ANNUAL REPORT

OF THE

POMOLOGICAL AND FRUIT GROWING SOCIETY

OF THE

PROVINCE OF QUEBEC

1895

MONTREAL
THE GAZETTE PRINTING COMPANY.

Sir Henry Joly

J. M. Fisk.....

R. W. Shepherd...

J. C. Chapais.....

W. W. Dunlop.....

No. 1 District—G.

" 2 " S.

" 3 " J.

" 4 " Sir

" 5 " Aug

" 6 " Dr.

" 7 " E.

" 8 " D.

" 9 " R.

LIST OF OFFICERS.

FOR 1895.

HONORARY PRESIDENT

SIR HENRY JOLY DE LOTBINIÈRE ..... Quebec.

HONORARY VICE-PRESIDENT

J. M. FISK..... Abbotsford.

PRESIDENT

R. W. SHEPHERD..... Como.

VICE-PRESIDENT

J. C. CHAPAIS..... St. Denis.

SECRETARY

W. W. DUNLOP..... Outremont.

DIRECTORS

No. 1 District—G. B. EDWARDS..... Covey Hill.
" 2 " S. A. FISHER..... Knowlton.
" 3 " J. M. FISK..... Abbotsford.
" 4 " SIR HENRY JOLY DE LOTBINIÈRE ..... Quebec.
" 5 " AUGUSTE DUPUIS..... Village des Aulnaies.
" 6 " DR. GRIGNON..... St. Adèle.
" 7 " E. A. BARNARD..... Quebec.
" 8 " D. PYKE..... Hudson.
" 9 " R. BRODIE..... St. Henri.

LIST OF MEMBERS, 1895.

Ayer, A. A.....Montreal.
Abbotsford Fruit Growers Association.....Abbotsford.
Alleyn, E. R.....Ste. Marie, Beauce Co.
Ainslie, James.....Outremont.

Bachelder, Jethro.....Rougemont.
Bradford, R. C.....Abbotsford.
Buzzell, E. A.....Abbotsford.
Brousseau, Miles.....Abbotsford.
Buzzell, G. W.....Abbotsford.
Brodie, R.....St. Henri.
Barnard, E. A.....Quebec.
Blanchard, Joseph.....Abbotsford.
Bell, Andrew C. E.....Almonte, Ont.
Beer, E. H.....Clarenceville.
Bourque, M. L'Abbé.....St. Alexandre, Kamouraska Co.

Castel, Emile.....St. Hyacinthe.
Chapais, J. C.....St. Denis, Kamouraska Co.
Carter, J. H.....Massawippi.
Campbell, R.....Quebec.
Caldwell, E.....Knowlton.
Crossfield, S.....Abbotsford.
Coupland, James.....Shefford Mountain.
Carbourreau, Rev. C. A.....St. Cecil du Bic.
Craig, W. & Son.....Abbotsford.
Cooke, G. E.....Outremont.
Cross, W. H.....Montreal.
Cross, E. L.....Bridge End, Ont.

Douth, L. E., Curé.....St. Leonard d'Aston.
Duggan, W. E.....Murray Bay.
Dunlop, W. W.....Outremont.
Dupuis, A.....Village des Aulnaies.
Davidson, Joseph.....Como.
Decarie, Jeremie.....Notre-Dame de Grace.
Decarie, Telesphore.....Notre-Dame de Grace.

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

Fisk, J. M.....Abbotsford.
Fisher, S. A.....Knowlton.
Fisk, Newell.....Montreal.
Fulton, James.....St. Vincent de Paul.
Fisk, H. C.....Abbotsford.
Fisk, C. O.....Abbotsford.

Grignon, Dr .....St. Adele.
Graham, W.....Hudson.
Gareau, J. J .....St. Roch l'Achigan.
Gibb, J. J.....Como.
Godreau, F.....Abbotsford.
Giroux, N. J.....River Beaudette.

Herrick, J. E. R .....Abbotsford.
Hamilton, R.....Grenville.
Heatlee, W.....Stonefield.
Horsey, Rev. H. E.....Abbotsford.
Hodgson, W. H.....Hudson.
Harrison, T. L.....Outremont.
Hardisty, J. A.....Westmount.
Hodgson, E. A.....Hudson.
Halcro, W. F.....Hudson.
Hampson, Robert.....Montreal.
Hodgson, W.....Hudson.

Joly, Sir Henri de Lotbinière.....Quebec.
Johnson, Asa .....Cowansville.
Joyal, Hormidas.....St Michel de Yamaska.

LaRocque, G .....Quebec.
Lancaster, George.....Hudson.
Leger, A.....Como.

Marshall, W.....Abbotsford.
Morris, William.....Sherbrooke.
Mullan, A. W.....Hudson.
McGibbon, D. D.....Brownsburg.
McKerley, Mark.....Abbotsford.
McCabe, John.....St. Marthe.
McNeil, W. D.....Hudson.
McColl, H.....St. Joseph du Lac.
McNaughton, John.....Hudson.

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

Price, Herbert M .....Montmorency.
Paradis, E.....Charlesbourg.
Pattison, W. M.....Clarenceville.

Pyke D.....Hudson.
Park, Arthur W.....St. Marthe.
Park, James.....Hudson.

Richard, Rev. M. C.....St. Gervais, Bellechasse Co.
Robinson, Robert.....St. Amedée.
Roach, G. E.....Abbotsford.
Robinson, Mrs. F.....Abbotsford.
Robinson, E. N.....Granby.
Robson, James.....Outremont.
Riopelle, H. A.....St. Esprit.
Robinson, W. R.....Como.

Shepherd, R. W.....Como.
Savage, J. G.....Montreal.
Stuart, G. G.....Quebec.
Sicotte, E.....Boucherville.

Thompson, W.....Hudson.
Thompson, H.....Hudson.
Tessier, F. D.....Mount Oscar.

Verret, J.....Charlesbourg.
Verret, J. F.....Charlesbourg.
Vipond, Jacob.....St. Marthe.

Wood, Hon. Thos.....Dunham.
Wonham, W. R.....Montreal.

TABLE OF CONTENTS.

POMOLOG

The Pomolo
its second winte

The Society
Private Bills Co

Rev. Mr. Da
W. Shepherd, jr
Abbotsford; W.
John Craig, of t
Aulnais; R. Han
Minister of Agri
Secretary of the
and others.

The presiden
retary Mr. R. Ha
were submitted b

The secretary
showing the recei

Financial sta
Province of Quebe

Gove
Mem

Stati
Repo
Posta
Direc
White
Secre

THE POMOLOGICAL AND FRUIT-GROWING SOCIETY

OF THE

PROVINCE OF QUEBEC.

The Pomological and Fruit-Growing Society of the Province of Quebec held its second winter meeting at Quebec in the Legislative building.

The Society met on Tuesday the 11th Dec. 1894, in the Chamber of the Private Bills Committee, at 3.30 p.m. Present:—

Rev. Mr. Dauth, St. Leonard d'Aston; J. C. Chapais, Sidney A. Fisher, R. W. Shepherd, jr., Hon. Joly de Lothbiniere, D. Pyke, Hudson; J. M. Fisk, Abbotsford; W. W. Dunlop, Outremont; Cecil Newman, Lachine; Professor John Craig, of the Experimental Farm, Ottawa; Auguste Dupuis, Village des Aulnais; R. Hamilton, Grenville; Dr. Grignon, St. Adele; G. A. Gigault, Deputy Minister of Agriculture, Quebec; E. Castel, St. Hyacinthe; Ed. A. Barnard, Secretary of the Council of Agriculture, Quebec; Geo. Edwards, Covey Hill; and others.

The president, Mr. J. M. Fisk of Abbotsford, took the Chair, and the secretary Mr. R. Hamilton, of Grenville, read the minutes of the last meeting, which were submitted by the president and approved of.

Financial Statement.

The secretary then read the following financial statement by the treasurer, showing the receipts and expenditures:—

Financial statement of the Pomological and Fruit-Growing Society of the Province of Quebec for the year 1894.

Receipts.

Government Grant	$500 00	
Members subscriptions	56 00	
		$556 00

Expenditures.

Stationery and Printing	$ 42 80	
Reporting meetings	90 00	
Postage	11 00	
Directors expenses attending meetings	104 11	
White, Duclos & O'Halloran	25 00	
Secretary Treasurer	50 00	
		$322 91
		$233 09

Mr. R. W. Shepherd explained the delay in getting out the report. It was thought better to have the reports of the winter and summer meetings in the one volume for the whole year's transactions, and the report was in the hands of the printer and would be distributed in a few days.

Prof. Craig.—Is it not usual to have the financial statement audited by an auditor appointed by the Society ?

Mr. Shepherd.—As vice-president and one of the executive officers, I asked Mr. Dunlop to audit the accounts. The financial matters have been somewhat rushed in consequence of the money grant from the Government having only been received a few days ago.

Mr. Barnard.—The moment the Society is told that Mr. Dunlop was requested to act as auditor, that is perfectly satisfactory.

Mr. Dunlop.—No provision was made to audit the accounts this year. It might be well to appoint an auditor now for the ensuing year.

Mr. President.—If I take the sense of the meeting rightly, there is no objection to the present account being accepted with Mr. Dunlop's audit.

Mr. Dunlop.—I simply examined the accounts at the request of Mr. Shepherd.

Mr. Hamilton.—The expenses of all the directors are still to be paid.

Mr. Shepherd.—That will go to next year. This is the third meeting within nine months, and the expenses at this meeting will go into next year.

Mr. Fisher.—Would you not get over the difficulty by nominating Mr. Dunlop now as auditor for the past year and accepting his report ?

Mr. President.—There is no objection whatever to that. I should be glad to see Mr. Dunlop act as auditor. Last year he refused the position of secretary for reasons which have since passed away.

Mr. Fisher.—I move that Mr. Dunlop be now nominated to audit the accounts up to the present time. This motion was seconded by Mr. Shepherd and carried.

Prof. Craig moved that the annual report be received and adopted. Motion agreed to.

The President's Address.

Mr. President.—I have prepared a few notes as retiring president, which I think, I should read before the election of officers takes place. With your permission, I will read them : —

Mr. Chairman, Ladies and Gentlemen :

It is with pleasure that we find ourselves gathered here to-day, to hold the first annual meeting, since the organization, of the Pomological and Fruit-Growing Society of the Province of Quebec, and quite in accord with our title as a Provincial Society, that we meet at the capital of the province, in the grand old City of Quebec, during the sitting of its Legislature.

We are under obligations to the Local Government, and the provisional committees for so generously placing a portion of this building at our disposal, and otherwise facilitating the progress of this meeting ; and I feel that I but

voice a general sentiment of our friends and delegates from the different parts of the province, when I say, that we heartily appreciate every effort of our friends at Quebec, for the provisions they have made for our comfort, and the ultimate success of this meeting.

As this Society is of recent birth and still in its infancy, I may be pardoned if I allude to its organization, and in a humble way offer a few suggestions.

The Montreal Horticultural Society has represented the provincial interests of the fruit-growers for the last fifteen years; its charter being amended in 1878, to combine with the Fruit-Growers' Association of the province, and is known as the "Montreal Horticultural and Fruit-Growers' Association of the Province of Quebec"; and, owing to its membership and interests being largely local, it was found that it did not meet the requirements as a provincial society in the full sense of the term. Hence in 1893, the Provincial Government was approached by petition, through the local associations of L'Islet, Brome, Missisquoi, Shefford, Abbotsford and others; and its management placed in charge of a committee consisting of Messrs. Dupuis, Shepherd and Dunlop, for the formation of a strictly provincial society.

The petition was favorably received by the government, and after conforming to the necessary formalities according to the Act, public notice was given in the Official Gazette under date of November 14th, 1893, "that a Horticultural Society had just been formed under the name of the Pomological and Fruit-Growing Society of the Province of Quebec."

Consequently, the provincial committee took the necessary steps for convening as early as possible a meeting of the members and its supporters, for the purpose of organizing, and adopting a Constitution, By-laws, etc.; which meeting was held at Abbotsford, on the 8th and 9th February, 1894, and was well represented by the fruit-growers of the province, and also by a deputation from the Experimental Farm at Ottawa, when a successful and interesting meeting was held, and a representive board elected, comprising a President, Vice-President, Secretary and Treasurer and nine Directors, who were residents of the divisions for which they were elected, thus forming an electorate truly provincial in its character.

The summer meeting was held at Knowlton in the Pettes Memorial Hall on the 14th and 15th August, and it may truly be said "that our lines fell in pleasant places," under the auspices of the Brome County Horticultural Society and the hospitalities of its President, Mr. Fisher, and the people of Knowlton generally; all were unanimous in pronouncing the meeting a success, and the society received an impetus which promised well for its future usefulness.

The general interest awakened in the discussion of the different subjects presented at such meetings goes to prove, that its interests are not confined to the agricultural and farming community only, but are much more widespread, embracing all classes; non-political, as well as non-sectarian. The man of business, the professional man, those living in affluence as well as the humblest peasant of the land, all are interested in those choice gifts of the orchard, garden and forest, which add so largely to the comfort, refinement and health of all, whether residing in country or town.

There is no branch of agriculture of greater importance than that which gives us a better knowledge as to how to select, grow, and care for the fruits, flowers and trees of our country.

