, and from what you have learned from this meeting what are you going to do next year.

Mr. Smith—We had good success last year by cultivation. But if the ground is cultivated the trees must be mulched.

Dr. Fletcher—There may be difficulty with mice, for, as you know, mice come when we have deep snow. The simple method which we adopt at Ottawa on the Experimental Farm has been very effective. We have simply stamped the snow down around the trees, and that seems to be sufficient to keep the mice out.

Mr. Barnard—We were tramping the whole winter in an orchard at Varrennes, and when the spring came the mice were on the tops of the trees.

Mr. Shepherd—In reply to Mr. Farmer's statement I may tell him that we cannot grow Northern Spy to advantage north of the County of Huntingdon, I have a Northern Spy planted 25 years and I have never had an apple off it yet. I merely planted it in order to test it, and I have found that five or six

times it has been winter killed in the top down to the snow line, and then in the spring it would push up a shoot from below the snow line and start again. The tree is not sufficiently hardy to stand our severe winters, and I would not advise anyone north of the St. Lawrence to plant Northern Spy.

Mr. Chapais—Nor even south of the St. Lawrence.

Mr. Brodie—Next year I intend to take an early crop for the market and sow either buckwheat or clover.

A member—Which will you sow ?

Mr. Brodie—Buckwheat is the cheapest.

Mr. Whyte—I have a comparatively small garden and I always mulch with manure. Last year I mulched with rotted manure with practically no straw in it and I lost several trees. I am quite satisfied that if I had had straw manure I would not have lost any. Straw manure is the best as a covering.

The President (Mr. Dupuis)—Is it still your opinion, Mr. Brodie, that it is better to plant in the spring ?

Mr. Brodie—Every time. My experience in heeling in has not been successful. The bark got killed between the ground and where the snow was lying. I have heeled in the whole thing, branches and everything, and I was successful in that. So far, I planted hundreds of trees in the spring of the year, that I got out of the nursery in the spring, and I never lost a tree hardly.

Mr. Shepherd—In the fall of 1896, I heeled in three thousand trees, which I had to transplant, and we did not lose one. They were very carefully heeled in in a dry place and, the trees were sunk in the earth right up to the branches.

AFTERNOON MEETING.

The meeting resumed in the afternoon :

Mr. Shepherd, Mr. Fisk, Mr. Newman and Mr. Chapais were appointed a Committee on Resolutions.

Mr. Shepherd from the Committee appointed with reference to the fruit exhibits at the meeting, reported as follows :

R. W. Shepherd, Como, exhibits very fine plate Winter St. Lawrence, that had been kept in cold storage.

J. J. Gibb, Como exhibits plate McIntosh Red and plate of Winter Arakaba.

C. P. Newman, Lachine Locks, exhibits plate Duchess and Alexander, that had been kept in cold storage, all in good condition.

R. Hamilton, Grenville, exhibits 22 varieties of very fine display, altogether Russians, Lord Apple, Boradorffer, Howard apple (aport); 5 plates dissimilar aports, Arakaba, 12 (Budd importation) Red Anis (an apple of very fine quality),

Sweet Russian. McIntosh Red, La Victoire, a Fameuse seedling of very good quality and recommended, Scott's Winter, Shield's (Wisconsin crab) Camille. 2 plates Fameuse seedling.

N. E. Jack, Chateauguay Basin, exhibits for name a plate apples which the Committee unanimously declared to be McIntosh Red in fine condition; plate Golden Russet, a plate Grimes Golden, plate of Fameuse, plate of Swazie Pomme Grise.

Capt. W. F. Halcro, Hudson—exhibits two plates of seedlings;—1st a large apple, but past its season, fair quality, good cooking; 2nd a small apple, good keeper, fair quality, rather small for market.

Mr. Malcolm Smith, of Beech Ridge, Argenteuil Co., showed a splendid plate of King Tomkin's apple and also a plate of Fameuse and Golden Russet.

THE NEW STRAWBERRY CULTURE.

Mr. L. J. Farmer of Pulaski, N. Y., read the following paper on the New Strawberry culture.

STRAWBERRIES.

CULTURAL DIRECTIONS FOR BEGINNERS.

The proper way to begin the strawberry business is to start in a small way and increase the plantings as your knowledge increases. Many people make the great mistake of planting too largely on the start. They become impressed with the idea that they can get rich quickly in this business, by reading of the success of some expert or by hearing some enthusiast speak from the platform of a farmers institute or horticultural gathering. They rush into the business without knowledge or definite purpose, plant more acres than they can properly care for and when the final returns come in they are almost always less than is expected. Natural abilities being equal, the man who has the most experience can get the best results. Of course there are men who will learn in a few years more than others will be able to learn in a lifetime It is the lack of a proper knowledge of details which often causes the beginner to fail. We get general ideas by reading and listening to speakers, but the details so necessary to success come only by long and expensive experience. The most successful strawberry experts are those who have given it the most study. Every farmer and rural resident, who has space enough, should have a patch of strawberries that will supply the table for six weeks or so, and enough to put up for the rest of the year. It is a safe way to first learn by reading and experiment how to grow enough berries for the family; then, if we like the business and a market is in reach, we can go into it on a larger scale to meet the demands of that market

Find out what the market wants and try to supply it. It takes from 200 to 500 plants, made up of early, medium and late varieties, to supply the wants of a family, depending on the skill of the grower and the size of the family. People will eat more berries when they grow them in their own gardens than when purchased, even at a low price.

Location—Plant your strawberry bed near the buildings, where you can see it every day; then if it gets weedy you will know it. Plant it near the road; then you will take pride in keeping it clean, so others will notice it. It saves time in gathering the berries as well as in hauling fertilizers, mulching materials, etc. Then there are odd hours often lost that might be profitably spent in the strawberry bed, if located near, whereas, if located at the other end of the farm, no one would think of the strawberries. In going to and coming from other crops, the cultivator may be run through the strawberry rows as often as opportunity occurs, with great advantage. Lands nearly level are best for strawberries, if underdrained. A southern slope makes the berries earlier; a northern exposure tends to retard the time of ripening.

Soils—Any rich soil that will grow a good crop of either corn or potatoes will grow strawberries. Sandy soils produce earlier berries than clay, and the berries are firmer. Soils made up largely of clay, produce the largest crops of the largest berries. It is because they retain the fertilizers and moisture better, do not leach. But clay must be drained well by deep open ditches or underdrains, and well covered by mulch in winter. The ideal soil is that made up of a mixture of all kinds of soils.

Fertilizers—It is economy to have the soil very rich. While strawberries do not rob the soil of much fertility, (a ton of berries removes only 85 cents worth—the balance of their make up is mostly water), it is necessary to have sufficient plant food in the soil to provide for the growth of the plants. A well fed, thrifty growing plant will ward off most diseases of the foliage, when weak plants will succumb. The vines and roots remain on the land and go to fertilize succeeding crops, The soil should be made rich before the plants are set out, by heavy applications of fertilizers to the crops that precede the strawberries. It is good to plant two crops of corn and one crop of potatoes before the strawberries are set, and apply heavy coats of manure to the two crops of corn. Use commercial fertilizers on the potatoes and on the strawberries. Use part of the fertilizers before the plants are set, harrowing it in, and the balance during the growing season, scattered around the plants. Do not allow the fertiliser to get on the foliage to burn it. It is a good plan to fertilize the beds in the spring of the fruiting year by scattering on the rows before growth starts. About one ton of mixed commercial fertilizers is about right. One-half should be applied before the plants are set and harrowed in, one fourth during the growing season and hoed in about the plants, and the balance in the spring before fruiting.

Preparing land, and marking—Plow deeply in the spring, as soon as the soil will admit of working. Harrow and remove stones or rubbish that will interfere with cultivation. Harrow again and again until the bed is as loose as an ash heap, If necessary, plow again, then harrow and harrow again. Nothing is lost in this thorough preparation, and much may be gained. Usually the crop

is large in proportion to the time spent in preparing the soil. If ready to plant, mark the rows four feet apart and set the plants one foot apart in the rows. If the plants come from the nursery and the soil is not in fit condition to plant them upon, they may be heeled in closely together and held until the latter part of May ; then transplanted to the field where they are to remain permanently. While the plants are heeled in the bed, they should be watered when necessary and sprayed about once a weak with Bordeaux mixture to prevent the growth of blight and mildew fungii. Meanwhile the field where they are to be set out permanently is receiving the most thorough preparation. It is plowed and harrowed again and again, bringing to the surface all stones and other rubbish and ridding the soil of the white grub so destructive to strawberry plants. Mark the rows absolutely straight and have them run the long way of the piece. If straight, we can cultivate closer to the plant : and if long, less time is spent in turning arond in cultivating.

Planting—Trim the roots so they will be but four inches long. This will save time in planting, and they will be less liable to be crowded together in the hole.

If they have been heeled in, earth will cling to the roots when taken up, and they will receive no check in their growth by the final transplanting. Use any tool that will make the hole deep enough and allow the roots to be put down straight without doubling up. Some use a trowel and others an old hoe with the handle cut off short. In our section an adze shaped tool is used that meets with general satisfaction. It costs $1, and will pay for itself in one season where one has a good many plants to set. The operator strikes the tool into the ground with the right hand and inserts a plant with the left hand back of the blade, while the adze is being withdrawn. Earth settles about the roots and the operation is completed by shoving earth up to the plants by a forward movement, or push of the blade. Common workmen will set 2,000 plants in a day with this tool. We know of experts who will set 5,000 in a day, and set them well.

Cultivation—As soon as the plants are set, stir the soil about them with a garden rake, potato hook or common hoe. Be very careful not to loosen the plant. Break the crust only. Don't dig deep. Use a Breeds Weeder between the rows, running it close up to the plants. In one week start the Planet Junior Cultivator, using the narrow teeth, Cultivate shallow and as close up to the plants as possible. Run the cultivator through the rows close up to the plants once a week as long as growth continues. As the plants spread, narrow the sweep, and go only one way in the row, and always that way. Hoe as often as possible, the time to kill weeds is when they first sprout. I think that there is hardly any limit to the amount of cultivation that may be given to an acre of strawberries and yet return a profit. There are men who get as high as $1,000 from an acre, but they spend almost their entire time on that acre. Keep the soil loose on top where the cultivator does not reach. A narrow pointed hoe may be used in among the runners and small plants with advantage.

Blossoms and runners—You can get a small crop of berries from the plants the first year, but it does not pay to let them bear. It robs the plants of energy that ought to be bestowed on making a better growth, that thay may produce a

larger crop the following year. It is the best plan to cut every blossom off as soon as it appears the first season. The runners should also be clipped for the same reason. We cut them till the plant begins to become stocky, say the middle of July, and then allow them to grow and strike root. The young plants ought not to mat the ground too closely. Six inches apart each way is close enough. After a sufficient number of runners have rooted, the surplus may be cut off with knives, or the row may be chopped off after a certain width is secured Plants must not be allowed to run wild. Cutting back makes stocky plants, and these produce the largest berries and the most of them. We use common shears for cutting blossoms and runners.

Mulching—Strawberries should be covered with some coarse material just before the severest weather comes in the fall, say the latter part of November. It may be applied before the ground freezes, or after it is frozen solid. If covered before, the mulch should be dropped off at the ends of the rows and carried on to the beds with forks. After the ground is frozen we can drive anywhere, depositing the material where most convenient to spread. The entire surface should be covered just deep enough to completely hide the plants. When applied, the straw will be about three inches deep. Rain and snow will pack it down to about an inch. Strawberries will not smother no matter how deep the covering if it is not applied too early in the fall or left on too late in the spring. Remove the covering and place it in the paths between the rows about May 1st, or as soon as growth starts. Just before the berries begin to ripen, go through the fields and pull all thistles and place the straw carefully about the plants so as to cover all the surface not occupied by the plants.

Picking and marketing—Have a cool building or crating house where the berries may be carried, arranged and placed in the crates. Do not let the sun shine on berries after they have been picked. Sun and wind scald and discolor the fruit. Pick berries as soon as colored. Do not let a large picking ripen before you begin to harvest. Pick every other day. Leave a stem on each berry a half inch long. Do not handle the berries in picking. Take hold of the stem, pinch it off and place in the basket carefully, so as not to bruise it. Do not pick in one hand and place in the other till you get a handful. It mushes the berries. Pick each berry separately and place in the basket. If you ship to a distant market, pick before too ripe and hustle them off to the train or hold in a cool place till the proper time for shipping. For the home market, allow the fruit to ripen more thoroughly. The flavor will be better and consequently you will sell more. If there is an enterprising merchant in your town let him sell your fruit. If dealing with the merchant proves unsatisfactory and there are others who peddle, your only course will be to peddle. This is hard work, but a good peddler will average to receive two cents more per quart than he would get from a merchant. It is a fact, too, that no one can sell fruit better than the grower of that fruit, provided he is a good salesman. Marketing, the business end of fruit growing, is more important than growing the fruit.

Profits—The profits will be in proportion to the amount of manure, muscle and brains invested. The usual receipts from an acre are from $200 to $300. There are men, however, who receive from $500 to $1,000, from an acre. They put into an acre as much as the average grower does into three or four acres.

Varieties—One of the most important points in strawberry culture, as well as the most difficult for the beginner to understand, is the question of varieties. Most catalogues are confusing. A long list of varieties are named and the beginner is at sea. He is unable to select the varieties he wants. For this reason I will attempt to classify the several varieties into groups for different purposes. This classification, with the descriptions of varieties which follow, ought to be a sufficient guide for anybody. There are hundreds of varieties of Strawberries with especial traits that enables them to be adapted to certain soils and climates, as well as special treatment. There are only a few that seem to do well on all soils and in all locations. If you will name kind of soil and for what purpose wanted, I shall be pleased to furnish you a list of varieties adapted to your special purpose.

CLASSIFICATION OF VARIETIES.

Those requiring high culture—Crawford, Gandy, Hunn, Jessie, Margaret, Brunette, Champion of England, Marshall, Mary, Sharpless, Timbrell, Henry, Bouncer and Atlantic. These varieties not only require the highest culture, but they do the best on heavy, rich soils.

Lazy Man's berries—These will do well with indifferent culture and on most any soil. Bisel, Brandywine, Beeder Wood, Cloud, Crescent, Downing, Dayton, Enhance, Earliest, Swindle, Splendid, Sunnyside, Burt, Michel.

The other varieties—Bismark, Barton's Eclipse, Bubach, Carrie, Cyclone, Clyde, Cumberland, Edgar Queen, Eureka, Enormous, Greenville Glen Mary, Hall's Favorite, Haverland, Isabella, Michigan, Mastodon, Nick Ohmer, Oriole, Ocean City, Parker Earle, Princess, Ridgway, Ruby, Shuckless, Seaford, Star, VanDeman, Wilson, Warfield, William Belt, etc., etc., require good care. They won't stand much neglect, yet do not require the very highest kind of culture.

My own selection—Strawberries are very fickle, and varieties that do well here may not do so well elsewhere. After testing hundreds of varieties, I prefer the following among those that have been thoroughly tested. Further experience with Carrie, Margaret, Seaford, Ridgway, Star, Earliest, Hall's Favorite, Clyde and other new ones may lead me to change this list. Here is my list: Brandywine, Beeder Wood, Bubach, Edgar Queen, Eureka, Glen Mary, Haverland, Isabella, Lovett, Parker Earle, Splendid, VanDeman, Warfield and Barton.

A Member—I suppose you have early strawberries at your place?

Mr. Farmer—It is a good plan to have several varieties because some years early berries will pay and some years late berries. There have been great changes in the strawberry business since I began 15 years ago, and one thing that has helped me in making it a success is what I call "the new strawberry culture." Instead of planting strawberries in the spring we take them up as early in the spring as possible, and set the plants in a little bed close together. We break open the bunches, and spread the plants so that each root will reach the soil. We make the trenches about three inches apart. We have

three rows close together. We skip a space and have three more rows close together, and in that way you can get 10,000 plants on a very small piece of ground. We do this trenching in the spring when we are very busy, and keep the plants until the rush of ordinary farm work is over, or about the first of June. We then transplant them, and the roots having struck they receive no check but grow right along and do as well as if they are planted in the very early spring. The advantages are that you save time, and you have your plants close together where you can kill the fungii. We are troubled in our section with mildew and sometimes the berries never come to maturity, but spraying will kill the fungii before the plants are set. It is absolutely impossible to fit up the soil as we would like to fit it up very early in the spring. When the plants are transplanted about the first of June they are set in the best growing time and we get just as good results as if we set them by the old method. Continual ploughing and harrowing of the ground brings the grubs to the surface and they are killed by the birds. It is a good plan to cultivate your land for three years before setting the strawberry plants, because it takes the May bug three years to go through its different stages and cultivation removes it. We have carried on experiments with fertilizers under the direction of Cornell University. The old way was to plough your land and put on manure and ashes, but the results were comparatively unsuccessful. Now the successful strawberry grower studies the condition of the soil and applies fertilizers accordingly. Strawberries require certain natural elements in the soil and if the elements are not there we must introduce them. In one section of the country, a gentleman found that he got better results with dissolved bone than any other fertilizer. Three hundred and fifty pounds of dissolved South Carolina rock to an acre gave over 13,000 quarts to the acre. On another plot he applied 700 pounds of dissolved bone and he picked twenty thousand quarts of berries to the acre. In another section of the country a gentleman applied 300 pounds of nitrate of soda, three hundred pounds of muriate of potash, three hundred pounds of dissolved bone, and he got 7,382 quarts to the acre. On another plot with 500 pounds of nitrate of soda, three hundred pounds of muriate of potash, 300 pounds of dissolved bone, he picked 7,000 quarts to the acre. On another farm the experiments shows that the soil needed potash more than any other and the potash makes the berries better color and flavor.

Mr. Brodie—Do you find muriate of potash better than sulphate of potash?

Mr. Farmer—It is cheaper, that is all the difference. It is a good plan to test your soil with these different elements in different proportions and you find out what it can do. Your soil might be already rich enough in one or two of these elements and you have no need to apply them. I have now something to say as regards the mode of shipping strawberries. The first strawberries from Oswego county were shipped in 1859 to Montreal. A gentleman in Oswego, now living, told me that he took them over and he brought back $22 in silver for 80 quarts shipped. The industry has grown from 1859 until now we ship from our county 100,000 thirty-six quart crates in the year. This represents only a few towns in our county. A gentleman, who has kept an accurate account of the cost of growing an acre of berries and who has thirty acres this year, gives me the following information. He finds it costs him for preparing

the soil and setting the plants about $7.53 an acre, and for harrowing eight times, and cultivating sixteen times, the total cost of all came to $22.45 an acre. He gave ordinary cultivation and his usual results are 95 crates to the acre, and for five or six years he has averaged $2.75 per crate. These berries that were first shipped to Montreal were shipped in a sort of chest that weighed more than the fruit. It was a big heavy affair and it took two men to lift it. A man who was messenger on the railroad at the time told me that it was a hard thing to handle and that he generally dumped the thing when it was empty into the river. It was then decreased to a forty-five quart crate, and some years afterwards Mr. Baker invented a thirty-six quart crate which is used in Oswego county, and which has made the Oswego fruit very popular on the markets of New York, Philadelphia and Chicago. The crate is the trade mark of the Oswego county strawberries, and if you send them in other packages they do not sell so well. Mr. Haggarty has a crate patented in the United States and Canada which is a still greater improvement and which he can sell for 25 cents apiece, and you can buy the baskets for $2.50 per thousand. An important item in the strawberry business is advertising in some way or other so as to let the people know that you have good strawberries to sell. In Oswego county we have a reputation for strawberries and we built it up by a great deal of advertising in one way and another. In the first place we all ship in a uniform package and the people knew when they saw the package that it came from our section of the country. We found that it paid to put berries up honestly. I have been shipping to the same commission man for thirteen years, and he tells me that my berries in New York are sold before they arrive to the same man year after year. On comparing my returns with those who ship in a different kind of way I find that I receive three cents a quart more. Another thing that helped our county was the exhibit of strawberries we made at the World's Fair, and while Yankees have their faults and the people of Canada are a good deal like them, one of their virtues is, that they get on to things quick. They pick up new ideas, and when the World's Fair came, the gentleman who represented our State was very anxious to have me make an exhibit of my strawberries, as I was growing about 80 varieties. I thought it was a gigantic undertaking to send strawberries such a distance, but I did it successfully and I have the honor of holding the World's Fair diploma and medal for the largest and finest exhibit of strawberries. I will tell you now the way in which I put the strawberries up. We selected crates like egg crates and took a piece of cotton wadding, not batting, and picked our berries and put them right in the center, and brought the cotton around it, and pressed them down in the compartment. The gentleman who had charge of them told me they arrived at Chicago in perfect condition, and they kept for eleven days on exhibition.

Mr. Barnard—How long will these crates last ?

Mr. Farmer—These patent crates will be made in Canada as well as in the United States, and, as they only cost 25 cents each, you can afford in some cases to lose them. They are made to ship several times, but they won't stand the racket with the old wooden crate. They will be made in 32-quart and 36-quart sizes, and they will stand for several shipments.

Mr. Shepherd—How long are the beds kept producing at this expenditure of $24. for the acre.

Mr. Farmer—That is a very small expenditure and it is not the cultivation I give my berries. You will take out in berries in proportion to what you put into the strawberry patch.

Mr. Brodie—How many crops do you take off the bed before ploughing it?

Mr. Farmer—We take one crop. Many men put $100 into an acre of strawberries and get proportionate results. Our rule is to take one crop, plough under, and sow with buckwheat, but if the bed does not bear well, we keep it another year. Some manures will grow an excess of foliage and you will not get much fruit. If you put on some form of potash you get a good crop the second year, and it will pay to keep them over. But in view of disease and weeds and the like, it is better to make it a rule to take off but one crop.

Mr. Brodie—You set out your plants in April or June and they fruit the next year in June or July?

Mr. Farmer—Yes.

Mr. Hamilton—Have you ever tried planting in August?

Mr. Farmer—It does not pay. You cannot make it pay for commercial purposes in these northern climates. It may be all right for some who have plants of their own.

Mr. Hamilton—If you had your own plants, would you still advise not planting in August.

Mr. Farmer—There are a few people who make a success setting in August but they are what you might call gentlemen strawberry growers. The soil which they use is in elegant condition and does not lack anything in the way of fertility. I spoke of setting the plants four feet but my way is to set them five, and if you are growing merely for the fruit it is better to set five.

Mr. Brodie—I notice in the "Rural New Yorker," an article by Mr. Joyce, an Oswego gentleman. He grew onions in every fourth row and set strawberry plants. He took 600 bushels of early onions to the acre and had these strawberries growing in the row, and had a large crop of strawberries next year, and so got double money out of his land.

Mr. Farmer—As a rule it does not pay to grow a crop of anything else in your strawberry patch and that is principally because of the cheapness of land. If your land was worth $1,000 an acre it would pay to give more care to it We have found in our county that an onion crop is the only thing you can grow successfully with strawberries. Mr. Joyce, who wrote that article, did make a success, but he says that after this he will not have anything else in his strawberry bed. There is one thing which Mr. Joyce is doing that I think more of than his onion scheme, and that is, he is restricting the runners in a systematic manner. He allows only four runners to root from each plant and

cuts off all the others. If you go through a strawberry bed you will notice there are only four or five plants that ever amount to anything, and it is better that you should give these plenty of room to develop, and they will bear a larger crop and the berries will be larger than if you allow the ground to be matted with plants.

Mr. Hamilton—When any of your people plant in August do they take a full crop the following year?

Mr. Farmer—Nobody in Oswego county plants in August, but they do in New York and New Jersey.

Mr. Jack—I do not understand you to mean potted plants?

Mr. Farmer—It does not make any difference whether they are potted or not. If you are taking up plants from your own ground and take them up carefully with earth around them, they are better than if potted, because some plants get contracted in the pots. They never do as well as the plant that has full freedom in the soil

Mr. Hamilton—Do you know if those who plant in August, take a full crop the following summer.

Mr. Farmer—They take all the plants will bear, but they will not bear so much as if they were set in the spring.

Mr. Brodie—If they plant in August they will have half a crop the following year and the full crop the year following that.

Mr. Hamilton—If you plant in the spring you lose the whole year waiting for the crop?

Mr. Farmer—Yes but my experience is that it is worth it.

Mr. Brodie—Did that cost of $24 an acre cover the two years?

Mr. Farmer—That is what it cost the gentleman with the thirty acres. I never figured it down closely, but I always supposed it cost me $50 an acre each year, covering them up to the fall.

Mr. Brodie—Then you got a crop of buckwheat the next year?

Mr. Farmer—Yes. I may say this gentleman did not figure anything for fertilizers in the $24.

Mr. Brodie—Do you count anything on the buckwheat or do you sow it just to clean the ground?

Mr. Farmer—It depends on the season. Sometimes we get a good crop of buckwheat. We find it is useless to sow buckwheat in our section before July 4th. The strawberries sometimes last until July 15th, and then we have to take chances on buckwheat.

Mr. Shepherd—Did you ever try clover?

Mr. Farmer—I have tried crimson clover, but I did not make a success of it the first time and I have not tried it since.

Mr. Shepherd moved a vote of thanks to Mr. Farmer for his very instructive address.

The motion was agreed to.

Mr. Hamilton read the following paper:

SOME METHODS OF COUNTERACTING SEVERE PROLONGED FROST LIKE OF THE WINTER OF 1896-97, IN ORCHARDS OF THIS PROVINCE.

By R. HAMILTON, Grenville.

The subject which I have chosen for this paper is one of melancholy interest to many of the fruit growers in the Province of Quebec; the ravages of last winter in our orchards were sufficiently trying to discourage even the stoutest from further planting of fruit trees.

There have been similar disasters in years gone by but probably none so severe nor so general as that of last winter.

Several years ago, about fifteen, I think, we had a very severe frost, 27 below zero, in early winter, following a prolonged spell of heavy rain, when we underwent a somewhat similar experience and lost a large number of trees. In the spring following that winter, the trees leaved and blossomed as usual, and then began to fade and die until a large proportion of the previous year's planting died. On taking them up to replace them, I found that the roots had been frozen. I drew attention to the matter in the Horticulturist of that year, and the item excited some interest, as the occurrence did not seem to have been noted before.

In about the year 1859 there was a winter that proved very disastrous to orchards in this Province, chiefly in the neighbourhood of Montreal. I cannot recall at this date whether the trees leaved and blossomed the following spring but I well remember digging up some of the ruined trees and observing their roots which appeared to me to be rotten. I had not the experience at that time which I have since had of frozen roots. On that occasion many thousands of apple trees were destroyed on the Island of Montreal. Some fine old orchards of seedling apples were then destroyed as well as orchards of grafted kinds.

A great deal was said and written about the devastation of that winter, but few if any of those who took part in the discussion on the subject seemed to have grasped the facts of the case, and many of the suggestions offered as to cause and manner of the injury, were to say the least very amusing. The year

preceding that hard winter, and for one or two succeeding I had charge of a considerable orchard a short distance out of Montreal. It suffered severely, as did all the rest. On taking charge of it I found that it had been sadly neglected for a long time and I was consequently under the necessity of giving it a thorough pruning. This was charged by some of my neighbours with being the cause of the loss in my case, but none of them could explain why the neighbouring orchards that had not been pruned suffered as much damage or more than mine. Many of the sufferers of that date felt that the damage was chargeable to the severe frost but few of them realized that it was through the roots they had been attacked.

It was a very common thing for fruit trees to be killed to the snow line, about that time.

Iron clad trees had not been heard of then; many of the trees planted then were imported from England and France, as well as from the United States and were unsuited to the climate of this country. An acquaintance of mine, about that time, brought several hundreds of the Northern Spy—then a new variety—from Rochester, and in a year or two the whole lot disappeared.

But the winters of 1859 and 1893 were not so disastrous, nor were the losses so general and wide spread as those of last winter, though my own loss on this last occasion was insignificant and extended to only about one per cent. of the whole.

I may say here, in passing, that in 1892 I think it was—my orchard sustained some injury but I did not finally lose a single tree, on that occasion, although during the first half of the summer I feared that I would lose a good many. All the young fruit fell to the ground and the foliage was of pale green, but, though they had a severe check, the trees eventually recovered.

Now I noticed on every occasion when injury occurred through freezing of the roots that certain conditions obtained in those parts of the orchard where the injury prevailed and that where those conditions did not prevail there was exemption from loss. I refer now particularly to my own place and other places that came under my notice, as in these I had opportunity for close observation.

And, first, as to the character of the soil where the loss of trees was sustained. In every case it was of a very porous, loose, open character and denuded of covering. In such a soil apple trees are very liable to have the roots frozen in an extraordinary severe winter, unless, before the severe frost occurs, there is a good depth of snow covering the ground.

My first serious loss in Grenville, was in a very sandy spot near my dwelling, and was a part of my earliest planting. When I had not more than about 300 trees planted and was proportionally very large. On that occasion I lost about 40 trees in orchard and a larger number in the nursery. I was not disheartened, however, but recognised the necessity of doing something to prevent a recurrence of the loss, and for several succeeding years mulched all my trees, especially the newly planted ones, heavily. For this purpose the rank grasses, rushes, and coarse weeds which are found growing in low swampy

ground. I induced some of my French neighbours to cut and draw me a large quantity of it. After serving as a mulch, it was allowed to remain and rot on the ground and greatly enriched it. The mulching was absolutely necessary to the existence of the trees and was continued during all the time that I was growing hoed crops amongst the young trees, for at least four or five years. What with the cultivation and the mulching, I not only had no losses, but the trees grow fast and were vigorous and sturdy. I then began to seed down gradually till the whole was in grass and since then have had very few losses. The injury of 1892 already referred to was consequent on breaking up a bit of ground of about an acre in extent, on which I grew a heavy crop of turnips. This patch I neglected to mulch in the fall and in the early part of the winter we had a very severe frost before we had any covering of snow on the ground. In spring the trees looked very bad, and showed great weakness during the whole summer, meantime I had reseeded the patch, and in the fall mulched it heavily. The following season the trees seemed to almost regain old vigor, and since then have borne freely—I might say—heavily.

Now to come to last year, all my losses were in cultivated ground only. That is, ground on which I had grown roots, corn, and beans. I did not lose a single tree in grass. Had I mulched the bare ground where I had grown hoed crops, I believe I would not have lost a tree—but I did not and consequence was, a loss of between forty and fifty large trees. And I believe the loss would have been much greater but for the protection afforded by the currants, gooseberries, and rasps growing in the rows of apple trees.

A very remarkable thing in connection with these losses is that they were confined to the extra hardy sorts, that we are in the habit of calling ironclads. Chiefly Duchess and some of the new Russians.

I have indicated in passing some of the circumstances under which losses occurred and, by inference, the method to be adopted to avoid losses under similar recurring circumstances. Where a choice of soils is possible, it is well to avoid a very porous soil for planting apple trees, and where the ground is cultivated—as it should always be in young orchards—mulching is an absolute necessity. But after four or five years thorough cultivation the ground should be seeded down with a good cover plant. And for this purpose, the large red, or the common red clovers, are very good but they disappear after two years. White clover lasts long enough but is rather short, though it make a very close, compact sod that covers the ground completely. Lucerne alone grows too thin and spindly. The plant I like best, is the orchard grass. It makes the densest and most complete cover of any plant I know. It is rarely less than a foot in height and when cut or browsed shoots up again with wonderful rapidity. It is besides a very hardy grass and lasts for many years.

I would strongly recommend leaving the grass or other herbage grown in an orchard to rot upon the ground. The plan that seems to me to be best is to cut the grass with a machine twice up to the beginning of July and allow it to remain on the ground and leave it uncut after that date—and, if the soil is in good condition, it will again reach two feet or more in height before growth ceases, and there will be no hard, sharp stubbles to pierce fallen apples, and a sufficient protection against early severe frost without a snow covering.

Mr. Chapais—I endorse all that has been said about orchard grass. In one part of my land, I have taken four crops of it for my cows. The last crop was taken on the 27th of September, and on the 15th of October when the hard frost came the grass was 6 inches long.

Mr. Barnard—In sandy soil orchard grass is not very high. But my experience is that in good soil it is higher than timothy.

Mr. Brodie—It will never take the place of timothy for it will not grow as many heads.

Mr. Chapais—It never will be as good for hay.

Mr. Whyte—When we consider that the great desideratum in this country is enough moisture to get a good crop of fruit and when you consider the action of a crop of grass on soil, we should hesitate before we cover our orchards. Every blade of grass is pumping up water at a tremendous rate and that is a thing that it seems to me will do immense mischief to a crop that wants moisture. It is absolutely necessary that the ground should be bare for the better part of the season, and the best protector we know about is a thin layer of dry soil on the top. It is a great mistake to have your ground covered all the time with a grass crop of any kind of grass. If you can grow a crop of grass after the dry season, sufficient to cover during the winter it would be a great advantage ; but after all there is nothing so good as a mulching of straw manure. You can get from that all the protection you get from the grass and without any of the disadvantages.

Mr. J. C. Chapais, of St-Denis, read the following paper :

LAW AS A HELP AGAINST PLANT DISEASES AND PARASITES.

By Mr. J. C. Chapais, St-Denis.

In our century of development and progress, the more we cultivate new plants, new fruits, new trees, the more we increase the cultivation of old varieties, the more we see fungi, weeds, insects invade our lands, our gardens, our orchards. Every year, almost, brings us its share of new enemies of our crops and we have to keep fighting against them, striving to find some way of getting rid of them. But, unfortunately, in many cases, we find that we have to fight as much against the carelessness of our neighbours as against the real enemies of our plants. That is to say that, while we would perhaps succeed in getting rid of the pests which infest our lands, we cannot do it because our neighbour does not himself wage war on them. On the contrary he, very often, seems to take pleasure in nursing them in his own orchard, in order to render useless our struggles. On such occasions, I have often thought that the only way to protect ourselves against such a gross negligence would be to force by a strict law

everybody to play his own part in the destruction of the parasites, the application of remedies against the diseases of our plants, and above all to take all the preventive means available against their invasion.

While studying that important question, I have found that, in many cases, should we have had a law to prevent the spreading of certain diseases we would have been successful in saving many trees that have been lost. Take, for example, the black knot. In some districts of our province, it has killed all plum and cherry trees, because people did not take notice of it, while in some other districts where we fought it with all our might, we got rid of it and kept our trees healthy. If we had had a law to force everybody to cut and burn the small knots at their first appearance, all or almost all of the trees lost would have been spared.

The question I lay before you, gentlemen, is not new. It has been discussed in many countries and we find that laws have been enacted in many of the United States and even in our Dominion, to prevent the invasion and spreading of the pests infesting our lands, plants and trees.

We may classify those pests under three different categories, viz.: Fungi, weeds and insects, and they must be considered separately, if we wish to make laws to fight them. In looking over the laws enacted against them in other countries we find that these laws assume three different characters. There are, first, local laws, then there are interstate laws and again international laws.

Some pests can be fought only by local or provincial laws; such are all fungi. In fact, we can find trace of them only when the trees or plants are growing, and they spread without being visible. There is only a local law that would protect us against them by requiring every owner of plants or trees infested to apply the remedies known as being efficacious, or to destroy the plants or trees if they are too much damaged.

As to weeds, interprovincial as well as local laws can help us to prevent their invasion and spreading, by providing for the inspection of all seeds brought from one province to another and by requiring all farmers to destroy weeds as soon as they show themselves on their lands.

Insects of some classes would require even more general laws, such as international legislation establishing a quarantine and a close inspection for all seeds, plants and trees imported from foreign countries, as it is done in California. Such should be the case for the San Jose scale, the pea weavil, the apple tree borer and many others that are found in the seeds, trees and plants imported, very often.

I find that some countries have organized boards of horticulture and have appointed entomological commissions to take the supervision of the preventive means spoken of above, and I may name, in United States, the states of California, Connecticut, Delaware, Kentucky, Maryland, Massachusetts, Michigan, New Jersey, New York, Oregon, Pennsylvania, Virginia, Washington, and, in the Dominion, the provinces of Ontario and British Columbia, as having enacted laws to prevent the invasion and spreading of fields, gardens and orchards pests.

Moreover, during the winter of 1897, has taken place, at Washington, D.C., United States, a national convention for the suppression of insect pests and plants diseases by legislation. This convention has appointed a committee to prepare a bill on this subject and this committee has adopted a bill such as they thought it should be enacted relating to interstate and international legislation against insects and fungous pests. Now, I think that our association would be making a good work if it would try to start the idea of a convention of delegates of Horticultural and Fruit Growers' Associations from all our Dominion provinces interested in fruit growing, to discuss the same matter amongst us. This is the reason why I have brought the question before you, hoping that it will be a first step in the direction of protecting ourselves by law against our land, garden and orchard enemies. We have been too long seeming to seek the only consolation that an old Irishman, in Ireland, whose potatoes were all rotten, appeared to find in the fact that: Thank God, his neighbour's potatoes were as bad as his own. Let us, now, try to prevent our neighbour from keeping rot thriving on his own farm to bring it after in our fields.

Mr. Hamilton—Mr. Chapais' paper is one of great importance. A neighbour living close to me seeded a meadow and after a time the field was covered with an immense quantity of weeds. He had seeded timothy and clover and I am bound to say that not one third of the seed was either of these, but the field was covered with weeds that are found very abundantly in the Western States. He consulted me and I told him to cut it down and burn it right off. It was all on account of his buying cheap and bad seed. I was a long time in a very important seed house in Montreal, and we always made it a point of getting in good seeds, but about twelve years ago the Government of the day removed the duty on seeds coming from the U. S. which had previously been about 15 per cent. In consequence, merchants and grocers brought in a cargo of seeds from the States and they sold it at the lowest possible price. It was cheap and nasty and we never knew what weeds were until that time. The people began to buy that cheap seed and have unfortunately continued it up to the present time and the results are very bad. The farmers of the country ought be deeply impressed with the need of getting rid of this evil of weeds. I had hoped that if the Minister of Agriculture were present to bring this matter to his notice so that he might take some action. I would advise that fancy and choice grades of seeds should be allowed to come in free, that on what are called "prime seed" there should be a duty of 15 cents and that on what are known as "good and fair seed" there should be a duty of 150 per cent. or whatever was necessary to keep them out of the country. I would have an inspector appointed whose duty it would be to altogether prevent such seed as that coming into the country. In former days the farmers produced their own timothy seed and we could buy from the habitants absolutely pure seed, but since the duty has been removed it is not worth a man's while to engage in the business. This cheap seed is brought in from the States and sold at such a low price that our farmers, even though it is against their own interests, are tempted to buy it. I would be glad if this meeting would bring that matter before the Government.

Dr. Fletcher—May I say a word with reference to the San Jose scale. If any of you gentlemen have been buying from a New Jersey nursery called the

Lovett Nursery, I would advise you particularly to examine your trees, as it is stated that this firm has not been sufficiently careful about sending out infested trees. Any of you who bought trees from that nursery or from the Maryland and Virginia nurseries had better be very careful and make a thorough inspection of them to see if they are infested. If you send samples to the Experimental Farm, Ottawa, I shall be happy to examine them for you.

Mr. Barnard—Perhaps the Minister of Agriculture would call a meeting before the Committee on Agriculture at the next session of parliament and see what could be done.

Mr. Brodie—I should think that the different Pomological and Fruit Growers' Associations throughout the Dominion should send delegates to the Government at Ottawa.

Mr. J. H. Carter, of Massawippi, read the following paper.

MAPLE SYRUP AND SUGAR MAKING.

By JAMES H. CARTER, Massawippi.

Mr. PRESIDENT,—By the request of our Secretary I have written a short paper on the modern method of making maple syrup and sugar, but I could explain all very much easier if we were in a well equipped camp some time next April. Of the old methods it is not worth while to speak, as they are, or ought to be, a thing of the past.

The first thing essential about sugar making after getting the trees properly tapped is to have everything connected with the business strictly clean, even from the spout that goes into the tree to the syrup can or sugar mould.

If wooden buckets are used to catch the sap, I have found it best to use scalding hot lime water, and so treat all wooden vessels. With tin or galvanized iron vessels I have found Sapolio Soap the most satisfactory, and now use nothing else.

The tapping process—as to the best kind of spouts, the best place to tap, and how deep to bore the hole—is about as varied as anything can well be, and every man is a law unto himself.

My men get instructions in gathering to keep the sap as free from foreign substances, such as leaves, bark, etc., as possible; and to further assist in that way, I use a strainer of two or three thicknesses over entrance to the hauling tubs; then a similar strainer over the end of spout that conveys sap to storage tank.

There seems to be quite a difference of opinion as to whether sap deteriorates by keeping any length of time. My opinion is that the sooner it can be boiled to standard syrup the better it is, although this view is not in accord with reports of experiments made at the Experimental Stations of Vermont and New Hampshire.

By the kindness of Professor Waugh I have received bulletins from both stations, and have to admit that some of my own ideas were somewhat shaken up in the face of actual results.

However, as it is always well to get a task done as soon as possible, I shall still continue to boil the sap to syrup as fast as possible, for I am sure of one thing, if the plan is no better it is equally as good.

After getting the sap into the storage tank is really the time that I take charge.

To save labor the tank should be raised sufficiently high to allow the sap to run continuously through the self-feeder to the evaporator, and I am pretty well convinced that there is no danger of spoiling either flavor or color by the hottest fire, providing the evaporating surface is in proportion to the heating surface, and the sap is kept as shallow as may be with safety.

I always prefer that it should be kept at boiling point until it reaches the stage of standard syrup.

To do this I use a small pan, 2 ft. x 4 ft., on a separate arch, and after getting the sap down to about 30°, by the saccharometer, hold it at about that point by adding the sweetest sap from the back end of the evaporator, from time to time as needed, until I get from 6 to 8 gallons of standard syrup in the small pan.

After getting syrup boiled to this point the pan is removed completely from the arch, in order to stop further boiling. It is then passed directly through not less than four thicknesses of woollen blanket strainer, which I have found practically removes all the so-called "nitre."

There is a felt strainer on the market that is claimed to be good, but I am inclined towards the blanket strainer, as being the cheaper, and easier to clean, when large quantities of nitre or malate of lime are present. Some good sugar makers resort to settling to remove all sediment, but I think it a waste of time, as the strainers do the business well, and then by the time the syrup has drained through into the syrup holder it will be just about the right temperature to draw off into the cans, say 140° to 160°, thus doing away with the necessity of again heating the syrup to can, and so saving both time and fuel.

I am not quite sure how long syrup could be stored in the holder without deteriorating, but it is safe to say that at the standard weight it is less likely to lose flavor than if taken off at an earlier stage, which is a plan adopted by many.

My experience is that the nitre will not precipitate entirely until the standard point has been reached, so that syrup taken off the fire prematurely cannot

be properly freed from "nitre," either by straining or settling, and by reheating would develop more or less "nitre," which would get into the cans or sugar unless strained a second time, which makes extra and useless labor.

As to the matter of clarifying syrup with egg, milk or other substances, I am of opinion it is time and that substance thrown away, and even worse, should the scum which is thrown up not be removed very thoroughly, as it will result in getting the scorched scum well mixed into the syrup and sugar.

For testing syrup by all means buy the best saccharometer and thermometer you can get. The cheap ones are not reliable, and one cannot afford to wait a year to know if they are testing correctly. It is also well to test the weight of a gallon of syrup, which should not go under 13 lbs. nor over 13 lbs. 3 oz.

In making sugar use a thermometer; it is safer and easier, and you will then know just what you are about—228° to 232° is about right for tubs sugar.

For making a good hard cake that will keep indefinitely, without draining, boil from 240° to 244°. If taken above 244° it is apt to make things lively, either boiling out of the pan after being taken off the fire, or, worse yet, out of the moulds after getting that far. A little syrup added at that time, and well stirred, will remedy the trouble, but it is best that it should not occur.

I think most men would find sugar-making something of an experience, if attempted, without some actual work in a camp. And even then I have known men with good appliances who failed to make more than one-half of the crop that would pass as first-class. Then again many claim that it does not pay, as a poor, dark syrup or sugar will bring as good prices as the best. My experience has not been that way, and I feel sure that if the quality of maple products could be improved more generally, and city purchasers once get the idea that maple syrup and sugar need not necessarily be dark to be pure, the makers would find a better market at better prices.

To sugar off the above, as it were, I should say: Get covers to all sap buckets; keep everything as clean as possible; tap the tree in a healthy spot; gather sap up closely; boil in quickly and to standard syrup, in small quantities; use clean strainer at the bottom with every batch, removing the top one; be careful in testing and can at 150°.

Mr. Carter exhibited some samples of maple syrup and two samples of maple sugar which were pronounced to be of excellent quality.

Mr. Chapais—In tapping the trees does it make any difference as to the depth of the hole?

Mr. Carter—I think it does. My advice with respect to small trees is not to tap too deep on account of the danger of future damage to the trees. You can get more sap by going further, but I would not advise it.

Mr. Chapais—I suppose with a hole three inches deep you can get more sap?

Mr. Carter—Undoubtedly. You get more sap if you make a deep hole. But it is not a wise plan if a man wants to keep his sugar orchard in good condition. I think a hole an inch and a half or two inches deep is enough for any ordinary man to bore, because he will get all the sap he wants to make.

Mr. Chapais—Have you ever tried to tap two holes in large trees?

Mr. Carter—No, I have trees enough to go around now, and I would rather take each tree separately. It is harder to manage two buckets to each tree.

Mr. Chapais—Would you get more sap?

Mr. Carter—Yes, you would get more sap, but I think eventually it would injure the tree.

Mr. Chapais—What spout do you use?

Mr. Carter—I use the Lawrence spout.

Mr. Chapais—Does it make any difference with you tapping from the north or south?

Mr. Carter—Yes, that will depend on the season. Last year I tapped to the north and got more sap than I ever got before; for what reason I do not know.

Mr. Chapais—In making your sugar, have you had any experience of the fact that some people are able to get more water in their sugar than others?

Mr. Carter—You can get as much water as you want, but you cannot get it so much without draining.

Mr. Chapais—We find on the market some sugar that will have more water in it than some others. Do you think it advisable to have the water in it?

Mr. Carter—Of course it is more profitable to leave the water in the sugar.

Mr. Chapais—Would it injure the quality of the sugar?

Mr. Carter—I do not know of any reason why it should. You never know the actual point in making sugar when you can get what you think is right.

Mr. Chapais—Can you tell by your thermometer the degree of water to leave in your sugar?

Mr. Carter—I think so.

I have here a sample of sugar made at the last run of the sap, and I want to show that it makes very good sugar. That was made last spring, and it has been in a dry place, and I do not think you can squeeze any moisture out of it.

This sample of sugar was examined by those present and highly commended.

Mr. Crandall—I happen to know something about maple sugar, and I can fully endorse everything that Mr. Carter has said. In the section where I live we make some very fine syrup and fine sugar, and the people are now getting into the habit of using the new methods instead of making sugar the old fashioned way. There is just as much improvement to be made in the manufacture of the sap of the maple tree as there has been made in the manufacture of first class butter and cheese, and such meetings as this all tend to educate people in that direction.

MEMBERSHIP IN THE SOCIETY.

Mr. Brodie—Before Mr. Shepherd reads his paper I would like to say a word in the interests of the society. I would remind the ladies and gentlemen here that the membership is only $1, and in consideration of that the members are entitled to our annual report and our plant distribution. These plants are well worth the dollar themselves. The able lectures and addresses delivered by Prof. Robertson, Prof. Fletcher, Mr. Farmer and others will be published in this annual report, and the members will be able to study them and go more into fruit growing if they wish.

Mr. Shepherd—I wish to supplement Mr. Brodie's remarks by saying that Mr. Malcolm Smith has been appointed to act as the agent for the society in this county, and he will remit to the secretary, Mr. Dunlop, the subscriptions paid by any new members. Each new member will receive a copy of the next annual report. I may say that the directors have resolved that the plant distribution to the members shall be larger this year than ever before. The finances of the society are in good shape, and we are prepared to make a large distribution of plants to each member. I can say that no one who joins the society will ever regret it. He will get more than the value of his dollar in the plant distribution and the reports of the society. I hope that the meeting of the society will again be held in Lachute at some future time, for we have been well treated in Lachute, in the County of Argenteuil.

Mr. McGibbon also endorsed the objects of the society, and invited those present to join.

Mr. Shepherd said that the distribution of plants included roses and ornamental shrubs.

Mr. McGibbon said that last year the plants distributed by the society were worth more than the dollar.

Mr. R. W. Shepherd, of Como, read the following paper :—

LA FAMEUSE.

By R. W. SHEPHERD, Montreal, Que.

We can picture to ourselves the Sulpician Fathers—the earliest of the Missionaries to establish themselves at Mont-Royal, bringing with them, from France, seeds of the best French apples to plant in the virgin soil of the Island of Montreal ; and after some years, by sowing and re-sowing all seeds of the best seedling apples, selecting the best, and doing this again and again, at last producing La Fameuse. With what astonishment these first settlers must have regarded the beautiful highly colored apples raised from seed in the virgin soil. The appearance of these seedling fruits must have been beautiful, more beautiful than they had been accustomed to in Western Europe; enhanced and developed by our hot, short, summer weather and sunshine, followed by cool autumn nights. It is our experience that sunny days and cool nights are necessary to produce well colored Fameuse.

Fameuse grown either in France or England do not attain perfection of color, although the apples may have nearly the same taste.

There are in many orchards about Montreal, trees that produce apples very near of kin to La Fameuse—apples that may pass for it and meet with ready sale. This is evidence of in-breeding and proof of my assertion that the early colonists of the Island of Montreal planted again and again the seeds of their best seedling apples, generation after generation.

I once heard a remark by that veteran pomologist, Dr. T. H. Hoskins, of Vermont, which struck me forcibly at the time. He said: "I believe there are about three hundred kinds of Fameuse." This, of course, was said in a joke, but expressed the fact that numerous apples of Fameuse type were known to exist on the Island and vicinity.

We know of the Red Fameuse—La Fameuse. There is also the striped Fameuse—Fameuse Barre—of which no doubt the Snow apple of Western Ontario is a degenerate offspring.

There are the Fameuse Sucre and many seedlings which closely resemble the parent.

Then Canada Baldwin, Decarie, and McIntosh Red are very near relations of La Fameuse.

The Red Fameuse is, no doubt, the handsomest, the most productive, successful and profitable apple of this province. It excells all other varieties for quality, and since the advent of spraying with Bordeaux mixture, we can grow as fine specimens as in years gone by.

La Fameuse has been known, probably over two hundred years. Trees were sent to England and the fruit exhibited there at the Horticultural Society

exhibitions as early as 1818. It is a common fallacy to suppose that Fameuse is dying out. Let me tell you that as long as a variety is profitable it will not die out.

For example, the Ribston Pippin, of England, produced from seed brought formerly from Normandy, it is said, about 1688, is yet one of the most favorite apples of England, and to-day is very largely grown in Nova Scotia and Ontario.

The American Baldwin was introduced about 1750; the Rhode Island Greening about 1765; Roxbury Russet originated about 1649. All of the above mentioned are favorite market varieties of the present day.

La Fameuse, has, within the last three or four seasons, become a great favorite—famous— in England.

Since the means of ocean transportation are improving year by year, the successful exportation of this favorite apple to England is assured.

Cold storage in transit, is, thanks to our Honorable Minister of Agriculture, an accomplished fact.

By means of cold storage we can not only put our fruit on the London market in prime condition in the autumn, but in years of plenty, by placing our crop in cold storage, here, and sending forward shipments during winter, as prices on the other side improve, prevent a glut in the English market which often obtains during heavy fall shipments.

My advice to the orchardists of this province is, keep on planting Fameuse, as well, of course, as other varieties that are profitable.

Province of Quebec growers are very favorably situated for shipping to England—no long inland hauling that our friends in Ontario have to contend with. We do not begin to grow one-fourth the apples required for our own needs. We have never attempted to cultivate on an extensive scale for export.

Every dairy farmer who can grow good Indian corn can grow good apples and should have his commercial orchard.

Grow only the best apples and not too many varieties. It costs no more to grow Fameuse and McIntosh Red, and apples of that grade, than it does to grow the 'Sauvageau." I have had the past season many enquiries for La Fameuse from France, and I hope next season to open up a trade there. In fact Canada and the Province of Quebec apples are just now beginning to be known in the markets of Great Britain and other European centres.

Mr. Brodie—I remember that in my young days the Pomme Grise was reckoned to be the most profitable apple, but now the trees have, to some extent, died out, and we cannot get them to bear as they used to in those days. I remember that from one tree we got $60 worth of apples, and we sent them to the old country and got a fine price.

Mr. Hamilton—Do you find the Pomme Grise profitable now?

Mr. Brodie—I do not consider them profitable now.

Mr. Fisk—What are your recollections of the first Fameuse. Was it the Fameuse Barre or the Fameuse Red ?

Mr. Shepherd—My earliest recollections are of the Red Fameuse, but I believe in some districts of Quebec it was different.

Mr. Hamilton—The earliest Fameuse I can remember were those that had a sort of light mark on them, but that sort of Fameuse it seems to me are very rarely seen now. Most of the Fameuse nowadays are Fameuse Barre, but I think it is a question whether the Fameuse Barre and the Fameuse Rouge are not the same apple ? I would make another statement, and that is that if a Fameuse has not died out there is not the least doubt but that it is dying out, and had it not been for spraying it would have died a natural death by this time.

Mr. Shepherd—That bears out exactly what I say. If we had not discovered the virtues of spraying the Fameuse would possibly have died out, because it would not have been profitable, and the moment any variety of apple gets unprofitable it will die out. If spraying with the Bordeaux mixture had not been discovered no doubt the variety would have died out. I know that some of Mr. Brodie's neighbours cut down a good many of their Fameuse trees because they got disgusted with the spotting.

Mr. Hamilton—With regard to the profitableness of apples, I may say that I planted Fameuse at the same time that I planted Duchess and Wealthy and Yellow Transparent, and I have not got $1 from the Fameuse trees while I have had from $3 to $10 a year from trees of corresponding size in other varieties. That certainly is against Mr. Shepherd's view that the Fameuse is as profitable as any other.

Mr. Shepherd—It is the most profitable apple.

Mr. Hamilton—I agree that the Fameuse is the finest eating apple in existence, but it is not profitable with me.

Mr. Shepherd—Why ?

Mr. Hamilton—Because in any place I know around Grenville the Fameuse are worthless on account of the spot.

Mr. Shepherd—They want spraying.

Mr. Hamilton—The apples are small and spotted, and of bad flavor. Dr. Wood said last night that what is being said here is chiefly for the benefit of farmers; that is to say, that Mr. Shepherd and Mr. Fisk and some others of us do not really need this information, but it is needed by the great majority of the farmers of the country. Now, if a farmer were to leave this meeting this evening in the belief that Fameuse is as profitable as anything that he can grow, he would go away under a great mistake. He might plant Fameuse, and in a few years he would become disgusted, and we would have again the old story that we cannot grow apples in Argenteuil. I have shown that we can

grow apples here, but if I had stuck to the Fameuse it would have been a failure. I have proven that we can grow apples in this County of Argenteuil as good as anywhere in Canada except in the case of a few varieties. We can grow apples here that will answer every purpose.

Mr. Brodie—What five varieties would you recommend for this region?

Mr. Hamilton—Duchess, Wealthy, Yellow Transparent, and for prolonged keepers, this New Lord's Apple; and I am much impressed with what I have seen of Canada Red this year. That would make five varieties that would answer every purpose for which we grow apples. They are not the best in the world, but when we cannot grow the best it is our duty to endeavor to ascertain what is the best we can grow and grow them. I found last season that for handsome apples, well packed in a nice basket, we can get the highest price current for the kinds we can grow here. I have this year got up to 75 cents a small basket for them.

Mr. Brodie—This is an exceptional year. What did you get last year?

Mr. Hamilton—As low as 25 cents, and as high as 50 cents. What I want above all things to combat is letting it go forth to farmers and others who are inexperienced that an apple like the Fameuse is the best apple that can be grown. It is the worst apple we can grow here.

Mr. Barnard—It may depend upon the quality of the soil. The soil on the Montreal Mountain in the early days was the richest in Canada. It laid on limestone, and the priests kept on manuring these orchards, and no better cultivation could be given as far as richness was concerned. I am afraid that the trouble is with the Fameuse, that it is a tree which required a great deal of feeding, and it probably has been neglected. When I was a boy we had just one Fameuse tree in Three Rivers, and it was about dying, but my father scraped the manure about it on the advice of an American gentlemen, and we cared for it, and that tree was brought from death to life.

Mr. Whyte—The question of the Fameuse apple is like many others; the more highly organized the fruit is the more it is subject to disease. It is just as easy to grow Fameuse, barring the spot, as it was 20 years ago. The only difference now is that you have to spray it. This disease, which was unknown twenty years ago, is now destroying the Fameuse apple unless you spray. There is no reason why one man cannot grow Fameuse apples as well as another if he takes the precautions. It is the coarse common apples that are not affected with spot, and if you want to grow a fine apple you have got to take the necessary means to do so; that means is spraying.

Mr. Smith—I would like to say a word in favor of the Fameuse. As regards Lachute, I think that probably the climate has something to do with it, for I see that Mr. Hamilton's Fameuse is not as good as ours. In the Lachute district there is no apple grown as popular as the Fameuse. It is an easy tree to grow, and my experience is that if I were planting out my orchard to-day it would be all Fameuse, or if I were to take the second best apple in my estimation I would take the St. Lawrence. It is an easier apple to handle than the

Duchess, easier to market, and better flavored. We have thirty varieties at least, and the St. Lawrence is my favorite apple. Whenever I put it on the market in Lachute every one wants it in preference to any other apple.

Mr. Brodie—That would be all right as long as you have a good local market, but as soon as you have St. Lawrence to export you will find it to be at a loss every time.

Mr. Smith—The island of Montreal is well known for its fine Fameuse, but I think we color the Fameuse higher here. When I brought my apples to the exhibition at Montreal, we took eight or nine first prizes, and the judges asked me where I lived that I had such a highly colored apple. There is a Mr. Sherret ten miles north of here, and he has apples of a much finer color than mine. It is my view that we must uphold the Fameuse.

Mr. Shepherd—Mr. Hamilton deserves a great deal of credit for his success in growing the varieties he shows to-day and his success in growing early varieties like Yellow Transparent and Duchess. I regret that he cannot grow Fameuse successfully, but if Mr. Hamilton were to grow these early varieties on a very large scale—I am speaking from the standpoint of an orchardist on a large scale—he would have some difficulty to market the early variety, for he would have to compete with the California fruit. There was a time, fifteen years ago, when I thought the Duchess was the most profitable apple I could grow, and I thought if I had planted all my orchards in Duchess I would have made a great deal more out of them. I am glad I did not now. I am not going to plant any more Duchess, because I have to compete with the California fruit, which arrives in Ottawa and Montreal just at the time the Duchess used to be sent forward in baskets. In 1896 I could not make a cent out of my Duchess if I sent them to Montreal in baskets. I had great difficulty in getting 25 cents a basket for nearly half a bushel in each basket. That year I shipped my Duchess to England in barrels, and I shipped them green, before they were ripe. I tested the local market with green Duchess before I shipped any to Liverpool or Glasgow. I realized $1 a barrel in the Montreal market, less 10 per cent., or 90c a barrel, and I shipped to Liverpool and Glasgow the balance of my crop of Duchess, and I realized $1.25 net after paying all expenses. Therefore, as Mr. Crandall said, we have to look to the English market if we are going to raise fruit on a comparatively large scale. If I were asked what apple is most profitable to grow in the Province of Quebec for the English market I would say every time the Fameuse or McIntosh Red, or some of that kind, and I think Mr. Brodie and Mr. Newman and Mr. Jack will bear me out in that.

Mr. Brodie—Yes, but add "Wealthy."

Mr. Shepherd—I say that the McIntosh Red comes next to the Fameuse.

Mr. Smith—Do they grow Fameuse in Ottawa? I shipped some Fameuse to Kavanagh Bros, and they told me my Fameuse were better than I could get in Ottawa.

Mr. Shepherd—I am glad to find Mr. Hamilton finds these early varieties profitable, because he can grow them well, but I would not recommend the

farmers to go into too many varieties. I say that every farmer in the County of Argenteuil should have a small orchard if he is situated in any locality where he can grow trees. The early varieties should be marketed in the last week of August or the first week in September, but the farmer is a pretty busy man in harvest time, and he has not time to look for a market for his early apples. It is my experience that a farmer is better with late fall apples or winter apples. I think he will find that the August and September apples will be difficult to dispose of, and it is becoming more difficult every year on account of the competition with California fruits. One carload a day of California fruit is sold in Montreal alone, and I believe there are to be three or four carloads a day sent in future, and that represents a large quantity of fruit. For every barrel of peaches and pears and plums consumed in Montreal, they buy so much less apples. At least a dozen grocers to whom I used to ship say they do not want the apples now, and as a matter of fact it is getting to be that apples are only used for cooking. Mr. Hamilton is deserving of a great deal of credit for his success in growing early varieties, and he has some very fine varieties. You can grow Duchess easier than you can a winter apple, but you can grow half a dozen other varieties, which you can grow well, without planting many Duchess. You can grow Alexander, Wealthy, Winter St. Lawrence, Scott's Winter, which is a long keeper; Arabka, which is a very fine apple; Canada Red, and where Canada Red succeeds it is a very fine apple.

A Member—What is the earliest variety that can be grown successfully?

Mr. Shepherd—Yellow Transparent is about the earliest, and Tetofsky is a good early apple.

Mr. Hamilton—What I wish to do is to combat the idea that the Fameuse is the best apple grown.

Mr. Shepherd—I had reference in my paper to the English market, and Fameuse is the best apple to grow in the Province of Quebec for that market. We cannot grow Northern Spy, or American Baldwin, as they grow in Ontario, and therefore we want to grow something that will be profitable. I say for the English trade La Fameuse and McIntosh Red are the leading varieties. I had the honor of shipping to the Prince of Wales in 1896 six cases of Fameuse packed in my own cases, and they arrived in excellent condition. He sent me an order on the 28th November last for six more cases, but I could not fill the order. The Prince of Wales has fifty Fameuse trees that he got from me in the spring of 1896, and I heard this fall that they were all doing well and that everyone of them had taken.

Mr. Dupuis (the President)—In the counties below Quebec La Fameuse is cited as one of the best five varieties to be grown. There is an orchard 25 years old in our district and the trees produce good crops. The apples in our locality are a Fameuse Barre in years that we have not much snow, but when we have a fine September you will get the Red Fameuse on the same tree.

Mr. Barnard—The more snow the more red?

Mr. Brodie—I cannot agree that the exhaustion of the soil around Montreal is the cause of the decay of the Fameuse.

Mr. Barnard—I did not say that. I said that in some places the cause is disease, and in others exhaustion of the soil. I do not mean to say that a man such as yourself would not give the soil proper nourishment.

Mr. Brodie—I know one orchard on the slope of the Montreal Mountain, in Westmount, where the soil right on the limestone rock was very shallow, and the trees were not long lived and very shy bearing, but on the slope near the Lachine Road, and on the river side, we have the best orchards. In the year of the great crop our best apples were on the oldest trees; trees in fact that had been neglected while we were nourishing the young trees.

Mr. C. P. Newman, of Lachine Locks, read the following paper:—

EXPERIENCES IN SPRAYING.

By Mr. C. P. NEWMAN, Lachine Locks.

It is a very evident fact to those who have sprayed a number of seasons and have done the work well, that the Bordeaux mixture, properly and timely applied, is a remedy more or less effectual for the spot.

Its action on a spotted leaf is evident to the most careless observer; the spot is destroyed and the leaf under the spot is rusted, which only shows that the application has been made too late, the leaf has practically been destroyed before.

The marked improvements that have attended spraying in many orchards shows the general and practical nature of this remedy.

Even in this season sprayed Fameuse orchards have borne fair crops of good apples in the midst of others which have been small and worthless.

Spraying for destructive insects I consider a matter of secondary importance except in localities which have become largely infested with them.

In orchards which are continuously sprayed these are easily held in check, if not exterminated.

In spraying those trees which are also sprayed for the spot, no further concern need be taken than adding the Paris green to the mixture.

But with trees not affected by the spot the Bordeaux mixture is an injury as well as an unnecessary expense. I have seriously rusted the Wealthy and Ben Davis, and also slightly the Duchess, without benefiting them.

In spraying for the spot the greatest judgment must be used to make the work effective.

The orchard should firstly, before the work commences, have all conditions aiding its growth removed

I have found the two best assistants to spraying were good sun exposure and air circulation, and these go hand in hand.

This is very evident some seasons by getting clean apples from the tops of trees.

It is also seen on the Lower Lachine Road in the front rows of orchards without windbreaks, which get the breezes fresh from the water; they have generally clean apples, but for a few rows back only.

I should recommend the removal of all windbreaks and hedges and a thinning of trees where they are planted too close together and interlap.

Also the removal of the under branches, especially on the north side of the tree. Another work which from experience this year would appear to be of great assistance is the burning of all the dead leaves.

In orchards where the old leaves fall and stay in the grass at the foot of the trees I have every reason to believe that more spores of the disease are carried over on them than on the bark itself.

In our work this season one orchard, consisting of old high-branched trees and young low-branched trees intermixed, was sprayed rather early, some 8 or 9 days before the blossoms opened. The young trees, being low, were sprayed thoroughly, literally drenched; the old trees, being higher, were not done as well.

Yet on returning to them after the blossom has fallen the young trees were black with spot, but the old ones were very much less affected.

Now, the only explanation that appeared to me was that the young trees branching nearer to the ground had caught the spores more readily from the leaves. Although I do not believe that utter extermination is possible of all the spores, yet a reduction of their number must assist; and it does not appear reasonable to me to recommend spraying on the bare tree before leafing, as the spraying calendar does recommend you, and leave the ground with a much larger surface untouched.

The leaves in most orchards can be easily fired after the first warm weather of the spring, and burnt with the old aftermath with little or no labor, except a man or two to watch and prevent the fire doing injury. So much for the work before the actual spraying.

I have made no departures in the formulæ of the spraying mixtures, except some slight work with a weak solution of the sulphate, 1 lb. to 200 gallons, and as far as I could judge it was not effective.

With regard to pumps I have found the brass lined handle pump the best.

I have not been able to do better than have two men to one nozzle, that is one man at the pump and one at the nozzle; one man was not able to keep two nozzles with sufficient pressure to make good spraying. I think though that

some improvement might be made in this direction I will now pass on to what I consider to be the most important part of it all, that is the time of spraying. I think a great many that do all of the rest of the work right make their mistake here.

It is most essential that the tree should be sprayed before the spot appears; once it has appeared in any quantity before spraying all chances of making good work are past. This I think has been the experience of many this season. The spot has not only a fast hold of the tree, but all the leaves it has touched are partially or wholly destroyed.

On the other hand too early a spraying is not good; considerable fresh foliage will have grown and the spray will have washed off and this would give it plenty of surface to attack.

This last season the spot made its appearance shortly after the blossoms opened; by the time they had fallen trees were beginning to look black. This was the earliest that I have ever seen it appear; generally it has been the first week of June before it has come.

In our work last year the orchards that showed a marked improvement over the other, particularly in foliage, were those sprayed the last three days before the blossom opened, particularly the orchard sprayed on the last day.

I think this all goes to show that not only must the tree be sprayed before the spot appears; but for good work all the foliage at the time of appearance must be covered with spray and the fresher the better.

I have never seen or heard of the spot appearing before the blossom opened, so I am of the opinion that on the three or four fine days that always precede the opening of the blossom the first spraying should be made.

This will protect considerable foliage and the interval until the blossoms fall is not very long.

After they have fallen the orchard should be sprayed again; and for open, airy orchards this I think will make very good work.

But for close orchards, or to make a sure thing, spray again just when the tree has finished making its leaves.

This last spraying would have probably been the best for the season of 1896 when the spot did not make its appearance until the first week in July.

Dr. Fletcher—This paper is of great interest to me, chiefly because it does not agree with my opinions. I sincerely trust that Mr. Newman improved on our methods, and no one will be more pleased to recognize that than I will. I could not suppose that his solution would be of any use, but one pound to twenty-five is what we recommend The experiment with the sulphate was one pound to two hundred.

Mr. Newman—I tried that sulphate experiment one to twenty-five.

Mr. Barnard—Did you find it was any use?

Mr. Newman—I did.

Dr. Fletcher—Our experiments at Ottawa have shown that one of the most useful applications is sulphate of copper, one pound in twenty-five gallons of water, to be applied before the buds open. The spot appeared last autumn on some of our trees and that is why we sprayed before the buds opened. If you look at the end twigs of the tree which were infested with the black spot last year you can see it on the twig now. The application of the Bordeaux mixture I think would relieve Mr. Hamilton from his trouble with his Fameuse. It would be almost as unfair to say that the potato was not a useful plant for us to grow if we did not use Paris green, and if we do not use Paris green we cannot get a crop of potatoes in Canada. The time is coming when you cannot grow good Fameuse apples in many districts unless you do spray them, and farmers have to learn how to do it. Arsenate of lead will probably take the place of Paris green because it is about half the price of Paris green. I know Mr. Newman grows apples on a large scale and carries out his work carefully, and the fact that his experiments do not agree with mine shows that I have to try my experiments over again.

Mr. Hamilton—My remarks about the Fameuse have been misunderstood. Now we will suppose that a great many of the remarks which we make here are for the benefit of the farmers, and in that view I insist that it is not wise for farmers to plant largely of Fameuse when they can get other apples that will grow without the trouble of spraying.

Mr. Shepherd—Mr. Hamilton will have to come to the idea that spraying is not only good for Fameuse but good for Wealthy and Yellow Transparent and every variety he grows. He cannot get along without it. I myself thought at one time the spraying was not much good but now I would not do without it.

Mr. Barnard—The trouble is the farmers may not carry out the instructions they receive at these meetings. If farmers want good crops of fruit they must spray. We must not make it too difficult for farmers to manage their orchards, and it should be pointed out that one small pump would serve a dozen such orchards as the farmer usually plants. There is no difficulty about spraying, for a man can spray one hundred trees in an afternoon without any difficulty at all.

Mr. Brodie—I recollect that when Prof. Craig came down first from Ottawa they had no apple trees on the Experimental Farm large enough to experiment with in spraying. I had been spraying successfully for the codling moth with Paris green long before, and he asked me if I would assist him in making some experiments. At that time there was a mixture of carbonate of copper, and I had a sweet job in making it, so that I was very glad when I found that the Bordeaux mixture was successful. It took me some time before I could convince my friend Mr. Shepherd, but I talked the matter over with him and got him converted and I hope in time we will get Mr. Hamilton converted too.

Mr. Jack—In my district we have started spraying, but the farmers take their apples up as a secondary consideration, and they will spray probably once

or twice in the season and then let it go, and at the end of the year they will tell you that spraying is no good. Now, spraying has got to be done thoroughly, and if it is well done good results will come from it. There are only one or two around the district I come from who spray thoroughly and make a success of it. For my part I would not do without it.

Mr. Hamilton—I do not wish it to be understood that I am opposed to spraying, but the farmers who have not many trees do not want to buy an expensive pump, and do not want to be forced to do it.

Mr. Fisk—There is as much necessity for spraying apple trees as there is for putting paris green on potatoes. Had any one of you gentlemen had experience last summer with regard to falling foliage in the month of June? In my orchard the foliage fell to a serious extent, especially on the Winter St. Lawrence, and in some cases the Duchess. I thought it was due to using a too strong solution in spraying, but it occurred in some orchards where they did not spray at all.

Dr. Fletcher—Was it as bad on trees that were sprayed as those that were not sprayed?

Mr. Fisk—Yes.

Mr. Brodie—Do you not think it was the great heat?

Mr. Fisk—Nearly one-third of some trees blighted and fell in June

Mr. Carter—The same thing occurred in my orchard, and I did not have a pump within a mile of it, so that it could not be the spraying.