How many a neglected home could be beautified and made more homelike, more attractive to the youth whose desire is so often to leave the farm and home, if more attention were given to the planting and cultivation of a few ornamental trees, shrubs, small fruits, hedges, flowers, or any of those attractions which tend to fix the mind, and create a love for the surroundings of home and its influences. We should hear less of the evils of the exodus, the crowding of factories, and the keen competition which is to be met with in all the business and professional callings of the present age.

We are living in a progressive age, and agriculture being the acknowledged foundation of every prosperous nation, it is gratifying to note that Canada is alive to this important fact. By the introduction of her experimental stations, doing such good work, and by organizations similar to our own, we are brought into closer touch with this progress and other efforts made by the government to advance the development of those natural resources which are special to a climate like our own.

One of these is the Dairy interest, and through the valuable assistance rendered by the Experimental Farm, we have to-day Dairy Schools and Dairy Associations which through their practical and systematical teaching, have placed our dairy products for quality, at the head of the list. And this is practically what this Pomological Society should do for the fruit interests of this province. The same energy of purpose on our part, accompanied by the same fertility of soil and climatic influences which impart that high flavor and gilt-edge to our dairy products, will give to our fruits that color and quality which are acknowledged to be unsurpassed by any country. And here the question suggests itself, what shall we plant?

This is an important question and can be answered only by those having experience. A variety of fruit which is perfectly hardy in Huntingdon County, in the southern part of the province, might be wholly unfit for Kamouraska County, in the northern part. We want fruit lists, adapted to the different sections of the province, and in order to procure these it is necessary that we have the experience of those living in those sections to which the lists apply. Such information can be gathered by the appointment of a committee to prepare a list for each division, or at least to cover the province by sub-dividing it into three sections for such a purpose, one to embrace the southern portion of the province, another the central, and the third the northern, or all that section north of Quebec. Also, that these lists, when published in our reports, should be revised year by year, or at such times as the Society holds its meetings within the limits of the district to which the list applies.

Such lists would be a guide to planters, and might contain, besides the apples, pears, plums, and small fruits, the nut-bearing trees suitable to our climate; also the hardiest varieties of vines and shrubs, especially those best adapted for ornamental and hedge purposes.

We are indebted to the government for the printing of our reports, which has been done in the English and French language, and when distributed, I hope will tend to increase our membership and interest in the work of the Society.

A move is being made to affiliate the agricultural clubs and local fruit-growers' associations as a part of our organization, which will entitle them to receive our reports and enable us to extend to them any assistance in our power as co-workers in a common cause to the best interests of the province.

In conclusion, as retiring president, I beg to return thanks for the honor conferred in electing me as the first president of this Society, and in accepting that charge, I did so with a knowledge of my inability for so responsible a position, feeling that the mantle had fallen upon Abbotsford rather than upon me personally, because of its pioneer work through its nurseries and its notoriety as a leading fruit section of the province; also that it was the home and site of the experimental work so largely entered into by the late Mr. Chas. Gibb.

NOTIFICATION OF MEETING.

Mr. Barnard.—I think that Quebeckers owe an apology and an explanation. I must say that until half an hour ago I was not aware of this meeting. I learned some days ago from Mr. Joly that you were coming to Quebec, but I did not hear of the date and hour until to-day, when Mr. Shepherd gave me the information. That, no doubt, explains why more Quebecers are not present, as if we had received notices no doubt three hundred or four hundred of us would have turned up.

Mr. Shepherd.—I did not receive my notice until last Saturday.

Mr. Chapais.—I received a notice, as director, to go to Montreal about the middle of November for a meeting of the Board of Directors to prepare for this meeting. That is the only way I heard of it until last Saturday when I received a programme.

Mr. Hamilton.—I think this is very extraordinary, because as soon as the programmes were printed they were sent to every member upon the list, and that was about ten days ago.

Mr. Chapais.—I did not receive it until last Saturday.

Mr. Hamilton.—That is very extraordinary. The fault must be with the mails. They were certainly mailed.

Prof. Craig.—I received none, but concluded from the Quebec papers of several days ago, which published the programme, that there would be a meeting, and the news-reading public should have seen this at any rate. It came to me through the Press Bureau from Ottawa, and was published in the papers about a week ago.

Mr. Dupuis.—The programmes were certainly published in the French newspapers, and we received our notice in time.

Mr. Shepherd.—The programme was published in the Montreal papers in French and English and in the Quebec papers. The first meeting of the directors was in November, and it devolved upon those present at that meeting to draw up, as well as they could, a programme. Then there was a second meeting called and considerable work done. The bulk of the work was done by the executive committee in Montreal, consisting of Mr. Dunlop, Mr. Hamilton and myself, and it was rushed through as quickly as possible. The chief difficulty was that the

first meeting of the directors was not called early enough. Mr. Hamilton had to wait a considerable time to get the names of the different members of the Cercle Agricole before he could despatch his programme.

Mr. Presdt.—I quite agree that in the future more attention should be paid to holding meetings early enough and giving longer notice. There was only a month or two between the meeting of the directors and the meeting at Quebec, and there should be at least three months.

Mr. Chapais.—The directors ought to receive notice of the meetings of the board a little sooner. The first time, I received my notice on the 5th for the meeting on the 6th, and, of course, could not go.

Mr. Hamilton.—The notices to the directors should be registered.

Mr. Fisher.—The notices for the directors of the Agricultural Societies are not legal unless registered eight days before the meeting.

Mr. Hamilton.—With regard to the difficulty about the programmes, a number of the gentlemen who were asked to make addresses did not answer, and we had to wait a long time before we could arrange a programme, which left us a very short time to get them printed.

Mr. Fisher.—The meeting has been a little difficult to manage. We had decided to hold it in January at St. Johns, but afterwards concluded that it would be better to meet during the session at Quebec.

Mr. Shepherd.—Last year it was resolved to have the meeting at St. Johns in the winter and the summer meeting at Knowlton, but then we decided to hold our winter meeting instead at Quebec during the session, and that has rushed things a little. The whole trouble is due to the fact that the directors' meeting to organize this one was not called early enough. It should have been called two months earlier.

ELECTION OF OFFICERS.

Prof. Craig.—In the sister society to this in Ontrrio they have a method which facilitates the election of officers in shorter time. I would suggest that a committee be appointed to meet to-night and make nominations, which will be presented to the meeting to-morrow morning. I beg to move, therefore, that a nomination committee, composed of the following persons, be appointed to nominate the officers of this Society and to report to the meeting to-morrow morning, namely, Messrs. Barnard, Dupuis, Shepherd, Edwards, Fisher and Dr. Grignon.

Mr. Shepherd seconded this motion which was agreed to.

LOCAL ADVISERS, AMENDMENTS TO CONSTITUTION, ETC.

Mr. Barnard.—I know the great disadvantage from which the Province of Quebec has suffered in not paying greater attention to our fruit association, and there should be a great effort made to arouse general interest in it throughout the province. I was speaking to a gentleman from Chicoutimi respecting fruit-growing, and he told me, to my astonishment, that although the climate down there is very severe, and he thought at first the fruit could not be cultivated, yet

he found that four varieties of grapes, including the Niagara, ripened in Chicoutimi. If the Niagara ripens there, others may; and what we require is local committees in all such localities to promote active work. Our constitution might possibly require amendment in that respect, so as to get our Society spread in these localities where it is not now known. I would propose that a committee be now appointed to study what changes are needed and what other districts should be added to the nine already established, in order that the Society may work with greater efficiency. We have not sufficient representatives in distant districts such as Chicoutimi, Rimouski and Gaspe. We require active members there who will work to make the Society known and spread the culture of fruits. To that end we would require more districts.

Mr. Chapais.—How many districts are there now ?

Mr. Barnard.—Nine. We should have a district in Chicoutimi and Saguenay. Nobody from Lake St. John can be appointed to represent Quebec, and Mr. Joly will tell you that the representative of Quebec cannot work in Chicoutimi and Lake St. John. The same thing may be said of Gaspé and Bonaventure and Rimouski. That is a province by itself. A change is certainly required in the constitution. Our Dairymen's Association is composed of twenty-one districts. That may be too many, but it is a good means of spreading out the work of the Society. A committee should be appointed to consider the necessity of new divisions and what changes are required to make the Society as efficient as possible.

Mr. Shepherd.—The Dairymen's Association have a great number of directors, and if these directors had to attend all the meetings the expense would be very heavy If we had an executive committee composed of five or seven of the directors, who would do all the work, and then have a meeting of the full board only once a year, which is the plan the Dairymen's Association adopt, the change might work.

Mr. Barnard.—The question now is whether one plan is better than the other. Take Lake St. John, if we appoint one man ourselves as member of an advisory board, he may feel that after all he should be a director. The question of expense is now the only impediment. Can we meet that impediment and still have all the benefit of a director in each district ? I would suggest that we do not pay the directors for coming to the annual meetings. We are supposed to have sufficient interest in the Society to attend each annual meeting. It would be a great improvement if we had men who would come to our annual meeting at their own expense. Let us have twenty districts if necessary and a director in every district, and let those directors have their own executive committees as they like.

Mr. Dupuis.—I would suggest that this Society admits the principle of accepting, as affiliated members, the directors of the horticultural and agricultural societies and farmers' clubs throughout this province, without charge, from this to five years hence, and that the board of directors be authorized to frame an additional clause in our constitution for this purpose

Mr. Chapais.—The suggestion as regards the directors of horticultural societies is all right, but if we admit all the directors of the farmers' clubs and agricultural societies—there are nine in each society, and seven hundred of these

societies—we will have to print a very large addition to our report. We will have to print 6,300 additional copies.

Mr. Dupuis.—If the government publish the report at its expense, that will make our work all the better known.

Mr. Barnard.—I propose that we study this very question. The government now are giving a grant to every farmers' club, which, on an average, amounts to over $50. These fifty dollars are given for the improvement of agriculture generally, and certainly fruit-growing is a most important part of agriculture. If the government give fifty dollars a year to every parish or municipality for the promotion of agriculture, it strikes me that one dollar out of those fifty dollars should furnish just what Mr. Dupuis proposes. Then these societies will have paid their subscription and be entitled to the report and to be represented at our general meeting. We will thus be in touch with every parish in the province and have besides an additional revenue of about five hundred dollars ($500), which is very important, considering our very small grant.

Mr. Fisher.—As these are questions for the further improvement of the rules of our Society, it would perhaps be wise to appoint a committee to discuss and investigate the best way in which our Society may become known throughout the province and whether we can take such a step as is suggested. The suggestion of Mr. Barnard is one, I understand, which would require an absolute change in the law under which agricultural clubs are formed. I understand that he wishes to compel each club to join our Society.

Mr. Barnard.—By law these clubs and societies are bound to take from the Council of Agriculture instructions as to the expenditure of one-half the grants given to each. The grant being fifty dollars, the Council of Agriculture have the power to direct the expenditure of twenty-five dollars, and we ask that one dollar of that expenditure be given to us.

Mr. Fisher.—We would have to ask the Council of Agriculture for this, and there are other things we might also ask for. It would be wise for the committee to discuss these things and report to a future meeting. I would propose that this matter be referred to a small committee for discussion, composed of Messrs. Joly, Chapais, Dunlop, Dr. Grignon, Fisher, Shepherd and Craig.

Motion agreed to.

Prof. Craig.—We may have an exhibition of fruits. Would it not be well to appoint a fruit committee to report to the Society before it adjourns and also a committee whose duty it would be to draw up any resolutions we may desire to pass. I move that two committees, one on fruits and one on resolutions, be appointed. On the fruit committee I would nominate Mr. Hamilton, Mr. Pyke and myself.

Motion agreed to.

Prof. Craig.—I would move that the committee on resolutions be composed of Hon. Mr. Joly de Lotbiniere, the President, Mr. Fisher and Mr. Douth.

Hon. Mr. Joly de Lothbiniere.—The same committee which is appointed to consider the proposition of Mr. Barnard and Mr. Dupuis will consider the resolutions.

Motion, as amended, agreed to.

The meeting then took recess.

THE OFFICIAL OPENING.

11th December, 1894.

At 8.30 the official opening of the Province of Quebec Pomological and Fruit-Growers' Association, second winter meeting, took place in the Legislative Council Chamber, which presented a very striking and beautiful "coup d'œil." The seats usually occupied by the councillors were moved to the centre of the chamber and were filled with members of the Association and others interested in its good work, while on the clerks' table and another table alongside were set out the Association's splendid exhibit of apples, the whole making a display which, in point of color, appearance, size and quality, as well as variety, could hardly be beaten by any country in the world. Every one admired it and was loud in its praise. The exhibit also included a large number of new varieties especially adapted to culture in the eastern portion of the province. The principal exhibitors were Mr. Craig, of the Dominion Experimental Farm, and Mr. J. N. Fisk, of the Abbotsford Fruit-Growers' Association, while among the individual exhibitors were Messrs. G. B. Edwards of Covey Hill, R. W. Shepherd, Jr., Como; C. P. Newman, Lachine; D. Pyke, Hudson; J. C. Chapais, Kamouraska, and Aug. Dupuis, L'Islet.

The President, Mr. J. N. Fisk, showed some exceptionally fine specimens of Wealthy, also Winter Arabka and Blunt Seedling. Also some Longfields, a Russian variety, the Pewaukee, an American seedling, and Golden Russet.

Mr. J. C. Chapais showed a number of varieties suited for a winter latitude, grown in the latitude of Kamouraska. Among these were the Longfield and Titovka.