Mr. Jack—Speaking about scab on apple trees I sent up a sample to Ottawa, and I think Mr. Craig called it the apple scab. My experience was that the Fameuse were bad but the St. Lawrence were worse.

Mr. Smith—What is the best spraying pump and the price?

Mr. Brodie—I believe they had an exhibition at Grimsby, Ontario, of spraying pumps, and Mr. Pettit was one of the judges, and I think they approved of the Spray Motor Pump as the best, and the Eclipse of Michigan as the second best. I have tried the Eclipse and used it successfully.

Mr. Shepherd—I have seen Mr. Jack's pump, and my neighbour got one and it worked well. The pump I use is the Stahl Pump, but I think Mr. Jack's is better. If I were buying another I would buy the same as he has.

Mr. Smith—What is the cost of your pump, Mr. Jack?

Mr. Jack—I think duty and all paid it comes to $14 or $15, laid down at Montreal. It is an American pump, and it is called "The Empire King."

Mr. Chapais—The one I got is a splendid pump.

Mr. Brodie—I like the Spray Motor Pump. It is as good as any made in America, and it is besides home manufacture.

Mr. W. W. Dunlop, secretary, read the following paper written by Mr. J. Raymond Ball, of Knowlton:—

SOME NOTES ON ORCHARDING IN BROME COUNTY.

By J. R. Ball, Knowlton.

Those who have attended the Brome County Horticulture Society's exhibitions for the past few years must have been impressed with the fact that this County is capable of producing fine specimens of fruit, particularly of the apple. Yet it is a deplorable fact that there are within the limits of the County but few orchards properly planted, cultivated and cared for. On nearly every farm may be found a number of old, scraggy, moss-covered trees bravely fighting for existence in sod, among rocks and stones, the trunks of which are often partially hidden from view by a growth of sprouts, never trimmed, except by the proverbial cow, that has been said to be the nurseryman's best friend, as she eats the trees, and therefore more must be bought. I think it is within the province of this Association to endeavor as much as possible to impart information among the rural inhabitants of every County in the Province where fruit can be successfully grown—the right methods to be pursued in the proper planting and intelligent care in all lines of work in connection with horticulture. Orcharding is yet in its infancy in this County, although upwards of sixty years ago the late Austin Wheeler, a pioneer among horticulturists of the Eastern Townships, introduced from the New England States improved varieties of the apple, many of which proved too tender and soon succumbed to the rigours of our Canadian climate. Still among them were some that stood the test, and from the seeds of which hundreds of seedling trees were grown all over this section of the country. The Wheeler Crab, Hardy, Tibbits Greening and other kinds could, no doubt, be traced to the orchard of this pioneer of advanced husbandry. But for some reason, which, perhaps, is not far to seek, the people seemed to lose faith in the possibility of successfully growing improved varieties of tree fruits so far north as we are situated, but since the introduction of the more hardy Russians, and some of our own iron-clad originations, and with, perhaps, a somewhat better knowledge of the conditions pertaining to the cultivation and care of orchards, owing, no doubt, to the good influences of local horticultural fairs, and to our own and kindred associations, there is certainly a growing interest being manifested in this fascinating and profitable industry. Within the last dozen years quite a number of small orchards have been planted in this County of from twenty-five to one hundred trees of hardy and improved varieties, which I hope will be the means of inducing others to go and do likewise. For surely it is time old fogyism became converted to the fact that Brome County can produce not only first prize dairy products, but apples fit to grace the tables of Kings and Queens of foreign lands. And is there anything in connection with rural life that adds more to the attractiveness and comforts of the home, and that will tend to make our young people contented with farm life, than a thrifty orchard loaded with luscious fruit; and from the standpoint of healthfulness alone, if for no other reason, it is a duty every farmer owes to his family to provide in some

way an abundance of fruit, particularly the king of all fruits—the apple. The writer has a small orchard of about one hundred trees, from two to eight years planted, half of which the past year bore from half a dozen specimens to three bushels of fruit each, consisting of some twenty-five varieties, netting me at least fifty dollars, including prizes won at fairs, which, considering the unfruitfulness of the season, is not, I think, a bad showing. My orchard has received very good treatment as regards fertilization, cultivation and spraying. No grass or weeds has yet been allowed to grow near them; the ground has been annually cultivated and enriched by an application of manure, with an occasional sprinkling of hard wood ashes, which has proved beneficial in various ways. And with such experience and close observation I have come to the conclusion, if one possesses the right location and the proper kind of soil, orcharding, as a commercial enterprise, can be made to pay, and, with that object in view, I have some three acres ready for planting in the spring to such varieties as Duchess, Wealthy, Fameuse, Scott's Winter and Bethel. Perhaps I can do no better in bringing this paper to a close than to state what I consider the best dozen varieties for farmers to plant in the County of Brome for home use, and therefore would recommend the following kinds, with the number of each in setting an orchard, of say, fifty trees:—2 Transparent, 3 Peach, 3 Duchess, 2 Strawberry (Foundling), 3 St. Lawrence, 3 Wealthy, 4 Fameuse, 5 McIntosh Red, 5 Bethel, 5 Golden Russets, 5 Hardys, 10 Scott's Winter.

SOME OF OUR NOXIOUS WEEDS.

By Norman E. Jack.

Idly, we plant no seed, but lo the ground
Is filled with blossoms Nature places there;
Though fair to see, too soon, alas, we've found,
Nothing but weeds regards our want of care.

Toiling through long rows of green crop, or working in a strawberry bed after the fruiting season, one is apt to wonder why weeds were created, and to recall sorrowfully the full import of that primal curse: "Thorns also and thistles shall it bring forth to thee." There is no doubt that every weed robs the soil of a portion of the nutriment that should be given to other crops. Yet it is also true that some weeds, like clover, are wonderful renovators of the land. And while wondering why they were created, it is not hard to surmise that their mission is to make those that would not otherwise do so to till their land thoroughly. The labor of the agriculturist, and those engaged in fruit and flower culture, is a continued fight in the endeavor to make grow the plants he wishes to cultivate, and induce them to produce their best, while preventing the growth of those he does not want there.

It is also a well-known fact that those which first establish themselves in a locality have a tendency to exclude others, and the longest lived to flourish and

to smother those of shorter duration or weaker growth. I remember when a lad (when going to and from the field where we were working) of taking my hoe handle and snapping the heads off the tallest weeds, making believe they were Indians.

All plants that come up from the ground spontaneously where crops are sown or planted are weeds, and, in more than one instance in our garden, seeds sown as flowers have reproduced themselves to such an extent as to come under this head. The well known portulaca multiplies and deteriorates each year if not carefully destroyed; it is the city cousin to that troublesome weed portulana oleracea, or common purslane, which spreads over the ground and defies the hoe, as every little morsel left in the ground, as we well know, starts into new and vigorous life.

Nowhere is it better described than in Charles Dudley Warner's "Summer in a Garden," in which he finds and fights usual and unusual weeds, and thus describes the purslane:—

"I am satisfied that it is useless to try to cultivate 'pusley.' I set a little "of it on one side and gave it some extra care. It did not thrive as well as that "which I was fighting. The fact is, there is a spirit of moral perversity in the "plant, which makes it grow the more the more it is interfered with. I am "satisfied of that. I doubt if any one has raised more 'pusley' this year than I "have; and my warfare with it has been continual. Neither of us has slept "much. If you combat it, it will grow, to use an expression that will be under-"stood by many, like the devil. I have a neighbour, a good Christian man, "benevolent, and a person of good judgment. He planted, next to me, an acre "of turnips recently. A few days after he went to look at his crop; and he "found the entire ground covered with a thick luxurious carpet of 'pusley,' with "a turnip or two worked in here and there as an ornament. I have seldom seen "so thrifty a field. I advised my neighbour next time to sow 'pusley,' and then "he might get a few turnips.

"I wish there was more demand in our city markets for 'pusley' as a salad. "I can recommend it."

In the balance as to the worst weed, daisy or buttercup, it would be hard to decide. Both are acrid and refused by cattle because they blister their mouths. The buttercup was introduced into this country from Europe, and delights in moist pasture land.

When dried they do not injure the hay, as the acrid principle evaporates with the curing. A quaint fancy attaches to this common plant that has been named by Robert Browning the little children's dower, and we associate it with them when playing in the grass holding the golden blossom under each other's chin to see by the reflection if they love butter, though how the idea originated is a query to a practical farmer.

The Leucanthemum or Ox-eye daisy is not in favor with the clean cultivator, though it is the favorite with the artists of either sex, and, indeed, I have often admired them when adopted by some fair Marguerite, though even such an

adoption could not efface from memory an orchard not far away where they have taken possession of the ground and are dreams of beauty, but at the same time a pernicious weed. It is a perennial and increases rapidly from seed, while the smallest piece left in the ground becomes a sturdy plant. In ancient times it was worn by knights and ladies when they frequented the tournament, and if I rememer rightly one of the Queens of Thessaly was called the Daisy Queen and is supposed to have been transformed into this flower. Coming down to the practical again we find that cows will sometimes crop a portion of the weed, and yet it is admitted that it is the stamp of a slovenly farmer or a careless neighbour, for even if ploughed and cropped to eradicate it, the fence sides and distant fields will soon bring it back. At "Hillside" we go on a tour of inspection through the hay fields every summer to dig it out, no matter for the hay; we drive a horse and cart along every few ridges, and in this way we manage to keep the place pretty free from them. Often when mowing a field I have halted my team when I have seen a daisy and dug it up with my pocket knife and carried it home and put it in the fire.

Not so much a field weed but one that shows itself in gardens and yards is the burdock lappa major. It is one of the coarsest plants, and the roots are used in medicine as a tonic and a substitute for sarsaparilla and the leaves and juice relieve rheumatic pains if laid on the aching limb, while the young stems make a good vegetable for the table and it is cultivated for this purpose in Japan. This weed seems to have a mission to cover up waste places while not making them to blossom, as the rose still fills that vacancy nature is said to abhor. Unfortunately the flowers of dull purple are not attractive, and the burs are a disagreeable part of the weed, as each little scale that forms the floral sheath is armed with a hook by which it fastens to anything it may touch, and if ripe and dry adhers tenaciously.

Shakespeare makes Pandarus say of his kindred "They are burs I tell ye, they will stick when they are thrown," and without being thrown, even by gently touching the rigid prickles we have all suffered no doubt both in fingers and clothing.

Yet when we think of its medicinal uses, we find that its good qualities surpass its charms, as it is of undoubted value. Mentioning methods of killing it, one not included in this list, and that I have never seen in print, was told to me of a bashful farmer who used it to propose to the lady of his choice. She remarked one day when at his house that the yard was overrun with burdocks, and asked him why he did not clear them out. Now was his chance, and without hesitation he answered: "They are too much for me, won't you come and help me?" It has been a life-long warfare around those doors, and still here and there a burdock shows its friendly face and reminds them of those byegone days.

TARAXACUM OFFICINALE.

I do not like to make war on the dandelion for it was the favorite of my childhood, and even now, when some fine morning the fields are golden with their open flowers, I enjoy them as well as roses, but they will grow among the strawberries, and circulate among the well-bred garden blossoms.

Of course they are not welcomed anywhere, for that downy ball, so lovely in its whiteness, will fly away on a mission of reproduction.

Many practical farmers know that the leaves of the dandelion act as a health-giving medicine to animals, and so tolerate them.

In France and Germany the leaves are blanched for salad, and the cultivation of the dandelion as a vegetable and tonic has become quite a business of late years.

I once asked a wise farmer which was the worst weed in our locality, and he answered, mustard. I remembered the Klondyke fields that met our view at every turn last season, and concluded that he was about right.

In reading over an old book printed in the year 1859, in the United States, I find this observation about the mustard: "This is an exceedingly troublesome weed in Europe, and is becoming so in some portions of this country. It infests those grounds which are best suited to grain culture; as the seeds retain their vitality for a long time it is difficult to eradicate it when it is once established."

And so, after nearly forty years, we find it is one of the worst weeds of our country, and it is a serious problem how we are going to get rid of it.

CHICKWEED—STELLARIA MEDIA.

This plant loves moist shady places, and like the purslane seems to thrive the more you try to kill it, and seems to be quite at home in our asparagus field in spite of our efforts to get rid of it. The flowers are star like, and at night the leaves, in pairs, close over the young stems. Birds, especially canaries, take to it as a natural food, picking the leaves and seeds.

There is said to be some value in the plant for consumption—being nutritive and allaying fever—while externally applied warm, inflammation is allayed.

CIRSIUM.

The worst addition to the word Canada is that of "Thistle"—which is the curse of any land when it gains a footing, as every seed is furnished with a balloon of its own to bear it to some pastures new. It is also spread by its creeping roots. They seem to be the natural food for donkeys, and some varieties are eaten by humans when first out of the ground in spring and boiled as a vegetable.

It is a well-known tradition how first adopted by the Scots. A body of Danes waiting to attack the Scots during the night sent out some spies, who tramped on some thistles (Scotch ones no doubt), and uttered such imprecations as were heard by the Scots in time to save themselves.

It is said to have been first introduced into New York in the year 1777 in hay taken over from Canada for the horses of General Burgoyne's army. A fact I would like to call special attention to is the spread of foreign weeds by railroads.

Also to have a municipal law to compel parties to destroy all noxious weeds.

I could go on telling about the uses and harm of the different weeds of Canada, but I would just say this in conclusion : You cannot have weeds and a good crop at the same time.

Mr. Brodie—Around the city of Montreal we have more than our share of weeds. The municipality in which I live passed a by-law forcing the farmers to put the weeds down, and among them the burdock is the worst. It got into a corner of my orchard and I neglected it a little while, and I found it hard to get rid of. I got crude petroleum, and a man went around with an adze and cut it down and then poured the oil on each plant and killed them.

Mr. McGowan—Burdock is easy to get rid of. Cut them close to the ground and put a little salt on them and the roots will rot. I have tried that successfully.

Dr. Fletcher—I do not think it is necessary to put anything on them. Burdock is biennial and lives two years, and even if mowed continually for one year you will check nearly all of them.

Mr. Brodie—Yes, but it blooms and bears seeds.

Dr. Fletcher—They are so big you can easily see them, and if you attack them once or twice they disappear. The worst weed in the province is the perennial Sow Thistle, and I protest against calling it the Canada Thistle. It came here from Europe, and it was christened the Canada thistle by our friends across the border. That perennial Sow Thistle is the worst weed in this province, and everybody who sees it should make every effort to eradicate it when first introduced on the farm. It is easily pulled up, for it grows above the grain, and it will pay you to go through your grain and pull it out. When you get it badly in a field, you must plough your land, and by cultivating prevent it forming leaves through which it consumes its food.

A Member—I wrote to the Experimental Farm about the Sow Thistle and I started to plough and kept it going all summer.

Dr. Fletcher—You must have reduced it.

Mr. Dunlop—My neighbours had it in their grain, which I think came from Ontario.

Mr. Fletcher—You have ten times as much of it here as you have in Ontario.

Mr. Hammond—With respect to that, we found that putting sheep in the field will eradicate it. So far as my experience has gone the worst weed we

have around here is the scutch grass. Mr. Chapais spoke about legislating against these weeds, and I think it is a good idea. A neighbour of mine has a farm infested with them, and as our winter roads are usually through the fields, when he sends his hay to market he scatters the seeds of the weed all over the country. If a man has such weeds as that on his farm he ought to be compelled by law to remove them and not be destroying the farms of his neighbors. Some legislation should certainly be adopted to prevent that kind of thing.

Mr. Brodie—There is a law. You can oblige your neighbour to cut down weeds up to the 1st of August.

Mr. Hammond—But you cannot prevent his drawing his hay and scattering his weeds all over the country.

Mr. Wood—I wish to call attention to a weed introduced into the County of Brome called the "Paint Brush," which evidently belongs to the thistle family. It is one of the most noxious weeds ever introduced into the country, for wherever it grows nothing else can or will grow. It is propagated both from the root and the seed, and every little portion of root will produce a new portion of plant. They have tried salt and tried digging it up, but I do not know that it is effective.

Dr. Fletcher—There are one or two practical points gained from our experience that may be worth mentioning with regard to the ox-eyed daisy, which is one of the worst curses ever introduced into North America. All through the Maritime Provinces it destroys the value of the hay and the value of the farms upon which it grows. It is not bad in this part of Canada compared with others. The best remedy we have been able to devise is to plough your land and seed it to clover. Its method of growth is entirely on the surface of the ground. From a central point it throws out short stems which turn up again and grow. It is not a weed that has the power to live a long time if ploughed up. It dies easily enough, but it has an enormous power of producing seeds. Being very conspicuous, and its bad qualities being known, it has caused a good deal of apprehension. It is a common practice in some parts of Canada to have a daisy day, and I believe the first one to invent it was the Hon. Mr. Fisher. He stops all work on a certain day; gets all the farm hands together, and picks out every plant, and, in consequence, he has been fighting it successfully. That is a good idea. Perhaps the best method is to sow the clover, and when you get your crop plough up the lea, and in that way you get rid of the ox-eyed daisy.

Mr. Brodie—How about the weed being in seed?

Dr. Fletcher—Pay more for your seed and get a good quality. The seed trade is cut down so much by competition that you may come to the conclusion that cheap seed is dirty seed and high priced seed is extra clean. When you think that with 12 pounds of clover seed to the acre, the difference between having dirty seed and clean seed is only 24 cents, you will see that it is in the interests of the farmers to get the very best seed. The "paint brush" is the "orange Haw weed" of Europe. In ordinary arable land it is not a troublesome weed because it grows near the surface of the ground, but in the Eastern Town-

ships and throughout Vermont it has got into the mountain and upland pastures. It is very difficult in these situations to plough them, and that is where the injury is so great. It is rather a showy plant, being of a crimson orange color, and this is the remedy which has been found successful. The method devised and worked out by Professor Jones, of the Vermont Experimental Station, is sowing Briggs salt in the proportion of one and a half tons to the acre. It improves the grass and destroys the weed. With regard to the "dandelion" it is considered a hard weed to get rid of, but I do not think so. It is a comparatively harmless plant, and is very easy to kill. It is to some extent a useful plant, and no doubt some of you drink it every year as if you were drinking coffee. The weed of all others which is the most difficult to get rid of is "scutch grass" or "couch grass." At least a great many people think it is difficult to get rid of, but after all it is easy. I have tried a great many experiments. All through Ontario and Quebec and the eastern parts of Canada, where we plough the soil deep, couch grass is one of the most troublesome weeds, but in Manitoba it is never mentioned as a weed. The reason is that we plough seven inches deep, and they plough four inches. The root of the scutch grass goes down four inches. If you plough four inches you turn it up where the sun can get at it and it dries out. If you plough deep you give the scutch grass all the chance it needs, because you cover it with soil and it grows again. It makes an enormous growth, and every joint produces a plant. When you plough deep you give it the chance to grow by planting it comfortably. You propagate it in this way. If you plough your land shallow during the summer you will have far less trouble getting rid of the scutch grass. This is no theory of mine, for I have tried it year after year, and I tell you that if you plough shallow you will get rid of it quicker than if you plough deep. I mentioned this some years ago to Mr. Trenholme of Montreal, and he tried the method and found it successful.

Mr. Brodie—I agree heartily with what Dr. Fletcher says about eradicating the scutch grass. I am bothered with it considerably if we leave our land in meadow for any length of time. I generally plough as shallow as I can in the spring, and I leave it to dry as much as I can. I have a cut-away harrow, and I harrow it down, and about the beginning of June I put the land in fodder corn for the cattle, and after the corn is set I get out the cultivator, and next year, with a crop of potatoes, I have no more scutch grass.

Dr. Fletcher—Mr. Smith asked about the mustard plant. I know that my father's theory about the mustard plant was to turn out the boys to pull it, and I know that the mustard in this country is the same old mustard as in England. I believe there is no better method of getting rid of the wild mustard than pulling it. It is not an indigenous plant, and therefore if it does not produce its seeds it dies out. Harrowing it will in time clear the land, but you cannot afford to wait. Hand pulling becomes one of the practical remedies where you can do it, but in an infested field the only way is to sow some crop that you can cut early—oats, or barley would do—and cut it green for hay. In that way you get rid of the first crop of mustard before the seed ripens. If you want to use your land for ripening grain you must have the mustard hand pulled. You

should not adopt the method of pulling the weed and throwing it down again, because the seed will propagate and be as bad as ever. You should collect the weeds and burn them.

Mr. Barnard—How long will the seeds last ?

Dr. Fletcher—There is an actual instance of their being buried 22 years in salt marsh in Nova Scotia, and of their being propagated and the seed growing afterwards.

Mr. Whyte—There is a matter which I wish to bring before the attention of the Board of Directors. There is in Ontario a society similar to this and one of the largest societies of the kind in America. Do you not think it would be a good plan if this society would send a delegate to their annual meeting every year in the month of December. I think they would reciprocate by sending a delegate to this society if the matter were brought before them.

Mr. Shepherd—Mr. Brodie, Mr. Dunlop and myself were invited by the Secretary of the Ontario Fruit Growers' Association to attend a meeting at Kingston last year. I attended and I enjoyed it very much. The greater intercourse between the two societies the better.

Mr. Whyte—If we could amalgamate, we would possibly influence legislation in certain directions beneficial to fruit growers.

The President (Mr. Dupuis)—Perhaps our Secretary would correspond with the Ontario Society in reference to the matter.

EVENING MEETING.

The meeting of the Society was resumed in the evening.

Mr. R. B. Whyte, of Ottawa, read the following paper :

A FARMER'S FRUIT GARDEN.

In presenting a plea for the Farmer's Fruit Garden I propose describing such a garden as is within the reach of every farmer in the country and such a one as every farmer should have, who values the health and happiness of himself and family.

It would be hard to overestimate the value of a well stocked fruit garden ; it not only supplies an element in our diet, that we cannot dispense with without injury to our health, but the free use of fruit on your tables would relieve the overworked farm-cook of a large part of the cake and pie baking that absorbs so much of her time, and who that has ever tried it would not prefer a dish of ripe strawberries or raspberries or baked apples with cream to the best

cake or pie that was ever baked, and yet how few farmers grow any fruit, and how very few grow all they could use. There is no city mechanic that does not use more fruit than the average faemer, though the city man has to pay out his hard earned money for it, and the farmer can get it for practically nothing, because, as I will show later on, the money outlay for a fruit garden is very small indeed.

The indifference of the average farmer to growing fruit for his own use is partly owing to his ignorance of the advantages of having plenty of it, but chiefly to the mistaken idea that a fruit garden is a very expensive thing to start, and that there is a great deal of hard work connected with it. I will endeavor to show that both these ideas are erroneous, by giving you a list of what such a garden should contain to give a daily supply of fruit from May till the following spring; what it should cost to stock it, and how it should be arranged so as to reduce the necessary labour to a minimum.

Half an acre is amply sufficient to grow all that any family could use fresh and allow enough to can for winter use.

A convenient shape is twice as long as it is broad, or 105 ft. by 210 ft. A wire fence is the cheapest and best, allowing free circulation of air and light, but it should be close enough at the bottom to keep out poultry, or any animals that are running loose: hens do a great deal of damage to fruit when ripe, though beneficial at other times in picking up insects and weed seeds. There should be no trees near enough to shade it or impoverish the soil with their roots. Most of our fruits need all the sunlight they can get to ripen properly; indeed there is no use trying to grow grapes in this section if they are shaded during any part of the day. The only path should be one from end to end, down the centre, and if it is wide enough to take in a horse and waggon a great deal of labour will be saved when manuring in the fall. Plant everything in rows running from path to fence. The space will allow of only two apple trees in the row, but, if planted 30 ft. apart, there will be room enough between the rows of trees to grow all the small fruits, except the grapes, which should be at one end, away from the shade of the trees. You will see from the plan that there is more than enough room for all the plants required, quite a large space being left for changing the location of any of the fruits when necessary, or increasing the space allowed to any of the kinds, if you so desire. The extra ground can be utilized for a vegetable garden till required.

The best soil is a good, sandy loam, heavy enough to retain moisture, and not stiff enough to bake hard during the hot summer months. But though moisture is desirable, there must be no stagnant water at the roots; no fruit plant will thrive with wet feet. If not naturally well drained a tile drain half way between path and fence on each side will be necessary.

As the soil immediately about the plants cannot be disturbed after planting, the ground should be plowed as deep as possible; if subsoiled so much the better, and well fertilized with stable manure and wood ashes—30 waggon loads of manure and 30 bushels of ashes would be none too much—and it is better if a

hoed crop occupied the land the previous year. If the surface has been covered with sod for two or three years you are sure to be troubled with white grubs, eating the roots of your strawberry plants.

After the first year the roots occupy the ground so much that all future cultivation should be by hand, as no matter how carefully you may plow you can't help cutting a large proportion of the roots of your plants, and thereby materially reducing the crop that you ought to get. Even a spade should not be used near plants, as it is only a little less injurious than the plow-share. By far the best implement for garden use is the digging fork. The work is done with the least possible injury to the plants; very much better done than it could be by the plow, and with one-half the labor that is required with the spade. With any ordinary soil there is nothing to equal a Crescent hoe. This, a modification of the old Dutch or push hoe, is a very great improvement on it, having two cutting faces instead of one only; both convex and concave edges are sharpened, and, as it lies flat on the ground when in use, cuts both ways equally well. The points are very useful for pulling out weeds in close quarters.

You will add very much to the attractiveness of your garden if you devote three or four feet wide along your path to flower growing; it won't interfere with your fruit and will give a great deal of pleasure to your wife and daughters, and to your sons as well, if they have any love for the beautiful. Any boy or girl of 14 or 15 could easily keep it in order, particularly if they have the assistance of a hand weeder such as I use, which any blacksmith would make for a few cents. I find it very handy in keeping my flower borders clear of weeds; it is also very useful in weeding about strawberry plants when grown in matted rows.

WHAT TO GROW.

In offering you a list of the best varieties of each kind of fruits that should be in every farmer's fruit garden, I will as far as possible only recommend well tested reliable kinds, such as can be got from any good nursery at moderate prices. Every season there are many novelties offered by the nurserymen, but the beginner in fruit culture would be wise to plant only the old well-tried varieties, those that he is sure will do well; and then in after years, as he gains experience and interest in his work, he can add some of the most promising of the new varieties each season.

The first of the fruits to ripen is the strawberry, but five weeks before the earliest strawberry the rhubarb stalks are large enough to pull, and though not a fruit rhubarb is so like one in properties and uses that no fruit garden is complete without a few plants.

After the first year, six plants will give all an ordinary family can use; of these three should be of the Linnaeus variety, the earliest and one of the best flavored kinds; the stalks are reddish in colour and very juicy.

For a later kind try Victoria or Stotts Mammoth; the latter is the largest variety in cultivation and very fine quality; the stalks are very large, often 2½ in. across, having the great recommendations of keeping crisp and fresh into

the month of August, long after the other kinds have become soft and stringy. To grow good stalks of any variety the soil must be rich and moist; before setting the roots dig in a liberal allowance of well-rotted stable manure, and every fall cover them 8 or 10 inches thick with strawy manure, which fork in around the plant as soon as the ground thaws out in the spring.

The varieties of strawberries are now so numerous that it is very perplexing for the novice to make a selection, but it is very important that he should make a proper selection, as many varieties are only of local value, only doing well in special soil and climate; and some varieties known as "pistillate" have defective flowers, and are not able to fertilize themselves, having no stamens or pollen-bearing organs. It has often happened that when only one kind had been planted there would be a luxuriant growth of foliage and flowers, but no fruit, until a pollen-bearing variety had been planted alongside. Many of these pistillate varieties are very heavy bearers, if every third or fourth row is a pollen-bearing sort.

Among the many varieties that I have grown none have done better than Williams, Warfield, New Dominion and Bubach; they are all large, good flavoured, prolific berries. The Williams is a variety much grown for market in Western Ontario, of largest size, good quality, a vigourous grower and heavy bearer, the largest berries often wedge shaped.

Warfield is a dark-colored berry, pointed in shape, fine flavoured, and a very heavy bearer.

New Dominion is a light colored, uniformly round-shaped berry of extra fine quality; it is one of the sweetest and finest looking berries I know of; these three have all complete flowers, and will set their fruit all right if grown alone.

The Bubach must be grown along with some other kind, as it is a pistillate sort; but it is such a strong, vigourous grower and immense bearer of very large berries, that it is worthy of a place in every collection. These four kinds do well over the whole strawberry district of Canada. About 200 plants, fifty each of these four sorts, would be enough to start with the first season; after you experience the delight of having fresh strawberries on your table daily, you won't be satisfied till you have three or four times that many; it costs nothing to extend your beds, as you can easily grow your own plants. A little care in preparing the soil for your strawberry bed will repay you; you can easily double your crop by having your soil very rich and in good condition. Plant in the spring as soon as the ground is ready, in rows three feet apart, the plants one foot apart in the row; the after treatment depends on whether you grow them in single plants or in matted rows. If in single plants cut off all runners as soon as they appear; a few minutes once a week is all the time it will take. There is much to recommend this system for small plots, it is simple for beginners, there is no posibility of making any mistake, any child could do it. It is much easier to keep the weeds down and though you may not get as large a crop as in matted rows your berries will be larger and finer.

In the matted row system the runners are allowed to grow till they cover the ground forming a solid row about 2 feet wide. When grown on a large scale there is no attempt made to control the number of plants in the row, except to trim the edges when it gets wide enough; the result is that the bed gets to be such a dense mass of plants and weeds, that after bearing one crop it is plowed under. If grown in matted rows in the garden it will pay to allow only one plant to about 5 in. square, pulling off the surplus runners. If properly cared for you can get three crops off your plants before making a new bed. Whatever system you follow, don't allow weeds to grow, and don't allow any fruit to set the first season; pull off all blossoms as soon as they open. In the fall, as soon as the ground freezes, cover between the rows with straw or marsh hay, allowing just a little of it over the plants, not enough to hide the foliage; in the spring rake it off the plants leaving it between the rows till after the fruit ripens.

Closely following the last of the strawberries come the raspberries; these I have found the most satisfactory of all the small fruits and a good large plot should be in every fruit garden; they are easily grown, bear immense crops and in flavor are unequalled. I don't know anything in the fruit line as good as a plate of good raspberries with cream and sugar. I have often heard farmers say there was no use their growing raspberries as they could get all the wild ones they wanted, but there is no comparison between the wild fruit and the best of the cultivated varieties; in delicate aroma, size and sweetness they are far superior, while in ease of cultivation, amount of crop for space occupied and length of season, they have the advantage of any of the other small fruits. No one who has ever grown Herstine or Cuthbert would ever think of depending on the wild crop for their supply. By a proper selection of kinds you can have fresh fruit on your table every day for five weeks. About 200 plants will give all any family could use, and allow lots to can and make raspberry vinegar, and you will be surprised how much you can use when you have them for the picking.

The best soil is a heavy, moist, sandy loam, though they will do well in any soil that is not a light sand or stiff clay. The best time to plant the Red and Yellow kinds is in the fall; the Purple and Black varieties do better if planted in the spring. When you get your plants from the nursery, unpack at once and cover the roots with moist soil until ready to plant. Exposure of the roots to the drying action of the sun and wind is the chief cause of plants failing to grow.

Plant 3 feet apart in the row and 6 feet between the rows; before the earth freezes cover with stable manure one foot on each side, 3 or 4 inches thick. During the first summer they do not require much attention. You can grow any vegetable crop between the rows if you like. Keep down weeds; cut off all side branches that may appear to two buds from the main cane; hoe out all weak shoots or suckers that you do not want. In the fall cut back all the main canes to 5 feet high; mulch with manure as when planted; bend the canes down close to the ground, putting on them pieces of cordwood or boards, or anything heavy enough to keep them under the snow. No other protection is necessary. During

the second and each succeeding season the treatment is the same. As soon as the frost is out of the ground remove the covering and tie the canes to a stake, or to a stout wire attached to a post at each end of the row.

When tied up spread the mulch between the rows and lightly fork under. Never use a spade; the roots are so near the surface that they are very much injured if spaded. If your plants have been well cared for you should have a fair crop the second summer, and a full one every year after for 8 or 10 years, when it is better to start a new plot.

As soon as the fruit is picked cut out all the old canes, as they never bear again, and all the new ones, except four to six of the strongest to each hill, tie them loosely to the stake to prevent them being broken by high winds. No further attention is required till autumn, when the leaves fall; cut back all branches to 6 in. long, and the main canes to 5 feet. They are now ready to be laid down for the winter. In more favored parts of the country it is not customary to lay raspberries down for the winter, but in this district there is no variety so hardy that it will not winter kill more or less during our severe winters; sometimes killing back to the earth line, this ruining the crop for that year. The only safe course is to lay down, as I have described. In bending them over you may sometimes break a stiff cane, but that seldom happens.

Among the many varieties of red berries I have found Herstine and Cuthbert are the most satisfactory. Herstine is a very large, sweet, juicy berry—about a week earlier than Cuthbert, one of the very best for table use. I have grown it for fifteen years, and have yet to find a fault in it. The Cuthbert, the great market berry, more extensively grown than any other sort, is a large, firm, dark-colored berry, and very productive. It is not so juicy as most red berries, therefore keeps longer after picking, and is more suitable for canning or preserving.

"Golden Queen" is upon the whole the best yellow berry; is very like Cuthbert in appearance and flavor, but not quite so vigorous a grower.

The best of the black caps are "Hilborn" and "Older," but it is very doubtful if any of the black caps are worth growing; the plants are more difficult to manage, requiring to be renewed every three or four years, while the fruit is small and seedy; in every way they are inferior to the purple hybrids. Of these the best is the "Shæffer," a true cross between the black cap and red raspberry, having the habit of growth and rich flavor of the black cap, with the size and juiciness of the red; altogether a most desirable variety that should be in every collection.

I would not advise anyone to grow any of the black or thimble berries in this district. I have not found any of them hardy enough, and the canes are so covered with long hooked prickles that they are very difficult to work with.

Of all the small fruits the currant is the most easily grown. No matter how poor the soil, or how careless the cultivation, you can expect a crop of currants, but there is no fruit that responds more readily to good feeding and care. The difference in the fruit from bushes struggling for existence among the weeds

along the fence, and that from well grown and properly cared for plants, is very great, both in size and flavor. The virtues of the currant for eating raw are not half appreciated. The best varieties are not only very palatable, but have a very beneficial influence on weak digestion, if used raw before breakfast. I use them very freely every morning during the season, chiefly the sweeter varieties, such as Moore's Ruby and White Grape.

All varieties grow freely from cuttings of the new wood, which may be planted in September or October, or the following spring; but they can be bought so cheap now that where only a few are wanted it is better to get them from a nurseryman. Plant at least five feet apart each way, preferably in the spring; the only attention they require the first summer is to pinch out the tip of any shoot that is growing too fast for the rest, and to keep down weeds. In the fall mulch well with rotten manure. The second year there will be a few bunches of fruit, and after the third year a full crop for ten or twelve years, when it is better to start new plants, as the best fruit is got from plants three to eight years old.

Pruning, after the second year, consists in cutting out all surplus canes from the centre of the bush, and all that lie on or close to the ground, and cutting back all side branches to about 3 inches from the main stalk. The best season for pruning is in August, after the fruit is picked and wood growth has ceased.

If you want to grow the largest berries possible, in June, when the new wood is about 6 inches long, pinch off the end of every shoot, thus checking wood growth and throwing the energy of the plant into the fruit.

Good feeding requires the mulch of manure every fall, and in addition a good dressing of wood ashes and bone-dust, if you have it; about 1 lb. of bone and 2 lbs. of ashes to each bush every spring will pay well. The winter mulch may be forked in very lightly in spring, but the less the earth is disturbed, within three feet of the stem, the better, as the roots being near the surface, a great deal of harm is done by deep cultivation, even with a fork.

The great enemy of the Red and White Currant is the "Currant Worm," which works such havoc in May, if not checked, destroying every leaf on the bush, and with the leaves goes the crop for that season. The first brood is hatched out in this locality about the 20th to 24th May. As soon as they begin eating the leaves apply Paris green, one teaspoonful to a wooden pail of water, with a whisk, or, if you have it, a spray pump. One application as a rule is enough, but some seasons a second brood appears as the fruit ripens. It is not safe to use Paris green then, but a good substitute is found in White Hellebore, about 1 oz. to a pail of water, applied in the same way.

Among Red Currants in every way the most desirable is "Moore's Ruby," an upright strong grower, berries large, bunches long, a heavy bearer, quality the very best, sweeter and finer flavored than any other currant. Not quite so sweet, but in every other way equal to it, is "Wilder Red." The "Fay" is also a good variety, very extensively grown, of largest size and bunch, and good quality; unfortunately it is a weak grower, and is very apt when the bush grows old to split in the forks when loaded with fruit. The "North Star," a new

variety, is probably the strongest grower and heaviest bearer of all red currants, but is not equal in size or quality to any of the above three sorts. Unless you would like to have the variety there is no object in growing any of the white ones. There is none of them as good as the best reds; if you wish for them, White Grape, White Gondoin and White Imperial are all good sorts.

In black currants, Lee's Prolific is the best standard kind..

There are several new varieties in the market, but they are only on trial yet. The pruning of the black kinds is somewhat different from the reds; cut out all surplus and low growing canes, but do not shorten branches any more than is necessary to keep the bush open; otherwise the treatment is the same.

Black currants are not often used raw, but are very fine canned, and if mixed with equal quantities of raspberries, they make a jelly that is unequalled; both canned fruit and jelly have a good reputation as a soothing remedy in throat affections. Don't be persuaded to buy the "Crandall," so much puffed by some nurserymen; it is perfectly worthless. One dozen red and half a dozen black will give you all the currants an ordinary family would use.

The gooseberry requires the same treatment and system of pruning as the red currant, but needs a heavier soil to do its best; a heavy clay loam is necessary for the best results, particularly for the large foreign sorts; if grown on light soil you are sure to be troubled with mildew.

There are a great many varieties in the market, which may be divided into native American and foreign; most of the latter are grown with difficulty in this climate, but some of them do very well. Among over forty varieties that I have grown, the Whitesmith has been the most satisfactory; it is perfectly hardy, and free from mildew; large size, good quality and a heavy cropper.

Among the native sorts the Downing stands at the head for vigor, size and quality; among the standard varieties there are many new kinds offered by the dealers that are said to be superior to it, but none of them have been sufficiently well tested yet to establish their claim.

It is unfortunate for the reputation of the gooseberry that it has been the custom in this country to pick them green for cooking purposes, before they have acquired their proper flavor and sweetness; few are aware, even among those who have grown them, how delicious and wholesome a thoroughly ripe gooseberry is. Plant six each, Downing and Whitesmith, and you will be surprised how many of them you will use raw.

I doubt if it is wise for the average farmer to attempt growing grapes in this part of the country, or in any but the most favored sections of this Province. If you have the proper location, a warm gravelly soil, a southern slope, exposed to the sun all day, and are willing to give them the necessary attention, by all means try a few, but be sure and only plant early ripening kinds, or some seasons you will lose a large part of your crop by early frosts.

I have found the following very satisfactory kinds at Ottawa: in black, Worden" and "Rogers' 4" or "Wilder." "Moore's Early" is considerably arlier than Worden, but it is too shy a bearer to be profitable. Among the

large numbers of good red grapes first place must be given to Rogers' 3, Deleware and Brighton, the latter the finest in quality of all American grapes. There are not many really desirable green sorts; Moore's Diamond and Green Mountain are the best I have seen; all of these will ripen their fruit in any ordinary season.

The finer varieties of plums, such as can be grown in Western Ontario, are not hardy enough to stand our severe winters, and it is only a waste of time and money to attempt growing them in this district except in very favoured localities. Up to a few years ago, we could grow with great success the improved forms of our native Canadian red plum, but of recent years the prevalence of the fungous disease known as the *blight* has made it practically impossible to get a crop of clean fruit, and large numbers of trees are being cut down every year. To a certain extent this disease can be controlled by spraying with copper sulphate and Bordeaux Mixture, but the spraying must be very carefully done to be of any value. Fortunately there has been introduced in recent years, a form of the native red plum from the North-Western States, that has so far been free from this disease. The best known varieties of this fruit are "DeSota" and "Weaver," but the "Wyan and "Hawkeye" are superior to either of them in size and quality. All of these are perfectly hardy, and bear every year enormous crops of yellowish red plums of good flavor, not equal to the best varieties grown in the west for table use, but still very good, and extra fine for canning. The trees do not grow very large; they bear such heavy crops that they have little energy left for wood growth. The only pruning necessary is to remove any branches that rest on one another. Plums should always be planted in the spring, as early as possible. Make the hole larger than the roots extend, about 18 inches deep, throwing the sub-soil to one side. Trim off all broken ends of the roots with a sharp knife, work the surface soil well in among the roots, and when all covered tramp the soil firmly. Don't have the tree any deeper in the ground than it was in the nursery. 20 feet apart will give them ample room.

The great variety of ways in which it can be used, its wholesome and nutritious properties and long keeping qualities make the apple the king of fruits. A man who can grow the Fameuse, McIntosh Red or Wealthy, does not need to envy the inhabitant of warmer climes his finest fruits. No other fruit of temperate climates is at the same time so appetizing, so wholesome and so nutritious as our apple, and in no other part of America can these varieties be grown in such perfection as in the Province of Quebec. There are not many kinds of winter apples that will stand our severe seasons, but for summer and fall fruit our climate is unsurpassed.

Among early apples "Tetofsky" and "Yellow Transparent" take the lead. "Tetofsky" is a first rate cooking apple, and, when ripe, good for table use as well. It has an unfortunate habit of dropping a large part of its crop before it is ripe; it grows in such large clusters that as they grow some of them are shoved off the branch. This is no great loss, as most of them are large enough to cook when they drop.

The Yellow Transparent is a rather larger apple, and better for table use; instead of dropping prematurely it holds on to the tree till it rots, if not picked when ripe.

Closely following these come the Duchess and Peach. The former, the type of hardiness and vigor, will thrive wherever an apple can grow; is a little coarse for a table fruit, but unrivalled for cooking; an enormous bearer of large, beautiful apples, the skin streaked and splashed with red. The Peach is a much better table fruit, finer grained, and better flavor; not so vigorous nor so prolific as the Duchess, green in color, with a red flush on the sunny side. For late fall and early winter the "Fameuse," "McIntosh Red" and "Wealthy" are ahead of all rivals. The Fameuse, most extensively grown, is too well known to need description. "McIntosh Red" is quite equal to it in quality, darker in color, and decidedly larger. Where the winter is too severe for these two to thrive, the "Wealthy" is a good substitute; as hardy as the Duchess, and one of the most beautiful of all apples; quality of the best either for cooking or dessert; at its best in November, but keeps well till January. We have no winter apples suitable for this district that can compare with the "King" or "Spy."

Of well tested sorts "Baxter," "Pewaukee" and "Scott's Winter" are the most reliable. The first two are large, dark colored, showy apples of only fair quality; the latter, while an extra good keeper, is too small ever to be a favorite.

There are a great many new kinds offered as good winter varieties for severe climates, but as yet they are only on trial; those mentioned above are the safe ones to plant in the meantime. Apple trees may be planted successfully in the fall, but on the whole the spring is the best time. Many planters buy their trees in the fall, trim the broken roots, dig a trench, and bury them, covering with earth up to near the ends of the branches; the advantage of this method is that, after putting in, the cut ends of the roots callous and are ready to put out new roots as soon as planted in the spring.

Plant as directed for plums, only allow more room; 25 to 30 feet apart is none too far.

One each of the above kinds will give you all the apples you could use if they all bore every year, but as they rarely do that it is better to plant two of each kind.

If you would like to grow some crabs the "Gibb," "Martha" and "Whitney" are all good sorts. The Whitney is large enough and good enough to be used as a dessert apple and is immensely superior to the Transcendant and Hislop so commonly planted.

Unless you are willing to grow a large number of cherry trees you had better leave them alone, you have to feed the birds before you get any for yourself; they take fully three-quarters of all I grow. I have found Ostheim and Bessarabian quite hardy and of very good size and quality.

When you make up your mind that you ought to have a fruit garden, write to all the nurserymen that you know of and ask for their catalogues and prices, compare them carefully, and everything else being equal, send your order to the nearest one.

You will find that you can always do best by dealing direct with the nursery. If in doubt as to what to plant ask some of your neighbors what has succeeded with them and profit by their experience. As a guide to you of what the cost should be I have made an estimate of everything recommended in this paper:

6	Rhubarb roots			$ 1 00
200	Strawberries,	assorted		2 00
200	Raspberries	"		3 00
18	Currants	"		2 00
12	Gooseberries			1 50
2 each of 7 kinds of			Grapes	3 00
2 "	2 "		Plums	2 00
2 "	10 "		Apples	6 00
				$20 50

These are all outside prices; most of the above articles can be bought for less from reliable Canadian nurseries, but supposing you pay these prices at 7 per cent. it would represent a yearly outlay of $1.40. Do you not think it would be well spent money to have such a collection of fruit as I have described.

Mr. Whyte—These remarks are intended for farmers who want to grow some fruits, not for commerce but for their own use. It is impossible in a short time to cover such a wide subject, and if I have omitted anything I hope you will ask questions. It is important to have the garden near your house. There are so many things to be done in the garden that it is a great advantage to have it leading to your house so that you may see what is wanted to be done; and when your friends see it, it is a great stimulus to your keeping it in good order.

Mr. Barnard—What is the best early corn.

Mr. Whyte—Cory's Extra. But I would rather wait longer and get a better corn.

Mr. Wood.—Early Vermont is the best I know. It comes in about the same time as Child's Honey Dew, and it is one of the best corns that I ever used.

Mr. Dunlop—English gooseberries vary in regard to their location. Sometimes Industry will do well, in certain locations, and in other places it will do badly. Generally speaking, the Industry has mildewed almost everywhere. It has not with me to any great extent, but elsewhere it has. The Whitesmith has been more generally grown and I think it is less liable to mildew than the Industry.

Mr. Shepherd—Do you spray for the mildew?

Mr. Dunlop—Yes, when necessary; but it is only in an occasional season that it becomes necessary. For the last two or three years I have no traces of mildew, but the bushes are inclined to winter killing.

Mr. Whyte—I mention the Whitesmith because it is the hardiest berry of the whole lot. I know others that are better, but we do not get the same crop from them. There is no use recommending a berry to a farmer that has to be sprayed, and the Downing and the Whitesmith are the best.

Mr. Wood—In our heavy soil in St. John the Industry does not mildew. Last winter many were unprotected, but the trees grew very well. I find the Industry a very good berry for our locality.

Mr. Smith—Are these plums you refer to cling stone or free stone.

Mr. Whyte—I believe they are cling stone. I think the DeSoto is the best of those I have mentioned.

Mr. Dunlop—If you want them for preserving purposes I think you will find the Cheney the best. I tried Wolf and De Soto and the Cheney was the best for preserving.

Mr. Whyte—There is too much water in the Cheney for preserving. The Cheney is the best eating plum.

Mr. Dupuis—What is the best gooseberry on the Montreal market?

Mr. Dunlop—I think the Whitesmith is the best on the market. They commence selling them for pies and tarts when they are green. The bulk of them are sold when they are ripe for preserving purposes, but not ripe enough to eat. The Whitesmith and Downing are the only varieties sold in any quantity on the Montreal market. The Downing is the principal American variety, and the Whitesmith the principal English.

Mr. Wood—With regard to the disposal of the old raspberry canes, I believe it is a good idea to burn them as soon as possible after they are cut, in order to guard against insects.

Mr. Whyte—They should be cut out as soon as the fruit is off, and the sooner you burn them the better.

Mr. Dunlop—If you go to the proper place you can get the North-west varieties of plum on the wild plum stock. I have them from Minnesota in that way and they are very good, but the peach stock is no good at all.

Mr. Whyte—I know a friend of mine who bought some in Minnesota and he had to make a special bargain that they should not be put on peach stocks.

Mr. Shepherd—Minnesota has a more severe climate than Quebec, because they cannot grow our apples, and yet they can grow the plum grafted on the peach stock. They have not the snow protection that we usually have here, and yet I know for a fact that they cannot grow the range of apples that we grow. That is one reason why I do not think they can in Minnesota grow plums grafted on peach stock.

Mr. Whyte—I know a man who planted three hundred in the last two years and he had to make the bargain I refer to. I know in Ohio they grow

them grafted on peach stock, but of course that is different. I got quite a collection of them five years ago from Pennsylvania; I planted them in the fall and had only one left out of the whole lot.

Mr. Shepherd—Mr. Dunlop and myself have been importing from Northern Minnesota, and that is not our experience.

I now wish to move a vote of thanks to Mr. Whyte for his very able paper. I do not think I have ever listened to a more complete paper than he has read, and I do not think I could even add to the list of apples he has mentioned. If the farmers of Argenteuil county will follow Mr. Whyte's advice and invest the small amount of money he has mentioned they will find out how much richer they will be in ten years.

The President (Mr. Dupuis)—The meeting cordially agrees in the vote of thanks moved by Mr. Shepherd, and I have much pleasure in tendering them to Mr. Whyte.

Mr. Barnard—I have no doubt that those garden tools exhibited by Mr. Whyte could easily be made in Montreal.

Mr. Whyte—I will present them to Mr. Dunlop, the Secretary, and he can have them made if he thinks proper.

TRANSPORT OF FRUIT IN COLD STORAGE.

The President (Mr. Dupuis)—We have the advantage of having Professor Robertson, of Ottawa, amongst us to-night, and everyone who has heard him knows what a treat there is in store for them in his lecture. I have much pleasure in introducing Professor Robertson.

Professor Robertson, Dominion Dairy Commissioner, then delivered the following address:

Mr. Chairman, Ladies and Gentlemen—I came a good deal more to learn how our Department could serve the Fruit Growers than to try to offer you very much of advice and suggestions. At the same time, having learned a good many things during the last summer about cold storage and transportation, I brought with me, in addition to what I carry in my head, as full reports as I could collect of all that the English people said about our fruit and our packages, and the advice they give us as to how we could best meet their wants. The fruit men of England are like the other importers of England—they insist on having things done their way, even if that be not in our judgment quite as good a way as the way we suggest; and so we have been trying, so far as we could during the progress of the season, to send over, in the shipments that were sent under the supervision of the Department of Agriculture, fruit packed in just the kind of way they said they wanted it. Allow me to assure you that the Department regards this work as being so very important to the whole fruit-

growing industry of Canada, that the Minister authorized me to say that no pains and no reasonable expense that is necessary will be spared to get the Canadian tender fruits on the British market in the best kind of packages and packed in the best way and delivered in the best condition. (Applause.)

Now it is very well to discuss varieties and methods of growing fruit, but unless the fruit can be marketed at a profitable price of course the whole business must fail—(hear, hear)—because a large orchard with a small demand for its fruit is only a source of expense to the man who owns it. Now, how can the demand be made steady, and be made as far as possible at profitable prices? Well, first of all, by taking away as far as practicable the risk of loss to the fruit merchants, the men who now in Canada handle the fruit. During the summer I have taken a great many opportunities of going into the fruit shops, both retail and wholesale, and talking to those people. One thing that keeps a man from paying even a fair price is the risk he runs of having the fruit somehow go bad on his hands. Now, I think that main risk is caused because of the fruit leaving the fruit-grower's hands in a warm condition. That applies to nearly all kinds of fruit that I have seen this year. If the fruit could somehow be cooled before it leaves the place where it is grown its natural term of life would be nearly quadrupled, and then that risk would be very much lessened. There is a tremendous loss in Toronto this last year from peaches going there and going bad on the streets, in the shops, even with cold storage there, because they get very warm, and men had to get rid of them right off before they got worse. If they had been cooled before they started, or held back a few days, it would be a great protection to the whole fruit-growing interest. It would pay the fruit grower to put up a small cold storage building in his own place at a cost perhaps of $250 complete, enough to hold five or six tons of fruit. I only suggest that, now, as being a most desirable means whereby the fruit-grower can protect himself from great loss and ensure that the merchants who get fruit from him will have more confidence in the future trade with him. Then the next matter that will affect the demand for fruit is to make it possible for the consumer to get the best quality of fruit in the best condition. It is not easy in Canada in many markets to be quite sure you can get a perfect package of fruit in good condition. If you buy California fruit you can get a package with every single specimen of fruit like every other one; but if you buy a basket of Canadian grapes or pears or peaches you will find some very good fruit and some rather poor fruit; not the good always on top. I am not speaking at all of any tricks of the trade. I am speaking now of the need of catering for the best class of customers by a uniformly fine article which they can rely upon being the same all through. Now, a cool place to handle fruit will give every grower a chance to send that kind of fruit to market, and that will mean that every family both here and in England, and in England particularly, would eat twice as much and three times as much, and by-and-bye, six times as much Canadian fruit as they now consume. I have been enquiring of the householders in Ottawa this season why they don't eat more fruit. They get home one basket, and one part of the fruit is good and two-thirds bad, and they don't buy more. That applies to all perishable products, so it is most essential whatever the Government may do in cold storage, either at warehouses or at steamships, that every fruit grower should provide himself for some convenience for

protecting the fruit as well as he can protect it, so that he and the merchant will have more confidence that they are not likely to lose what they buy. Now, the home market is the best market for everything that we grow in Canada. I say that without any qualification at all—that out of every $10 worth grown in Canada $9 worth is eaten at home. But if you have a dollar's worth at home that the people do not want, then the other $9 worth is not worth so much; so that while the home market is the market to cater for, the home market price may be determined by what you can get in the foreign market, as the rate per basket of many kinds of fruit in a few years will be determined by the rate per basket or case you can get in Liverpool or Glasgow or London. That brings me to speak of this next, that the price of Canadian fruits, at any rate in Great Britain, in the meantime—when I speak of the meantime, during the last two years—is determined by the condition, as far as I have been able to observe, with the single exception of apples—having found no uniform range of prices arising from the variety of fruit. I found that the pears that are spoken of as not being so good sold just as high as others in the shipment we sent forward if they landed in good condition. The first requisite in shipping fruit to England is to get fruit there in good condition, and not to have it get there in what they call a sleeping condition, that is, a condition where the fruit is firm but just ready to be wakened up into decay by the least little bit of heat. That means that the retail men will buy it only if they get it at about 25 per cent. of its value. I do not know that it is right that that should be so, but the fact is that it is so, and the wholesale men say that they cannot get the retail men to buy fruit that is sleepy—that is, too ripe when it started from the other side. Then the next thing that gives fruit value in Britain in regard to condition is that the fruit shall be seen to. that it will have reasonable keeping qualities there—and the longer the life period of the fruit there the higher the price you can get for it. Pears that land in England to be eaten within three days necessarily will fetch one-third the price of pears that land there in such a condition as to be kept for eight days—about that difference in regard to comparative value. That is gathered from correspondence as well as the results we have had from our own trial shipments. Then a minor matter, which has been counted a major matter, is the quality of the fruit in regard to its flavor. In a few years, when they get to know our fruit as being reliable in condition, they will discriminate as to flavors; but just yet, except in apples, they don't discriminate as to varieties—they merely want the thing sound. So if you can send a high-flavored fruit also sound, so much the better; but I do not think for one or two years you will get any more money per case for them than for the commoner fruit which will have a good color and be in a sound condition. Then, that I might glean from you some information as to what we should do during this coming year, let me instance what seemed to me the great difficulties of getting our fruit in England in the best way. Everybody knows there are difficulties in general. I want to indicate some of them in particular, so that you will put your best thought at work and be able to suggest the best means of meeting some of these difficulties that have not occurred to us. The main difficulty is that of climate here; that is most capricious, especially at the time that the fruit ripens. When we sent the two largest lots of peaches from Grimsby the temperature was recorded as being over 90° in the shade. Now, temperature like that, you see, does not give you any chance to cool fruit by

ordinary ventilation, except the least little bit through the evaporation of the fruit itself. That accounts a good deal for the very over-ripe condition in which the first peaches landed, because they were picked at a temperature of 90° and there was no way of cooling them thoroughly in the length of time available between the time they were packed and when they went on the car. That makes me think again that some simple cooling convenience should exist on every fruit farm where a man expects to handle his fruit in the best way. Then we have distances from market, which is a very serious thing, but it is not such a great thing if you can get the fruit to carry there safely and at not too great a cost. Now the actual cost of shipments from Grimsby to London was as follows:—

Freight in Montreal, counting those large sized cases	19½c
Wharfage and marine insurance, and those incidental expenses	2½c
Ocean freight (including cold storage charge)	31½c
Consignees' charges on the other side, such as delivery charges, fire insurance and hauling, and all those things	17c

Making a total of 70c a case into Covent Garden, England, from Grimsby, with additional charge of 5 per cent. commission for the sale and guarantee. That would vary more as the fruit sold high or low. Now the cost to Glasgow is 64c per case, the Glasgow delivery being rather cheaper than the London delivery. The cost to Liverpool would be a little less still than the Glasgow case—being 60c per case to Liverpool. Perhaps I might interject here a statement of what the fruit would realize as sold in these markets. I take first the fruit as sold in Glasgow, which did not give as good returns as London for, perhaps, two reasons: the Glasgow market, so far, has received no California fruit, as far as I can learn, and therefore the people are not prepared to buy imported fruit, as they are in Covent Garden; and then, besides, the first shipment that went to Glasgow was the one that was carried at a temperature of 48° by the ship's instructions to keep the hold at that temperature to save some eggs that had been put in. Of course there was a clear case against the ship if one should wish to push it, but in the experimental work we did not want to lay the blame on anybody. But that was one reason why Glasgow shipments did not realize as much at any time as the shipments to London. Take the peaches first. They landed in very poor condition, and I give you about the best price of those that went to Glasgow. There were some fancy dessert peaches by L. L. Hagar sold at only 4s a case, that netted 29c. at Grimsby. Then others at that rate. Then grapes we practically gave away, and I do not think because they were given away that therefore we should not make any more shipments of grapes. Where the grapes were put on the hotel table the guests would pick them off and spit them out on their plates. A big hotel dining-room was watched, where the Canadian grapes were put on in the best condition, and that was the result. They were put on every day for a week, and by the end of the week they were eating the grapes off the plates. (Laughter.) One sees the same thing by any Englishman and Scotchman and Irishman coming to this country. They don't like Canadian grapes, but in a while they devour as many of them as any of the rest of us. So I don't think because the grapes were given away, and that was the cause of a great deal of our loss—because there was a larger quantity of grapes sent than anything else, and the expense was

piled up in carrying the grapes—that was a bad investment; and from my standpoint I am prepared to say this, that it would be a good investment to send a few carloads of grapes next year over the country as a whole, even if they didn't much more than meet expenses—(Hear, hear)—for we are growing so many grapes that we must find an outlet for our surplus, and, perhaps, if you can educate the English people to eat grapes they will take kindly to our grapes as they did to our tomatoes, which are now eaten in enormous volume from the Canary Islands and the Channel Islands and England itself. The pears sold from 15s. a case downwards. Those sold at 15s. a case realized at Grimsby $2.78, that is counting every expense. Those that realized 8s. 3d. a case netted $1.24. Then tomatoes realized all the way from 5s. 2d.—57c. at Grimsby—down to 31c. at Grimsby. Then there were a few lots which were practically given away altogether. Then of the shipments that went to London—and these I quote from are the very highest prices that were realized—peaches were sold at 15s. 4d. a case, realizing at Grimsby $2.84 a case after all expenses were off. Peaches were sold at 12s., realizing $2.04 at Grimsby, and these were not landed in the very best condition—that is, in as good condition as I am quite confident we could land them in with the experience that we gained in regard to a lot of little things which I will refer to when I speak of packages. Pears were sold at 16s., realizing $2.95; at 14s., realizing $2.49; and 12s., realizing $2.04. The highest price realized for Bartletts was 12s., and for the Louise Bonne 16s. and 14s.—higher than the Bartletts. I find also that the Kieffer pears in one case were sold for 11s., and the Beurre d'Anjou for 15s. in Glasgow—both prices being higher than the Bartletts, I think the main reason of that being that they landed in better condition—perhaps a kind of pear that would not injure so quickly. Tomatoes realized 9s. 4d., realizing $1.43 at Grimsby. Let me interject an explanation there, that these were small sized tomatoes. Now, that was the kind of tomato that was advised to be sent from all over Canada. The horticulturist at the Experimental Farm had issued a bulletin a year before, advising medium and small-sized fruit to be sent, and in the same lot we sent some large-sized fruit. Large size fruit sold 6s. 8d., netting 62c. against $1.43 at Grimsby, and that occurred twice over, with the statement back from the consignees each time. "Large sized tomatoes don't sell well in our market even in the best condition." Then grapes sold in London at 4s., netting 22c. down to 10c., and down to less than nothing, but the last shipment bringing back a better report from the retailers who got the grapes. We didn't send many plums altogether, but they sold at 15s. 6d., realizing $2.83 at Grimsby. The apples we sold at 8s. 3d., realizing $1.18. These are among the best prices that we got for the fruit that landed in reasonably good condition, but I am confident, from what I saw of the work this year on the steamships and at the warehouses in Montreal, and on the railway cars and back to the starting point, that the fruit this year didn't land in England in as good a condition as the same fruit can be sent next year, if we merely just carry out with fair judgment what we have learned this past year. Now, the next thing I find on my notes to bring before the convention is the matter of package itself. What is the best package in which to send Canadian fruit to Great Britain? Now, there is no best package that is equally suitable for all kinds of things, and no package will suit all markets equally well. There is a market preference as well as a fruit need in regard to the package that will be selected. First of all we want a package that will

provide for the safe carriage, and in all the tender fruits the safety should be against attack from the inside rather than from bruising or from injury from the outside. The first shipments were conducted in a very unsatisfactory way in that sense. They were thoroughly protected against any possible injury from the outside, and that protected them from being cooled by the cold storage current to the extent that they decayed from the inside. I would like to make that clear so it will help you in any package you want to use, that the safe carriage is one protected from danger from the interior and not from the exterior of the package. Then the package must be cheap and suitable for any kind of handling, and, for such things as tomatoes and peaches and grapes, the smaller the package the better, consistent at all with strength and safe stowage. Half cases sold every time for a good deal more than half the price of whole cases, because they gave much better satisfaction—a reasonably small case rather than a large case, such as one of these bushel ones, for everything except apples and the more hardy and firmer variety of pears. I think a package as small as the Burlington package or this other package is quite small enough, for firm apples or pears, but for peaches and tomatoes, and grapes and plums these packages are abundantly large to enable one to get the best results. Then retailers don't care to buy a large package in many cases from the wholesale men in Covent Garden. I would rather, after saying one thing more in general terms, discuss the particular kind of package you want in each case by itself. Nobody would think of packing apples in the same kind of package that you would pack strawberries in. One thing more : The package in which tender fruits are packed must be provided with thorough ventilation. There is no possibility of carrying fruit safe to England, in large quantities, unless each package is provided with thorough ventilation. If you have a few packages—a dozen or twenty packages—perhaps you would carry those packages quite safely without each package being ventilated, because you would only have a certain little generation of heat which would be taken by the atmosphere ; but if you have a great mass of packages, each one generates some little heat until you raise the heat of the whole mass 5, 10, 15 degrees, and then there will be rapid decay ; so there must not only be ventilation for each package, but a large amount of room for circulation around the packages on the ship. Take this as an instance : During this last year, one of the firms in Covent Garden, who have not much experience in importing tender fruit, bought 5,000 packages of California pears in New York, in cold storage, said to be in the best of condition, and they packed the ship with that fruit quite full, and they had the misfortune of having to sell the fruit for a mere song, it being found in a rotten condition ; whereas another more experienced shipper put in about 4,500 packages in a 6,000 package apartment and left a space around every package for the circulation of air, and he landed his fruit in splendid condition and made a very handsome profit. Now our first mistake on the ship was that we left only slats between the boxes, and the slat between the boxes, with the boxes at all filled with even moderately warm fruit, does not allow enough air to carry off the heat ; and in our late shipments we left space between the boxes and the heat was cooled going on the voyage. The essential difficulty of a package like this (sample produced) in packing fruit as in packing butter was in using a pine package, which is the most objectionable kind you can use as to material ; it imparts a very offensive odor, and while the odor of pine is exceedingly agreeable in itself, when the odor of pine is mixed

with the odor of any food product it becomes exceedingly offensive. Now a package that is built like this (McKinnon package) with a cover close on top and left that way, will in half an hour become full of heat, say all around as low as that piece (about half way down the side). The hot air won't go down and run up that way, and if you have cold air all around that, it will take a very long while for the cold air to be diffused through this warm air. If there be an opening at the top to enable it to rise it will cool the package very quickly. But the safety of that package, I should judge, is that you have just enough of a spread there at the top to let the warm air out, whereas in this package each specimen of fruit becomes a small slow-drawing stove, the fruit being the fuel and the generation of heat going on; so that you may have a thermometer outside the package down to 38°—where it is held down at ship—and the thermometer inside the box is 68°.

A Member—May I ask if the fruit in the upper part of the cases was found to be more decayed than the fruit in the lower half of the cases?

Prof. Robertson—In those I examined in Montreal, yes. From England I have no report, but some packages that landed in Montreal in a very warm condition we kept there and sold there. I had these opened, and counted the peaches out myself. I had these cases at one time in Montreal kept in a large cold storage room where the thermometer was 36° all the time, and with a 600 h. p. plant there was no trouble in having that cooling power, and after the fruit being there for forty-eight hours the fruit inside here I should say was something over 65°, whereas the ventilated package that would allow an escape of air like that would get cooled down in less than twelve hours. We have so much of fragmentary information on this part of it that this I may say to you: not grudging the cost the department was at last year in this matter, we are going to have a cold storage building in Ottawa this summer just to find out these things, and will know exactly, having it under our eye all the time so as to learn precisely how long it takes to cool certain packages, and the temperature at which the different kinds of fruit can be kept in the very best way. There is no way of knowing except doing it ourselves that way, and we are doing it in that way so that the public at large can profit from it. Meantime make sure of ventilation near the top where there is none, and let the hot air escape. What I have to say next in the way of suggestion, and also perhaps a text for somebody's remarks afterwards, is not on the package but on the packing. Now there is a wide difference between the two. You may have an excellent package and so pack fruit as to make the fruit spoil quickly. The packing includes first the handling. Now while I do, I know very little about the handling of tender fruits—at least I have this knowledge from my general knowledge of the causes of decaying substances, that it is far better to handle the tender fruit like the peach once than six times in packing, and it is much safer to handle the fruit when in cold condition than in a warm condition, even the one time, when you can manage it. So if in the handling of peaches they could be picked from the trees and then put in a cool place at once in baskets before any attempt was made to sort or pack them they would not suffer, whereas I could see marks of fingers showing where they were pulled or handled over, causing them to spoil at this place first. I think that is a matter that should be looked into as to

whether it would not be better to have a place to put the fruit directly from the orchard, and leave it there for say twelve hours before any sorting or wrapping was done at all, and then it would be wrapped when cooled, and the fruit would be protected. Then in packing a good deal of care must be taken as to the temperature when the fruit is packed so as to keep the outside temperature from touching it. I say this by way of explanation and also by way of getting as much information as possible. If I put fruit in a case like this—thoroughly close and padded all round with excelsior or with peat moss, and each separate fruit wrapped in paper—and then put a tight cover on and have a tight box, if each separate fruit was quite cold when put in the ice, I could send that quite safely to England without cold storage at all ; the cold fruit being insulated by the thickness of this box and the half-inch of excelsior lining of paper would keep the moisture from getting at the fruit. Now, if I pack that fruit in a box warm I do precisely the opposite. I keep the fruit from being warmed up in one case, and in the other case I keep the fruit from being cooled down. That brings me to say this next, that the packing should be so as to hold the fruit firm with as little packing material as can be used, and with an entire absence of all covering paper except the wrapper that goes around each single fruit. Every extra layer of paper you put around any kind of fruit keeps the cold air from getting at the case, and so far is a disadvantage. If any of you from what I have said will feel disposed to put up a cold storage building, I have brought a lot of very simple plans for building in the very best way and at the least possible cost, and a cold storage building can be erected at about this rate. If you will count the whole of the inside contents of the ice-house and cold storage room it would cost about ten cents a cubic foot for the full cost of material and insulation. If you want a big one it will cost you so much more.

The Secretary : This is for the whole space ?