Mr. C. P. Newman, of Lachine, showed a number of varieties of seedling origin, promising in appearance and good in quality.

The Ottawa Experimental Farm exhibited twenty-five varieties, selected on account of hardiness of trees and keeping quality principally. They included two of the most promising of the Russian varieties, Winter Arabka and Bombarger. Also two of the promising American varieties, McMahon's White, Gideon and Scott's Winter.

Mr. R. W. Shepherd, Jr., of Como, showed fine specimens of Winter St. Lawrence, McIntosh Red and two seedlings.

Mr. G. B. Edwards, of Covey Hill, showed a number of the older varieties of better quality which cannot be grown in other portions of the province. Among these were some fine specimens of Northern Spy, Fallawater, Cabashea, Golden Russet and Spitzenberg

Mr. Dupuis, of L'Islet, one of the most northern portions of the province, showed a number of apples which are, on account of latitude, winter apples there though summer apples in other localities, thus bringing out the effect of climate upon the keeping quality of apples in a remarkable way.

The Abbotsford Fruit-Growers' Association exhibited twenty varieties of fruits composed of seedlings of local origin and specimens of the newer Russians all very fine, handsome in appearance, and mostly winter kinds, the Blue Pearmain, and other varieties of local fame. The Johnson seedling was exhibited, grown on a tree now eighty years old, located on the farm of the late Chas. Gibb

The Lieutenant-Governor and his A.D.C., Capt. Shepherd, the Hon. H. G. Joly and several others were present in evening dress and a number of ladies were accommodated with seats on either sides of the chamber. The Speakers and many members of both Houses, as well as three of the Cabinet Ministers, Messrs. Beaubien, Nantel and Pelletier, were also present to lend importance to the gathering. The Hon. H. G. Joly opened the proceedings by expressing the pleasure which the Association and all interested in its excellent objects felt at the honor conferred upon them by the presence of the representative of the Crown and the sympathy shown by him in its work in consenting to deliver the opening address.

THE LIEUTENANT-GOVERNOR'S ADDRESS.

The Hon. Mr. Chapleau, Lieutenant-Governor of the Province, then spoke as follows :—

MR. PRESIDENT AND GENTLEMEN,—

Allow me to begin by complimenting you on your very successful meeting. Your success shows how sympathetic and popular is your work, and your work could be neither, were it not at once both useful and agreeable. Those who hold that horticulture is but a hobby are greatly deceived. If it be a hobby, it is, at any rate, one which has a great many devoted adherents—one which has made itself *la mode*, that divinity numbering millions of worshippers. If horticulture, even that branch of it which deals only with flowers, be a fad, as certain narrow minded utilitarians have said, it is certainly the most inoffensive, the least costly, the most recreative, the least fatiguing, of the distractions which furnish to suffering humanity a relief from the pressure of work or the weariness caused by discussion. For the brain-worker it is the healthiest of recreations ; for those who have no work to do, especially for the rich, it is the most satisfying, the most absorbing of distractions. And I confess, that if I had the time and the means to give myself up to a fad, that is the one I would choose.

"You ought to practise botany on a grand scale at Spencer Wood," said a friend of mine to whom I was showing the beautiful property which the Federal Government has given to Quebec to be the residence of its First Magistrate. "Well," I replied, "it is not in the thistles, the nettles, and the poisonous ivy of politics, among which my life has been spent, that one learns to cultivate begonias and orchids: and, in any event, even had I the taste, I would be very fearful about planting a garden, because, having seen so many stones thrown into other people's gardens, I would dread seeing mine converted into a mound of rocks." You can easily understand, therefore, Mr. President and gentlemen, that the host of Spencer Wood had not even the qualification of being a novice in horticulture when he took possession of that superb domain. And yet, what a field for the arboriculturist and the horticulturist! The only drawback is that the lease is rather short. If even it were only for life, I would promise to convert the place into a garden of Hesperides—without the dragon, of course. As it is, however, one has hardly the time to study the historical souvenirs with which Spencer Wood is replete, in the few weeks one has yet to remain there, as compared with the number of years which have passed since those lived who people its history.

Last spring, in passing from the green-house to the large kitchen garden adjoining, the naive question suggested itself to my mind, whether the culture of flowers preceded that of the useful plants, and at the moment an apple tree covered with blossoms caught my eye and seemed to smile at the question. In fact, one would be very embarrassed to decide which was entitled to the precedence of age. As well might one ask if the taste for the beautiful preceded in man his appreciation of the useful. But why discuss the question. The beautiful and the useful are twin products of the intelligence and the human heart. The desire for them is innate to mankind. We all agree in admitting that floriculture has not yet succeeded in disclosing all the secrets of form, colour and perfume with which Eden greeted the first man ; and as regards the culture of plants useful to life, the command to labor, promulgated on the exit from the terrestrial paradise, gave that day an impulse to the culture of these plants which will only have completely accomplished its object when we again discover the seeds of that tree of life which a jealous creator feared to have touched by a too daring and imprudent hand. Let me add, to the honor of horticulturists and to the credit of their discoveries, that when we consider the astonishing improvements in their methods, and enjoy the savory, delicious and wonderful fruits of their labor, we are forced to acknowledge that they have, in a great measure, reconstituted the ancient Eden, and we cannot but perceive that they truly belong, by their genius, to the family of "ce dieu tombé qui se souvient des cieux"—the fallen god who remembers Heaven.

I, who am not one of you except in the admiration and sympathy I feel for you and your art, I feel, gentlemen, I must admit, altogether at a loss in attempting to speak of the one subject which, this evening, can have any interest for you. What shall I do? Shall I frighten you by repeating the nomenclature of root vegetables with their ignames of China, their rampions and scorzonera ; of green vegetables with their soldella marina, their sprouts and their lettuces ; of the root fruits with their sojas and their gourds ; and of the vegetable condiments, with their garlic, onions and tarragons? Should I speak to you of trees and their culture, of their regeneration by grafting, in its various forms, and of their propagation by planting in its different methods? No, all that would be very simple to you, gentlemen of the Horticultural Society, but to me it would be Greek, and I would not like to risk it. I remember too well the difficulty I had one day in replying in Latin to some young disciples of Cicero and Virgil ; and the utmost I dare attempt now is to tell you that I know something, in the class of annual plants, of balsamines, capucins, petunias, and convolvulus ; and among the bi-annuals of the gillie flowers, the myosotos and the pansies ; and of the begonias, the dahlias, the narcissus and tulips among the bulbous plants.

I would much prefer, if you had the time to listen, to speak to you of those eternal choristers of love and life, the roses, those queens of the woods and the field, which display loftily the blazonry of their glory, and behold without care, from the midst of their wealth of bewildering beauty and perfume, the advent of their young rivals, inscribed only yesterday in the golden book of the royalty of flowers. I might perhaps, having read some pages of Pierre Loti, tell you if, like him, I admire the chrysanthemum with its saucy dishevelled head, in turn anxious, frightened and dainty, according as it crowns itself with purple or gold, or snow or fire, or a flood of lace of sombre black, or a simple plume floating listlessly beneath its rosy tints.

But it is not to speak to you of these things that I came to your meeting this evening nor to tell you what I know or of what I am ignorant in horticulture. I came simply to give you the encouragement of my presence and my words, to thank you for having invited me to this brilliant and interesting session, to congratulate you, Mr. President and your colleagues, on the labours you have undertaken and the successes you have gained since your society has been organized. I came here to tell you that you are entitled to my congratulations and to those of the whole country, because you are one of the valiant phalanxes of the great army of tillers of the soil who are, at this moment, marching on to the conquest of the riches and the glory of our great and beautiful province.

It is a duty for me to tell you, as it is a pleasure for you to hear, and as it is a surprise for our neighbors to learn, that a remarkable phenomena is being produced to-day in the Province of Quebec. One would imagine that the earth had opened its womb to show the treasures of fecundity which it still has to reward its children; one may say that the soul of the nation has become aroused into a spontaneous movement of courage and energy. Long enough has the population of our province allowed itself to be called by its enemies, a disturbing element in politics, an anachronism in education, and a nonentity in agriculture. Without pausing to take up and reply to these calumnies, it seems as if the people, this valiant people, had said to themselves: "Well, we shall see. Let us have less politics and more business, less sentiment and more matter-of-fact, less enthusiasm and more forethought, less chivalry and more well-ordered charity. Our schools are filled with pupils; the learning our children have acquired, we will utilise, rather for the paternal estate than for the brilliant, but often arid fields of the liberal professions." From the school house to the farmers' club, there is but one step, and that is not the step which costs, but the step which pays. And this movement, started as a generous impulse of the soul, following the avowal of negligence and the firm resolve to reform, is being continued in full strength and power. Chicanery, jealousy, routine, have in vain sounded their alarms; the people scarcely pause to listen, so absorbed are they by the new idea they are pursuing and the work they are accomplishing. I do not think that I am wrong in saying that to-day the absorbing question with the immense majority of our people is the evolution, not to say revolution, in agricultural teaching—in the methods of exploiting the soil and its products, and as a necessary consequence the study of the economic conditions of that class so interesting and so numerous—the tillers of the soil. This question imposes itself on the pastor who instructs, the legislator who guides, the government which directs and the people who believe and wait, conscious of the value of their work, and confident in the greatness of its success.

As for myself, gentlemen, it is with emotion mingled with respect that I salute this movement providential for our country—a movement noble as the bursting forth of a generous thought, beautiful as the opening of flowers, consoling as the growing crop, and grand as the horizon just opened by Aurora. (Prolonged Applause.)

Hon. Mr. Joly de Lotbinière invited the Hon. Mr. Beaubien, who was a worker in the field of which Mr. Chapleau had so eloquently spoken, to add his mite to the words of encouragement spoken by that gentleman.

Mr. Beaubien.—How can I hope to find in my poor garden any flowers which will be acceptable or worthy of admiration after the brilliant display of the flowers of rhetoric to which we have been just treated; but if I cannot appeal to your imagination I can at least try to be useful. Sometime ago when I was in the beautiful valley of Naples, so dear to Italians, I saw a magnificent exposition of fruits, and I could not help saying to myself when shall we in Canada possess valleys so beautiful and productive as this? Later on I went to Chicago, and there saw the exposition of the Province of Quebec, and again this evening when I see the beautiful display of fruits that lie so temptingly before us, I feel that we have entered the path of progress in the growing of fruit as in the dairy industry. It is a very important branch which we are here this evening to discuss. On the agricultural tree, there is more than one branch, and a good agriculturist, like a good gardener, knows how to train his branches. By the method of grafting, he will take the recalcitrant wood out of the way of evil and conduct it into the path of good. That is, gentlemen, what you are doing. It is by means of grafting that all these delicious fruits are produced. He who grows only from the seeds he puts into the ground in the hope that he will thereby get first class trees, may sometimes find one; but to be sure of his crop he must take this plant and join to it a branch of the tree, the fruit of which has been tested and approved. He must take a graft or bud, as the case may be, for the variety he wishes to propagate and join it to this plant. That is what, gentlemen, you are teaching our population to do. I notice with pleasure that you hold your meetings in different parts of the province. That is, in my opinion, a strong title in your favor to our gratitude. Up to the present, the society of apple-growers was content to do good in its own centre. But imitating the great dairy industry, it now goes everywhere to sow the seeds of prosperity by showing the fruits of your labors everywhere, and thus spreading a knowledge of your art and a taste for it throughout the whole province. I congratulate you on your enterprise and goodwill, and I hope that all our legislatures will make it their business to sustain and encourage you and facilitate your industry.

There are many important branches, gentlemen, in your industry. Many of us come from old Normandy which is noted for its fine cider. When shall we see this fine Normandy cider flowing in our province? We have the climate, the soil, everything required. You can import a tree which produces the cider fruit. In Normandy they have practiced that art until now they have reached perfection. You know, gentlemen, that there are trees which we have grafted and from which we have succeeded in obtaining the best quality of apples to make the cider. In our province we have until now always held that to make good cider required not the best of apples, and that these should be taken from a tree which had come from the seed sown in the ground and not from grafting. Now, the opinion has changed, and in Normandy they graft the cider tree. That is an industry you can encourage and one which we have already begun with much success. Up to the present the work is done in great measure by our compatriots from France, but there is nothing to prevent our own people acquiring all the skill necessary to achieve success.

There is another industry, concerning which I expect a very interesting report from one of your principal members, Mr. Shepherd. I refer to the great industry of drying fruits. Unfortunately we cannot preserve our best kinds of

apples so as to have always a sufficient provision even for the wants of the family much less for export. There is quite an art in gathering the crop of apples, cutting the apples into small pieces, passing them through the drying process, and packing them into barrels ready to be put on the market when required. We must not forget that in horticulture as in agriculture, we must keep pace with the times and use all the latest improvements, because if we do not advance, we will go back. This industry of drying fruits is one which I hope to see introduced into this province. Mr. Shepherd, who visited Ontario at my request, in order to examine into this business, has put in my hands a most excellent report which I shall hasten to publish. I regret that I received it too late to embody it in my departmental report. Mr. Shepherd will tell us how to dry these fruits in the most economic manner, so that each farmer, if he cannot bring these fruits to where cider is made, may associate himself with some of his neighbors for the purpose of drying and preserving them for his family or for shipment at a profit when the market is favorable.

His Honor the Lieutenant-Governor has told us that we are assisting at an agricultural awakening in Quebec. I can bear witness to the truth of that statement. I do not claim any merit for myself in this awakening. The time simply had come, and everyone, old and young, is hastening to step forward in the way of progress and success.

Last spring the department distributed a number of fruit trees, from seventy-five to one hundred and twenty-five. These trees were furnished in great part by the Ottawa Experimental Farm, a number of citizens, and the Reverend Oka Fathers. The chief citizens in each county took the idea up and went in for the culture of fruit trees. Our intention was to create a taste for this culture among our farmers and make them better acquainted with our nurserymen, and I am glad to say that from all accounts the experiment has been a decided success.

What a magnificent province for the growing of orchards is ours! As you travel through, you cannot fail to be struck by the number of hills and valleys for this purpose. If our farmers would only take the thing up energetically, they could have, besides the crops they reap to-day, a much better-paying one. By planting your orchards in such fashion that there would be forty feet space between the trees on every side, so that you could use agricultural implements to advantage you could have your crops of cereals or vegetables as well as your crop of fruits. And the fruit crop can be made a very paying one. Our apples are known in England and on the continent, and all that we require, both for our fruits and our dairy products, is steamers fitted up with refrigerators, in which could be carried our butter, eggs and cheese, as well as apples and other fruits.

I hope, gentlemen, that you will not abandon our old "Fameuse," but will strive to give it back its youth. I remember when the Fameuses did not carry any spots, and with the use of ashes and other remedies, especially spraying in the spring to destroy the insects at the very time when they do the greatest injury, I have no doubt we can restore this queen of apples to its pristine glory.

I congratulate you, gentlemen, on the exposition you have made here. You must have taken great care of these fruits to be able, at this late season, to make so presentable a display.

I need not speak of the cultivation of small fruits, such as strawberries, because they are abundantly grown. Gooseberries and blackberries ought to be grown in greater quantities.

We look to you gentlemen to indicate the best kinds for cultivation in these small fruits which suit people who have but little land. There are also other fruits which we do not cultivate sufficiently We can procure pear trees from Russia that will resist our climate, and we ought to exchange as much as possible with Russia where the climate is colder than ours.

I shall not detain you longer. I came rather to listen than to instruct, and I came with the best of good will and pleasure, because I know the good you can do. Continue your work and the country will profit by your industry, and we will see in fruit tree culture a movement and expansion which cannot fail to be of great benefit to our province. (Applause).

Hon. Mr. Joly de Lotbinière.—As a great majority of the members of this Society are more familiar with the English than the French language, they have asked me to say a few words so as to explain to the meeting the purpose and object of the Association. When we look at such a result as we now see spread on the table, we can see at once, if not the purpose, at all events, the fruits of the work of the Association. The most useful part of its work, as I understand it, we do not see, and that is the attempt to encourage the planting of new orchards and the improvement of those now existing. We have two different kinds of work. The first is to try and get rid of the enemies which, year after year, are profiting by our neglect and have increased so rapidly—to try and restore the fertility to our fruit trees which they enjoyed before we allowed them to deteriorate as they have. When we consider that there is no branch of farming, if you take into consideration the space occupied by it, which yields so much pecuniary profit as the orchard, we will see the necessity of this. Yet, in many cases—of course I am not alluding to such orchards as have produced the fruit we see before us—there is no doubt the owners of orchards neglect them, and it is wonderful what good results the orchards still produce even with the little care given to them. Taking into account the superficial extent of these little orchards, they are really more profitable than any other part of farming. Therefore the first thing this Association must do is to teach our people to protect and improve their fruit trees and derive more profits from their orchards than they now do.

When we think of all the good a society such as this can do, we can feel, with all due humility, a certain amount of pride in taking part in such a work. When we think of the devotion of the man whom we must consider our chief and master, even now that he is gone from us—the late Chas. Gibb—who lay down his life in the work we are trying to prosecute, we cannot but feel a noble ambition and desire to follow in his footsteps. Very few people know what this country owes to Mr. Chas. Gibb. The first time I became acquainted with him was about sixteen years ago. I happened to be then, for a very short time, at the head of the Government of Quebec—my friends and I say, for the good of the province, the time was a little shorter than it ought to have been. One of Mr. Gibb's friends came to me and told me that Mr. Gibb proposed to go to Russia in order to study the fruits of that country, especially the apple tree, and to find

out what varieties could be imported and cultivated with advantage here. The moment I heard of this mission to Russia, I naturally, as anyone will understand, put the question: but where is the money to come from? We have, I said, no money to pay for sending a delegate to Russia to travel all through that country and study its botany, even although—as anyone must admit—the result would be very interesting and advantageous. But to my astonishment, Mr. Gibb's friend said to me: "But Mr. Gibb does not want any money." What?" I asked, "he proposes to go to Russia and spend months there in the interests of his province and does not want any money from the government!" The reply again came: "No, he does not." I can never forget the intense feeling of astonishment I experienced on hearing that a man was ready to cross the Atlantic and spend months in Russia in the public interests, solely for the love of his country, and without calling on the government to pay a cent. Mr. Gibb did not go once only, but twice. When he notified me that he wanted to go to Russia, the only favor he asked of me was that I should give him some credentials which would show the public authorities in Russia that he had the confidence of our government and that he was sent upon public business in order to study the fruit trees of that country and ascertain the best species for growth in Canada. He got the necessary letter from me, and he explored that country twice at his own expense. Then he went to nearly the opposite end of the world, China and Japan, in order to bring back—at his own cost also—those trees which might be cultivated with advantage in our province. On his return, he was seized in Egypt by the fatal sickness which carried him to his grave. He died all alone in Egypt, like a soldier who falls in battle while doing his duty. It is not only those who shed blood who render services to their country; and we should be proud of a man like Mr. Gibb and cherish his memory, and by every means in our power further the good work to which he gave up his life. (Applause.)

I would ask His Honor the Lieutenant-Governor to do us the kindness of addressing us a few words in language other than that in which he has already spoken so beautifully.

Hon. Mr. Chapleau.—It is very kind of you, Mr. de Lotbinière, to ask me to say a few words in English. I do not go so far as to say that in so doing you have thrown the apple of discord into my intellectual faculties, but I feel certain that some discordant notes must be the result, because I cannot at all happily combine my thoughts in the English language and not always in the French. You have been very happy in your reference to the late Mr. Gibb, and had you not so adroitly reminded me that you had been my predecessor in the chiefship of the State, I would have fancied that it was to me Mr. Gibb had made his request, because I remember having been equally astonished at Mr. Gibb's modesty, disinterestedness and devotion. I first met Mr. Gibb at Abbotsford, where I was acting as counsel in a celebrated case, and I met him afterwards when I was first Minister of the Province of Quebec. That was shortly after the time when, as you have said, the province cut untimely short your existence as Prime Minister. It may have been, as you intimated, that the province was mistaken and led astray by somebody who held the scissors; but, sir, as you have kept no bad feelings on that account, neither have I, and I always look back with happy recollection to the days when we sat on the opposite sides of the same House. I am happy here to be able to bear testimony to the disinter-

estedness and devotion to the practical arts of which the present display is so admirable an illustration. I came here, gentlemen, merely for the purpose of thanking you for the honor you have done me and of expressing my appreciation of the practical good you are doing I feel a deep interest in every branch of education and progress, especially in that most useful branch, which at present is experiencing a most happy awakening and impetus throughout the province. This industry of fruit culture is one which, as Mr. Beaubien has well said, can be made to benefit not only the scientists and the wealthy men, but the poor farmers, the men owning poor soil, but which soil may be well adapted for the cultivation of apples. I congratulate you, Mr. President and gentlemen, on your work and on your devotion to your country. (Applause.)

The Hon. M. Joly de Lotbinière then presented to the Lieutenant-Governor, on behalf of the Society, the handsome collection of fruits from Abbotsford.

Mr. Fisher.—It would not be fitting that we should separate without expressing our thanks to the Lieutenant-Governor and the Minister of Agriculture for their attendance and addresses on this occasion. I am sure that the words of appreciation which have fallen from them will be an encouragement to us to persist in our work. Up to the present the provincial association has done but little. There have been scattered efforts all over this province in fruit-growing, and it is the object of this Society to harmonize these scattered efforts and concentrate them in one centre, and by this means ensure more vigorous progress than in the past. By thus combining the work in different parts of the province, we expect to accomplish a great deal more than we could possibly do by desultory and disunited efforts in various directions. I am satisfied that this meeting in the city of Quebec, the headquarters of our province, will give a great impetus to our work. I am aware that in the more remote parts of the province where fruit-culture has been hitherto considered very difficult, certain individuals have achieved great success; and one of the objects of our Association is to have these results reported, so that other fruit-growers may derive advantage from their knowledge of these experiments and from the influence of example. It is well known that the cultivation of fruit is not only a source of profit but also elevates and improves those engaged in it, making them not only better agriculturists and horticulturists, but better citizens. This Association feels the greatest gratitude to His Honor the Lieutenant-Governor and to the Minister of Agriculture, and I take this opportunity of expressing our appreciation before we part.

Prof. Craig.—If I may claim the privilege, I wish to second the motion which Mr. Fisher has so well placed in your hands, Mr. President. I wish to do so for two reasons. In the first place I desire to express my gratification at being present at this magnificent gathering—on the occasion of the first annual meeting of the Pomological Society of Quebec—and also to express my appreciation at the honor which the Lieutenant-Governor has done us by attending this meeting. In the second place, I wish to emphasize some of the remarks which Mr. Joly de Lotbinière has so well made, with reference to the work of the late Chas. Gibb. I had the privilege of knowing Mr. Gibb very well. In fact I owe him a great deal for having assisted me early in life in gaining a knowledge of horticultural matters. It may not be known to all of you, ladies and gentlemen, that in my official position I represent the Experimental farm at Ottawa as horticulturist.

We have heard what Mr. Gibb has done for the province for the promotion of fruit-growing interests, and I am glad to say that we have evidence on the table before us that his labors have not been in vain. I would show this apple as an evidence of the fruits of his labors—the Arabka. This apple, while not introduced directly by himself, was brought into Canada through his efforts, and is now being cultivated, and I have no doubt that in the near future it will become one of our leading varieties, and so commemorate his good work. I have much pleasure in seconding the motion of Mr. Fisher.

Motion agreed to.

The meeting then adjourned until the following morning.

QUEBEC, 12th December, 1894.

The Society met at 10 a.m.

ELECTION OF OFFICERS.

Mr. Barnard read the report of the committee on nominations. The following nominations were made: Honorary President, Hon. Mr. Joly de Lotbinière; Honorary Vice-President, J. M. Fisk, of Abbotsford; President, Mr. R. W. Shepherd, Jr., Como; Vice-President, Mr. J. C. Chapais, St. Denis; Secretary, W. W. Dunlop, Outremont.

Directors.—No. 1 District, G. B. Edwards, Covey Hill; No. 2, S. Fisher; Knowlton; No. 3, J. M. Fisk, Abbotsford; No. 4, Hon. Henri Joly de Lothbinière, No. 5, Auguste Dupuis, L'Islet; No. 6, Dr. Grignon, St. Adele; No. 7, Mr. Edward Barnard; No. 8, Mr. D. Pyke, Hudson; No. 9, Mr. R. Brodie, St. Henri.

Mr. President.—You have heard the report. Is it your intention to have it accepted *en bloc* or to have a ballot taken?

Mr. Fisher.—I propose that the names be read, and that each nomination be accepted by open voting.

Mr. President.—I submit the name of Mr. R. W. Shepherd, Jr., as president.

Mr. Shepherd.—My idea is that a French gentleman should be appointed president. My ambition does not lie in this direction. I am very willing to do all the work I can as a director, but the Chair should be filled by a much more able man than myself. I know my own shortcomings, and am anxious that a French gentleman should be elected.

The nomination of Mr. Shepherd was agreed to unanimously.

The other nominations were read and agreed to.

Mr. Fisher.—There was a recommendation that there should be a small executive committee in the neighborhood of Montreal. That, of course, could not be moved by the committee which had this question of the nomination of officers under consideration. I think it ought to be referred to the committee which was nominated yesterday to discuss changes in the rules and constitution—the Committee on Resolutions.

Mr. Chapais.—I move that the recommendations of the Committee on Nominations be referred to the Committee on Resolutions.

Mr. R. W. Shepherd, Jr., the newly elected president, was invited by the retiring president to take the Chair.

Mr. Shepherd.—You have placed me, gentlemen, in a very responsible position, and one I did not seek. I shall do the best I can to fill it properly. I know that it has great responsibilities. The president of this Society cannot remain inactive and see the Society stand still. We have got to progress, and it requires a great deal of thought and work to keep the society as advanced as possible and fulfilling the work cut out for it. I am under very many obligations, to you, gentlemen, for electing me to this position, and hope that you will not find out that you have made a mistake.

Mr. Hamilton.—I think the Society has made no mistake. I know Mr. Shepherd to be a very energetic man and very enthusiastic in everything pertaining to our work; the Society has certainly shown a keen sense of its own interest in electing him for the presidency.

Mr. J. M. Fisk.—I feel that Mr. Hamilton has expressed the unanimous opinion of the fruit-growers. I certainly cordially endorse his remarks. Having been president myself, I can sympathize with what our new president has said regarding the duties and responsibilities of the office, and I do not think we could have made a wiser choice.

SPRAYING.