Prof. Robertson : That is where you cool by leaving the ice in position. If the room be cooled by taking the ice out and putting in galvanized iron cylinders, your ice house would cost you very much less. That brings me to say a few things about the general plan of cold storage and how it can be applied this year to keep very many other Canadian fruits along those lines I have spoken of. Its main use is by preserving the fruit. I repeat that,—to preserve the fruit, and not to give a man a chance to speculate in fruit. There is a great danger that the cold storage service of the Government may be diverted from its proper and intended use, so that people will buy all kinds of products of a perishable kind and put them in cold storage and hold them until they are out of their season. Now, I think only disaster can follow a course like that ; that every kind of product will do its best when marketed in its season. There may be a little amount of exception here and there, but every kind of product will do better in its own season, and make room for what is to follow after that. Then it gives a rather long marketing period ; you can spread the period out perhaps two weeks longer in the case of each fruit ; and then it gives a man a little better chance to choose his time of selling within those limits ; and then most of all it should be used to protect fruit while waiting shipment and on the way to the steamer. The latter is the main thing. Now, of all the different agents used for preservation let me mention just two things to make this cold storage matter perhaps clearer than

it otherwise would be. In preserving anything like fruit there are two causes of decay. One of these is the attack on the outside of the fruit by all kinds of fermenting germs, and the other is the change in fruit itself—the change in its vitality. Instead of trying to reason at any length with you at all, we will be glad to send enough printed matter to make clear to any one who wants to read it, the theory and the principles of cold storage; and let me make these two things clear—that in every change that occurs one has to take notice of two things: One is the agent and the other are the conditions. For want of clearness in these two things, cold storage methods are found defective. You have an agent that is active toward decay, and you have the conditions under which that agent will work well or will work badly. Now, you have, first of all in the agents that destroy fruit, the life of the fruit itself—the life in the cells of the fruit—bringing about changes that mean decay from the inside. Then you have changes from all kinds of molds and germs of these things that attack the fruit trees, often only in a very minute form. Now, packing in paper will protect from attacks from the outside, but wrapping in paper will never prevent the attacks that start from the inside. Therefore fruit needs protection by paper wrapping to protect it from one of these, and needs a cold condition to prevent other agents from doing their rapid work. Then I might note that one condition that makes for the rapid decay of all kinds of perishable products is the condition where the product is very wet, because all kinds of changes and fermentation go on more rapidly in a very moist product than a dry one. That is why grapes, when put in the form of rasins, will keep indefinitely. You dry the water off and they remain unchanged. Canadian fruits, such as pears and peaches, seem to be specially liable to decay because they are full of juice, more so than other fruits. It is needful that the temperature should be still lower for them than for other fruits of the same name. California fruit goes to England at a temperature of 40° to 38°, and this temperature they recommend for all fruits that go from California to Covent Garden. I think our Canadian peaches and pears will stand probably two degrees lower with advantage, just because they are more liable to decay. I will not say what I thought once of saying on the matter of cold storage principles, but pass on to say a few words about the package itself for the cold storage building. There is no use of sending to Britain any small peaches, any small pears, or any small apples, and there is no use sending to Britain any large tomatoes. If you will bear this in mind in regard to these three things, you will get twice the price you would if you send the wrong thing large. Then, every packer should so pack his fruit that whatever the size will be or whatever the selection will be, it will be always the same. For, in Glasgow, and Liverpool and London, you will see men waiting around there in the auction room and holding their bids till the fruit of the packer they like goes up; and when that brand that three or four men all like goes up, the price goes up at the same time. If every packer could spend a week over there looking at the difference in price, there would not be a single packer that would not strive to have his packing of the best and uniformly the best. It will pay every packer to put nearly one-third of his fruit wherever he can so that it will not go to anybody's table. If fruit had a higher fertilizing value than it has I would say it would be a valuable thing to make a compost of it; and that is not saying anything against the fruit growers, because any man who uses his eyes knows that you cannot have any large quantity of good things without

a large quantity of poor things. Now it would be a good deal better to use them in any kind of way than to put them on the consumer's tables, and especially to use it in any kind of way that would not let them go to the consumers, especially in the same case with the best fruit. This year in apples one man's brand was wanted very actively at 30 and 35s. a barrel, while another man's brand was not wanted at 18s, a barrel. It is telling every year more and more, that the man who packs uniformly well, and has uniformly fine fruit, will have his brand set off and bid for until he gets a bigger price. That brings me to say a few words on the packing of soft apples in connection with this fruit. In all the soft and tender varieties of apples if they are packed warm and the barrels are closed up at once, and they are sent over to England in the usual way on the railway and on the ship, the experience has been about sixty per cent. returned back "wet and slack," and the feeling here has been rather of suspecting the Englishmen of fraud. Now if a soft kind of apple be packed in a barrel while it is warm and the barrel closed up, the barrel will generate more heat, and the heat will cause the apples to occupy more space, and they will shrink and be wet. I am not going to argue that beyond telling you that this season 267 barrels of early apples were sent in cold storage in one of the best ships for cooling things down after they are put in the ship, and in the same week a shipment was made of the same stock of 325 barrels without cold storage and not being cooled down. The first parcel netted back in Ontario $2.45 a barrel, and the other parcel averaged 75 cents a barrel—the same stock. The proportion of wets and slacks returned in the one case I think was about 200 barrels out of 325, and there was not a single barrel returned for wet or slack out of the 267 barrels that went to cold storage. Thereby hangs a very, very valuable piece of admonition in regard to the shipment of early apples—that if the apples are packed on a hot day then they should be put in the cellar for a day before the heads are put on, and then the heads or staves of the barrels should have holes that the heat may get out, and they ought to go in cold storage, and you would not get back more than three per cent. of slacks as against sixty per cent. of slacks that have been reported in past years. We have also learned a good deal about apple shipments; and before shipping the things at all I wrote every steamship company which was to carry apples a special letter urging them to have put in their ships for even fall and winter apples not a cold storage but an electric fan that would suck the warm air out and let the cool air down to the bottom of the apple hole. Two of them that have done that said they never had as much satisfaction in carrying apples before. (Hear, hear.) I believe with little things like that you could have the late fall and winter apples landed in England at bigger prices, and cause consumers to want three, four and five times as many Canadian apples. I have sent some odd barrels myself to friends whom I have over there. The people all want Canadian apples when they get them fine, and when they get poor apples they simply give the country a bad name. Now the slacks that have come back reported in such large quantities have not been due to the packer's dishonesty, as the Englishman says, and they have not been due to the Englishman's trickery, as the packer says, but have been due to the conditions between these two men having been wrong and apples getting spoiled on the way. (Hear, hear.) I want to say also in regard to the sending of even later variety of apples in cold storage as against those that were sent in the ordinary holds of the ship. From one of those lots

I have not yet the report, but from one lot that was sent from Grimsby we have a report to this extent, that all the apples in cold storage were sound and firm, and most of the apples not in cold storage, while sound, on careful examination showed the beginnings of decay and of the spots in under the skin. While they sold well, a careful examination by an expert showed the beginnings of decay there, while the others were found sound and solid throughout. That means that we must have the cold storage for the early apples and ventilated chambers for all the rest of the apples. Then our apple trade will be on a good basis; but the shippers must ventilate the barrels and allow the warm air that generates in the barrel itself to escape both in the hold and before they go there. I have only a few things to say about pears in regard to packages. I think a package about this size (showing sample) is best for pears, and they should not be put in trays, but should be packed solid in the case wrapped in paper. The Californians use a case something like this, and they put a cover on to keep the fruit solid and firm when moving, and then all the cases are packed on their edge in the ship, so that there is no possibility of squeezing the fruit by the pressure coming and crushing the sides, and then there are cleats nailed between each row, so that there is a circulation all round each row and between each layer. That means that it takes just about 5,000 cases to fill a 6,000 space in the hold, filled with the spaces all round, and by that means they could land the fruit in the best condition. I think a small package like this for Bartletts would be the best for us, with a centre piece, and then have the fruit packed in that way—(on the edge)—and have this side put on with a cleat. This small case is better for perishable fruit like Crawfords. The reason I advocate packing from the sides is because it it much easier to pack solid in a narrow space than you can pack in a large space. That will give you a better carrying package, and the same for nearly every kind of peach excepting the Crawford, and I think even the Crawford peach put in solid and cooled would carry best like that, with no trays at all between 2 and 2½ layers of peaches. The Glasgow people complain of those peaches being in layers—that the see-saw motion of the ship had bruised the surface of the peachees a little bit even when they were covered with paper; so I think we should try as far as possible to get small packages that would carry the fruit safely without any drawers or trays in between; and where one does use trays for such things as grapes, and perhaps even for tomatoes, those cheaper packages, let the trays be all wood and not of pasteboard. The last report I got two days ago complained that even in the cold weather the pasteboard trays, when the weather was quite cold, landed with the pears slightly molded from the paper becoming moldy in the damp; and every report I have says, "Do not send any more pasteboard trays." Judging from every report I have had from England and Scotland this would be an eminently suitable package to carry the firmer kinds of peaches and tomatoes, and then that larger package for carrying apples and the firmer sorts of pears. These packages will cost very much less per case than ones that are filled with trays inside. In regard to pears, it is very important that the pears should be of a uniformly large size—a few small pears lessen the value very much; and then that the pears should be of uniform regular shape. Incorrect or misshaped fruit lessens the value very much. I have nothing more to say about peaches, and I would rather say what I have to say about tomatoes in any discussion that may take place; and I have only to apologise for the uncon-

scionably long time taken in saying what I had to say; and if after I am through speaking any of you would like more direct definite information in regard to any part, I have got nearly all these letters by memory, and as well as I can I will give you the exact facts in regard to the Englishman's opinion of the fruits we have sent. Before I do that let me repeat what the Minister authorized me to say on his behalf here and on behalf of the Department and Government: "That having gone as far as he has gone this year at the request of the Fruit Growers' Association and others to try and open up a trade in Great Britain for Canadian fine and tender fruits, that any further information that is needed in regard to packages and methods of packing and methods of transportation, and even methods of distribution in Britain, that can be gained by trial or experimental shipments—that information on all these lines that can be gained will be gained this year for the fruit growers by any reasonable amount of attention here and also in Great Britain. On the British side, what I think needs to be done further is, in addition to what I have said, to have a departmental agent at Covent Garden market in London and at the markets in Glasgow and Liverpool, when regular shipments are sent forward, who would inform fruit buyers, fruit salesmen and merchants, in say fifty surrounding places, by either telegram or telephone or post card a day before, that an auction of Canadian fruit was to be held at a certain hour, and thus try and bring in the additional competition of country buyers to that of the operators in the cities alone. We want to get our Canadian fruit back into the towns of England as well as into those great centres, and so we hope this year to do these things and profit as well as we can by the mistakes that we made and which we paid for rather too dearly, I fear, but by which we gained information which we could not have got in any other way than by experimental shipments on the fairly large scale which were made." (Applause.)

On board steamships unless you have some thicker packages there is a very great degree of loss of space, Steamship space is about six feet high. If you are two inches short there is a good deal of space that is wasted that you have to pay for, whereas if you have thin packages as well as a package like that I think it would serve the purpose of getting the space filled up.

The steamship people in Montreal made a bargain for half of the space for people who were shippers outside of Montreal as long before as they like, but one-half of all the space of each steamship must be held for Montreal shippers, to give them their fair share, and that I suppose cannot be gotten till two days before, but the other half of the space may be bargained for as long before as the men will make the engagement. Then this is the same also with regard to the fruit, that the Government reserves space for two carloads on every ship, and if any shipper that is shipping fruit like that will notify the Department long enough beforehand that he will have the fruit, that space can be reserved for him, but he must fill the space. You see, if a man applies for space and says he will send a whole carload every week, we will provide it; but then he has to send the carload or pay for the space. This is the position now, that if the fruit growers will make up any sort of statement as to how much space they do want, and how much they will send every week, I am authorized to say that we will provide that space for them.

I think the grapes are like the fall apples—they don't require cold storage but require ventilation. The grapes that we landed in England were in capital condition except twenty boxes, so it was not the condition but it was the inherent flavor they complained of, and that would be improved slightly by the means you have suggested. Let me say this, that some of the first grapes were sent over, they thought, without being ripened enough, and I have got a good deal of information from I think the best authority on grapes in the world—a man who sells 50,000 barrels a year—and he says that every kind of grape meant for England should be ripened until it is dead ripe before it is taken from the vine; that while you may pluck pears and such other things that will ripen on the way, grapes do nothing but deteriorate after they leave the vine, and therefore all the grapes should be thoroughly ripened, and they will cling to the stem longer when thoroughly ripened than if picked too early.

Mr. Whyte—What varieties were sent in those shipments?

Prof. Robertson—They did not speak favorably, in that sense, of any. The reports all came back that they were not the kind of grape they liked; but they sent over the Concords and Niagaras, then afterwards the Vergennes and a large number of mixed varieties. There were several different varieties of Rogers, some of the Brightons, and some of the Agawams, and they complained of those that were mixed and said that they ought not to have been mixed. There was no difference in the price between the kinds that are called the best varieties here, like the Brighton, Vergennes and Rogers, and the prices we got from the Concords and Niagara.

There was no demand for cold storage space till this year except for butter. Now if there is going to be a demand for cold storage for fruit of any large dimensions, and we know what it is, we can have it provided for; but there never has been till now any demand. I can say I do not think any of those shipments—at least any of those that went from Burlington—would have gone at all if I had not taken the law into my own hands There was no application for space. If there is any application put in now, or in the spring before navigation opens, space will be provided.

Just as soon as the fruit men apply for this space and take it, the Minister says he will apply for the space for the fruit on the same terms as butter; but until now there has been no application for fruit except the trial shipments the Government sent. I did not have any application for space for fruit last season until some Montreal men spoke to me, and I went and had the United States butter hauled out of one hold and had the fruit put in instead.

If you apply for any space for fruit it will be provided. The Government of no country is as good as Providence—it does not usually give things until it is asked for them.

In each chamber there is an opening in the deck, and down that is a two-inch pipe, thoroughly closed. That goes down two-thirds of the way into the hold, and the thermometer is put down in that pipe and is pulled up and read four times a day. The engineers have given me the reports taken four times a day like that.

If any of you are shipping early fall apples in cold storage be sure you send instructions to the consignee to leave them two days on the other side after they come out before they are opened. If they come out of the cold storage very cold into the atmosphere of England they will sweat—meaning that there is a condensation from the air on them ; and I find that complaint the same as the egg sweating. Eggs left two days after coming out of the cold storage are perfectly dry.

Mr. Shepherd—I rise with a great deal of pleasure to move a vote of thanks to Professor Robertson for his very interesting and able and entertaining address. We have been looking forward with interest to Professor Robertson's arrival amongst us, and we have been very fortunate to hear him to-night.

Mr. Barnard—I second that motion, and I know it meets with the hearty approval of the whole meeting.

The President then tendered the thanks of the meeting to Prof. Robertson.

BRANDING OF CHEESE.

Dr. Fletcher—Your President (Mr. Dupuis) has asked me a question with reference to cheese, which I have much pleasure in answering. The cheese made in the Province of Quebec, Mr. Dupuis explains, is quoted in the Montreal and Canadian market as Quebec cheese, and is not sold in the English market as Quebec cheese. The cheese from this country in England is known as Canadian cheese, not as from any special province, and some of the cheese in Quebec is just as good and sells in England at just as high a price as the best cheese made in Ontario or any other part of Canada. Again some of it is not made so well or not packed so well, and therefore it sells at a lower price. I would like to see the people of Quebec send the names of their cheese factories or creameries to Ottawa and apply for a registration number. They can have that number stamped on their cheese, and they are protected in the exclusive use of it, and no one, not even the buyer in Montreal, can remove that without incurring a serious penalty. If every factory is known by that number it will gain a reputation. Meanwhile some of the best cheese in Quebec is picked out, and the shippers brand only is put on it, and that causes a discrimination on the market here. Some factories do not get enough money to encourage them to make the highest class of good cheese, and the explanation is that they do not have a registered number put on it. In England the difference is as high as six cents a pound between the price for one brand as compared with another. Here it is a quarter of a cent a pound. In England the difference between our finest and very finest is four cents a pound. I believe if we had a registered number all over the country and the cheese maker stamped it on the cheese, it would make a difference of millions of dollars in our pockets. It is only by looking after these small things that we can hope to succeed and hold our own. The French people in France look after branding everything they export, and the

genius of their own nice taste is displayed in everything they sell. We in Canada have been so much accustomed to doing things on a large scale and doing rough work on our farms that we are only now recognizing the value of doing these fine things. If we do not do it now, we will be left in the position of an inferior people as regards our products for all time. Whereas, if we look to it now, we will be recognized as a people of taste as well as of strength.

The President (Mr. Dupuis)—What made me ask the question of Prof. Fletcher was, that last summer Quebec cheese was quoted in the Montreal market at from ¾ of a cent to one cent less than the Ontario cheese. We found out on inquiry that 26 boxes of cheese were bought in Quebec and branded "Belleville, Ont." We had evidence that the man took the Quebec cheese to Montreal, and that it was there branded "Ontario," although it was made in Kamouraska County. We corresponded with some of the Montreal papers, asking them to quote the quality of cheese, but not the place of production. We discovered also that a great deal of cheese came from the United States and was entered in Montreal, not as American but as Canadian cheese.

Professor Robertson—No cheese from the United States goes through Montreal without being branded "Produce of the U. S.," and that brand cannot be removed. We have a special agent there, and if the brand is not on he puts it on.

RESOLUTIONS—JOURNAL OF AGRICULTURE.

Moved by Mr. W. W. Dunlop, seconded by Mr. W. E. Jack:

That the Executive Committee of this society be requested to disseminate the information obtained at our meetings as widely as possible through the medium of the Journal of Agriculture, and that efforts be made to obtain for members copies of the Journal at the same terms as furnished to farmers' clubs.

THE SAN JOSÉ SCALE.

Moved by Mr. Shepherd, seconded by Mr. Brodie:

That the Government be requested to take active measures to prevent the introduction into Canada of the San José Scale on nursery stock from foreign countries.

THANKS TO THE PEOPLE OF LACHUTE.

Resolved:

That the best thanks of this society are tendered to the citizens of Lachute for their hospitality generally and the interest they have shown in this meeting of the Society.

ONTARIO FRUIT GROWERS' ASSOCIATION.

Resolved :

That the Society send a delegate to the next annual meeting of the Ontario Fruit Growers' Association with instructions to report on all such questions as may prove interesting to our members and also to request the Ontario Society to kindly reciprocate in this matter.

Mr. Hammond—On behalf of the people of Lachute I beg to move a vote of thanks to the society for their kindness in paying us this visit. The interest awakened by this meeting will have the effect of stimulating us in the work of fruit growing in our district.

Mr. Barnard seconded the vote of thanks to the society which was unanimously agreed to.

The proceedings of the fifth annual meeting of the society were then brought to a termination.

The 1898 summer meeting of the Pomological and Fruit Growing Society of the Province of Quebec was held on August 23rd and 24th at Cowansville. Among those in attendance were Messrs. A. Dupuis, L'Islet County, President ; C. P. Newman, Lachine, Vice-President ; W. W. Dunlop, Outremont, Secretary ; Robert Hamilton, Grenville ; James H. Carter, Massawippi ; R. W. Shepherd, Montreal ; Norman E. Jack, Chateauguay Basin ; William Craig, jr., Abbotsford ; J. M. Fisk, Abbotsford ; Dr. Wood, St. Johns ; W. M. Pattison, Clarenceville ; R. Brodie, St. Henri ; Thomas Slack, Waterloo ; J. R. Ball, Knowlton ; Mayor McKinnon, Cowansville ; Senator Baker, Sweetsburg ; Judge Lynch, Knowlton ; and a number of ladies. Messrs. W. T. Macoun, Dominion horticulturist, Ottawa, and F. A. Waugh, of the Agricultural College, Burlington, Vt., delivered addresses, and papers were contributed by Mr. J. C. Chapais, St. Denis, and Mr. John Craig, of Cornell University, who were unable to be present.

The first item on the programme was the presidential address, which was delivered by Mr. Dupuis as follows :

COWANSVILLE, 23rd August, 1898.

THE PRESIDENT'S ADDRESS.

Gentlemen,—

You are aware that the purpose of the Pomological Society of the Province of Quebec has been to promote and advance the great industry of fruit growing and I think you will agree with me when I state that this society has done a great deal towards instructing the people in fruit culture generally, in the selection of the best varieties of fruits suitable to the different parts of the Province, fruits in demand in the local and foreign markets.

This society counts amongst its members, men who have devoted their lives in experiments and observations to find out the most profitable and hardiest varieties, all the qualities and defects of each, their fecundity or the reverse, their adaptation to soil and to our severe climate. They have noted that some species need very rich clay soil whilst others thrive best in sandy soil. Other members own and cultivate orchards and grow small fruits for profit, they have acquired great experience. They attend the meetings of the society held twice a year in different parts of the Province and report to their colleagues and to the public the results of their experiments, their expenses, their profits, their losses, their disappointments.

Nothing is hidden to their fellow citizens, who reap the advantage of learning in a short time what they should know in fruit growing and what they should practice to succeed in this beautiful industry. I say "beautiful industry," but no one must be led to think that all is beautiful and agreeable in fruit culture. To succeed they must have enthusiasm coupled with a determination to work, to utilize their brains and to profit by the experience of their neighbors. They must be ready to fight insects injurious to trees and fruits. They must not calculate on fabulous crops and profits. Even with the best prospects of large crops after a full bloom of the trees, they will often gather a very light crop. In years of great abundance of apples they should not count in advance the dollars to be derived therefrom, for the markets might be glutted at home and abroad, or the returns be insignificant, and the merchants will tell you that your apples are not of varieties most esteemed in the markets, that the mode of packing is defective, that the apples are not well sorted. If a few decayed or wormy apples have found their way into the barrels, the whole consignment is sometimes condemned and sold at a sacrifice. I have often heard that the fruit merchants' profits are much larger than ours. They never lose; it is not in their line. Our efforts should tend to deal as much as possible directly with all classes of consumers; the benefit would be mutual. We should unite to establish manufactories of jellies and jams and evaporators, also cider mills, to work out our surplus fruits.

I have observed in the eastern part of the Province that orchards of moderate size, of popular varieties of apples and plums, generally give better returns than large orchards. It is the case with the proprietors of small orchards who carefully attend to their trees or to the sale of their fruits to consumers.

In 1896 I had occasion to be often in the Quebec retail markets, and to observe that farmers who owned small orchards in Montmorency and Quebec Counties received as much money for two 3-gallon baskets of apples as the Montreal growers did per barrel, sold the same day by them to the wholesale firm of R. Borden.

It was the same with plums; the crop was very good that year, and the farmers sold them at a very remunerative price.

We sold all our Pond Seedling, Reine Claude, Lombard, Washington and Bradshaws at 50c. a gallon. They were put up in six gallons (McKinnon

crates), containing eight baskets. The crates were returned. I discovered that some retailers had a smaller gallon than ours, and sold each basket for a gallon, making a profit of 2 gallons on every crate.

I realized the same price, 50c. a gallon, in three gallons. California crates and baskets I sold directly to consumers at that price, and whilst Ontario plums were sold at 50c. (and less) per basket of three gallons, and on the same market, I found that these California packages, like the McKinnon, are much preferred by retailers to the ordinary basket.

The Ontario plums were not attractive; they had been shipped immature, and had no flavor.

The immense crop of apples of 1896 was not remunerative to the growers, but every family, even the poorest, has eaten apples that year, they were so cheap. Car loads were sold at the railway stations, and schooner loads sent down to all ports east from Quebec to Gaspe, and then distributed inland as far back as colonization extended. The Lake St. John and Saguenay settlements, containing a large, prosperous community, where no apples are grown, bought a great quantity, and all the fishermen of the coast purchased some apples.

A barrel of codfish worth $4 in Quebec was often given in exchange for a barrel of apples worth $1.50 to the shipper, but giving to the fishermen a nice change of diet. Tired of the salmon and the cod, they are delighted by the aroma of the apple. All those people of the eastern part of the Province who tasted the apples grown in this western section should be good customers in the future for most of your fruit which is not wanted in England. Their taste has not been cultivated for special varieties; a little spot on a Fameuse apple or a little deformity is not objected to by them. If a small worm has tasted some of the apples the grower is excused; he did not put the worm there, but Providence willed it so; the apples are not rejected for that.

I believe that the growers of apples of this section would find advantage in dealing with the country merchants of the eastern part of the Province, especially in years of great abundance; it would pay them better than to send them to Great Britain.

Agents of Ontario and Nova Scotia apple growers generally come down to the principal towns and villages on the Intercolonial Railroad with samples of fruits and they sell to merchants at fair prices. As soon as a car load is sold the grower is informed and the agent delivers the apples himself. The largest sales are effected at Montmagny, Riviere du Loup, Rimouski, Ste. Flavie, on the South Shore; Chicoutimi, Chambord and Roberval, on the Lake St. John Railway. I am afraid that these long details have fatigued you, but I hope you will forgive me, knowing that my motive is to make you know where your surplus fruit has a good chance of finding customers. You are aware, gentlemen, that California sends us an enormous quantity of fruits, specially of plums, which, on account of the dryness of their flesh keep for a long time. These plums have no flavor and are only used in Europe for evaporating. But these plums take the place of the Canadian fruit in our Canadian families; deprive us of our natural customers. The same may be said of pears and grapes.

How shall the fruit growers of this Province protect themselves is a question which should have the careful consideration of the Pomological Society. Our markets are wide open to the United States fruit growers. What advantage should the United States give us in return? Every Canadian industry is protected except the fruit growers'. We must admit that the Federal Government, the Hon. Mr. Fisher particularly, are doing for the fruit trade as much as they have done for the dairy products of the country, and we hope that their efforts will be equally successful in having the fruits of Canada kept in the best condition on the ocean, as they have for butter and cheese, so that our fruits shall reach the European ports as fresh as when they leave the Canadian refrigerator cars.

I have much pleasure in informing you that the Quebec Government has acquiesced to the demand of the Pomological Society in establishing experiment fruit stations.

Our regretted confrere, the late Chas. Gibb, was the first to mention the need of such stations in this Province. It was at a meeting of the Montreal Horticultural Society. Mr. J. C. Chapais was the first to advocate it before this Society, and every member unanimously approved of the project, and at our last meeting at Lachute it was proposed and adopted that a delegation should meet the Honorable Commissioner of Agriculture and request him to establish the stations as soon as possible. Mr. Brodie, ex-President of the Society; Mr. Dunlop, our Secretary, and myself, had the honor of an interview with Hon. Mr. Duffy in the absence of Hon. Mr. Duchene, and Messrs. Brodie and Dunlop with great ability exposed to the hon. minister the advantages to be derived by the Province by the establishment of fruit stations; they cited what had been done in Ontario and the United States. The hon. minister was soon convicted in favor of the project.

In the meantime the Council of Agriculture of the Province, having taken consideration of the request of the Pomological Society, passed a resolution suggesting to the Hon. Commissioner of Agriculture the establishment of fruit stations in the counties of the Province where fruit culture needed most encouragement, "Où le besoin s'en ferait le plus sentir."

Complying to the demand of the Pomological Society, and to the suggestion of the Council, the Hon. Commissioner of Agriculture, by Order-in-Council established the stations, and selected for the first fruit stations the counties of Beauce, Compton, Maskinonge, Chicoutimi and Gaspe; and as a member of the Society I was charged by the hon. minister to select the most suitable sites and the most careful and reliable persons to manage these experimental stations. Acting on the advice of the representatives of the above named counties I have visited and established the stations in all except Beauce County, where the ground was not suitably prepared for the plantation.

It was impossible to follow in these counties the method of Ontario.

The stations in Ontario are managed by specialists on either apple, plum or small fruit culture; but such specialists do not exist in the counties named.

I hope that the next five stations to be established will be in the counties of the western part of the Province, where specialists will take charge of them.

It is gratifying to see that the views and projects of the Society receive the approbation and support of the Government and of the Honorable Commissioner of Agriculture in particular.

The valuable manuscripts read at the meeting of this Association, and all the deliberations at Stanstead, are lost. Our worthy ex-President, Mr. Brodie, has expressed to me that we should print our reports to prevent such a loss as we have sustained.

I hope that we shall unite to petition the Government for a special grant to enable the Society to pay for printing the reports in English and French.

The prohibition of entry into Canada of trees from the United States has created much injury to traders and orchardists, and caused great damage to *bona fide* nurserymen of the United States who had sold the trees, and who had to keep them afterwards.

The L'Islet Hort. Society had bought 2,800 trees of a reliable firm of Rochester, N.Y., which the law prevented to be delivered, and is now menaced for damages by the nurseryman.

The Society then bought 2,800 trees, 6 ft. high, in Ontario ; unfortunately they went astray and reached the County four weeks after leaving Welland, Ont. The result was that only 4 or 5 per 100 have grown.

The L'Islet Society made a mistake in purchasing trees out of the Province; the low price of the trees induced them to buy Ontario trees. After the disaster of the winter of '96 and '97, which destroyed the orchards wholesale, the Society tried to procure the largest number of trees possible for its money,

Hon. Mr. Dechene was more lucky in his importation of 500 fruit trees from France for the Experimental Station. This importation comprices 44 varieties plums and 49 varieties apples. The trees arrived in splendid condition ; they average 8 to 11 feet in height, are strong, and are growing well.

Will you please consider and suggest at this meeting the best means which should be taken by this Society to have an exhibit of fruits worthy of the Province of Quebec at the great Paris exhibition in 1900.

Your suggestions would be greatly appreciated by the Honorable Minister and Commissioner of Agriculture.

Your advice is also earnestly solicited for the selection of extremely hardy fruit trees for the experimental stations, and for the address of reliable parties who could supply the trees.

The fruits of Russian origin, the seedlings originated in this Province, which are exhibited here to-day, are extremely fine, and most of them will prove, I hope, of great value.

Mr. Dunlop—If the Government undertook to get up an exhibit the Society would be glad to help them, but the Society could not do it by itself, as it involves a good deal of expense. I dare say the members of the Society would furnish specimens of fruit, but I do not think they would take upon themselves the expense of preserving and forwarding it. I would suggest that a resolution should be passed recommending that an exhibit be prepared, and offering the Government the support of the Society.

Mr. Brodie—One man would need to be employed to look after the whole thing.

Mr. Macoun—This summer we appointed two men to collect the fruit for the Omaha Exhibition.

Mr. Shepherd—In collecting the fruit for the World's Fair at Chicago I was one of the Advisory Board, and assisted in obtaining the fruit for the Province of Quebec. The Hon. John MacIntosh was the Commissioner for the Province, and had the selection of the men to represent the different districts. The Province paid the whole expense of the collection of the fruit, and we sent a very fine exhibit. Unfortunately there was a fire in cold storage warehouse, which destroyed a large quantity of our fruit, but undoubtedly the exhibit of apples was very fine, and we got very high praise. I think we ought to start in good time to prepare the exhibit for the Paris Exposition in 1900. All the bottling ought to be done the previous year. Then the fresh fruit could go forward during the current year of the exhibition, so that altogether the labor of the Commissioner of the Province and his assistants and Advisory Board will extend over one year. I think such a resolution as Mr. Dunlop suggested should be passed. The Society could certainly not be expected to bear the whole of the expense.

Mr. Dunlop (to Mr. Macoun)—Would fruit preserved in formaline stand well for a year?

Mr. Macoun—We had some currants (which are very hard to preserve) done at the Experimental Farm two years ago, and though the color has gone the form is still left.

The President—We might begin this year and get some varieties which may be scarce in other years.

Mr. Shepherd—It is a little too soon yet, I think.

It was agreed that the Committee of Resolutions should draft a motion to be sent to the Commissioner of Agriculture and the Board of Agriculture.

Mr. Fisk—I think the President's reference to the importation of California fruit is worthy of discussion. If it is really a detriment to the sale of Canadian fruit I think we should take action and endeavor to obtain better protection.

Mr. Shepherd—We shall have to send a deputation to the Quebec Conference.

Mr. Brodie—If we have a chance for our Fameuse apples in Boston and New York I think we could afford to let the Californian fruit come in. When once our fruit gets on the market they have no chance, because ours is so much superior in quality.

Mr. Dunlop—There is no doubt the Californian fruit affects the sale of ours. It is consumed in enormous quantities before our fruit comes in. But it would be asking a great deal to have the Californian fruit kept out that we might be able to get better prices for our summer apples.

Mr. Hamilton—The Californian fruit is prevented from coming into British Columbia on account of the Codling moth.

Mr. Shepherd—This is a matter for the Dominion Government. The Provincial authorities cannot prohibit except on the ground of protecting the Province from injurious insects.

Mr. Fisk—They have appointed inspectors to examine the fruit imported, and if these insects are found the consignment is confiscated.

Mr. Hamilton—Yes, and destroyed, if found to be badly infected by Codling moth. I should like to ask what is the nature of the work being done with regard to the establishment of fruit stations.

The President—The work is simply beginning. Only a few trees have been planted, because it was late in the spring when it was started. Some of the trees which had been ordered from the States could not be got in time. There was a demand for an experimental fruit station in this part of the Province, but the Government regarded the experimental orchard at Oka as sufficient.

Mr. Shepherd—They are all experimenters at Oka, because the Trappists have not had much experience of our climate. When they first started at Oka a great many varieties were planted which were not suitable. No doubt they were swindled by agents from the States and from Western Ontario, who sold them varieties which were quite unsuitable to the Ottawa valley. If they had come over to me they might have had the benefit of my twenty-five years experience, but they did not. Is Oka to be one of the experimental stations?

The President—It is regarded as one of the experimental stations already established.

Mr. Brodie—Do they issue bulletins from Oka for the benefit of the fruit growers of the Province?

The President—I don't know that, but Mr. Chapais regarded it as a station.

Mr. Fisk—I think as these stations were established in consequence of a resolution from this Society, the reports from the stations should be embodied with our reports.

The President—We might pass a resolution in that sense, because each of the people who are cultivating the trees for five years will have to make a report

in October, and it will be easy to include these in our reports. In Ontario specialists have the care of experimental orchards, but the form of the resolution passed by the Board of Agriculture decided the Government to put the stations in parts of the Province where fruit growing is backward, and specialists could not be found. If we can get any fruit trees from this part of the Province this fall, the Government will not take any from Ontario. Of those that we bought last spring not more than half have lived.

Mr. Shepherd—I should think the proper system to adopt would be for each experimental station to provide itself with root-grafted trees, and raise them in nursery, where they are intended to grow. Then they will be acclimatized to a great extent, and those who have the care of them will be able to state how these trees do in these particular stations from the beginning.

The President—It is very easy for you to cultivate root grafts, but for those who are not initiated in fruit growing it would be pretty difficult work. I think trees one or two years old would be preferable, unless you have specialists in charge. However, some very good suggestions have been made, and I hope this will be brought to the notice of the Government.

Mr. Shepherd suggested the appointment of a committee on resolutions, and Mr. Brodie proposed the names of Dr. Wood, Mr. Shepherd and Mr. Fisk, with the Secretary.

This was approved of by the meeting.

The President then called upon Mr. W. T. Macoun to give an address on

PROMISING SEEDLING AND CROSS BRED FRUITS GROWING AT THE EXPERIMENTAL FARM AT OTTAWA.

Mr. Macoun said: I have very great pleasure in attending this meeting of the Society, in making the acquaintance of some of the prominent members whom I have not known before. In accepting the position of horticulturist at the Experimental Farm, I felt I was assuming a great responsibility, especially after the good work done there by my predecessor, Mr. John Craig. My aim will be to do my utmost for the fruit growers of Canada, with the hope, in the years to come, of accomplishing some good work. Before this meeting comes to a close I should be glad to have the opinion of the Society as to the best lines of work to be carried on at Ottawa. In doing original work one is perhaps inclined to have prejudices in favor of certain lines, instead of following out the work most useful to fruit growers generally.

The subject of my address suggests one of the ways in which we can help fruit growers very much. At the Farm there are facilities for growing large numbers of seedlings and cross-bred varieties that private individuals have not, and cannot afford to have.

When the Experimental Farms were organized in 1887 the Director, who is a born experimenter, brought to the farm at Ottawa his large collection of

seedlings and cross-bred fruits, consisting of raspberries, gooseberries, currants and strawberries. These were planted at the Farm, and gradually the poorer varieties were weeded out. I shall show you presently some of the most promising varieties which were kept, In the spring of 1888 a collection of seeds of Russian apples was procured from Riga and Russia. These were sown and the young trees planted out, in 1890, five feet apart each way. Some three thousand trees were put out, and there are now a little over one thousand growing. The rest have been killed by blight or crowded out. Of these about eighty have fruited; specimens of some of which are here to-night.

Considerable work was done by the late horticulturist in raising seedlings of plums, cherries and black currants, which are now beginning to fruit, among which may be some promising sorts. In 1896 the Director began some experimental work in hybridizing the wild crab of Siberia with some large apples which were hardy at Ottawa. The prime object of this was to get some trees which would be hardy in Manitoba and the Northwest, and at the same time produce larger fruit than the crabs. The Siberian crab (Pyrus baccata) is the only apple that has proved hardy at Brandon and Indian Head after testing all the well-known sorts. It is hoped that among these fruits will be some that will be of great benefit to the fruit growers of that country. Our experience agrees with the remark made by Mr. Shepherd, that the trees will make better growth if they are started in the district where they are to remain permanently.

There have also been improvements made with the sand cherry, which will not interest fruit growers in this part of the country much, but may be of great benefit to settlers in the northern parts, where it is difficult to grow plums and cherries. The late horticulturist succeeded in getting three or four improved varieties, and they have been disseminated widely with good results.

The Russian seedling apples, of which mention has been made, were grown in very poor soil, apparently almost pure sand. Some of the trees have produced large apples. Nearly all the varieties which have fruited thus far are early. Among the best are numbers 11, 7 and 2, but none of these are of great merit.

Among the black currants originated by Dr. Saunders, Success, Standard and Climax are three of the most promising. Success is very early, the three covering a long season.

In gooseberries, 10/44, a seedling resembling Downing, but larger and probably more prolific, is very promising. Among others, 9/51 and 10/17, which are red varieties, are large and nearly free from mildew. A hybrid between Ribes Cynosbati, a native wild gooseberry, and Warrington, an English variety, is a very vigorous grower, with large fruit, which retains the spines of the wild species.

The Sarah raspberry, described in the Experimental Farm report for 1893, was originated by Dr. Saunders, from seed of Shaffer's Colossal. "Fruit large, round, red, firm, very juicy, pleasant acid, very rich flavor. Crop at best when Cuthbert is nearly over." This variety continues to succeed well at the Experimental Farm.

A large number of seedling strawberries were gradually thinned out, until now there are only a few of the best remaining. These are promising for home use on account of their high flavor, but as most of them are rather soft, they are of little value for shipping. Numbers 297 and 119 are among the best.

Some of the seedling sand cherries, originated by Mr. Craig, are much superior to the ordinary types.

Mr. Fisk—It is quite possible that among the many seedlings shown here to-night, there are some exceedingly hardy but of poor quality, as the Russians usually are. By crossing these with some of the finer varieties of Canadian apples we might get a better fruit. If you could combine the quality of the Northern Spy with the hardiness of some of the Russians, it would be a great benefit to the Quebec fruit growers. The same may be said with regard to some of the plums. If by crossing the Japanese with some of the seedlings you could produce a plum equal to them in hardiness, and nearer the Japanese in size and quality, it would be a God-send to the members of this Society. The question of hybridizing is a very important one for this Province. Get hardiness by all means, but combine with it quality if you can.