Mr. Dunlop read the following report of the Committee on Spraying:—

GENTLEMEN:—As a member of the committee appointed at last winter meeting to investigate the results of spraying for the prevention of fungous diseases and insect pests, I beg to submit the following short account of my own experiments and observations of the work of others during the past summer:—

For the prevention of gooseberry mildew I sprayed my bushes twice with the Bordeaux mixture, the first time when I detected the first trace of the disease, the second some ten days later. As the mildew generally appears first on the berries nearest the ground, I have found it necessary to do the spraying thoroughly, that the branches should be held up in order that the liquid should be brought in contact with every berry, and to accomplish this it is necessary that two men should perform the work.

The result of this treatment was a complete success, the fruit being very fine with no traces of mildew on it. In order that there might not be any doubt as to the result of the treatment I allowed a few bushes to remain unsprayed. The fruit on these was nearly all destroyed.

For some years past the Downing gooseberry, the fruit of which is not subject to mildew, has been affected with a disease of the foliage, which causes the leaves to drop off when the fruit is about half grown. As a consequence the berries cease to grow and are damaged by the sun. Experiments for the prevention of this proved quite a success, the bushes treated with the Bordeaux mixture retaining their foliage until frost, forming a marked contrast with those not sprayed.

For the destruction of insect enemies I have not been so succesful. The Codlin Moth, Bud Moth, etc., are easily destroyed with the arsenites, but I have not succeeded with the Curculio.

I sprayed a few trees this year with Bordeaux mixture containing one-quarter pound Paris Green to fifty gallons, but could not perceive any improve-

ment over trees not sprayed. In several instances I noticed the insects at work on plums which were blue with the liquid.

With regard to the apple spot I did not conduct any experiments myself, but as quite a number of the orchards on the island of Montreal had been sprayed with the Bordeaux mixture, I was enabled to observe with what result. In a great many cases no test trees had been left, and comparisons had to be made with adjoining orchards or the opinion of the proprietor taken with regard to the improvement. Where due care had been taken with the spraying I found in all cases that an improvement had been effected, though in no case had the disease been wholly prevented. A great many of the Fameuse orchards on the island are in sod, the trees planted closely together and in many cases receive little or no manure. Under these conditions it need not be a matter of surprise that trees which have been producing fruit for 20 years or more should no longer enjoy that vigour of health necessary to the production of good fruit and that disease should have crept in. So general has this disease become that in one orchard alone have I seen the fruit exempt. This is an orchard situated in Outremont about five acres in extent and consisting principally of Fameuse; the soil is a deep rich loam containing a good proportion of clay, and the space occupied by the trees has been used as a market garden for a number of years past, receiving fertilitizers to the extent of 75 to 100 tons of manure per annum. The trees have been planted about 15 years, and so far no trace of spot has appeared. I did not have an opportunity to examine this orchard in previous years, but this year did so, and found the fruit and foliage perfect. There were a great many barrels and the price realized by the owner was $4.00 per barrel. No spraying so far has been required here, but no doubt the fungus may appear here at any time as the adjoining orchards are badly affected. So far as my observations go higher cultivation in connection with spraying will be necessary to restore our orchards to the conditions they once enjoyed.

Mr. Fisher.—I may add to this report that Mr. Brodie, myself and the other members of the committee, also conducted certain experiments. Mr. Brodie is unfortunately not able to be here, and I unfortunately am not in a position to make such a report as I would like to. I was called away in the middle of the summer, and during the latter part of the season, when the results of my experiments could have been best observed, I was away from home for over two months. My gardener took notes of all that was done, but unfortunately he was an Englishman from the Old Country and wished this fall to return to his friends, and I allowed him to go without getting his notes. I therefore have really nothing to report except the general facts. The result of my spraying apples and plums this season was not so completely successful as last year. Last year my success was almost phenomenal. This year I conducted the operations in the same way, with the same care, but still there are a considerable number of spots on my apples. I may say that the codlin moths seem to have been completely destroyed. Although my apples were somewhat spotted, I hardly found a single codlin moth in all the crop. This is due to the fact that I sprayed with Paris green early in the season. I sprayed with Paris green mixed in the Bordeaux mixture. The spotting on my apples is not nearly so bad as it was before I commenced spraying. I may venture to say—I speak only in general terms—that the loss this year, in consequence of spotting, is less than twenty

per cent of what it was three or four years ago, before I began this spraying. In explanation of the fact that my success was not as great as last year, I would draw attention to this. During the season when my orchards were being sprayed, we had in my section a great many heavy showers, and I know that on various occasions the Bordeaux mixture was washed off the foliage before it had been on twenty-four hours. Another thing is that during that season the atmosphere with us was generally moist and heavy and more conducive to the growth of fungus than the season of 1893. I consider, therefore, that the results of my work this year, though not so satisfactory as the previous year, yet were very satisfactory, considering the conditions under which the experiment was carried on. Of course, my report is unfortunately not in sufficient detail. I cannot give the dates of the spraying, but I may say that I sprayed my trees once before the buds began to start in the spring. Then immediately after the blossoms had fallen, I sprayed with the Bordeaux mixture and Paris green. After that I sprayed three times with the Bordeaux mixture at intervals of from ten days to a fortnight. At the summer meeting of this Association at Knowlton, the Bordeaux mixture was visible upon the trees and the fruit, and the fear was expressed that such a quantity of this insecticide on the fruit would interfere with its marketing. But before the fruit was picked it disappeared entirely, and on the picked fruit I do not think anybody could have detected the fact that the fruit had been sprayed with the Bordeaux mixture, and this, notwithstanding the fact that on the 28th of August, when the Association was there, there were spots of the mixture visible on the fruit. The succeeding rains washed it off so completely that it did not appear on the fruit when picked. I was told then that probably the last spraying was not necessary. That I cannot say. I gave the fruit an extra spraying this year in consequence of the fact that early in the season my spraying had been washed off by the rain. My orchards, therefore had one early spraying and one late spraying more this year than last. It is quite possible the last spraying was not necessary, but it had no evil effect in the marketing of the fruit.

Mr. President.—We have heard the paper read. I regret very much that Mr. Brodie is not here. He is one of our most active members and a man of great experience in fruit culture. We could not expect him under the circumstances, though we pressed him very hard to attend. The paper is open for discussion.

Prof. Craig.—It is my pleasure to bring you, gentlemen, greeting from the Minister of Agriculture for the Dominion. It was at his special desire that I came here to see you again this year, and I wish on his behalf to express to you his deep interest in the work of the society in general. Prof. Saunders, our director, also wishes me to extend his greeting to you. The relation of the work at the Experimental Farm to the Province of Quebec is closer than it is to the other provinces, because our climatic conditions are more nearly like yours. The kinds of fruit that we test are also more suitable for cultivation in this province than in Ontario, so that I always feel specially at home when I come among the Quebec fruit-growers. Our work is on the same plan and we touch you here directly. I am very glad to have such corroborative reports this morning from the spraying committee. It strengthens my hand materially and adds weight to any arguments I may advance. The reports of the committee are indeed

satisfactory, and I would ask you to consider them carefully in all their bearings. The practice of spraying for the prevention of mildew on the gooseberry, of which Mr. Dunlop spoke to you, is very important. He says that in this instance it is not necessary to spray so very early in the season. I do not begin spraying until I see the first evidence of the starting of the disease. Then I spray thoroughly twice with the Bordeaux mixture. Mr. Dunlop emphasizes the fact that the work is to done with exceeding care. The branches have to be raised and the whole bush covered with this material. That caution applies to the whole work of spraying. Another point I wish to emphasize, and of which I shall speak later, is the fact that our orchards in this province are in a bad state generally with regard to fertility and the manner of planting. The soil has, in a great many cases, been producing two crops—a crop of hay and grass, and a crop of fruit—perhaps for twenty or thirty years; and while the land was primarily planted with trees with the object of gathering the fruit, yet another crop has been growing and exhausting the soil at the same time. In this way our trees have been gradually reduced to a debilitated condition and to such a low state of vitality that renders them an easy prey to fungi. I will not detain you further with general remarks. I will take up the results of some experiments which were conducted in Ontario during the past summer. Before going into the experiments particularly, it might be well, as this perhaps may be, and I hope will be, the starting point for better things in the way of spraying in this province, to give an outline of the origin and rise of this practice, and the paper may be of use as a reference sheet in the future.

Prof. Craig showed a chart on which was indicated the results of experiments in spraying:—

AVERAGED RESULTS.

Gained in Spraying Four Leading Varieties.

Varieties.	How Treated.	PERCENTAGE SCALE. Grades of Fruit.									
		10	20	30	40	50	60	70	80	90	100
A. G. Russet.	Sprayed.....	First Quality.				Second Quality.				Third Quality.	
A. G. Russet..	Unsprayed.....	First Quality.				Second Quality.				Third Quality.	
Baldwin.....	Sprayed..	First Quality.							2nd Qual.	3rd Qual.	
Baldwin.....	Unsprayed.....	First Quality.				Second Quality.					
Greening.....	Sprayed.....	First Quality.					Second Quality.			3rd Quality.	
Greening.....	Unsprayed	First Quality.		Second Quality.			Third Quality.				
Northern Spy..	Sprayed,.....	First Quality.					Second Qualit .			Third Quality.	
Northern Spy..	Unsprayed...	First Quality.		Second Quality.			Third Quality.				
Average of above.	Sprayed.....	First Quality.					Second Quality.			Third Quality.	
	Unsprayed	First Quality.			Second Quality.				Third Quality.		

The results delineated on the chart are an average of all the experiments; wherever I sprayed Golden Russet, Baldwin, Greening and Northern Spy, the results of the unsprayed as well as the sprayed trees are given.

Golden Russet gave 38 per cent. 1st class fruit in the sprayed trees, 38 per cent. seconds, and a less quantity of thirds. The unsprayed gave 17 per cent. firsts, 53 per cent. seconds and 23 per cent. thirds.

Baldwins sprayed gave 75 per cent. 1st class, 20 per cent. seconds and hardly any thirds. Unsprayed, 25 per cent. firsts, and the balance seconds.

Greenings, the results were very marked.

Mr. Chapais.—How do you account for their being no thirds in the Baldwins?

Prof. Craig.—It is just characteristic of that variety. They all attain very fine size and are graded according to size. In the case of Greenings there was about eight per cent. firsts and more than one-half thirds.

When you come to consider Baldwin you are astonished at the result. The sprayed gave two-thirds or more first class and the unsprayed two-thirds or more second class.

Northern Spy, about 52 per cent. of the sprayed were firsts and 36 per cent. seconds. Unsprayed 12 per cent. firsts.

Mr. Fisher.—In connection with the preparation of the mixture I would suggest putting the copper sulphate into a bag and then suspending the bag in the barrel of water and letting the copper dissolve in this way.

Mr. Fisk.—Must the water be heated?

Prof. Craig.—It will dissolve more readily in hot water, but that is not a necessity, if you allow it to stand a couple of hours before using.

Mr. Fisk.—For immediate application?

Prof. Craig.—I would recommend hot water. If you are uncertain as to the quantity of lime for a given quantity of copper sulphate in solution, you put in your gallon of that and add lime sufficient in amount to neutralize the copper sulphate solution, according to a certain test called the Potassium test. Get five cents worth of prussiate of potash from a druggist and dissolve it in two or three ounces of water, or make what is called a saturated solution. Then half fill your barrel with water, add the copper sulphate solution and pour the lime in, and then pour in two or three drops of the ferrocyanide of potassium and if there be not enough lime the liquid turns brown, but if there is sufficient lime present to neutralize the copper sulphate it remains the same colour. You must add lime until there is no reaction and the liquid remains colourless. I found this a very convenient way of getting over the difficulty. By the use of this test large quantities of copper sulphate and lime may be prepared in separate vessels at the beginning of the season, and may be used when needed.

Mr. Newman.—Do you add it after you put in the lime.

Prof. Craig.—Yes, before you fully reduce it with water. My opinion is that spraying with the Bordeaux mixture has come to stay until we find a better protective agent. The work of this season demonstrates that the results have been satisfactory in every case according as the work has been done thoroughly. I wish to draw your attention again to the fact that in the case of spraying pears and apples, *early spraying* is the most effective. Spray twice before the blossoms open. Take one pound of copper sulphate to twenty-five gallons of water, and spray with that mixture twelve or fourteen days before the buds open. The 1st May is about the right time in the province of Quebec. Spray again with the Bordeaux mixture immediately before the buds burst. Spray again with the Bordeaux mixture just after the blossoms have fallen and the fruit is formed. This time you can add Paris Green. Make a third application twelve or fifteen days later, and I think that will be sufficient for the season. The fameuse undoubtedly is one of the most difficult of all varieties to treat successfully.

Mr. Barnard.—How much Paris green ?

Prof. Craig.—I have used four ounces of Paris green to a barrel of water. That is at the rate of one pound to two hundred gallons. In the fourth spraying I used Paris green again.

Mr. Newman.—Do you use Paris green in the second?

Prof. Craig.—In the case of the bud moth or leaf roller, it would be well to use it in the second as well. You have to exercise your own judgment in the matter.

Mr. Shepherd.—My experience is that four ounces of Paris green to a barrel of water is sufficient.

Prof. Craig.—The experiments of 1892 showed the amount of wormy fruit about six per cent. on trees that had been sprayed with the four ounces of Paris green. This year I did not make observations on that line, but did make observations as to whether the Bordeaux mixture weakens the poisonous effect of Paris green. Some doubts had arisen with regard to this point. People found many of their apples wormy in harvest time. I tried it fairly this year on a row of trees at the Experimental Farm. I treated one tree of each variety with the Bordeaux mixture and Paris green and the adjoining tree with Paris green alone, making the applications at the same time. On averaging up the results on eight varieties, I found only a difference of two-tenths of one per cent. between the two series. Paris green was just as effective when applied with the Bordeaux mixture as applied without it. We use one-quarter pound per barrel.

Mr. Fisher.—I require much more Paris green with the Bordeaux mixture than that, when spraying against potato bugs.

Prof. Craig.—It may be so with the potato bug, but the larva of the codlin moth is much more tender and easily affected.

It has afforded me a great deal of pleasure to have had this opportunity of presenting you with the results of these spraying experiments. It is the earnest wish of the Minister of Agriculture, Mr. Angers, that I shall conduct, in the Province of Quebec during the coming year, experiments along the same line. The work is not yet outlined, but, no doubt, object lessons of the kind will have their value in districts where the benefits of spraying are not so well understood. I hope that at our next meeting we will have some results of experiments carried on in orchards in the Province of Quebec. I trust that this Society will co-operate with me in making the result as widely known as possible.

Mr. Barnard.—We are delighted to have in a succinct form the very valuable information given by Prof. Craig. I think it would be well if Prof. Craig would publish a bulletin of the facts noted, so that the Journal of Agriculture and the other papers which take an interest in this matter may have the information before the spring.

Prof. Craig.—I quite see the force of Mr. Barnard's remarks, and have, in a measure, anticipated them. At the Farmer's Institute of Ontario the horticultural delegates are going to talk up this matter of spraying very fully during the winter series of meetings, and I have been asked to prepare for them reports of the results of our experiments. It will give me great pleasure to furnish the agricultural clubs of Quebec with the same information.

Mr. Fisk.—With reference to the two first sprayings, what evidence have we that two sprayings are required before the leaf is formed? Could this work be done in the winter or in the fall after the fall of the leaf? Will the frost affect this work? There are times perhaps when this work could be done in the fall if it would have the same effect.

Prof. Craig.—I think that fall spraying would be beneficial, but only comparatively so, because the preventive agent must be on the ground at the time that the fungus is becoming active. If we sprayed in the fall, no doubt the wash of the winter rains would remove a large quantity of the protective material, but at the same time fall spraying would act as a disinfectant, in a general way, and no doubt destroy a large number of spores. I do not think, however, that the results would warrant us in anticipating spring spraying by applying it in the fall. The Bordeaux mixture, if applied in the spring, covers the tree with an effective film or medium in which the spores of the fungus will not germinate. If applied too early it becomes washed off, and, therefore, ineffective.

Mr. Chapais.—I hope that next summer, when these experiments are going on, Prof. Craig will not forget our district of Kamouraska, where we are making so many endeavours to promote fruit-growing.

Mr. Newman.—I had some experience in spraying this year with good results. As regards Mr. Dunlop's theory, I do not consider that cultivation has any effect in preventing spot. If anything, it will be worse in a cultivated than in an uncultivated orchard, but, of course, cultivation will increase the yield and reduce the cost of spraying. With regard to Mr. Craig's statement of the yield, I must say that spraying has doubled the yield in almost every case in my place. I took five acres.

Mr. Shepherd.—You mean the yield of No. 1 fruit.

Mr. Newman—The yield altogether. I did not have in every case No. 1 fruit. I took five acres at the northeast end of my orchard, where I have never since 1886 got any apples of any quality. They used to be all small and spotted and not saleable. There are about two hundred and fifty trees there. About two hundred of them I sprayed twice. I sprayed them before the blossoms opened and afterward with Bordeaux mixture and Paris green in both cases. I left one row unsprayed. There were eleven rows, ten of which I sprayed. I sold this orchard with the apples on the trees for $550 cash without touching it. The rest of the orchard had about four hundred fameuse trees of a larger size and bearing, and out of that I do not suppose I cleared more than $300, though at the same rate it should have produced more. The orchard lies to the west. The rest next the other part of the orchard showed very little advantage from spraying, but as we got westward the quality got better—west and north—until in the northeast corner the fruit was two-thirds clean. In one bad section I sprayed four rows, two rows once and two rows twice. The rows sprayed once did not show the slightest effect at all, so that I do not think that in a bad section, unless you have a very favorable season, one or two sprayings would have much effect.

Prof. Craig.—What time did you spray?

Mr. Newman.—I sprayed four rows before the blossoms opened, and two of

these four I sprayed again the second time. They gave very conclusive evidence that spraying was good, as the two rows I sprayed twice produced their apples clean and were loaded down. The other two rows, which had only been sprayed once, showed not the slightest effect, and we could scarcely tell that they had been sprayed at all. So conclusive has been the result that all the neighbors around my place—and I suppose there are eight owning about three hundred acres of orchard—have decided to spray next year.

Mr. Fisk.—What effect has it as regards the fungus disease? It is a well recognized fact that this is a disease which attacks first the foliage and afterwards falls upon the fruits. It is hardly reasonable to suppose that an orchard which has been giving fruit for the last ten or fifteen years and has been more or less subject to disease is going to be cured by the application of spraying alone. I think there are other requisites as well as spraying. Cultivation is very essential in order to assist the spraying.

Mr. President.—You mean in run down orchards?

Mr. Fisk.—Yes. I am speaking of orchards that have been bearing ten or fifteen years before the introduction of spraying. In Abbotsford, where we are subject to this disease for years, the trees have lost to a certain extent their foliage, and my experience in spraying is that it has not produced those results found where the orchards have been kept up better. There is a lack in proper cultivation. We require to assist the spraying with more fertilization, and the question is what kind of fertilization shall it be. Will it be barnyard manure or phosphates or chemical fertilizers? There is something wanted, and I think the question of cultivation in connection with spraying is very important and bears to a very large extent on the success of spraying, I would like to ask Prof. Craig what he would recommend in this case.

Prof. Craig.—There is a great deal, of course, in what Mr. Fisk has said with regard to the depleted condition of the soil of our orchards at present. As to the best course to adopt with the view of bringing up our orchards, that will depend very largely on the character of the soil and the peculiar circumstances which surround the orchard. With regard to the fertilizers to be used, I have a chart—I am sorry I did not bring it with me—which shows the relative quantities of the different constituents taken from the soil by the various fruits which we cultivate. The amount of potash, the amount of phosphoric acid, the amount of nitrogen, taken away from the soil by a crop of one ton of fruit. In the case of apples it establishes that the constituents drawn most largely from the soil by a ton of apples are potash and phosphoric acid. An analysis of the fruit shows that fact. On the other hand if we analyze the wood and the leaves, we get the other constituent in greatest quantity, namely, the nitrogen, and we find that in the wood and leaves the tree draws that constituent most largely from the soil, but as the leaves are returned to the soil more or less each year we are led to believe that the two elements required most for bearing fruit trees are potash and phosphoric acid. I would recommend the ploughing and cultivation of orchards, the growing of a green crop, such as clover, one year and ploughing it under the next year. That will give you the nitrogen required to build up a vigorous tree, and the application of wood ashes and bone meal to the orchards for the supply of these other two elements I have mentioned. If the

orchards were sown with clover and this ploughed under the second year, you would probably get all the nitrogen required for a period of two or three years. In addition to that, give it fifty barrels of wood ashes and two hundred pounds of bone meal per acre, and that orchard would get what you might call a fair dressing. We cannot grow grass in our orchards as well as fruit; when it is impossible to cultivate them, then pasture them with sheep.

Mr. Hamilton.—I can endorse what Mr. Newman has said as I have seen his orchard once or twice. The point he made is well worthy of attention. I saw the ten rows and quality of the fruit, and I saw that as you got away from the old orchards, on the one side, the spraying was much more effective. Ten rows were sprayed and one was not. Some of the spraying on the tenth row fell to one side of the eleventh, and the apples in that row were pretty clean where the spraying fell.

Mr. Fisher.—Is the prevailing wind from the unsprayed orchard towards the sprayed orchard?

Mr. Newman.—Yes.

Mr. Fisher.—And the spores of the fungus disease would be carried from the unsprayed to the sprayed?

Mr. Newman.—That is my theory.

Mr. President.—I can give you my own experience in spraying last year. Every tree was strayed twice, but the fameuse three times. I grow clover in my orchard, and there was great difficulty in getting amongst the clover at the third spraying. In the case of the fameuse, the result was very apparent. The fameuse, No. 1 quality, averaged 50 per cent, No. 2, 40 per cent, and No. 3, 10 per cent. We bought up several fameuse orchards in the county, and were figuring upon paying about the same as we did two years ago when we had a large crop. Two years ago our No. 1 fameuse averaged in the unsprayed orchards about 50 per cent, and we were figuring upon the same yield. We were deceived, however, because the fungus had increased very much, and in those orchards we bought, which had not been sprayed since 1892, instead of obtaining 50 per cent No. 1, they only averaged 25 and 75 per cent Nos. 2 and 3. In my sprayed orchards, the average was 50 per cent No. 1 and 40 per cent No. 2. In my orchards not sprayed, there was only 25 per cent first, and the rest were very inferior. We were more particular with the fameuse because it showed "spotting" more than any other variety. I notice very good effects on St. Lawrence and a number of other varieties. I left one good healthy tree in each orchard unsprayed. The good results of spraying were very apparent in the foliage; that the foliage of the trees was excellent and the bark green and thrifty, showing healthiness. The trees were great bearers because the leaves were not attacked by insects, while the foliage of the unsprayed trees was badly affected. I am strongly in favor of spraying and shall go into it more thoroughly next year. I have a very good pump which I imported from the United States and which worked admirably.

Mr. Hamilton.—With regard to fertilizers, would it not be as effective, if the clover, instead of being ploughed in, were cut off and allowed to remain upon the ground.

Mr. President. – Perhaps we had better take up that this afternoon on the cultivation of orchards. Mr. Chapais has a paper to read on northern fruit cultivation.

Did I understand Prof. Craig to say that in the returns of those orchards where he experimented, seventy-four per cent. of all the fruits came from the sprayed trees and only the refuse from the unsprayed trees. Was there an equal number sprayed and unsprayed?

Prof. Craig.—Yes, and nearly three times as much crop from the sprayed as from the unsprayed.

Mr. Newman.—When is the best time to spray for plum rot?

Prof. Craig.—Just after the fruit is formed. I spray first with the Bordeaux mixture and Paris green as a joint preventive for curculio and the rot. Three sprayings of Bordeaux mixture is necessary with the usual intervals between. Possibly another spraying with ammoniacal copper carbonate may be necessary as the fruit is ripening, because the rot goes on very freely just at the ripening time.

Mr. Newman.—Some plum trees of mine look as if covered with soot.

Prof. Craig.—That is caused by the rot I refer to.

Mr. Fisk.—Before we proceed to the next item, it will be important to name a committee to assist Prof. Craig and work in conjunction with him in the coming season I think they do that in Ontario. Prof. Craig will perhaps be able to say how that committee shall be composed—whether of men from different parts of the province or whether of men in some central part where they can easily work together.

Prof. Craig.—It would be desirable to make it as comprehensive as possible. We want also to collate information obtained from other sources. It would be best to have a committee of men from the fameuse growing district, because we want to make our experiments emphatic on this variety—I think from the eastern townships and Montreal district mainly.

Mr. Hamilton.—I second that motion.

Mr. President.—Mr. Fisk moves and Mr. Hamilton seconds, that a committee be appointed to co-operate with Prof. Craig in his experiments with regard to spraying in the Province of Quebec during the coming season.

Mr. Fisher.—I was going to suggest that in addition to that district, it would be well to have somebody from below, either Mr. Chapais or Mr. Dupuis, to conduct separate experiments in spraying. It would be unfortunate if the experiments should be confined to one part of the province.

ENTOMOLOGY.

The Rev. Mr. Fyles read the following paper on entomological studies:—

THE IMPORTANCE OF ENTOMOLOGICAL STUDIES TO AN AGRICULTURAL AND FRUIT-GROWING COMMUNITY.

Rev. Thomas W. Fyles, F.L.S.

It is a wonderful proof of the wisdom and goodness of God that this earth which He hath given to the children of men, is so fitted and prepared that it affords scope and claim for the exercise of man's powers, and that man himself is so constituted that the employment of those powers is conducive to his well being and enjoyment of life.

So true is this, that though the fiat has gone forth, "Thorns and thistles shall the earth bring forth to thee. In the sweat of thy face shalt thou eat bread," it is also written, "Thou shalt eat the labour of thine hands, Oh well is thee, and happy shalt thou be!"

In the vegetable kingdom materials in such great variety are so abundantly furnished, and man finds that he can, to so great an extent, select, transplant, modify and improve the plants producing them, for the supply of his necessities and the gratification of his tastes, that he is stimulated to exertion, and comes to realize that he is, in a humble way, a co-worker with God; and his work is ennobled to him by the thought.