Mr. Shepherd—I think what Mr. Fisk says is very true, but they have been hybridizing in the United States for a great many years, and there are very few hybridized apples which hold a high place in the estimation of American fruit growers at the present day. The great majority of the apples for market and export are derived from seed. I believe in hybridizing for experimental purposes, but I think we shall get the apples we want by planting and replanting the seed. That was how the Fameuse originated. It was not brought over from France. They brought over apples of good quality, and planted and replanted until they discovered the Fameuse. It is the king of North American apples, and is so esteemed in the Old Country, as my experience in exporting for ten years shows. This year the importers write me from Europe, "Send me only Fameuse." If Mr. Macoun can provide us with a winter apple as good as the Northern Spy in Ontario, the Ribston Pippen or the Spitzenberg, it will be a very great boon. We want a late keeping apple of good quality that we can export. Canada Red has proved hardy, and it is a good apple, but I don't think it fills the bill. We must look to the Experimental Farm at Ottawa to produce the apple we require. Private individuals cannot afford to carry out the experiments necessary.

Mr. Hamilton—About the beginning of this century and the close of last there was a great deal of hybridizing done in Europe, and very few of the varieties produced proved a permanent success. From this it has been inferred that hybridized varieties are not so hardy as those that are natural hybridizers. If we want to produce an apple such as has been described I think we shall have to change our tactics, and the plan I would suggest would be that the varieties operated upon should be grown upon their own roots, not grafts. If they are grown upon their own roots, from healthy vigorous trees, and the varieties that are required to be hybridized are grown fairly closely together, I think that from these varieties will be originated some that will give both hardiness and fine quality. I don't think this can be accomplished as quickly from grafted

trees as from trees on their own roots. Van de mont operated with seedlings from seedlings, and he obtained some very important results. If we cannot get long keeping apples of good quality, size and color, we might try to get one of fine appearance.

The President named Messrs. Brodie, Hamilton and Fisk as a committee to examine the fruit exhibited and report to the meeting.

Carried.

Mr. Fisk read the following paper :—

ORCHARD NOTES FOR 1898.

By J. M. Fisk.

The bloom of 1898 was so profuse as to indicate another apple crop equal to that of 1896 ; but for various reasons, some of which it is difficult to account for, the promise in many instances failed to materialize.

The spring was unusually early and favorable to vegetation, with no late frosts, as is often the case to destroy bloom and blight the efforts of nature in reproduction, which instinct prevails in the vegetable as well as the animal kingdom.

Is it not possible that many varieties of the apple are deficient in pollenization ? In fact I am satisfied that this is the case, and is more prevalent with the winter than the summer varieties.

Most of our winter varieties are shy bearers, though usually setting fruit buds and carrying sufficient bloom. We are seldom troubled with an over-production of winter apples.

The Ben Davis is one of the best croppers, while the Blue Pearmain is one of the poorest among our winter varieties ; both ripen their fruit about the same time, and why one should be an annual bearer and the other produce only an occasional crop, when grown upon the same soil and with the same cultivation, must be due largely to the power of self-fertilization.

At Abbotsford, the crop of winter apples this season is below average, while the fall and summer varieties are doing much better ; Duchess, Wealthy, and Fameuse yielding well, the latter showing less spot than last season, even upon orchards that have not been sprayed.

One can quite understand why the summer varieties should, as a rule, be better croppers than the winter, from the fact that they mature their fruit so much earlier in the season ; they have a longer period of rest, and time to recoup their forces in order to prepare for next season's crop.

Science in the near future will no doubt determine as to how far a short crop is due to the want of self-fertilization; while it may not be unprofitable to consider some of the other causes why the crop is not up to the average this season.

Though some varieties after bloom failed to make a good showing, others promised well, and carried their fruit until the size of common marbles, when the fruit dropped badly, as did also the leaves after turning yellow; this was especially the case with Winter St. Lawrence, which by June 20th had lost fully one-half of its foliage and nearly all of its fruit. I first thought this might be due, in a measure, to the effects of spraying, but found that the same trouble existed where the trees had not been treated. Is this is a new enemy, in the form of a blight? Or is it due to the want of proper cultivation and a lack of vitality?

Although this trouble appeared in both cultivated and uncultivated orchards, it was much worse where the trees had stood for years in sod, and had not received liberal dressings of manure or other fertilizers.

To many, another source of trouble existed in the presence of that old enemy, the tent caterpillar, which, in far too many cases, has worked havoc upon the fruit trees and injured the crop, not only of this season, but also for that of next year; for a tree that has been stripped by this pest has to expend its energies in renewing its foliage, and is not in a condition to mature fruit buds for the next season. I wish that all our insect pests were as easy to control as the tent caterpillar.

Its greed is the source by which a timely application of Paris green, through the spray pump, will rid us of its presence, and I know of no means more effective to annihilate this pest.

Two applications in connection with the Bordeaux mixture protected my orchards from its ravages this season, and there is every indication that it will be more prevalent during next summer, as there is an abundance of moths who are already at work placing their nets, nicely arranged in rings, upon the twigs, ready for next spring's hatch.

If these rings were carefully gathered during the autumn and winter, and destroyed, it would greatly facilitate the labor in fighting them next year.

Another and unexpected source of loss to many in our section during the present season is through the developed taste for some of our best apples of the common black crow. Heretofore it was usually considered that outside of the corn field the crow was a friend to the farmer and fruit grower, by doing more good than harm through the numerous insects he devoured, especially the grasshopper, which, by the way, is not very numerous this summer, and may to some extent account for his change of diet.

He rivalled the robin and other birds in the cherry tree, getting the major part of that fruit, and then turned his attention to the summer apples, coming in flocks, and in many instances stripping a tree of its fruit by knocking off and pecking every apple.

After one has planted an orchard and been to considerable labor and expense in its care, spraying the trees for the scab, codling moth, caterpillar and other insects, it is not a pleasant sensation to go into one's orchard some fine morning and view the wholesale slaughter by this ruthless bird of some of his choicest Yellow Transparents, Duchess, Red Astrachan, etc.

For my part, I have declared war against him, and unless he changes his tactics shall shoot every one I get a chance to.

Mr. Hamilton—I can testify to the ravages of the crow. A flock of crows will do more damage in a morning than all the caterpillars put together. We use imitation dead crows to frighten them away.

Mr. Brodie—The advantage about the crows is that they make sufficient noise to let you know that they are there. There is another pest I should like to draw attention to. My neighbor, Mr. Decary, never obtained a crop of apples off his orchard on account of this fungous growth, which prevents the trees from budding. Even in 1896, when other orchards were heavily loaded, he had very few. I think if some of the old orchards on the island were intermixed with seedlings, it would be a good thing. We all know that seedlings set their fruit very well, and are very heavy bearers. The seedlings would help to pollenize the old trees, and make perfect blossoms of the Fameuse. I have always had a heavy crop of Fameuse, which I keep mixed with Wealthies and some other varieties.

Mr. Fisk—Did your winter fruit trees blossom well?

Mr. Brodie—They all bloomed very freely. I have very good crops of Golden Russets, but Ben Davis proved rather light.

Mr. Hamilton—The promise of the blossoming last spring was certainly not borne out. Our trees blossomed as freely as ever, and there is not a tenth of the crop; not a quarter of the trees that were white with blossom bore fruit at all. Ben Davis blossomed well and gave no fruit. It is not due to their not being mixed with other varieties. The Wealthies and some of the Russians have borne very heavily, but, generally speaking, the crop was a failure. With respect to Mr. Brodie's idea about seedlings, I have been watching some seedlings for years that have always blossomed and not given fruit yet.

Mr. Brodie—I was simply trying to account for the differences between neighboring orchards. I have a heavy crop of apples and my neighbor across the fence has none. The only way I can account for it is that I have sprayed my trees and kept them in good healthy condition, and he has not sprayed at all.

Dr. Wood—Has the orchard you refer to been in bloom in recent years?

Mr. Brodie—I think it was in heavy bloom this year, but I have not noticed it in previous years. If bud-moth gets into the bloom it will destroy a whole crop of apples. People do not notice it, it is so small, but spraying kills it.

Mr. Fisk—I have Duchess, Wealthy and Yellow Transparent, bearing heavy crops. The winter varieties, Ben Davis and Golden Russet, in the same orchard, and treated in the same way by spraying, bloomed with the others, but gave very little fruit.

The President—I did not find the apples in the vicinity of Mr. Brodie's orchard in a very healthy state last fall when I was there.

Mr. Brodie—It is not for lack of fertility in the soil, but possibly there is a cold bottom, as it is near a brick yard.

Mr. Fisk—Did you suffer with foliage falling or leaf blight in Montreal?

Mr. Brodie—No.

Mr. Dunlop—My Winter St. Lawrence were affected in the same way as Mr. Fisk's last year. This year the foliage is perfect. The trees lost their leaves last summer, and did not make any fruit buds, and they have not borne fruit this year; but that was confined to the Winter St. Lawrence.

Mr. Fisk—I noticed it in several other varieties, but that was the worst.

Mr. Shepherd—I have not noticed anything like that with my Winter St. Lawrence. I have a fair crop, though not a heavy crop. The Fameuse is about the average, and Wealthy and Duchess very heavy.

Mr. Dunlop—It appeared to me to be the same fungus that attacks the Fameuse, but of a more virulent type, because it took all the leaves off.

Mr. Jack—My orchards are exceedingly good compared with those which have not been sprayed. For the last three or four years we have left a few trees unsprayed, and they have not borne a barrel of good apples during that time.

Mr. Macoun—Perhaps the falling off of leaves is largely due to the extremely dry weather.

Mr. Brodie—We had a very wet June about Montreal.

Mr. Macoun—It was extremely dry at Ottawa.

The meeting then adjourned until the following morning.

WEDNESDAY, AUGUST 24TH.

MORNING SESSION.

After a few introductory remarks from the President, Mr. McKinnon, mayor of Cowansville, gave the Society a cordial welcome to the district. He said: I desire on behalf of the village of Cowansville and the surrounding municipalities to offer you and your distinguished associates a most hearty welcome. Not

many of us have the pleasure of your acquaintance, but the reputation of your Society has preceded you. I consider it a great honour to have such a meeting in this village for the benefit of our people. I know it will prove of great advantage to us from our experience of kindred associations, which have met here in the past, such as the District of Bedford Dairymen's Association, which started with a handful of people, and has grown into a very large and important organization. The Dominion Dairy Commissioner, Prof. Robertson, Prof. Fletcher, and other gentlemen from the Experimental Farm, have done splendid work in this part of the country by giving instruction as to improved methods in dairying and the raising of suitable crops. Occasionally and incidentally these gentlemen have touched on the great benefits to be derived from the culture of apples and small fruits, especially in the way of improved health. But I am not aware that our people have taken hold of this matter with any great enthusiasm. It remains for your association to sow the seed anew, and create and promote the interest in this work. I feel sure you will convince our people that not only will fruit cultivation improve their health and add to the comfort of farm life, but that it will very materially augment their income. I again thank you for the honour you have conferred upon our community. I trust your sojourn amongst us will be pleasant, and that you will repeat your visit another year.

The President—We have all heard of the achievements of this district in dairying, and I had the proof this morning that fruit culture is not neglected. In Mr. Nesbitt's orchard I found the trees well cultivated and very healthy, even without spraying. I am sure that the members of the Society who have time to go and see the orchards here will be very pleased. The members are greatly enjoying their visit to this progressive place and will be glad to come back again if the opportunity offers.

I have to announce to you the painful news of the death of Mr. E. A. Barnard, who was one of the most devoted friends of Agriculture and Horticulture in this Province or in the Dominion of Canada. I am sure it will be a great loss to the country for he was a hard worker and exceedingly active in every organization for the promotion of Agriculture and Horticulture. I received from the Department of Agriculture at Quebec the following letter :—

QUÉBEC, 19 août 1898.

M. AUGUSTE DUPUIS,

Vice-Président du Conseil d'Agriculture,

Village des Aulnaies—comté de l'Islet.

Monsieur,

J'ai le regret de vous annoncer la mort de Monsieur Ed. A. Barnard, agronome, secrétaire du Conseil d'Agriculture, et directeur du Journal d'Agriculture de la Province de Québec, décédé ce matin à la suite d'une courte maladie, à l'Ange-Gardien (près Québec) à l'âge de soixante-deux ans,

Veuillez me croire, Monsieur,

Votre tout dévoué,

OCT. OUELLETTE.

Mr. Brodie moved the following resolution of condolence, which was carried unanimously :—

"In view of the loss we have sustained by the decease of our friend and associate, and the still heavier loss sustained by those who were nearest and dearest to him, be it

Resolved, That it is only a just tribute to the memory of the departed to say that, in regretting his removal from our midst, we mourn for one who was in every way worthy of our respect and regard;

Resolved, That we sincerely condole with the family of the deceased on the dispensation with which it has pleased Divine Providence to afflict them, and commend them for consolation to Him who orders all things for the best;

Resolved, That this heartfelt testimonial of our sympathy and sorrow be forwarded to the family of our departed friend by the Secretary of this Society

———

The President read the following letter from Mr. J. C. Chapais :—

ROOT-ROT OF FRUIT TREES.

Various observations made in my own orchard, and in some other localities, and above all a fact noticed at home last spring, have led me to write the present paper on root-rot of fruit trees.

Let us learn first what is root-rot. It is a disease which, as understood from its name, spreads on the roots of forest, ornamental or fruit trees, shrubs and vines, and soon kills the trees infested by it. Two fungus growths are kcown as producing root-rot. The mycelium of a fungus called *Dematophora necatria* gives rise specially to the grape-vine root-rot or *pourridié*, and the mycelium of a fungus called *agaricus melleus* causes the fruit trees, root-rot, subject of this paper,

Those myceliums are called *Rhizomorpha* on account of their filiform ramifications which look like the rootlets of plants of a superior class. The mycelium of the *agaricus melleus* is known by the name of *Rhizomorpha Fragilis*. I append here its description as found in a book written by Mr. F. Lawson-Scribner, entitled :—"*Fungus diseases of the grape and other plants and their treatment.*"

"The mycelium of that fungus forms much branched root-like cords that are very dark brown or nearly black on the outside and white within. These growing through the soil meet roots, penetrate the bark of the latter, between which and the wood they continue their growth, remaining as slightly flattened cords distending and even rupturing the bark over them, or spreading out into

thin felt-like plaques, often of considerable extent, with elegant fringe-like borders. These flat expansions are whitish in color..... The finer mycelial filaments penetrate into all parts of the roots, causing their final decomposition."

I have found trees suffering from root-rot in three different circumstances. Three years ago (1895), we had a very dry summer and I have been obliged to water often a certain number of young fruit trees planted in the spring of that year. Some of those trees have benefitted by that watering, while many others did not and died. Having uprooted these last ones, I have found their roots covered in many places with white filaments looking like mould. At all the spots where I found those filaments the wood of the roots was rotten. I found none of those filaments on the roots of a few small trees I did not water and which were killed by drought.

On the farm of a settler of Lake St. John district, whose name I have forgotten—for the fact I am going to mention is already of old date—I was shown a few plum trees which had been planted the previous year and had made some growth, but died almost suddenly at the end of June of the second year, after having put on leaves. Uprooting two or three of these trees, I noticed some pieces of old tree roots decayed and covered with root-rot as were also the roots of the young plum trees in contact with the remains of those old roots.

Lastly, last spring, I have been in position to make a very characteristic observation on the same subject. Everybody remembers how killing has been the winter 1896-97 for our fruit trees. A large number of these were killed right off, last year some others lived poorly and passed through the summer making but very little growth. In the spring of the present year, these have put on a few leaves and even a few blossoms, but died afterwards. Wishing to ascertain what was the matter with them, as soon as I saw these trees beginning to wither away, I uprooted two of them to inspect their roots. The greatest part of those roots frozen last year were decomposed and covered with those whitish filaments which are peculiar to root rot, and these filaments had infected the sound part of the roots left, which could be easily singled out by the numerous rootlets they had thrown out last summer. From that observation, I concluded that if the root-rot developed on the old frozen roots had not infected the new rootlets on the sound part of the old roots the trees would have been all right. In order to see if my conclusion was correct, I lost no time and took away the earth from the whole root system of two of the trees showing a sickly appearance. I cut away with great care all the parts infested by the rot, as well as all the parts of the new rootlets already infested. Then I took some good composted soil from a hot-bed, adding to it about one twentieth of a preparation I have found indicated against root-rot in a French book, the title of which is:— "*L'Arboriculture Fruitière*," *(Fruit Culture)*, by Gressent, a well-known fruit grower from France, preparation of which I give here the composition:—

Flower of sulphur.....	7	tenths.
Finely powdered charcoal.....	2	"
Finely ground salt.....	1	"

This compost being prepared, I have removed all the soil covering the roots, and surrounding them, and I have put in its place that prepared compost. The result has been that both trees are alive, while the others not treated are dead. They have not, however, grown as much as those that were completely sound last year.

The three different observations I have made of the presence of root-rot seem to show that it may come from many causes. First, it is sure, not only from the observations I have made, but even from what is said by all those who have written on that tree-disease, that watering is liable to cause root-rot. Why should artificial watering be a cause of root-rot more than natural watering produced by rain, is a question that one may feel inclined to ask. I think it can easily be answered. When land becomes wet through rain, the temperature of the land, of the air and of the water, are generally the same. The sun is screened by clouds, and has no immediate action on the wet land. When watering artificially is resorted to, generally the tree is under quite different conditions. Very seldom will the temperature of the soil, of the water and of the air, be uniform. Unexpected transitions from heat to cold, sudden and unwonted evaporation take place and disturb the equilibrium in the circulation of the sap, and offers a chance to the mycelium of the fungus, if it is present in the soil, to develop itself to the detriment of the roots. So much for the first observations quoted.

The second and third observations mentioned tend to assign another cause to the presence of root-rot. The plum trees attacked by it at Lake St. John, and the apple trees infected by the same disease in my orchard this spring, were brought into contact, by their roots, with dead and decayed wood. On forest land newly cleared, we find in the soil dead wood, not entirely rotten, many years after the trees have been destroyed by fire. In my orchard, last spring, there was also in the soil much dead wood, remains of the roots killed by the frost of the previous year. Now, those who, in books on fruit culture, write about root-rot, say that this fungus develops itself specially on decayed wood, and from it spreads to trees which are brought by their roots into contact with that infested dead wood. This would help to explain why, in some newly-settled forest districts of our Province, fruit trees cannot be grown. To quote an example, I may say that for many years it was found impossible to grow fruit trees at Chicoutimi. Now, we find that lately new experiments have been successful there. It is probably because the working of the soil through cultivation during many years has destroyed the last roots in the soil, which now offers no more decayed wood for the development of root-rot.

Let us see now what we could try to prevent the attacks of root-rot on our fruit trees. First, we should avoid artificial watering; resort to it only in extreme cases, then use only soft, warm water, give plenty of it, about a gallon per square foot, and water only after sunset. Better keep the surface of the soil around newly planted trees mellow, by frequent tillage, which will prevent the escape of water from the soil through evaporation, and the drought from injuring the trees.

On newly cleared land it would be well, I think, to remove from the ground which is to be planted with fruit trees all the roots to be found after a deep ploughing and subsoiling. Then I would give the land a heavy dressing of lime, say from 25 to 30 bushels per acre, following for that application the ordinary rules of land-liming. This would hasten, no doubt, the decomposition of the old tree roots remaining still in the soil. After a couple of years of grain and clover culture, I would then plant the fruit trees. This would prepare the ground in such a way that, I think, it would be possible to prevent root-rot and grow fruit trees in many localities where, till now, they could not be grown successfully. Let somebody try it.

A FEW NOTES ON CHERRIES.

By R. Brodie, St. Henri.

We are indebted to the early French settlers who brought pits and scions of most of the cherries that are grown in the Province of Quebec. The only native cherries of this continent are the Choke Cherry, Bird Cherry and Wild Black. The variety Cerise de France, closely resembling the Early Richmond (only not so early by 8 or 10 days), is grown extensively throughout the Province of Quebec and as far north as the counties of Kamouraska and L'Islet and also into the northern New England States. These cherries are generally grown without any care along the line fences; but the black knot has played havoc among them, also several seasons with late spring frosts have destroyed the fruit buds, so a good many farmers have got discouraged and dug out the fruit trees. Last winter was one of our old fashioned ones, with plenty of snow and no late frosts, consequently, this summer the trees are laden with fruit.

Next to the Cerise de France, the only other cherry I remember when a boy, was a black cherry grown on the Newman Farm, Lower Lachine Road, now the property of our worthy Vice-President, Mr. Newman. It was of the Morrello type, about the size of the Richmond only more flat with a slight hollow on the top. It ripens three weeks after the Cerise de France, quality very good. Mr. Newman says his grandfather bought this farm from a priest, in all probability the worthy father brought this variety from France.

We have to thank Prof. Budd, of Ames College, Iowa, and the late Charles Gibb for a new race of cherries, introduced to this country from Northern Europe.

The trees I have were procured from the late Charles Gibb, of Abbotsford, and Professor Budd of Ames College, Iowa, about 1890. In transit from Iowa some of the labels came off and I have lost the names of the trees, however with the aid of Mr. Craig's bulletin on cherries I think I have the trees properly named now. Being led to believe these trees grew in bush form, I planted them about ten feet apart in the row, but some of them have grown until they are 16 feet in height and 10 feet broad.

The Cherries I have growing, ripen in the following order :

Amarelle Hative—From Prof. Budd ; fully ripe June 25th ; tree hardy ; about 12 feet in height ; a good bearer ; skin dark red ; stalk long ; flesh tinged with red ; quite rich and juicy. It is well worth growing.

Fouches' Morello—From Prof. Budd ; ripe June 28th ; in size like Early Richmond; bright red, semi-transparent ; good quality ; tree hardy; tall ; vigorous grower.

Orel No. 20—From Prof. Budd ; tree medium size ; round top ; heavy bearer ; fruit like Richmond, but not so large.

Early Richmond—From Rochester ; needs no description.

Cerise de France—Five days later than Richmond.

Montmorency de Ordinaire—From Rochester ; fruit medium sized ; skin bright red, thin and tough ; flesh white, tender, juicy, lacking richness; tree productive.

Griotte d'Ostheim—From late Charles Gibb, of Abbotsford. Mr. Craig's description of Minnesota Ostheim agrees with the description of my Griotte. Fruit much larger than Richmond ; skin dark red, when fully ripe a brownish black ; flesh tender, deeply colored, quality good ; productive ; ripens about the third week in July. If I had to grow only one variety of cherry, it would be this Griotte d'Ostheim.

Griotte Imperial—From Mr. Gibb ; tree a slow grower ; hardy and productive ; fruit medium to large, oval in form ; skin dark red ; flesh firm and like the juice deeply colored ; slightly acid ; ripe near end of July.

Lithauer Weichsel—From Prof. Budd ; tree a robust grower ; 16 feet in height, but fruit is inferior in size and quality ; small, round, black ; quality very acid ; heavy bearer ; fruit buds hardy, can resist frost better than other varieties ; makes good jam.

Newman's Black—Already described.

Brusseler Braun—From Prof. Budd ; tree vigorous grower ; 14 feet in height ; fruit large, heart shaped ; skin dark red, almost black ; stalk about 2 in. in length ; flesh firm ; highly colored ; quite acid ; ripe this year August 5th.

My choice of five varieties would be Griotte d'Ostheim, Cerise de France, Montmorency, Newman's Black and Amarelie Hative.

I hope these few notes will encourage people to grow more cherries. They are the first of our stone fruits.

Most of us here present know what it is to mow grass in an orchard. How hard it is to swing the scythe under the branches and when our mouths get parched with thirst how refeshing it is to eat the ripe cherries off the trees near the line fence. They are a healthy fruit and one can eat a large quantity of them without hurting one's self.

The great enemy to the cherry tree is the black knot, plum curculio and codling moth. By cutting out the branches with black knot, spraying with Bordeaux mixture and Paris green, not forgetting to manure the trees, we should be able to conquer all diseases and insect enemies and grow cherries both for pleasure and profit.

Mr. Shepherd—I should like to ask Mr. Brodie if he noticed that the birds took the Russian varieties less than the French.

Mr. Brodie—Yes, for the Russian varieties are considerably more acid. I had some of the English Royal Duke, and had quite a number of nice cherries, but before they were fully ripe the cat-birds got the whole of them. Although the cherries were not ripe, they were sweet cherries, and the birds have a greater partiality for sweet cherries than for sour ones.

Mr. Shepherd—That is my experience. I have about fifty trees, Morello's and the French varieties, but I only get enough for preserving for the family. The birds got the most, and the boys got a good many. The Griotte de Nord is a very fine cherry, quite as fine for preserving as any others, and so acid that the birds took very few.

Mr. Brodie—The Griotte d'Ostheim was even more sweet than our Cerise de France. This you speak of must be more acid.

Mr. Hamilton—It would be a very good thing if Mr. Brodie would tell us something about the soil, because a great deal depends upon that. In a deep cool soil like his the trees will thrive and give plenty of fruit, but with a dry soil like mine there are very few cherries. I would not advise anyone with such soil to attempt it. I got a hundred of the Russian varieties from Prof. Budd, but we have not had enough fruit for preserving. The birds took nine-tenths of them. They would begin at the sweetest tree, and go from one to another, leaving the bitterest to the last; but they would take that rather than none. Mr. Brodie lives close to the city, and almost every boy who can buy a gun goes out on Sunday and peppers away at the birds. In our place we have not allowed a shot to be fired in twenty years. There are robins, cat birds and cherry birds going at the trees day after day. I do not see what we are to do unless we put nets to protect the fruit.

Mr. Brodie—I would not like to see the soil much dryer than that I have these cherries growing on.

Mr. Hamilton—But it is a deep soil?

Mr. Brodie—It is deep sand. Our wells are all dry, and we have to fetch water half a mile. As to birds the Society for the Prevention of Cruelty to Animals do good work near Montreal, and there are plenty of birds and plenty of crows.

Mr. Fisk—With us the crows take the big share of the cherries. They appeared not to have eaten them all, because I found them scattered in the fields for acres round, where they had been dropped. They carry them away to their young.

Mr. Macoun—At the Experimental Farm this year we had a very heavy crop of cherries on such trees as escaped the winter. The birds do not trouble us much, because we have several rows of June berries close by. The birds clean these off as as fast as they ripen, and in that way they satisfy their hunger. As a rule there are not more than a hundred birds in the neighbourhood of one orchard. They will not go more than half a mile and something like the June berry planted near will save this fruit.

Mr. Hamilton—They do not seem to care a fig for the little wild choke cherry, the Prunus Pennsylvanica. They leave them right in the midst of the growing cherries.

The President—The cherry orchards east of Quebec, are all on sandy or gravelly soil, and the trees thrive well and fruit abundantly. On what soil were these trees planted at the Experimental Farm?

Mr. Macoun—Very light sandy soil.

Mr. Hamilton—Down in Mr. Dupuis' neighbourhood the air is always moist. In my neighbourhood the air is always dry and thin.

Mr. Westover—Some of my trees have done well, but others suffered from mildew, which has practically killed them. I wonder whether it is the soil, which is very dry, or the variety, for they were nearly all the newer Russians. I have never sprayed them. It was so far gone that I thought the best thing to do was to pull the trees up.

Mr. Brodie—We find we have to spray our cherries as well as our apples for the codling moth and plum curculio.

Mr. Westover—I have my cherry trees apart from my apples. The curculio does not seem to trouble them.

Mr. Hamilton—I noticed that *that mealy* mildew has attacked quite a number of trees within the last ten or twelve years. Up to that time, whilst the apple trees showed signs of mildew occasionally, very few other trees were affected; but since then I notice that the plums and even the cherries frequently suffer. I notice too that the trees with the smaller leaves are not affected like the larger ones. The lilac has been almost destroyed by the same mildew, and I am as much interested in shrubs as in fruit trees. I think very likely spraying with Bordeaux mixture would keep it in check, but it would be very laborious to have to go over not only the orchard but the garden as well. I wish Prof. Fletcher were here to give us information about it.

Mr. Macoun—We have not been troubled with the mildew in cherries at the Experimental Farm, but the only thing I can see to get rid of it is Bordeaux mixture. It is possible that it will not have the effect of destroying the mildew, for we spray our English Gooseberries very freely and we cannot prevent it.

The President—Will the Bordeaux mixture destroy all the insects that attack the leaves?

Mr. Macoun—By adding Paris green, a quarter of a pound to a coal oil barrel. We use tobacco water for sucking insects.

Mr. Brodie—Do you find that sufficient ?

Mr. Macoun—Yes. Mr. Craig and I have found it very satisfactory. I use a quarter of a pound for potatoes and potato bugs are hard to kill.

Mr. Brodie—I think our potato bugs must take an emetic, because I increased the quantity to half, and then to a pound. When the caterpillars came a few years ago I found I had to give a larger dose than a quarter of a pound. If you give only a small quantity the insects have to eat so much more leaf to get killed

Mr. J. R. Ball—Will a large quantity not kill the leaves ?

Mr. Brodie—Not if it is mixed with lime or Bordeaux mixture.

Mr. W. Craig—Our cherry trees are on dry land, and are doing very well. Of course, if they bear very heavily when young, they have to be replaced, but we have not been without cherrries for a number of years. They are a great luxury on the farm, coming at a season when nothing else is to be had.

Mr. Thomas Slack, at the President's request, continued the discussion on small fruits by some remarks upon strawberries. He said: I nearly went into cherries very extensively. I consulted Mr. Gibb on the subject and he said, "If you want to feed robins grow cherries. If you want to make money grow strawberries." I took his advice and with strawberries the birds do not trouble us much. I cannot say that I have found strawberries a very profitable crop, but they have done well enough to encourage me to go on. Through want of cultivation and inattention and especially not covering in winter and not having a good fertilizer I have lost a great deal of money. Three acres is the most I ever had under cultivation and last year I cut it down to half an acre, in order to give it full attention. The last part of the crop blighted, but the first part gave me as much from half an acre as I had from three acres before. I have no doubt but that aven, at the low prices prevailing, strawberries are a profitable crop, but you must attend to your business. There is more money in half an acre properly cultivated, fertilized and protected during the winter than in a much larger area not properly looked after.

Mr. Brodie—What varieties have you been most successful with ?

Mr. Slack—Warfield is away ahead. Wilson is a good fertilizer. I have sometimes failed to get it and I believe the lack of it has cost me a great deal. Captain Jack with me is perfectly useless. It gives a little dried up ugly berry and is a poor bearer.

Mr. Shepherd—What do you use for winter covering ?

Mr. Slack—Straw.

Mr. Shepherd—What kind of straw ?

Mr. Slack—Any we can get.

Mr. Shepherd—Buckwheat ?

Mr. Slack—Yes, but if it not well threshed you will have buckwheat growing up among your strawberries.

Mr. Dunlop—Pea straw will do, and there are no seeds.

Mr. Carter—Boughs make the best and cheapest covering.

Mr. Shepherd—Is oat straw good ?

Mr. Slack—Yes, it is the best thing we can get if the seeds are out.

Mr. Brodie—They grow strawberries very extensively north of Montreal in Laval connty. Some of the French Canadian farmers there sow a row of corn with the rows of strawberries and leave it for snow covering. Last winter if they had covered with straw, the amount of snow would have rotted the plants while the standing corn will hold enough snow for protection.

Mr. Carter—Do you set out any plants in August ?

Mr. Slack—No, I never should. I would rather have a quarter of an acre set out as early as possible in the spring than two acres set out in any other part of the year.

Mr. Shepherd—Do you use chemical manure ?

Mr. Slack—We use wood ashes and get them on to ground that has been well fertilized the year before.

Mr. Shepherd—Do you keep a plantation three years ?

Mr. Slack—No, two years. It is a very difficult matter to keep strawberries clean. They mat very heavily.

Mr. Westover—Do you plant *in hills?*

Mr. Slack—We plant in *hills three* feet by three and a half, and limit each hill to five runners.

Mr. Newman—Do you check the runners ?

Mr. Slack—We cut them this year about the first of July. Now they are running very heavily.

Mr. Westover—What is the best part of the plant to transplant? Would you use the runner or the old plant ?

Mr. Slack—The old plant is useless. I have found copperas of great benefit. Seventy-five cents will save you seventy-five dollars.

Mr. Hamilton—Is that sulphate of copper ?

Mr. Slack—Sulphate of Iron. It has given the best results of anything I have tried.

Mr. Hamilton—What about the method of cultivation ?

Mr. Slack—We run the cultivator once a week ?

Mr. Hamilton—Have you ever tried planting at this date ?

Mr. Slack—No, I do not believe in it.

Mr. Hamilton—I have found that people setting out now have had fine strawberry plants by winter, and fruit next year. Thus you save a year.

Mr. Slack—You save a year and get half a crop. That has been my experience.

Mr. Ball—Do you cultivate now ?

Mr. Slack—Yes we hoe regularly.

Mr. Hamilton—How do you prepare the soil for planting ?

Mr. Slack—This spring we ploughed it as deeply as possible, then worked it with a harrow, and got it nice and smooth, and put the roller over it before marking.

In my onion field I lift every third row and put in strawberries, so as to have them next year. I have a good crop of onions this fall, and the strawberries have made a vigorous growth.

Mr. Newman—How do you cart your onions out ?

Mr. Brodie—I left a space of about six feet to drive in and load them up. I am well pleased with the experiment so far. The onion crop will pay me even if I do not get a cent out of the berries.

Mr. Pattison—I have succeeded in fall planting by potting near the stool of the small plants and pinning them down with a hair pin. In that way just about this time they are in good condition to separate from the stool and set out. That is the only way in which I have succeeded in fall planting. For winter covering I have used the coarse grass which grows on river bottoms. Where I reside, near the Richelieu River, we have to go two miles to get this grass, but it is worth while, as it is free from the objection of seeding.

Mr. Slack—You would advise putting the potted plants out at this time of the year ?

Mr. Pattison—Yes. With regard to the variety I stick to the Wilson. Mr. Craig told me they were sour, but my reply was "sugar is cheap." I paid three dollars a dozen for some new sorts that did not amount to a row of pins.

Mr. Brodie—Did you ever try the Williams ? Try it and the Wilson is nowhere.

Mr. Slack—In my last crop of Wilsons we took a big basket full off one plant.

Mr. Dunlop—Mr. Slack has brought out some very good points, one particularly, that you will get more satisfaction out of the thorough cultivation of a

small patch of strawberries than by having a larger one and neglecting it. That applies to all fruits, but particularly to strawberries. With regard to fall planting, growing in a commercial way, it will be impossible in the summer to give them sufficient care. But with the amateur, planting in the summer can be done very successfully. I have planted sometimes as much as half an acre, using ground manure heavily and moving the plants soon after a rain. They received no check at all, but continued to grow, and by the fall they covered the ground and formed large stools; by that means I have got some of the finest plants and large crops the next year. Then I would let them grow in stool form one year, and one year in matted rows. Where you raise your own plants, pots are not necessary. You get the same results by removing the plant after rain with a trowel with sufficient earth attached to it. If planted now they will make good growth and bear the following year, but you can only do it in a limited way. We find in Montreal that there is a demand for the large choice berries, and we have given up growing the Wilson, because the finer varieties will sell at ten or twelve cents a box even when the market is glutted. The Williams has been very successful. It is large and very productive and sells well. It is a staminate variety but not a very good fertilizer. Though it fertilizes its own blossoms it does not fertilize others. It is evidently descended from Sharples which is very good fertilizer.

Mr. Brodie—Did you ever try the Wolverton?

Mr. Dunlop—Yes, it is a very good bearer too and self-fertilizing. Size counts for everything in the Montreal market. I don't know anything that will carry a larger crop than Williams, considering the size of the berry.

Mr. Macoun—We grew at the Experimental Farm some two hundred and twenty-nine varieties. The Wilson was among the first five of the most productive. I was very much taken with a variety called the Buster. It is a very large berry, soft but very productive and mild in flavour. For a local berry I think it is very promising. It is pistillate.

Mr. Hamilton—What is your soil?

Mr. Macoun—Sandy loam, very poor soil. For commercial purposes I see nothing equal to the Warfield. Williams is not equal to it in productiveness, though it is a large berry and firm.