And not only do men whose very living depends upon their endeavours in the field, the garden, the orchard, or the vineyard, take an interest in rural occupations and their rewards, "the king himself," says the wise man, "is served by the field," and the devotees of Ceres, Flora and Pomona are to be found, as well among the highly gifted and trained leaders of the people, as among the hard-handed sons of toil. The most eminent statesmen can take pleasure in a *primrose* or an *orchid*. The great Lord Bacon spoke of horticulture as "the purest of human pleasures;" and the "judicious Hooker," one of Englands most learned and thoughtful divines, desired no higher preferment than a country cure, in which he might see God's gifts spring from the bosom of the mother earth.

It is this general interest in the productions of the soil, and whatever effects those productions, that is the *raison d'être* of the Association which has called us together in this place.

The duty I have to endeavour to perform is to show the importance of entomological studies to those who take an interest in the cultivation of the soil.

Entomology has to deal with the locust, the caterpillar and the palmer-worm, God's "great army." So vast is this army that—to use the words of Dr. Lintner, the State Entomologist of New York—"It has been truthfully said that "insects have established a kind of universal empire over the earth and its "inhabitants. Minute as many of them are, and insignificant in size to other "than naturalists, yet in combination they have desolated countries and brought "famine and pestilence in their train." (First Report. p. 2.)

According to the last estimate (that of Dr. C. V. Riley in 1892) there are perhaps 10,000,000 different species of insects in the world. It is difficult to convey an idea of so vast a number. To display all the kinds—allowing a single representative to each, and one square inch, on an average, to a representative—it would take the wall-space of fifty rooms, every room being 36 feet long, 24 feet

wide and 12 feet high, supposing every room to be lit from above and to have a door of entrance and a door of exit.[1]

Were it possible to bring types of all the species together, they would still be but a feeble representation of the whole insect army, for every species numbers its battalions. Happily the hordes are duly apportioned. Each natural division of territory has its share. And there is such a marvellous arrangement of checks and counter-checks operating upon them, that, as a rule, every kind is held in proper subjection. It is the intentional or accidental transportation of an injurious species, beyond the sphere of the operations of its natural foes, that occasions disaster.

The Cabbage Butterfly (*Pieris rapæ*, Linneus), which in twenty years spread over half the continent of North America, was brought to Quebec in refuse cabbages from the steamships. The name of Mr. Thevenot is known all over the eastern states because that he brought over intentionally, and let loose inadvertently, the Gipsy Moth (*Ocneria dispar*, Linneus). The Colorado Potato Beetle (*Doryphora decem-lineata*, Say.), came to us as soon as the potato fields of settlers bridged the prairies for it. The Larch Saw-fly (*Nematus Erichsonii*, Hartig.), which swept like a devastating fire over our tamarack woods in 1883 and subsequent years, and which is, no doubt, still marching on in the wilds of the Hudson Bay Territory and Labrador was, it is believed, brought over in young trees from northern Europe. The Fluted Scale (*Icerya purchasi*, Maskell), which has done immense injury to the orange groves of the South is believed to have been brought from Australia upon *Acacia latifolia*.

According to the Toronto list published in 1883, there were at that time three thousand eight hundred and fifty-three species of insects known to have been met with in the Dominion.

A very large proportion of the insect tribes, however, are positively beneficial. The numerous species of the Hymenoptera Parasitica—in keeping down the numbers of injurious insects—are especially so.

Of the 25,000 named insects found in the United States, about 8,000 only can be regarded as pests.

Some years ago I found a batch of Nematus larvæ feeding on a poplar of a kind brought from Russia by Mr. Charles Gibb. I took them into my house and cared for them till they buried themselves in the earth which I had provided, and went into cocoon. In due time I obtained from them, not what I expected, but a number of specimens of a new parasite *Tryphon flavifrons*, Fyles. So effectually had the mother Tryphon done her work, that not a single Nematus had escaped her.

Last summer I accompanied a party of gentlemen on an entomological excursion to the Back River. One of our number found, on the under-side of a leaf, about a score of the young larvæ of our Saturnians injurious to fruit-trees. He took them home, intending to raise specimens of the moth for his collection. But an ichneumon-fly had been before him—had gone over the

---

[1] $$\frac{10{,}000{,}000}{\left\{2\left(36\times24\right)\times12\times144\right\}-2\left(8\times4\times144\right)}=50+$$

larvæ systematically and prodded an egg into each. The hopes of my friend were defeated, but he obtained a nice lot of ichneumon-flies.

People are familiar with the idea of one grub feeding inside another grub, but it is not so generally known that there are insects that pass their early stages and arrive to perfection inside the eggs of other insects. Ashmead, in his valuable work on the Proctotrypidæ, published last year by the Smithsonian Institution, has given descriptions of forty-one such insects.

Then there are the numerous kinds of ground-beetles, lady-birds, syrphus flies, soldier flies, dragon flies, &c., predaceous on other sorts.

The first point I make therefore is, that *a knowledge of entomology is important that men may rightly distinguish between their insect friends and insect foes.*

In a paper which I had the honour to read before the Fruit Growers' Convention at Ottawa, I showed the important work done by humble bees in the cross-fertilization of blossoms. These insects are so entirely beneficial that some of their kind have been—with a sort of grim propriety—transported to New Zealand to labour there for the public good.

But at the very time that the humble bees are operating to the fruit-grower's benefit, there are a number of other insects at work that do a vast amount of harm, namely, the bud-worms, canker-worms, leaf-rollers, etc. The great remedy against all these hurtful insects is arsenical spraying. But if the spraying be delayed till the blossoms are opened, the nectaries will become clogged with the arsenite; and, though the instinct of the bees may lead them to shun the poisoned blossoms, the good those insects would do will be left undone. The first spraying should be given before the flower-buds are opened, the second after the fruit is fairly set.

In April, 1890, the Ontario Legislature passed a law which says:

Sec. I.—"No person in spraying or sprinkling fruit trees during the period within which such trees are in full bloom shall use, or cause to be used, any mixture containing Paris green, or any other poisonous substance injurious to bees."

Promptitude in dealing with insects is always of the utmost importance.

A patch of aphides neglected will spread, and spread, till it covers a tree—*a little one becoming a thousand.*

The apple tree aphis (*Aphis mali*, Fab.), lays its eggs in the fall, and Mr. F. M. Webster suggests that apple trees should be sprayed in winter (see 24th Rep. of the Ent. Soc. of Ont., p. 90), for the destruction of the eggs. *We should have to take an unusually mild time for such a purpose in the Province of Quebec.* But I dare say a spraying early in November, or early in the spring, would be beneficial. Kerosene emulsion, made by violently agitating a mixture of two gallons of kerosene and one gallon of hot soap solution,[1] is prescribed as the proper remedy for use. It should be diluted with nine gallons of water (Lintner's 5th Rep., p. 161).

Late in the fall, or on favourable days in winter, the fruit-grower can do good work by examining his trees and removing the egg-masses of various spe-

[1] This solution is made by dissolving half a pound of common soap in one gallon of water.

cies of injurious insects. A trained eye can readily detect the eggs of *Clisiocampa Americana*, Harris, *Orgyia nova*, Fitch, *O. leucostigma*, A. & S., and the cocoons of *Platysamia cecropia*, Linneus, *Telea Polyphemus*, Linneus, *Callosamia Promethea*, Drury, *Hyperchiria Io*, Linneus, etc. But, in removing such as these, he must be careful not to destroy the clustered cocoons of microgarters, nor the downy masses of those of *Apantelees longicornis*, Provencher, for these insects are among his most valuable friends.

The destruction of every hibernated "potato bug" in the early spring is the destruction of an incipient host. The potato plants should be sprinkled with Paris green as soon as they appear above ground.

A friend of mine when the beetle first invaded the province, and before it was quite known how they should be dealt with, broke up a piece of land in the very centre of his extensive farm, and planted it with potatoes, hoping that its isolation would secure him a good crop. One early day he went to the enclosure to see if the potato plants were showing themselves. They were not; but, to his disgust, there was—to use his own words—"a durned potato bug sitting on the fence, and waiting for the plants to appear."

Gooseberry and currant bushes should be gone over with white hellebore as soon as the leaf buds begin to open.

The eggs of many of our hurtful insects are laid in patches, as for example those of *Datana ministra*, Drury, which produce the yellow-necked apple tree caterpillars, and those of *Œdemasia concinna*, Abbot and Smith, which produce the red-humped apple tree caterpillars. The young broods of these may be found in July, each brood feeding on the *underside* of a leaf. The plucking and destroying of a leaf and its burden is easily accomplished.

The round-headed borer of the apple tree, *Saperda candida*, Fab., is a troublesome pest. Its native food plants are the Thorn, the Moosemissa and the Shad-bush, but it takes far too readily to the apple-tree. The perfect beetle appears in June, and lays its eggs in the end of that month and in July. In June then is the time for the fruit grower to go over the stems of his young apple-trees with a brush and diluted soft soap. He can give them a scrubbing at the same time if he likes. Sir Joseph Banks freed his apple-trees from the American Blight (*Eriosoma lanigera*, Hans.) by the use of the scrubbing brush alone (Kirby and Spence's Entomology, Letter VI).

The last new injurious insect we have found in the Province of Quebec is the case-making Semasia of the maple *(Semasia signatana*, Clemens*)*.

This insect gathers a portion of the leaf together and forms a tent for itself. It feeds on the underside of the leaf, and makes itself a curious case out of its *frass*. When full grown it abandons its case and habitation, drops to the ground, and spins a cocoon among the dead leaves under the tree.

The way to deal with the pest is to rake the dead leaves together late in the fall and to burn them.

The study of Entomology is then necessary to the cultivator that he may know how, and when, to deal with his insect foes.

The study of Entomology pays. What harm and loss have been averted by the making known of insecticides and how to use them? But greater good

is sometimes done by calling in the aid of friends than by direct attacks upon foes. The introduction of the Australian Lady-bird (*Vedalia cardinalis*) has probably saved the orange groves of California from extinction. I have no doubt that if the parasite (*Diplosis grassator*), which keeps down the numbers of the Phylloxera in this country, had been carried over to Europe it would have saved many a vineyard that has disappeared.

Mr. A. D. Hopkins, of the West Virginia Agricultural Experiment Station, has lately introduced the European predacious beetle *Clerus formicarius*, Linn., to New England, and it is thought that this insect will check the destruction of the spruce forests of that country—which has proceeded to such an alarming extent. The clerid larva is the natural foe of the bark-boring and wood-boring larvæ. It searches them out and devours them with avidity.

As *Clerus formicarius* is a new importation to this continent, and is at present little known, a short description of it may be acceptable. The beetle is about three-eights of an inch in length. Its head and the forepart of its thorax are black. The afterpart of the thorax and the base of the wing-covers are brick-red. The remaining portions of the wing-covers are black crossed by two somewhat wavy snow-white lines.

The name *Kleros* was given by Aristotle to certain larvæ found in bee-hives. The trivial name *formicarius* was given to this species by Linneus, because of the ant-like form of the beetles. (See Wood's Insects at Home, p. 138).

A knowledge of Entomology was necessary for the understanding of the habits of these predacious and parasitic insects, and for the placing of them where they may work to man's advantage. And this bringing about of good by the application of natural agencies is but in its inception. As our knowledge increases we shall in all probability be able to direct and control forces that at present are but little understood.

The study of Entomology is necessary that the agriculturist and fruit-grower may make the most of their insect friends.

The Americans—a practical people—are fully alive to the importance of Entomological research. Their Department of Entomology, their National Museum, their Experimental Stations dotted over the Union, their numerous scientific commissions with their reports and bulletins all bear witness to this fact.

Our own authorities do not mean to be behind hand. The establishment of experimental farms, the encouragement given to scientific and economic societies, farmer's institutes, etc., the printing and distributing of blue books bearing upon practical subjects, betoken an enlightened policy on their part.

The Quebec government has purchased the collection of natural objects made by the late Abbé Provencher, and has placed it in good hands—in the care of M. Saint Cyr. I may say that so important is the collection considered that Prof. Davis of the Michigan Agricultural College came all the way from Lansing and spent a fortnight here to examine it.

I wish the collection were in a more accessible part of the building, and in one where it would stand a better chance of preservation in case of fire. For the destruction of it would not simply be the destruction of things that could readily

be replaced. Ths collection contains types of species that will become more and more valuable as knowledge spreads. It is a monument of the life work of one of the best entomologists our country has produced. If any one wishes to form an idea of this work let him take a list of North American Hymenoptera and note to how many species the name *Provencher* is added as authority.

It is to be hoped that some good man will some day do for Quebec what Peter Redpath did for Montreal—build us a museum.

But notwithstanding all that has been accomplished, sufficient care has not yet been taken to reach the young.

So long ago as 1877, in a paper read before the Teachers' Convention at Sherbrooke, I advocated "the cultivation in schools of a taste for Natural History." The means I recommended were:

I. Conversations on natural objects; informal lessons; extempore sermons on texts from the Book of Nature.

II. The formation of school museums, libraries and gardens.

III. The reading of formal object lessons; each lesson complete in itself and bearing upon the purpose in view.

I recommended these at that time, and I recommend them still.

Examples of peripatetic lessons on Natural History may be found in Gosse's "Canadian Naturalist" (which is now, I am sorry to say, out of print), and in "Country Walks of a Naturalist with his Children," Groombridge & Sons, London.

Valuable hints for the formation of school museums may be found in a work written, I believe, by a brother of a former rector of Quebec, and published by the S. P. C. K., viz.: "The Story of our Museum," by the Rev. Henry Houseman, A.K.C.

We need some one to do for Canada what Miss Omerod is doing for England—to popularize PRACTICAL ENTOMOLOGY.