Mr. Hamilton—Does it rust?

Mr. Macoun—A little, but not badly. We sprayed it once this year, but I shall spray it two or three times in future. The fruit crop did not rust much this year, but there were a large number of berries poorly formed. Our experience has been that it would not pay to plant strawberries in the fall for commercial purposes. You need a very favourable autumn to produce a crop of any size next year.

Mr. Hamilton—Do you think the imperfect berries come from the hot weather?

Mr. Macoun—Yes, preventing the pollen developing.

Mr. Shepherd—I went over the beds at the Experimental Farm in July and there were certainly some very fine varieties among the new seedlings

Mr. Macoun—None of them are good shippers. They are all soft berries with exceptionally high flavour suitable for the local market.

Mr. Hamilton—Warfield rusted with me this year in a way I never saw before. They had been sprayed a week previous, but it was a very dry fortnight, and the leaves all turned brown.

Mr. Macoun—Warfield with us kept bright this year, though many others rusted quite badly. Our plantations are old, and the older plants suffered more than the younger.

Mr. Jack—A very common error is to cover strawberries too heavily. This is worse than not covering them at all, because they will heat. We have tried several things for covering, but we find that asparagus tips are the best. We grow our strawberries in rows, with vines between. We cut off the vines, and spread them over with the asparagus on top. In the spring they turn out fairly well.

Mr. Slack—Would you cover before the frost ?

Mr. Jack—No, it is not the frost which does the damage, it is the thaw. We cover after the first frost before the snow comes.

Mr. Hamilton—You cover to gather snow ?

Mr. Jack—No, to prevent heating.

Mr. Brodie—Does not the asparagus grow ?

Mr. Jack—We thrash out the seed and sell it.

Mr. Hamilton—There is not the least doubt that Mr. Jack's method is the best. Asparagus tops make an ideal covering, because they do not lie too close. I have tried oat straw, but it lay too heavy and heated and rotted. For quite a long time back we have given up using straw, and have used twigs, small branches and leaves. The leaves do not heat under any circumstances, and we do not lose any plants. But of course it would be out of the question to attempt to do that on a large scale. Growing corn every fifth or sixth row so as to gather snow is good, but twigs and asparagus tops would answer just as well. If you cover heavily you lose a large proportion of your plants.

Mr. Ball—If the ground is frozen sufficiently, you can put on as heavy covering as you like, and there is no danger provided the ground does not thaw afterwards. I have covered with heavy straw in manure and found my plants perfect. I have noticed that when the ice forms to the depth of three or four inches, and remains there during the winter, the plants will come out in better condition. The danger all lies in the thaw.

Mr. Macoun—I agree with Mr. Ball. I think most fruit growers are a little scared, and put on their covering too early. We often have warm weather about the middle of November, and the result is the plants are injured. In the

following spring they are injured again, and it kills them right off. If a heavy covering is put over after the ground is well frozen, it will prevent any damage, but you have to be very careful to take it off just at the right time, because if once the plants begin to grow under the straw they are done for.

Mr. Slack—The only plants I ever lost through bad covering were covered an inch or an inch and a half with manure.

Mr. Fisk—Has any one tried the barrel system recommended by the Ontario Agriculturists.

Mr. Slack—I have tried it on a small scale in a lettuce house where the temperature goes down thirty-five or forty degrees at night. I was surprised at the showing they made under those conditions.

Mr. Macoun—Perhaps some of you have noticed the suggestion of covering strawberries with ice to prolong the season. The bed is covered with ice in blocks three feet thick, with chaff on them to prevent thawing in the spring, and a few rows are removed at a time. In this way the grower had strawberries in August. Ice can be got very cheaply here, and it would be an interesting experiment to try.

Mr. Shepherd—Each quart of berries cost twenty cents, and the grower got fifty cents.

Mr. Macoun—I don't think you could get that price here.

Mr. Shepherd—Montreal is supplied at the end of July and the beginning of August by Quebec and New Brunswick. I was down at Quebec at the beginning of August, and we had lovely strawberries at the Frontenac Hotel. They were twenty-five cents a box.

Mr. Jack opened a discussion on raspberries. He said: We grow principally Cuthbert and Marlboros, and for early crop Golden Queen. We have tried several others, but we do not consider them good commercial varieties. There is a new one called the Loudon. We have not tried it long, nearly two years, but I think it will prove a superior berry, although this year it has not been a success. We have only gathered 4,000 or 5,000 boxes, where we expected 10,000. With regard to fertilizing, I don't think there has been any fertilizer put on except wood ashes since the canes were planted about nine years ago. At that time the ground was very rich, a sandy loam. For several years it was a young orchard. Then we broke up the land and put in corn, and the corn was growing on each side of the raspberry rows when they were planted out. They are now six feet apart, but when we started they were twelve feet. There was a row of apple trees every twelve feet, and we planted a row of raspberries between. Now the suckers have run across and killed the apple trees, and you would think that they were all planted at the same time.

I do not think raspberries are very profitable as a rule. This year they were, for they sold at about 8 cents a box all through the season. But last year they were down as low as 4½c; they were of poorer quality, and there was not the

same demand. It is not profitable to grow them in this part of the country, because you are not sure of a crop. You will have a crop one year, and probably the second they will winter kill.

Mr. Brodie—Do you cut back your canes?

Mr. Jack—Yes, we have to; if we did not we would have to use a ladder to pick them. We can grow canes about 10 feet high.

Mr. Slack—Do they kill in the winter?

Mr. Jack—Yes. They seem to dry on the south or sunny side. This spring we had a peculiar experience. There was a sleety rain storm in the winter and the deeps now got a crust on it, which slipped down when the snow melted and stripped the buds right off.

Mr. Slack—You do not lay them down?

Mr. Jack—We tried it two years ago. We did not cover them. We just laid the canes down and threw earth on the tops. In the spring we let them up and cut them off to the required height. They sprouted abundantly, but they seemed to soon dry.

Mr. Fisk—I should think raspberries growing among the apples would interfere with the spraying.

Mr. Jack—It just interfered with the third spraying. They did not need much spraying, being chiefly Wealthy and Yellow Transparent.

Mr. Shepherd—Then you do not thin your canes in the fall?

Mr. Jack—We thin out the centre canes and the dead wood.

Mr. Shepherd—You do not do anything with the current year's growth?

Mr. Jack—No. We have experimented in several ways, and we find cutting at this time of the year starts new growth, and that kills.

Mr. Dunlop—I think the uncertainty of the crop arises from the tenderness of the cane. Before we protected our canes we had very seldom a profitable crop. Now we get a full crop practically every year because we lay them down and protect them.

Mr. Shepherd—Don't you find a difficulty in laying down these strong canes? Don't they break?

Mr. Dunlop—No. It is sometimes necessary to put a shovel full of earth against the canes down near the root, so that the angle will not be too acute. Then we weight them with a heavy clod of frozen earth. We completely cover the canes with a light cover of manure. In the spring we remove the clod and leave the manure in the rows as a mulch. In ordinary seasons it is sufficient to cover the top, but last winter but one, there being no snow, the middle of the canes was left uncovered, and they suffered severely from the cold. I think it wise to protect them every year.

With regard to trimming, I agree with Mr. Jack. We only trim the Cap varieties. We lay the others down every year and in the spring we shorten them; sometimes we have to shorten them very considerably. We plant them in rows 6 to 7½ feet apart, and a stool every three feet We allow four or five strong fruiting canes to grow and keep the suckers down. As soon as the fruiting season is over we cut out the old canes and allow the new canes to get sun and light. At first I allowed too many canes to grow, and we had fruit on the outside but none on the inside. You want to have them well exposed to the sunlight on all sides.

Mr. Slack—What backberries are hardy with you?

Mr. Dunlop—I have not grown blackberries commercially, because there is not a great demand for them. We cannot get the same price as for raspberries, because people prefer raspberries.

Mr. Brodie—Did you ever try Stone's Hardy?

Mr. Dunlop—Yes, and the Agawam also does well.

Mr. Brodie—The Hilborn is said to be satisfactory, but I have not tried it, because there is no demand except at very low prices.

Mr. Slack—How could you hold raspberries off in the Spring to avoid the late frost?

Mr. Dunlop—Our raspberries very seldom suffer from late frost. Strawberries sometimes do.

Mr. Jack—I think mulching the straw keeps the frost in. With blackberries I would keep it on, and not remove it.

Mr Slack—What would you call a fair crop per acre?

Mr. Dunlop—As a rule blackberries are about twice as productive as red raspberries, and average from 6,000 to 8,000 boxes to the acre, if the plantation is in first rate condition and there are no misses. These estimates are generally made on a small piece of ground, and when a man has 10 acres, he does not give it the same degree of cultivation as a quarter of an acre.

Mr. Macoun—We have found nothing yet to equal the Cuthbert as a general market berry, though the Loudon is superior to it in quality and very promising. The variety originated by Dr. Saunders called the Sarah is a very late bearer, firm, and of higher quality than Cuthbert; it lengthens the season by nearly two weeks. I should be glad to send some to growers for testing.

Mr. Shepherd—Mr. Craig sent me some. It is a raspberry of very fine quality, but I do not think it can compare with Cuthbert.

Mr. Macoun—It is of better quality.

Mr. Shepherd—Well, it could not compare so far as profit is concerned.

AFTERNOON SESSION.

Committee on resolutions.

REPORT OF THE COMMITTEE ON RESOLUTIONS.

Resolved—That this Society having learned that it is the intention of the Provincial Government to have a collection of our fruits prepared for the Paris Exhibition, to be held in 1900, is heartily in accord with the project, and will give all possible assistance in obtaining a collection of chemically prepared and of green fruits, which will be a credit to the Province of Quebec.

Resolved—That in order to ensure the reports of this Society to be issued more promptly, that the manuscript of the present meeting be arranged with that of the last winter meeting and forwarded to the Provincial Government with a request that it be at once published, and that the same course be adopted hereafter, so that our reports may be issued in the fall or early winter, so that the information contained in them may be available to the readers for the operation of the following season.

J. M. Fisk,
R. W. Shepherd,
W. W. Dunlop,
} *Committee.*

A FEW NOTES ON ASPARAGUS.

By N. E. Jack, Chateauguay Basin.

This vegetable is not so well known, or so much cultivated as it might be, for every kitchen garden should have its bed of asparagus, which, without much extra labor, if once planted, will live in the ground for twenty years or more without replanting.

People in towns and cities are more familiar with it, as they find it in their market tied in bundles about eight inches in length.

At its most useful season it has not any appearance of foliage, and the quick growing sprouts are cut deep into the ground, so as to reach the blanched part that is valued for market purposes. But in late summer it is of fine appearance, with its growth of fine feathery foliage, and red berries being very ornamental. Formerly a luxury, it is now a vegetable freely used in its season, coming as it does when few other vegetables are available. It is frequently recommended as an article of diet, and when preserved it is said to be a remedy for rheumatism and kidney trouble.

It is one of the oldest vegetables known, having been a favorite from the time of the ancient Greeks, and was one of the epicurean delights of the Romans, who praised it with enthusiasm for its delicacy of taste and medicinal virtues. They made it familiar to other nations and spread its fame by the invading forces to the countries they sought to conquer. It was cultivated in the time of Cato, 200 years before Christ. In the sixteenth century there was what we would now call a "fad" for growing large stalks, and one weighing half a pound was not uncommon, a growth that our mammoths of to-day would need a good deal of doctoring to accomplish. The genus Asparagus belongs to the Lily of the Valley family, and includes about a hundred species, being related to the smilax of the florist and other plants that seem very unlike.

But A. officinalis, the garden asparagus, is the only plant of recognized value known to botanists.

It is found growing wild in many parts of Europe. Many growers contend that it is adaptation of soil through cultivation and rich fertilizing that explains the difference in varieties, and there is no doubt that favored localities and skilful culture increases the size of the stalk and yield of the plant.

In starting a bed from seed, care is necessary in selecting the best, which is produced on the lower part of the stalk, so it is a good plan to top the plant after the seed is well set, and to remove the berries from the upper branches, so that all the strength may go to the development of the seed required. After picking it must be washed several times in clean water, when the best seed will sink to the bottom and the lighter can be thrown away. It is well to soak awhile to soften the skin of the hull, then rub till the black seed is free, and spread out to dry, when they are perfectly dry they will go into small compass and can be stored till wanted. It is best to use fresh seed for planting, as after two years it loses some of its vitality.

A pound of seed will produce about 3,000 plants; indeed, our first bed of an ounce of seed, of Conover's Colossal, planted twenty-four years ago, furnished 750 plants. The soil for the seed bed is best of rich sandy loam, and the seed may be sown about two inches deep in rows about two feet apart.

In making the permanent bed much depends on the selection of plants. A good strong "crown," with few but well developed buds, and plenty of roots, is best. A "crown," with numerous buds or eyes, will be likely to produce many but small stalks, and afford a smaller yield than the first mentioned. Care must be exercised in selecting the locality; it is best to have a light sandy soil of fair fertility with a clay subsoil, on account of the earliness of growth and ease of cultivation. A soil on which the water stands after rain, or under which the standing sub-surface water is near the surface, into which the roots are liable to penetrate, is to be avoided. Of course such a soil, if otherwise suitable, can be made fit by thorough under-drainage, as an occasional overflow is not harmful if there is good drainage, it being a plant native of marshy regions. Trees must not be allowed near the bed, as their roots take the life of the soil, and the plants need sunshine to bring the shoots quickly to the surface.

In this country spring is the best time to plant; the roots bear transplanting better than later in the season, and the early spring rains insure against the necessity of watering.

In fall planting there is always the danger of winter killing if the season is unfavorable and frost sets in early. When it is dry enough to plow, and the ground will break up fine, rows should be marked off 4 to 6 feet apart and opened up with a large plow, going a sufficient number of times to make the furrows from 8 to 12 inches deep. Any loose earth should be shovelled out, and in these furrows the crowns are set, the distance apart being about three feet. If planted too close it will produce small stalks that will not appear well in the bunches, or bring as good returns.

The depth of planting depends on the soil and method of cultivation. It is said by those in favor of deep planting, that, as the crown is built anew each season a fraction of an inch above the old one, and a bed is expected to last many years, room should be left for new growth before the new crown will reach the surface of the soil ; this would be injured by cultivation. Rows planted north and south get the best sunshine. If planted east and west they will be shaded on one side, making the asparagus later in the early spring, which is an important item, and the heavy foliage later in the season is not beneficial to growth for the next year's crop, for it is after cutting that the plant stores its strength for the next season.

The old method of putting manure in the bottom of the rows before planting, and loosening the earth in the bottom, so that the roots will find an open soil, has been abandoned because it has been proved that top dressing and mulching are superior to the old method of manuring, and the roots of the plant, being lateral, thrive best in close stratum. The plants need covering with three or four inches of loose soil when planted, and the trench filled up as it grows.

No weeds must be allowed to grow, and the soil must be kept loose to promote growth, and retain moisture. There is some difference of opinion as to the best time to manure, but our own experience is that it be applied right after cutting. The bed is well harrowed both ways, then a furrow is ploughed away from each side of the rows; the manure is then put in and immediately covered, which keeps down any objectionable odor.

We often place in stale fish—and give a top-dressing of salt—about which there is a difference of opinion. We know however that it is a marine plant, and that if salt is not its native element, it will at least keep down weeds.

The first year our bed was in full bearing, we applied salt so thoroughly that the neighbours' boys sat on the fence and prophesied—"You'll kill your sparrow-grass Johnny." But the asparagus bed is there yet as thrifty as ever, and the prophets have learned wisdom.

From six to eight weeks is the full cutting season, and after that the shoots should be allowed to grow, that the roots may recover for the next season's crop.

Young beds are better allowed to grow and develop until the second year after being set out, and then only cut for three or four weeks, or the bed may sustain permanent injury. The best time to cut is early in the morning, as the shoots wilt when cut later in the day. It should be cut every day (except Sunday), and the work for that day is accomplished on the Saturday evening.

The manner of cutting is to take hold of the end of the shoot with the left hand, insert the knife nearly to the depth desired, carefully avoiding cutting those close by, and sever the shoot with one downward stroke. It is then placed evenly in a basket carried for the purpose. A machine called a buncher is used to make up the asparagus. The shoots are placed with the heads all one way, and the butts are cut off evenly with a sharp knife.

Some little practice is needed to make up the bunches rapidly and evenly, and the material used for tying is cocoa matting or sisal grass. If the asparagus is not to be sent away at once, it should be set on the butt end in a cool place. For many years we kept it in the cellar on the earthen floor.

In packing for shipment we use a crate holding 36 bunches, as it is easily handled. The bunches are set on end and packed closely together, so as to keep from injury in transportation. The crate is best with slatted top or sides for ventilation, as the "grass" is spoiled if heated.

Asparagus has become an article of commerce through canning, being in that way almost equal to the fresh vegetable. The following recipe, if given a fair trial, will be successful in this work: Cut the asparagus the length of a fruit jar, pack closely, fill with cold water, add a little salt, put the lid on loosely, and place the jar in water heating gradually. Boil for three hours, adding enough hot water before sealing to ensure the jar being full; close tightly, and set away in a cool place.

It can be dried exactly as one would dry apples, and by this method takes little room. The fruit jar method is rather expensive, but is preferable to cans.

That this vegetable gives a fair profit no one can deny. It comes in at a season of the year when there is no other crop ready for market, unless raised artificially, and always finds a ready market. But it needs constant attention in the early and busy part of the year, and is a heavy draft on the manure pile. The notes here given have been mostly gained by practical experience, and many times I have wished that those who used it could realize the work of cutting it some of the very hot mornings in June, when it has to be done with the thought of other work pressing. Besides this the constant stoop that is necessary for the cutting is enough to make one wish for Charles Dudley Warner's "cast iron back with a hinge to it."

But there is every encouragement for the asparagus grower as the vegetable becomes better known, and if the rust and the asparagus beetle do not find us out, we can still call asparagus culture a success, and as yet not injured by over production.

Mr. Craig—I should like to ask Mr. Jack what would be the average return per acre in money gross receipts?

Mr. Jack—This year we have a three acre field, and we cut between eight and nine thousand pounds. I think on an average it would sell as high as eight cents a pound. It is sold by the bunch, weighing about a pound and a half, and we get about a dollar fifty a dozen.

Mr. Slack—What time do you cut the tops for cleaning up next year?

Mr. Jack—Just as the seed inclines to get red, not too early, or you start a second growth.

Mr. Slack—What is the difference in the plants? Some have a great quantity of seed and some have none.

Mr. Jack—There is a male and female plant. The female do not bear any seed, and I think are more liable to rust.

Mr. Slack—What is the remedy for rust?

Mr. Jack—I think the best remedy is to burn off the growth as it stands in the field as soon as it gets dry enough.

Judge Lynch—Do you recommend the application of salt?

Mr. Jack—Yes, to keep down the weeds.

Mr. Slack—Do you think plowing in is better than top dressing?

Mr. Jack—No, but our bed is near the house, and we plough in because of the odor.

Mr. Shepherd—Do you recommend a dressing of fish?

Mr. Jack—I do.

Mr. Brodie—Mr. Jack's asparagus always takes the highest price in the Montreal market. It is packed hard and firm, in compact bunches, so that it will not wilt. Some of the Ontario growers sent some in, but it was not so well packed and would not stand. I have only grown asparagus in a small way. We put in all the manure we could, but I think I planted my rows too close—about 3½ feet apart.

Mr. Jack—That is all right if you do not want to work them with a horse.

Mr. Slack—Don't you think with ordinary cultivation five feet is better than three?

Mr. Jack—Probably it is.

Mr. Brodie—What variety do you recommend?

Mr. Jack—Well, we are using Conover's Colossal. We have tried Giant Purple and Donald's Elmira.

Mr. Brodie—Did you ever try the Argenteuil asparagus they have up at Oka?

Mr. Jack—No, but I believe it is very large.

Mr. Brodie—The asparagus specialist at Oka does not recommend the use of the knife at all. He breaks it off with his fingers.

Mr. Jack—That must be very hard on the fingers. Our ground is very stony.

Judge Lynch—Would it be profitable in this part of the country?

Mr. Slack—No, I think there are other crops which pay better. It takes a lot of manure.

Mr. Ball—I tried it, but I did not find it paid.

Mr. Slack—If you can't get herrings what fertilizer would you use?

Mr. Jack—I tried nitrate of soda this year, and I do not think it made much difference.

Mr. Brodie—Did you put it on while you were salting in the spring?

Mr. Jack—No, while we were cutting.

FERTILIZING ORCHARDS FROM A PRACTICAL STANDPOINT.

By W. Craig, Jr., Abbotsford.

Although this paper is based on practical experience and I can demonstrate by example in our orchard any part of it, I take the liberty of quoting a few lines from an article on the subject by Dr. Saunders, director of the Dominion Experimental Farms, where as a simile he compares the soil as the Farmers' or Fruit Growers' Saving Bank. There he has stored a large amount of capital. If he uses that capital carefully, if he returns—as he would if he wanted to keep his Savings Bank balance—something equivalent to the drafts he makes on it, or a little more, instead of having his account grow poorer from year to year, he will have it become better and richer, his land will be in better condition to continue to give him good crops, and considering the enormous productiveness which is attained by this intensive method of agriculture, he can well afford to deal with the soil in a liberal way.

It is the chief aim of all intelligent cultivators of the soil, whether engaged in cereal-fodder or fruit-crops to so treat the land as to secure satisfactory crops and at the same time maintain the fertility of the soil, so that good crops may be continued indefinitely.

I am inclined to be of the opinion that the fruit tree is a sufficient crop in itself. It has been proved that continued crops of apples will exhaust the soil more during the term of twenty years than wheat during the same time.

Soils respond more readily to the demands of plant growth when under good cultivation than any other condition.

Therefore, grass or grain crops spoil ideal conditions and also draw nourishment and moisture from the soil.

Water is the vehicle—the carrier of plant food. Other crops sap the soil of moisture and trees are unable, in dry times, to get food, being without the carrier. Consequently, clean cultivation during the first part of the season. Then seeding with clover, which acts as a catch crop. The best results in fertilizing soil in this way are attained when the clover is ploughed under in the fall, but where a cover crop is required for winter protection it is better to do it in the spring. By this means nitrogen, phosphoric acid and potash will be secured equal to a dressing of barnyard manure. If this system is not feasible owing to roughness of the land, pigs and sheep make a good combination in an orchard. I find where manure is thrown around trees it encourages the pigs to work up the soil more and after a time clover seed can be sown and worked in in with a spring toothed harrow, thereby improving the soil and giving better pasture.

Clover—Is the farmer and fruit grower's friend. It can be sown profitably each year with nearly all crops. Try it! you will find it pays.

Apple trees require more potash than phosphoric acid or nitrogen especially after coming into bearing.

Ashes—(Unleached)—Hardwood ashes is a very suitable fertilizer in this case, although it does not increase the immunity of apples from the scab as seen by a bulletin issued from the New York Experimental Station.

If it is not digressing too far from my subject I will read the results, which run thus:

"In an experiment including 124 trees in full bearing and continued for five years, liberal applications of hard wood ashes did not increase the immunity of apples from the scab. With few exceptions, the varieties on treated sections yielded larger percentages of scabbed fruit than those on untreated sections.

On the treated sections of the orchard the foliage in many case was improved but it cannot be said that the improvement was due to increased immunity from the scab.

Where the ashes were used the color of the fruit was much improved in some seasons with some varieties, but in a season which favored the perfect development of the fruit none of the varieties showed any improvement in color as compared with the same varieties on untreated sections.

Apparently the use of ashes had a general tendency to hasten the perfect development of the fruit When the season was not especially favorable to the perfect development of the fruit it improved the keeping quality, but in a season very favorable to the perfect development of the fruit the ripening processes were generally carried so far where the ashes were used that the apples did not keep so well as where no ashes were used.

The yield, except with the Baldwins, was greater on the treated sections; but the data are not such as make it safe to draw definite conclusions as to the effect of the use of ashes on the yield.

Decided differences were shown between varieties as to the ability to resist scab, and preliminary investigations indicate that the difference in resistant power is correllated with structural peculiarities.

But to return to my subject, another source of fertilizing is found in animals, bones, which are rich in posphoric acid when fresh. They should be collected and rendered soluble by the use of slacked lime and ashes."

SUMMARY :

1.—Then a summary of this paper would be to keep good your banking account with the soil, so that you may have a yearly surplus to your credit and be enabled to go on cropping indefinitely.

2.—Secure manure by keeping stock.

3.—Grow clover to plough it under fall or spring. Save the ashes. Also animal bones.

Lastly.—To get experience not only *read* but study the reports and bulletins issued by the different Experimental Farms and Stations. Watch well the movements of those men whose work it is to study out the best methods in operating our farms and orchards in order to get the best results with the least possible labor and expense.

Mr. Hamilton—I think Mr. Craig hit the key note in discrediting the taking of a second crop from the soil. The fruit is not only smaller, but it is more liable to disease. I think that the efficiency of clover when it reaches about a foot high and is well managed is equal to several loads of barn yard manure. It may not be a perfect fertilizer, but it approaches one. Nitrate of soda, in very small quantities early in the spring, also produces good results. I have one bit of orchard on the poorest soil, and some years it does almost nothing; but after a dressing of nitrate of soda it grows better clover and more, and better fruit. Possibly the advantage is indirect through the greater growth of grass and clover. I approve of what Mr. Craig says of keeping a good bank account with the soil. Some years ago I visited, with Mr Gibb, some orchards near Montreal where the soil had not been fertilized for a long time, and the apples were both small and a very poor quality. They were pitted right out with some special disease, apparently due to want of fertilizing and cultivation.

Mr. Brodie—Keeping up the fertility of the soil is quite easily accomplished with us, for near the city we get all the manure we want. Where I cultivated I lost several trees, 1896-7, but where I had them under grass and top-dressing, the trees are in a perfectly healthy condition. I put a double waggon load of manure about every four or five trees.

Mr. Newman—How often do you top-dress the orchard ?

Mr. Brodie—About every second year.

Judge Lynch—You think top-dressing is preferable to ploughing ?

Mr. Brodie—Yes, because of my experience in 1896-7, when I lost sixty trees in the cultivated land.

Mr. Fisk—One difficulty with ploughing in crops is that it induces late growth, and therefore the tree does not mature sufficiently to face the winter if it is a severe one. My idea is that you should produce what clover you can early in the season, but cease cultivation at any rate after the first of August, and let the tree mature as far as possible.

Mr. Craig—My experience has been different from Mr. Brodie's. The part of our orchard which is in sheep pasture, and has not been cultivated, shows very thin trees, while the cultivated stand well. From seven years' experience I am confident that where the trees are far enough apart to cultivate, I get better returns than with grass.

Mr. Brodie—Do you not find that where the trees are cultivated a number of apples fall on the ground and you get your barrels soiled ? I think it is better to have clean grass to work in.

Mr. Shepherd—The winter of 1896-7 was a most disastrous one. We had no snow till late in the season, and we had very severe weather later on. The orchards all through the Province suffered more or less, and that was the reason why our fruit last year was so poor in quality. I visited Mr. Brodie's orchard, and I found the only Fameuse trees he had bearing good apples were in sod; those in cultivated land were dying, and half of them dead. It was one of the greatest examples I ever saw, and impressed me so much that I gave up all idea of cultivating bearing orchards. In Ontario they cultivate to a large extent, but in this Province, where we are liable to such a winter as 1896-7, my opinion is that it is a great mistake. If you are going to cultivate you must mulch over the surface of the ground where the roots are with a heavy top dressing. If you do not, some winter you will lose all your bearing trees.

With reference to the experiments carried on in New York State, which Mr. Craig referred to, I have been applying wood ashes for twenty-five years, and I attribute entirely to that the high color I get in Winter St. Lawrence, for instance, and the foliage is much improved, but I have not noticed the early ripening.

Mr. Hamilton—I see no reason why Mr. Craig's system should not be carried out in such a way as would be satisfactory to Mr. Fisk, who does not want late cultivation, and to Mr. Shepherd, who wants the ground protected, The best way would be to cultivate early, and stop in July and August. By sowing clover early in August you will get sufficient covering, in fact equal to the old sod, and by turning under in the early part of the season you will enrich the soil. There is not the least doubt that we need first rate winter protection to save our trees in this Province, especially in the colder parts.

Mr. Macoun—At the farm, for the last few years, we have sowed down clover towards the end of the season and ploughed in the spring. Winter before last the clover was entirely killed, and there was nothing to plough under. Last year the orchard was in good condition, and this year we had a very heavy crop of clover to plough under. I am adopting different methods for test purposes. Of course a great deal depends upon the quality of the soil, and there is no doubt clover, which derives most of its nitrogen from the air, is the best means of enriching it.

Mr. Fisk—You do not cultivate later than the fifteenth of August?

Mr. Macoun—No, not as late as that.

Mr. Shepherd—With trees planted twenty-five feet apart, when they are twenty-five or thirty years old, the branches almost interlace, and it is almost impossible to plough the orchard without injuring the roots. To my mind the best way is to leave it in sod, and give it a top dressing every two years.

Mr. Brodie—The great difficulty is that when the orchard is drained with tiled drains, after twenty or thirty years they are disturbed by the roots, and if you have a wet season some of the trees are killed. I think good natural drainage is a great advantage.

Mr. Macoun—One of the principal points brought forward in favor of cultivation is that if the ground is in sod there is so much moisture evaporated that the trees suffer. Have you often noticed your orchard suffer from drought?

Mr. Newman—I have noticed that the fruit was more highly colored from the sod, probably from the lack of moisture, and also not quite so large. I think cultivation is a very expensive process, and if the orchard is at all closely planted it must be very difficult after the lapse of years.

A FEW NOTES ON PLUMS.

(By W. W. Dunlop, Outremont).

At the first meeting held by this Society I had the pleasure of contributing a short paper containing notes on the varieties of plums grown on the Island of Montreal. For some years previous to this I had been experimenting with a great number of varieties of the European type with a view to obtaining some knowledge of their adaptation to this climate. While there is quite a difference in hardiness of tree and fruit buds in some of these varieties it is questionable if any so far tested are hardy enough to be grown extensively for commercial purposes owing to the uncertainty of their fruiting in this severe climate. During the past ten years our plum crops have been few; this year however is an exception and nearly all varieties are bearing an enormous crop. So heavily are they laden that is has been found necessary to provide supports for the branches to enable them to sustain the enormous weight of fruit. The coming winter

will probable test the hardiness of many of these varieties, as a tree may be hardy enough while unfruitful, yet after bearing a heavy crop be liable to succumb to the severity of winter. Among the varieties fruiting this year on the Island of Montreal are Moer's Arctic, Richland, Quackenboss, German Prune, Gueii, Hudson, Rivers Purple, Egg, Enylebert, Cluster Damson, Victoria, Pond's Seedling, Fellemberg, Duanés Purple, Wangenheim, Washington, Field, Prince of Wales, French Damson, Union Purple, Saunders, Lombard, Aichduke, Grand Duke, Black Diamond, Maldanka, Sany Blue, White Nicholas, Hungarian, Beauty of Naples, Darwin Peach, Reine-Claude, Reine-Claude de Montmorency, Shropshire Damson, Jefferson and Monroe.

All of these and a number of others I have observed carefully during a number of years, and have come to the conclusion that though in these we have a number of varieties of excellent quality, of which a few trees may be planted in sheltered situations, yet I would not care to plant an orchard of any as a commercial venture. It may be that some may do better in the future, but we must take their record from the past. There are a number of unnamed seedlings growing on the Island of Montreal, some of them producing fruit of very fine quality. I have brought samples of the fruit of three of these varieties, which, for want of names, I have designated under numbers 53, 54, 56.

The fruit of these is not of so high a quality as some others, but is valuable for culinary or preserving purposes, and meets with a ready sale in the Montreal market. The trees of these are hardy and frequently bear crops when others less hardy in fruit bud fail.

Although I am not prepared to advocate the extensive planting of these, I have so much confidence in their superiority for our climate, over the standard varieties of the European type, that all recent additions to my plantation have been of these varieties, of which I have now several hundred trees.

The type of plum best suited to our northern climate is the *Prunus Americana*, the fruit buds of which will endure a temperature which would be fatal to the European. Many excellent varieties of this type exist, among which may be mentioned : Hawk Eye, Baker or Stoddard, Wolf, Weaver, De Soto, Rockford, Cheney, Forest, Garden, Rolling Stone. The Cheney is one of the earliest in season and one of the best in quality.

Of the Japanese and others types, Simoni is fairly hardy, and sometimes produces fruit. It is interesting as a curiosity.

Burbank is fairly hardy, and in favorable seasons has borne good crops not likely, however, to prove sufficiently hardy to be grown for commercial purposes.

Mr. Brodie—In planting graft plums about Montreal, my experience is that they will bear a couple of crops and then die right off.

Mr. Dunlop—There is no question that we are a little beyond the natural limit, and after bearing a heavy crop if the winter is severe the trees often die.

Mr. Shepherd—The North-West varieties are very heavy bearers. The Cheney had a very heavy crop last year and this year too. Hawkeye is also heavy with me.

Mr. Brodie—My trees were heavily loaded last year, and this year I have not a plum. The Rolling Stone I think one of the best.

Mr. Dunlop—It is a question of size and quality. Hawkeye is a fair sized plum, and so is Wolf, when it is not too heavily laden. Another point is that the skins are very thick and astringent. I think the Cheney is the best for preserving.

Mr. Brodie—Do you keep your plums in cultivation ?

Mr. Dunlop—Yes.

Mr. Brodie—Do you have much pruning ?

Mr. Dunlop—They do not require much pruning.

Mr. Ball—About how far apart do you set them ?

Mr. Dunlop—It is better to set them close together. I plant apple trees 30 feet apart, and a row of plums alternately, 150 plums to 50 apples.

Mr. Fisk—Do not you find it an advantage to plant them close together for fertilizing ?

Mr. Dunlop—That applies more to the American varieties. With the European there is no difficulty as a rule. A great many of the Americans are self-sterile, and must be planted with varieties that pollenize. The foliage is healthy, and we are not much troubled with curculio. So far it has done no damage beyond thinning them a little, which is perhaps an advantage.

Mr. Hamilton—What is the character of the soil ?

Mr. Dunlop—The soil is a heavy clay loam. The plums in a heavy soil bear better, and ripen a few days later. They require moisture in the soil for a heavy crop.

Mr. Brodie—Are the seedling varieties less liable to rot ?

Mr. Dunlop—The rot is pretty general this year. It is a fungus and causes fermentation. It does not affect the plums badly till they are nearly ripe. It differs with varieties.

Mr. Ball—Are you troubled with black knot ?

Mr. Dunlop—I have had cases very rarely, but I have always cut it out and kept it out. I have had no serious trouble with it.

Mr. Fisk—What method do you adopt for improving your seedlings ?

Mr. Dunlop—There is no systematic attempt to fertilize artificially. I have simply been selecting stones from hardy varieties, and varieties bearing good fruit, and planting these with the view of getting something to take the place of the old trees.

Mr. Shepherd—Do you plant at once?

Mr. Dunlop—Yes, the stone should not get dry.

Mr. Newman—Do you put a board over the row?

Mr. Dunlop—No nothing over them.

Mr. Shepherd—What depth do you sow?

Mr. Dunlop—One to one and a half inches.

Mr. Brodie—Will not the European varieties reproduce themselves?

Mr. Dunlop—No.

Mr. Fisk—In my own experience I found the same law as in the animal kingdom. I have sown pips, and they produced fruit, but most of them were inferior to the parent. Your seedlings are improved.

Mr. Dunlop—Some of mine are inferior, but none of those I have here. As a general rule these types come up pretty nearly alike.

Mr. Hamilton—Did you ever try any plan of making them fruit earlier?

Mr. Dunlop—No.

Mr. Hamilton—I hav[illegible] with a wire or strong cord the buds fill up.

Mr. Dunlop—You would test not only the fruit but the tree?

Mr. Newman—Were you troubled with aphis?

Mr. Dunlop—Yes, they were very bad, and did a great deal of damage in retarding the growth of the tree.

Mr. Craig—Kerosene emulsion is good, but Paris green has no effect on the aphis.

Mr. Macoun—This year our plum trees are very badly affected. I sprayed three times almost consecutively with tobacco water, mixed with soap to make it stick. The third spraying cleared them right out. The preparation I used was 10 lbs. of tobacco and 2 lbs. of whale oil soap to a barrel of water. It is better to boil the tobacco first. Tobacco waste is what is recommended; but anybody can grow a few plants of tobacco. Soft soap is good enough, but whale oil soap is better.

Mr. Brodie—It is all very fine talking about growing plums, but how are you to get a market? Last fall we were selling plums at 25 cents a three-gallon basket. This year they are 50 cents a basket. It is all right to grow a few for your own consumption, but for commercial purposes it is no use growing at a loss.

Mr. Craig—I bought strawberries in Montreal at four cents a basket, and I could not grow them for that. But I have a good local market for plums.

Mr. Newman—Fifty cents a bushel will pay.

Mr. Brodie—Not if you only get a good crop once in four or five years.

KEEPING GRAPES.

Wm. M. Pattison, Clarenceville, Que.

In seasons of abundance, like the present, the question is often asked: "How can I keep grapes?" Much has been written on this subject, and different methods to attain this object have been recommended and adopted during the past few years with varying success. When grapes are intended for keeping care should be taken that all cracked or bruised berries are removed, with long pointed scissors made for the purpose, for if such are left they will mould, rot and destroy others. One obstacle to guard against is the weight of the fruit as stored in baskets or boxes. The fruit continually settles, excludes the air, and finally the grapes mould. The question is how can we obviate this in packing. Two methods have been found successful in the grape growing region of Central New York, viz.: Ten pound market baskets are used; a layer of dry oats or sawdust is placed in the bottom, then a layer of grapes, then a layer of oats or sawdust, till the basket is full. Bran should never be used in packing fruit, as it heats. The objection to this method is that the grapes cannot be readily looked over during the winter, and rotten and mouldy grapes removed. My own experience has been that for all practicable purposes the ordinary cotton wadding in sheets is the most satisfactory packing, cut into pieces to cover the layers in shallow grape or peach baskets, with wire bales, which allow of their either being piled on tables or hung on nails to the beams in the fruit cellar. Line the sides and bottom of the baskets. Place a layer of grapes, then a layer of wadding, and so on till the basket is full—say four or five layers at most. With proper precaution and attention the best keepers will remain in good condition till May or June, though, of course, somewhat wilted at the last. Unripe, poor and watery grapes will not keep under any condition. In gathering grapes a dry day is preferable, and great care in handling. A bruised grape, like a bruised apple, is sure in time to decay and affect those in proximity. Hence in a basket of grapes, as we buy them in market from the south and west, from long carriage and solid packing, many bunches are more or less bruised, and require all injured berries cut out before packing. Grapes should not be packed away till the excess of moisture in the stem has dried off. This can be accomplished in fine weather in a few hours, by placing them in single layers in baskets, or on a table where the air will freely circulate through them. This process can be carried to excess, however, to the injury of the grape. The most important requirement after packing is to keep the grapes in a continued low, dry and even temperature; in very cold weather as near freezing point as consistent with safety. This requires some watchfulness, as in the fall we often have some warm days requiring their removal to the fruit cellar. For a time it is preferable to store the baskets on a verandah, or in an airy out-building till hard frost, even if they have to be covered with a blanket at night. When permanently removed to the fruit cellar it should be kept as near the freezing point as possible during the entire winter. To attain that object, and insure dryness, raise the windows during the day rather than during the night.

As to varieties to select for keeping,—the rather thick skinned ones are the best, as Salem and others of Roger's Hybrids. The Vergennes, originated in

Vermont, is the best keeper of all, though it rarely finds its way out of the home garden, as it is essentially a keeping grape, whereas Roger's Hybrids, Concord and Delaware are plentiful on our markets. The Duchess, a rather small white grape, is a good keeper, but efforts to keep extra early varieties like Champions and Hartford do not pay for the trouble. In a trial of some forty selected varieties in the winter of 1883-4, for an article written for the "American Agriculturist," I found Concord, Worden and Delaware to keep in fair condition till December. Duchess, several of Roger's Hybrids and a black wine and table grape given the name of "Pattison" at the Experimental Farm at Ottawa, till January, and Vergennes, Salem, Wilder, Herbert, Roger's No. 30, El Dorado, Gaertner, Mary and Owasso through February. These grapes were packed with paper between the layers, but since the adoption of wadding I have kept most of those till June, at which season it is not possible to keep the cellar at the proper temperature and dryness. If a system of cold storage could be adopted for our fruit cellars better results could be obtained. In warm weather, close cellars induce dampness and mould in our fruit.

USE OF GRAPES AS FOOD.

The highest medical authorities claim that the grape is a potent remedy for the prevailing derangements having their origin in the alimentary system. On the continent of Europe in the world-famous "Grape Cures" for dyspepsia and its sequel, consumption, the diet during the season consists almost exclusively of ripe grapes. The patients stroll about the vineyards and make their meals as appetite dictates. During the balance of the year, the diet is composed chiefly of fruit with coarsely ground cereals. With the permission of any medical man who may be present I will venture to give a prescription for indigestion and want of appetite, without charge, namely, make a breakfast or supper entirely of grapes or other fruit. I have endeavored to show how we may enjoy the grape nearly the entire year. In conclusion, I contend that if the apple is recognized as the king of fruit, the grape, the aristocrat of the garden, is entitled to be called the Queen.

Mr. Brodie—We find we can buy grapes near Montreal cheaper than we can grow them. At the last meeting of the Ontario Fruit Growers' Association one of the gentlemen then said that people eating grapes in England took only a few, while people in this country would eat two or three pounds at once. Mr. Pattison seems in favor of the Canadian practice.

Mr. Shepherd—That statement was made by Mr. Crandall, the representative of the Dominion Government in England. They are not accustomed to eat grapes as we do, because they are hot house grapes and very costly. We can grow them easily, and buy them cheaply. We expect they will get fond of our grapes, and there will be a large export trade shortly. I notice Mr. Fisher spoke at length on the other side about Canadian grapes.

Mr. Macoun—I should like to know on what account Mr. Pattison recommends cotton wadding?

Mr. Pattison—The wadding bears up the grapes, and they are not so apt to get jammed.

Mr. Hamilton—Paper is practically air-tight, and wadding is just the opposite. It allows air to penetrate the basket. I see objection has been made to the Canadian grapes sent over to England on account of their earthy taste. There is no earthiness about Delaware or Martha or Duchess. A number of these varieties are almost as luscious as hot-house grapes, and I do not see why they should not sell as well in England. I prefer some of them to the hot-house grapes. The best of our American grapes have a sprightliness that is lacking in the hot-house grapes. The latter are too luscious ; they cloy.

Mr. Brodie—Along with Prof. Robertson I had the pleasure of looking at the grapes sent over to England in cold storage. They were of good varieties, and ought not to have had any earthy flavor.

Mr. Slack—Prejudice has a great deal to do with English taste.

Mr. Hamilton—If they had the right varieties I do not think the English consumers would have anything to find fault with.

Mr. Pattison—The objection has no doubt arisen with reference to the early varieties, which have an earthy or musty taste. But the finer grapes, like the Rogers' Hybrids, the Delawares, and some of the Delaware seedlings, recently introduced, especially one called the Matemas, are quite free from that musty or foxy taste. The later grapes are very fine in flavor, but in our climate they do not always ripen fully, unless great attention is paid to cultivating them.

Mr. Hamilton—The probability is that the Ontario grapes were shipped on the green side.

Mr. Pattison—Unlike others fruits, grapes do not improve by keeping. If picked green they will not ripen, but will stay green.

Mr. Hamilton was then called upon to speak on :

THE SUMMER'S OBSERVATIONS IN THE ORCHARDS.

He said :

After the season 1896-97, you may all of you imagine how anxiously we felt on the opening of the following spring, although the year had been of such a character that we had no reason to be fearful. The spring opened finely, and the trees started vigorously, but almost the first thing we noticed, before the buds began to swell, was that they were covered with a little green insect, which ate well into them before the buds fully expanded. That was true not only of the growth buds, but also of the fruit buds. That may have tended to so weaken the blossom that the pollen was insufficient, and the flowers, which were very

abundant, did not produce much fruit. Perhaps some of the fruit growers will say that I ought to have sprayed before the buds burst in order to obviate that difficulty, and possibly if I had sprayed a week before I noticed this insect, the fruit buds would not have been unproductive. However that may be, the fact is that a great many of the blossoms of all the trees except the very hardiest did not produce any fruit. Duchess, Wealthy, Yellow Transparent, and some few of the Russians perfected their flowers and bore very good fruit. But the Fameuse, the St. Lawrence and the Peach apples suffered severely. The blossoms seemed imperfect, and no fruit was produced. The lesson I take to myself is that one should spray early, before the buds begin to burst, though it is possible that I am wrong, and that that tiny little insect had nothing to do with it.

Mr. Shepherd—Do you think the first spraying should be with Paris Green ?

Mr. Hamilton—Yes, I think the formula Mr. Macoun gave us, a quarter of a pound to the barrel would be quite sufficient to meet the occasion.

Mr. Macoun—Quite sufficient I think.

Mr. Hamilton—The spraying I did seemed to have good effect, not only in keeping down the codling moth and preventing mildew, but in keeping down the Aphis, which has been very destructive in my place for two or three years past. This year my apple trees are almost free from it, though some of the plum trees suffered very badly. For a year or two previous a great deal of the fruit was deformed, crooked and pitted, and was consequently useless, so that anything which tends to keep down these pests early in the season is of very great advantage. While early spraying with the usual formula will perhaps meet the case, it would be more effective I think if some kerosene emulsion were added. I think that one spraying would go a long way in keeping the orchard in good condition throughout the season. At all events men who are very busy would be strongly tempted to make it do.

Another thing I have not been able to account for was, that after the fruit was formed, and had reached nearly an inch in diameter, immense numbers fell to the ground, so that many of the trees were quite stripped. It may have been due to some atmospheric influence. We had cold rain followed by hot weather and that may have caused the falling.

We have had many discussions of late about varieties of apples and so forth. I think it would be a great advantage to Fruit Growers to divide apples generally into two classes, the Rinettes and the Calvilles. The former are much tenderer in every stage. The fruit is finer, but is more subject to be destroyed by insects, by atmospheric influences, and by mildew. The Calvilles are stronger and are conical in shape. These names are given to them in a list published in France from fifty to a hundred years ago. The Rinettes would include Fameuse, St. Lawrence, Golden Russets, etc., with clean outline and somewhat flattish shape, small fruit, but of fine quality. The coarser and stronger varieties are of the Calville type.

Mr. Pattison—How would you class the Northern Spy ?

Mr. Hamilton—Among the Calvilles.

Mr. Pattison—They are vey fine apples.

Mr. Hamilton—Yes; but I think we may lay it down as a rule that nearly all the fine apples are Rinettes. The general distinction is a useful one, and would make it easier to deal with new varieties.

When the apples have reached a fair size, if they can be sold at almost any price to pay for the labour of gathering, I think it is wise so sell them so as to thin out the trees. The remaining fruit will be very much larger and finer in quality. The lack of this thinning out has, I think, a bad effect on many varieties. Take for instance Yellow Transparent. Nine or ten years ago we thought them perfect. They were of good size, tender flesh, fine flavour and had everything to recommend them. Now we find that the trees, if not thinned bear thin fruit. A few years ago our neighbours thought a Yellow Transparent almost equal to a Peach. Now they will hardly accept it. They have lost all their fine qualities, and I do not think they would have done so if they had been thinned extensively.

Another point I would like to emphasize is that if you wish to keep apples for a long time, pick them in the cool weather. If they are picked early in the morning on a cool, cloudy day, they will keep several weeks longer than gathered during a hot spell. The quality is also better because the flavour is preserved.

As to shipping, it is worth while grading apples so that all the small ones go into one basket or barrel. The small ones, put into separate baskets, fetch as much as the mixed ones would, and the larger ones fetch more. The same is true if colours are mixed, the pale ones will lower the price of the higher ones, but if they are packed separately, the light ones will fetch as much and the high coloured ones will fetch a few cents more. Where one is shipping great numbers of baskets it means a considerable increase in the returns for a very slight increase of labour.

Mr. Shepherd—What do you consider the best Russian apple for export?

Mr. Hamilton—Up to this year I have found Yellow Transparent a very valuable apple. It comes early. We began shipping at the end of July and have continued up to now. But it is failing very fast in quality, and the price is being lowered so that I think perhaps we shall have to leave it out. I have brought with me a new Russian variety, Petrofskoi, and it promises exceedingly well.

Mr. Brodie—I can corroborate what Mr. Hamilton says about thinning the fruit. My Yellow Transparents, Duchess and White Astrachan were over-loaded. We started about July twentieth, and thinned them about half. Those that I thinned off sold for about twice as much as the rest of the crop.

Mr. Ball—With regard to spraying and that little insect which Mr. Hamilton mentioned, I used both copper sulphate and Paris green and sprayed twice, once immediately before the buds burst. The result is the same with me as with him, so that it could not arise from the lack of the early spraying. There is

another orchard of about the same age near mine, which was not sprayed at all, and the result is the same.

Mr. Fisk—What is this insect, this little green louse? Paris green does not seem to kill it.

M. Macoun—It is the Aphis. This year the buds were completely covered with them just before the blossoms opened. I sprayed mine with tobacco water and it cleaned them right out. I was not troubled any more this year.

Mr. Shepherd—That was before the buds burst?

Mr. Macoun—Just as they were breaking. The eggs were on the tree all winter, and they were ready as soon as the spring opened.

Mr. Ball—There are two kinds, black and green.

Mr. Macoun—There are several, black, green, brown and so on.

Mr. Slack—Where stock mixture is kept and the Paris green mixed in the lime water, will it keep?

Mr. Macoun—I think so. All that is required is to stir it up.

Mr. Newman—Do you think the aphis capable of cutting the blossom out?

Mr. Macoun—I never had the aphis affect the blossom; it is only the leaves. Of course if the leaves are diseased the blossoms will fall.

EVENING SESSION.

Mr. Fisk presented the report of the Fruit Committee, which was adopted.

REPORT ON SEEDLING AND OTHER PLUMS, RUSSIAN APPLES, PEARS, ETC.

Committee—John M. Fisk, Robt. Brodie and Robt. Hamilton.

Mr. John M. Fisk exhibited specimens of five varieties of Chicasaw, or North-western plums, all of fair quality, though rather small in size.

One variety Prunus Americana, or Ottawa seedling, a handsome native.

Three varieties Russian plums, Early Red, Veronesh and Trabische.

G. W. Buzzel, Abbottsford, sends specimens of White Ostrokoff, a plum of very good quality.

Mr. R. Brodie, St. Henri, sends specimens of eleven varieties, amongst them the Burbank, a Japan plum of large size, fine appearance and quality. Six varieties were on their own roots and four were grafts.

———

Mr. R. W. Shepherd, Montreal and Como, furnished fourteen varieties, chiefly Russians, amongst them Early Red, Late Red, St. Nicholas, Montreal Seedlings Nos. 53 and 54, Perdrigon (a fine French variety), Cheney, Hawkeye, De Soto, Rolingstone, Wyant and other Northwestern varieties, and Glass, Newman's Gage, with others of European origin.

———

Mr. W. W. Dunlop, of Outremont, furnished thirty-four varieties, many of them seedlings, originated by himself, showing improvement in each succeeding generation. The whole set is of the highest quality; altogether a remarkably fine collection.

———

PEARS.

Mr. Auguste Dupuis, L'Islet, furnished handsome specimens of La Petite Marguerite pear.

———

The Experimental Farm furnished one of the New Russians, the Baba.

———

Mr. Shepherd, Montreal, showed the Stakhanka New Russian.

———

Mr. John M. Fisk, Abbotsford, showed the Russian Pomeranovka.

———

APPLES.

The Experimental Farm, represented by Mr. W. T. Macoun, furnished eight varieties of seedling Russians. One of them of the largest size, and one very fine early apple that ripened on the 3rd of August. Also four named Russian varieties of the highest quality.

Mr. W. Craig, Abbotsford, furnished four varieties of the newer Russians, viz.: Gypsy Girl, Romneuskoe, Lievland Raspberry and Malinovskoe, the latter a most beautiful small red apple, never exhibited hitherto.

Mr. John M. Fisk, Abbotsford, furnished four varieties, viz.: Titooka, Switzer, Pointed Piepka and Lievland Raspberry, all very handsome varieties of fine quality.

J. K. Herrick, Abbotsford, sent one variety, the Lievland Raspberry.

Mr. Hamilton, Grenville, furnished fourteen varieties of the newer Russians, all large, showy apples, and many of fine quality, also three new seedlings that were much admired.

Mr. Cecil Newman, Lachine Locks, furnished one variety, the Pointed Pipka apple, and Gakovrka pear, the old Bon Chretien pear and Early Long blue plum.

The Vice-President briefly introduced Professor F. A. Waugh, Horticulturist at the University of Vermont and State Agricultural College, Burlington, who delivered an address on

"FACTS AND THEORIES REGARDING THE POLLINATION OF FRUITS."

Professor Waugh said: I cannot deny myself the satisfaction of saying in a word how much of a gratification it is for me to meet the Quebec fruit growers again. This Society has seemed to me not only enthusiastic and very much in earnest, but interest also in the scientific aspect of fruit growing, so that I am always glad to meet its members.

The cultivated plums we have belong to a number of species, there being six or eight with which we are chiefly concerned. For the most part these have been kept distinct in the breeding that has been done thus far. But the work of hybridizing or intercrossing the species has already progressed far enough to show that we may expect very important practical results. I have been working on the subject for some years, and during the last year I have been in communication with most of the plum growers and breeders of any reputation, from

whom I have obtained specimens of a large number of hybrid plums, combining two, three or four species. I do not think that these are of any immediate value to this country. Most of the work has been done in the extreme south, Florida, Texas and California, and while the results are chiefly of interest to the Southern States, they show what can be done. As soon as we have breeders to take up this line of work, we may expect equally valuable results for this country.

Fruit growing is really a very complicated business, having many sides and involving a great many problems. The commercial fruit grower must pay strict attention to a great many details, and the amateur even more. Propagation, planting out, cultivation, fertilization, soil, pruning, spraying, choice of varieties, hardiness, and a great many other points must be attended to if success is to be secured. Among other problems is that of pollination, which is more important than has sometimes been supposed. If we take a plum blossom we find it is made up of certain parts, each one of which has particular functions. The first things we notice are the five colored leaflets or petals, which are of no particular importance to us on this occasion. Stripping these off, we find a small leafy green cup or receptacle, which has five points. When these are torn off we have exposed to view the more important parts of the flower. Its outer parts are only for the protection of the more important inner parts. Next we find a row of stamens, made up of anthers and filaments. At the end of the filaments we find a little pod or sack, very much the shape of a grain of wheat, containing a yellow dust called pollen. When the flower is mature, this yellow dust spreads through the air and effects pollination. Tearing these off we find an organ known as the pistil. This is the beginning of the plum, which is inside the blossom in a very minute shape, a little larger than the head of a pin. The pollen from the anthers is distributed by the wind or the bees, and falls on the gummy stigma at the end of the standard, penetrating into the fleshy pistil and pollinating or fecundating the little seed inside. The plum is merely incidental so far as nature is concerned. She is looking after the seed, with a view to the perpetuation of the species. But in order to get the fruit we must have fertile seed, and for that purpose it is necessary to secure perfect pollination, that is, this yellow dust should be applied to the stigma at the proper time, and fecundate or fertilize the seed. That is not a very elaborate process, but there are certain conditions that may interfere with it, and affect the quantity and quality of the crop.

You are familiar with the fact that in growing strawberries it is necessary to provide for this matter of pollination. Some varieties have nothing but the pistils, the beginnings of the seed, and it is necessary to plant near them other varieties which bear an excess of pollen. In orchard fruits the importance of pollination is not so generally recognized, but recent experiments show that it is a matter which needs careful attention.

I find in examining many plum blossoms that quite frequently there are important parts missing—style, stigma, or pistil. Sometimes 40, 50, 60 and even 90 per cent. of the blossoms are defective in this way; I have seen trees in which the pistils were entirely absent, and you could not find a single complete blossom. I have been told of trees of which this was true year after year. But

in all the cases I have known the defect has been explained by disease. The absence of any one of these organs makes it impossible to bring fruit to maturity, and there is no remedy except to take the tree up and plant a new one. I merely call attention to it because in some cases it explains unfruitfulness.

Another difficulty, of considerably more importance, is that of self-sterility. The ordinary mode of pollination is for pollen from the anther to fall on the stigma in the same blossom ; it is the shortest road for it. If it does and fecundation is successful, the fruit will develop all right. But it has been found by observation and repeated experiment that very frequently the pollen will not fecundate blossoms on the same tree, no matter how plentiful it is and how carefully it is applied. The flower is self-sterile ; it cannot pollinate itself. In such cases it is necessary that pollen from same other variety shall reach the stigma. Different varieties must be planted side by side so the pollen of one may fall on the stigma of the other.

This difficulty of self-sterility is much more general than we have formerly supposed. Comparatively few careful experiments have been made, and our knowledge is by no means so extensive as we may expect it to be in the course of a few years. Very little work has been done with apples, but those conducting the investigations have been surprised how delicate apples are in this respect, and how quickly and well they respond to cross pollination.

The following have been found :

More or less self-sterile :—Bellefleur, Chenango (stwby), Gravenstein, King, N. Spy, Norton Melon, Primate, Rambo, Red Astrachan, Roxbury Russet, Spitzenburg, Talman Sweet.

Mostly self-fertile :—Baldwin, Codlin, R. I. Greening.

The pear list has been worked over much better than the apples. It reads:

More or less self-sterile :—Anjou, Bartlett, Boussock, Clairgeau, Clapp, Columbia, Doyenne Sieulle, Easter, Gansels Bergamotte, Gray Doyenne, Howell, Jones, Lawrence, Louise Bonne, Mount Vernon, Pound, Sheldon, Souvenir du Congress, Superfin, Colonel Wilder, Winter Nelis.

Generally self-fertile :—Angouleme, Bosc, Brockworth, Buffum, Diel, Doyenne d'Alencon, Flemish Beauty, Heathcote, Kieffer, Le Conte, Manning Elizabeth, Seckel, Tyson, White Doyenne.

I have not been able to get the grape list up to date. A very interesting and elaborate paper on this subject was presented in Boston last week, and will soon be in print, but I was not able to get the latest results. Those already published show that the following varieties are mostly self-sterile :—Black Eagle, Brighton, Eumelan, Massasoit, Wilder, Rogers' No 5, Gaertner, Merrimac, Requa, Aminia, Essex, Barry, Herbert, Salem.

Self-fertile, more or less :—Concord, Diamond, Niagara, Winchell, Rogers' 14, 24, 32, Agawan, Delaware.

My own experiments have been, so far as practical pomology is concerned, confined to plums. Some 250 varieties have been included in my experiments, which have occupied me for the last three or four years. I will give a general review of the results.

The American varieties, of which I spoke to the Society specially a year ago, are mostly self-sterile. I know of only one exception—Robinson—which you don't grow here at all. There are some partial exceptions, but they are not worth mentioning Practically all the American varieties are self-sterile. I have experimented with a considerable number of the Japanese varieties, and so far all I have worked on have been self-sterile also. With the European varieties I have made a few experiments, not enough to base any decision upon, but inclining me to the opinion that they are more self-fertile than the others I have spoken of. That opinion, however, must be held subject to revision.

Some currants and gooseberries also show signs of self-sterility, but sufficient work has not yet been done to enable me to express an exact opinion.

In dealing practically with this problem of self-sterility, obviously the first thing is to plant varieties in mixture, or else to engraft two or three varieties into the same top. But there are other conditions to be taken into consideration. To pollenize a self-sterile variety, you must choose another variety which has plenty of pollen. Then the pollen must be adapted to the variety it is intended to fertilize. We sometimes find, though not very often, that the pollen of a particular variety, when it is applied to the stigma of another, does not prove satisfactory,—there is not sufficient affinity between them. When I started my experiments with plums, I thought this question of affinity was going to be one of great importance, but all my work points to the conclusion that in practical plum growing it is not likely to be of serious consequence.

Another point in selecting pollenizers is that the two varieties must blossom at the same time. This is evident as soon as it is mentioned, and yet it is not always provided for. I know a man who has a fine orchard of Northern Spy, now thirty years old. It has never borne a full crop, and frequently, for two or three years, it does not bear at all. Northern Spy is emphatically self-sterile. He has Rhode Island Greening planted alongside, but it blossoms ten days earlier, and its blossoms are gone before Northern Spy opens. He was very much worried and asked me about it. I was sorry to say that at the present time I could not recommend a good variety for the pollination of Northern Spy. Perhaps some of the members know of one.

Mr. Brodie—St. Lawrence and Northern Spy blossom about the same time. I have only a couple of trees of Northern Spy, and last year was my first crop. I have kept track of the blossoming periods all this year, to assist Mr. Macoun, and I found they blossomed at the same time. I received about half a barrel off the tree last year, and the same this. Northern Spy is not hardy so far north.

Professor Waugh—The exact observation of blossoming periods is of great importance, and a good deal of work is needed among orchardists and experimenters upon this line. With regard to plums, for two years I worked over all the varieties I could get hold of, and about a year ago I published the results I

obtained in the form of a chart, including 137 varieties, and showing the blossoming periods of each. This year I have gone over a large number of Canadian and American varieties, through the kindness of Mr. Macoun and others, and I have revised my list. I hope soon to have the opportunity of working on apples.

Then after we have taken our blossom notes the question arises whether we can depend on varieties blossoming in the same order year after year. I have made extensive studies on that subject, and I find that for all practical purposes we can. There are exceptions, and some of them very striking and disconcerting; but if you watch your own orchards you are very unlikely to find serious variations from the rule.

Another question is whether observations taken in one locality are applicable to another. For instance, I have been making a number of experiments away down in Maryland. Are they of any value here, where the climate, season and varieties are so different? Other investigations which I have made seem to show that they are. In a general way they indicate the order of blossoming correctly, but they are not so safe as observations made in the immediate locality.

The duration of the blossoming period is also of importance. I was surprised to find a very wide divergence of opinion on this point. One man says that a plum is seldom open for pollination more than a day, and the actual time of pollinizing may be only a few hours or even an hour. Another, a careful experimenter, wrote me that certain varieties in Colorada stayed in blossom 27 days. I think he made a mistake on the other side. No doubt there were straggling blossoms hanging on his trees, but it is clear that there were not 27 days, during which it was possible for pollination to take place, especially as he said he had a long and severe snow storm during that time. According to the best observations I have been able to make, a variety is practically capable of pollination from two to five days, according to the weather. When the weather is good and everything is favorable, a tree will be fully pollinated inside of one day. On a fine warm day the bees get to work about nine in the morning (the "busy bee" does not begin till then), and they knock off about four in the afternoon. During that time they all pollinate the trees and provide for the entire crop. Next day the stigmas are drying up, and the bees are off to some other tree. But if the weather is unfavorable the process is prolonged, and the blossoms may hang on for a week or two. The importance of this question is in adjusting varieties to each other with respect to their blossoming periods. We cannot depend for pollination on varieties which are more than four or five days apart.

This question of self-sterility is largely one of degree. One variety is partially self-sterile, another more so, another absolutely. In certain cases you will get a very fair crop of plums or grapes without any cross-pollination, but you would get better results with it. It is like the difference between the crops of an unmanured and a highly fertilized field. There is also frequently a very striking difference in the size and appearance of the fruit. In some cases the

quality is considerably improved by cross-polination. Considering the small trouble involved in mixing varieties or inter-grafting, I think the return is well worth the outlay.

Mr. Shepherd—Professor Waugh tells us that with fine weather the entire pollination of a tree will be effected in one day, but in bad weather the process is postponed till the bees can get to work. May not that account for the fact that in some springs we have profuse bloom and a small crop of apples. There may have been a long spell of unfavorable weather when the trees were in bloom so that pollination is not thoroughly effected. The weather is evidently a very great factor in pollination.

Professor Waugh—Yes, indeed.

Mr. Newman—Would the rain wash the pollen away entirely ?

Professor Waugh—Usually not. I do not think it could be washed off the stamens. A good day of sunny weather settles the matter. Under the most favorable conditions four or five hours would be sufficient.

Mr. Newman—How long does the unpollinated blossom hang on the tree ?

Professor Waugh—Usually a week or ten days.

Mr. Newman—The blossoms that are thrown off the tree are not pollinated ?

Professor Waugh—With regard to plums I am sure of it, and I think it is true generally.

Mr. Hamilton—Is there no means of making the blossoms able to pollinate themselves ?

Profesor Waugh—No, I think not. Highly bred and cultivated varieties are perhaps less likely to pollinate themselves than wild fruits. But the point has not yet been thoroughly established.

Mr. Hamilton—I kept lists for the Professor at Cornell, and I noticed some very peculiar things as to fertilization, and the lack of it under different conditions. A gentleman sent me an Orleans plum, and I planted it near some common wild plums. This year both blossomed freely, but we only got a dozen plums. The blossom remains on the wild plum a much longer time, and though the other was a little later there was time for pollination. One would think that as they blossom about the same time the Calville varieties would fertilize the Rinette varieties. Would a heavy shower of rain which continued throughout the day destroy the gumminness of the stigma or wash away the pollen?

Professor Waugh—Not for a day, but if it continued for four or five days it miugt.

Mr. Macoun—In 1895 Mr. John Craig saw the importance of blossoming periods, and had 15 or 18 of the best fruit growers in the Dominion collecting records. Unfortunately he was not able to publish them before he left the Farm, but we hope to do so shortly. In the meantime I have the data and should be glad to furnish information as to the well-known varieties. I see the importance of this work and intend to push it vigorously in the future.

THE FRUIT CROP AND THE FRUIT MARKET.

By JOHN CRAIG, Ithaca, N. Y.

It is with a feeling of genuine and deep regret that I find it impossible at this time to meet with my friends the members of the Quebec Pomological Society at their annual summer convention. In lieu of my personal attendance I send you, in the form of "observation notes," outlines of some phases of the fruit industry more or less prominent at the present time, in New-York and the Western Middle States; but first let me say a word about the year's crop: Rarely have we had a season that has emphasized so strongly the assumption that conditions of heat and moisture immediately following the blossoming period, determine, other things being equal, very largely the amount of fruit that a tree will carry to maturity. Blossoms were almost universally abundant throughout New York State. At Ithaca fruit set fairly well during an almost continuous rainfall. A period of hot dry weather with occasional violent thunder storms followed; nearly all the tree fruits except plums of the Americana and Japanese types tumbled off. The life processes were evidently "knocked out of gear" putting it more graphically, than scientificlaly and the trees unburdened themselves as much as possible in the readjusting effort. So far as I can learn the winter apple crop will be very light in New York, light in Michigan, Illinois, and Iowa and moderate in Missouri and Arkansas. Missouri and Arkansas, the latter the state of the "big red apple" and the former the adopted home of the Ben Davis—are fast becoming the most important apple producing centers west of the Mississipi river. Large quantity of Ben Davis, Missouri Pippin, and Arkansas Black from both of these states found their way into the British and European markets last winter. At the Trans-Mississipi-Exhibition now in progress at Omaha, Nebraska, Ben Davis of last year's growth holds a prominent place in the exhibits of these states.

A WORD ABOUT A WESTERN MARKET

In passing through Chicago a month ago I took occasion to spend some hours on South Water St., the great produce distributing point for the Middle West. Here the early peaches of Georgia compete with the strawberries of Illinois and the cauliflowers of California with the pease of Michigan. It is a huge market covering a half or three-quarters of a mile of a wide thoroughfare, the sidewalks piled high with all kinds of packages, having a range in variety from cooped chickens, through butter and cheese to fish and fruit; the street jammed with drays and damning drivers, and in the background on each side, the capacious cold storage chambers. From the scenic and spectacular standpoint the market is worth visiting. However what I really wanted to say was that American plums, particularly of the Wild Goose, Miner and Wayland types were represented with, to me, astonishing fullness. The evolution of this fruit has been remarkable. In passing I venture to hope that Quebec fruit growers have not lost sight of the potential value to them of the Americana section of our native plums. To return to the market. Duchess apples were there in

quantity and I was surprised to find that Yellow Transparent was comparatively unrepresented while Red Astrachan was in no sense a competitor of the regal Duchess.

PACKAGES.

One is struck by the neatness of the Californian package, the nicety displayed in packing and the accuracy of the grading. Peaches and pears wrapped in a cheap grade of printing paper put up in twenty to fifty pound boxes; cherries and plums carefully "rowed" and faced. Cheap Chinese labor is responsible for much of this exactness and precision. The adoption of small packages for the marketing of the early, perishable and high priced fruits marks an epoch in the evolution of the fruit package. Will it not pay us to dispose of a larger proportion of our early and handsome but perishable apples in this way?

SOME REFLECTIONS.

In looking over the progress of fruit growing in varied and widely separated regions, one cannot fail to note development, well defined, along two or three lines common to all. It appears that there are at the present time two markets open to the grower of fruits. 1st. The commercial market—the open market free to the competition of the world. What in the fruit products are the governing factors in this market? I would say—first, a shipping texture—second, attractive appearance—third, good quality. These are from the selling standpoint. In this market where fine quality is not the first desideratum, competition is keen and the margin of profit narrow. To meet the demands of this market, what should the grower cultivate? Manifestly *productiveness* and *appearance* are of prime importance, shipping and keeping properties next in order, with quality as affecting dessert value last. In other words, he aims to produce a large quantity and hopes to secure average prices.

The second market is somewhat different in character and may be designated a personal market inasmuch as the producer endeavors to place himself in actual contact with the consumer. This consumer probably wants an article of extra fine quality and is willing to pay a premium for such a product. It is a market then, where quality ranks higher than quantity. To meet it the grower must produce fruit of fine quality, handsome appearance, and must deliver it in a neat and attractive form. Fine appearance and good quality are not always associated with productiveness so that while the product brings more in the market the cost of production is also increased. These, it seems to me, are the two markets open to the fruit grower of to-day. His environment and natural bent should determine the choice he ought to make. Too many fruit growers belong neither to the one class or the other, lacking in quantity and kind for the open market and wanting in quality and kind to suit the personal market.

The trend of the age in fruit growing, as in other lines, is towards specialism. The question is what class of fruit or variety of fruit can each man grow to best advantage. This must be answered by the grower himself and having done so,

he then proceeds to grow better fruit of that particular class or kind than any one else. In connection with this I think there is a big subject for thought and action on the part of the fruit growers in selecting and propagating only from the finest types of each variety. We do this in animal breeding, why not in plant propagation? Who is there who has not one Fameuse tree that bears nearly every year better apples and more of them than its neighbors under the same conditions. Why not propagate from this one? Why not topgraft some of those chronically unprofitable ones with scions from the good tree—and so with St. Lawrence, Bourassa, Wealthy and Canada Baldwin. Have we not paid too much attention to the variety, and not enough to the individual? There is infinite variation in nature and *man* the *cultivator* should select only the best.

With pleasant recollections of our former meetings and best wishes for a profitable round up at this session, I am,

Yours sincerely,

JOHN CRAIG.

Mr. Hamilton—Mr. Craig has drawn our attention to considerations of very great practical importance. Neat packages, and attention both to size and color, make a great deal of difference in the price obtained. Quality again is not always necessary for commercial success. Ben Davis, for instance, is a very poor apple, but it often sells exceedingly well.

Mr. Shepherd briefly expressed the pleasure of the Society in visiting Cowansville, and their gratitude for the interest shown by the residents in the proceedings, especially for the presence of a number of ladies. It was a lady who influenced a man to take the first apple, and the Pomological Association were always pleased to see them. He moved the following resolution, which was carried amid applause:—

The compliment was acknowledged by Mayor McKinnon and Senator Baker, who expressed their sense of the advantage to be derived by the locality by papers and addresses such as they had heard.

The proceedings then terminated.