We need a hand-book on Practical Entomology—written after the model of that useful work, "Spotton's High School Botany"—for use in our public schools.

We greatly need school wall-sheets representing the most important of our insect friends and insect foes in their different stages, and giving a few brief particulars concerning them.

But it is time that I brought this paper to a close. I will only say in conclusion that I know of no study so fascinating as that of Entomology. It deals with objects of such exceeding beauty: the life histories it makes known are so marvellous that they tell like fairy-tales; and above all the revelations that it makes to us, of the Divine power, wisdom and goodness, so lift our thoughts from earth to heaven that we are ready to exclaim with the Psalmist, "Oh Lord, how manifold are thy works; in wisdom hast thou made them all; the earth is full of thy riches." Ps. civ., 24.

Mr. Barnard—It would be a very good thing for our Society could we afford to have the drawings and pictures, which the Rev. Mr. Fyles has been kind enough to show to us as illustrating his very learned and interesting paper. I would suggest that an effort should be made by the Society to have these very fine drawings and paintings republished.

Rev. Mr. Fyles.—I could easily take advantage of the suggestion, but in a smaller form, giving the natural size. It would be a capital plan indeed to get a series of plates of our insect friends and foes published.

Mr. Fisk.—Mr. Fyles referred in his address to the American Blight. Is this identical with what is known as the Pear Blight?

Mr. Fyles.—I think so. It is a woolly coxus carried about from tree to tree.

Mr. Fisk.—One gentleman prevented its growth by scrubbing the tree.

Mr. Fyles.—Yes, that is a laborious proceeding, but the use of Paris green and spraying soon disposes of it.

Mr. Hamilton.—There is really such an immense amount of matter in Mr. Fyles' paper that one cannot adequately express himself upon it in a few words. It is almost impossible to express the thanks that I feel personally towards the Rev. Mr. Fyles for his very entertaining and instructive lecture. I have very much pleasure in moving a vote of thanks.

Mr. Fisk.—I second the motion with a great deal of pleasure. I have rarely listened to a more interesting and instructive paper.

Mr. Fisher.—I think that the remarks made by Mr. Fyles with regard to the advantage to this province of studying our entomological friends and enemies were much needed. It is a great pity that this science is not made a part of the studies in our schools. I hope that some day Mr. Fyles himself will write such a book as he speaks of for the benefit of our province. I know of nobody that could do it as well. I myself have tried to study these things, and felt the want of a book which would tell me what the different insects, caterpillars, etc., were. Such a book would be of the greatest use.

Rev. Mr. Fyles.—I thank you very much, Mr. President and gentlemen, for the very kind manner with which you have received my paper. I feel greatly obliged to you for your kind attention.

NORTHERN FRUIT CULTIVATION.

Mr. J. C. Chapais.—Since yesterday we have been talking English so much that we French Canadians are beginning to feel our tongues a little tired, and I shall take the liberty, for the benefit of my compatriots, of speaking in French. And most of our English fruit-growers understand French, especially when spoken so slowly as I speak it. My coming here to-day to give you a short essay on the culture of fruit in our Northern Canada, which has the reputation of being too cold for that industry, is due to the fact that in my travels I have been often asked to give, in a concise form, the experiments I have made, and thus give to people, who have not been able to make these experiments, the means of becoming perfectly informed as to what we can do. Mr. Joly said yesterday that what we required above all in our province, was to improve our orchards rather than make new ones. That is true as regards the western part of the province. I am convinced that we can do much better in the east, and it is with that idea that I prepared the report which I am about to read. It is rather a work of nomenclature, and will have the effect of rendering service to a great many farmers who desire to cultivate fruit.

FRUITS FOR NORTHERN DISTRICTS.

Mr. J. C. Chapais read the following paper :—

My object in putting before you, Mr. President and gentlemen, this short paper, is to give to the fruit-growers of the eastern section of the Province of Quebec an idea what they can do in fruit culture if they will profit by the experience of others. No doubt these notes will not offer anything new to many among you who are past-masters in the art of cultivating orchards, but, nevertheless, I thought it well to make a resumé of my experience, so that those who intend taking up the culture of fruits in our region may become acquainted with what has been done, without having to read through a large number of reports anterior to our horticultural and fruit growing society. My notes are divided in the order of the maturity of fruits, as they mature with us at St. Denis, Kamouraska, ninety miles below Quebec, and about 47°.30′ latitude. I shall begin with apples.

Charlottenthaler.

Description.—This apple is generally called, for brevity, the Thaler. The fruit is average size. It is round, flat, sometimes slightly greenish yellow on the one side, and with some traces of red, very slightly marked, on the one side next the sun. Its flesh is white, of loose texture, very tender and slightly acid. It is a dessert apple, ripening from the 15th to the 25th August; the flesh is compact and it sends out its branches vertically without spreading them. It grows very vigorously, ripens its wood well, and seems to suit the climate perfectly. I have no doubt that the Thaler and the Yellow Transparent are one and the same variety. One of its peculiarities is to diffuse extensively a suave odor when it is ripe.

Red Astrachan.

This is a fruit of average size, crimson in colour and very efflorescent. The flesh is white, often tinted with red, crisp, tender, and with an acid taste—very agreeable. It is a dessert fruit and excellent for cooking. It is much sought on the market, for fruit of its size, on account of its colour. The tree grows very vigorously and makes plenty of wood, it ripens well, and its branches spread out very much like the fameuse. It has a compact and vertical head like the Duchess. It ripens its fruit with us from the 5th to the 15th of September. The fruit ripens very irregularly, and the tree itself commences to produce late after it has left the nursery.

Duchess of Oldenberg.

The fruit is larger than the average, round, flattened and streaked and spotted with red. Its flesh is white and juicy, but acid and slightly sharp. It is a cooking apple, and on the market it is always sought after on account of its fine colour. It ripens with us from the 15th to the 30th September, but is fit to be plucked for sale from the 1st of September. The tree is very vigorous and compact and upright, and begins very early to fruit. It is the best of the trees we have in our region as regards hardiness, production and profit.

Summer Arabka.

Fruit, average size, oblong in shape and slightly streaked with red. The flesh is white and slightly acid. It ripens from the 10th September to the 15th October. The tree is vigorous, somewhat spread out, and ripens its wood very well. For the table the fruit is a better quality than the Duchess. In those districts where the Titovka suffers from a partial wasting away of the trunk, it may be replaced by the Arabka.

Titovka.

This fruit is large and oblong, of a greenish yellow, streaked with red on the sunny side, with flesh, tender and fine texture, sugared, but with a slight trace of acidity. It ripens in the beginning of October. The tree sends out its branches in a compact and vertical manner and is very hardy with us. The fruit is excellent for dessert. This tree has not yet given any sign of the wasting or cracking in the bark from which it suffered at Abbotsford and elsewhere, and I consider its fruit one of our finest Autumn fruits, only it is a little smaller than the Alexander, but much better for the table.

Alexander.

This is a very large fruit, attractive colour, round and slightly flattened in shape. The flesh is of coarse texture and too acid for eating as a dessert fruit, but it is excellent for cooking and very profitable for the market on account of its size and fine colour. It keeps a long time for an autumn apple. The tree does not spread much or become very large, and produces a good harvest. The fruit ripens at the beginning of October. There is no apple for which purchasers are found more easily in retail quantities, and although the tree only gives a good crop every two years it is very profitable to plant.

Antonovka.

The fruit is a little larger than the average. It is conic in shape and little marked. Colour, a greenish yellow, slightly reddened on the sunny side. The flesh is firm, yellowish and acid. The fruit is good for dessert and for cooking. It ripens at the beginning of October. The tree is very hardy, somewhat spread out and of moderate growth. With the summer Arabka and the Tetofsky, we can dispense easily with this variety.

Fameuse.

It would be useless to describe in detail this variety, which is the glory of pomology in the Province of Quebec. I will content myself with saying that it reaches perfection in our district and grows to a size which astonishes all those to whom I have shown specimens. With us it ripens during the first half of October. This apple keeps in our region until the month of March, and it seems to me that on account of its keeping quality, it ought to be very profitable for fruit growers in the eastern part of the province.

Wealthy.

This fruit is of average size, flat or round and flattened, palish yellow tinctured with red on the sunny side, and covered on the opposite side with broken streaks of red and lighter spots. The flesh is white, sometimes spotted with red, tender, juicy with a slightly acid and delicious taste. The tree grows well, is hardy and healthy, and produces liberally. The fruit ripens about the same time as the Fameuse. The Wealthy keeps with us until April. It and the Fameuse are the two best a ples that we have in our district.

McIntosh Red.

Fruit above average size. Shape, round and flattened. Colour, greenish yellow foundation, covered with a brilliant red, turning almost violet on the sunny side. Flesh, yellowish, sugared, but slightly acid. It ripens with us at the same time as the Fameuse. The tree is very hardy and spreading and ripens its wood perfectly. The McIntosh Red, like the Fameuse, has commenced to be attacked by the fungus or apple scab.

Golden Russet.

Fruit of average size, rather inclined to be small. Colour, green foundation, covered with red, rough to the touch, and having a slight reddish tint on the sunny side. Flesh, fresh, crisp, juicy and firm. The tree is vigorous, the top spreads out and has not suffered from the cold during the four years it has been planted in our section. The fruit clings well to the tree and only ripens towards the 20th of October.

It is more correct to say that this fruit does not ripen completely on the tree, because it is rare that we had not, sometimes long before the 20th October, to pluck it on account of heavy frosts.

Grandmother (Beebushskino.)

Fruit of average size, flat, round and not much marked. Colour, a greenish yellow, striped with red on the sunny side. Flesh, white, firm, crisp and juicy. Close texture. Ripens about the middle of October. The tree is pretty well spread out, vigorous, and makes much wood. What I have said with regard to Golden Russet, as to maturity, applies to this variety.

Longfield.

Fruit over average size. Shape, round and conical, slightly flattened. Colour, palish yellow, with yellowish red on the sunny side. Flesh, white, crisp, juicy. Close texture. Slightly acid, aromatic and excellent dessert fruit. The tree grows very quickly, produces very young, and is heavily laden. The fruit ripens about the 15th October. The Longfield, described in the catalogue as an early winter fruit, is a late winter fruit of superior quality with us. I have kept it perfectly sound until July.

Winter Arabka.

This fruit is much above the average in size. Shape, flat and conical. color, dark green, almost entirely covered with dark red, and the color of Oporto wine on the sunny side. Flesh, greenish white, very acid in the autumn, but becoming less acid in the spring, very firm, even hard. The tree is very vigorous. It lost three inches of wood the first year after it was planted by the frost, but since then it has not lost an inch of wood. The fruit ripens at the end of October. It is not strictly an apple for export, but it is a real acquisition as a keeping apple. The tree flowers very plentifully, the blossoms being of a violet tint. It is very pleasant to eat in the spring, but is too acid in the autumn. It holds on very well to the tree.

Siberian Apples.

Hyslop—This fruit is of good size, and scarlet in colour. The tree is vigorous and produces enormously, and the fruit clings very strongly to the tree. It ripens in October and keeps until January. It is excellent for jelly, but too astringent for dessert.

Transcendent.—Fruit passably large. Colour, yellow, streaked with red. Flesh, juicy and crisp, very astringent. The tree is the most vigorous we have in our orchards. The fruit ripens from 25th September to the 10th October, and only keeps fit for eating during the month ; it then becomes insipid.

Whitney.—Very large for a Siberian apple. It is glossy, and color green streaked with carmine on the sunny side. Flesh, firm, juicy and of agreeable flavor. It ripens from the 5th to the 15th September and only keeps some days —at the most two weeks in good condition. The tree produces heavily ; is very hardy and spreads a great deal, and of all the Siberian apples, it is the only one whose fruit is really a dessert fruit.

The varieties which I have described above, are, in our district, good to eat in the following periods :—

Charlottenthaler	15th August	to	15th September.
Red Astrachan	1st September	"	1st October.
Duchess of Oldenberg	1st "	"	1st December.
Summer Arabka	15th "	"	15th November.
Tetofsky	1st October	"	1st December.
Alexander	1st "	"	1st "
Antonovka	1st "	"	1st "
Fameuse	1st "	"	15th March.
McIntosh Red	1st "	"	15th "
Wealthy	10th "	"	10th April.
Grandmother	15th "	"	10th "
Golden Russet	15th "	"	15th May.
Longfield	10th "	"	15th June.
Winter Arabka	15th "	"	— May.

It is impossible to judge now what will be the commercial value of these different varieties of apples. We shall only, when the trees have reached their full growth, be able to estimate their capacity for production and choose among them those which are really profitable. They all grow very well at present in a sandy soil, drained, and with a northern exposure, in a place where, all the year round, you have the winds of the west, the north and the east. The orchard is covered with three feet of snow each winter. The trees stood a cold of 30 degrees below zero Fahrenheit in the winter of 1891.

The great danger that we have to avoid, in our part of the country, is the too rapid growth of trees. There is a Scotch proverb which says: "It is not the woman who fires up the quickest that makes the best match." It is the same with fruit trees. It is not those which grow quickest that are the most prolific. We require trees that ripen their wood well. Mr. Charles Gibb gave me some very practical advice in the planting of an orchard, and his predictions were always realized to the letter.

FRUIT CULTURE IN THE NORTH.

Dr Grignon, of St. Adèle, read the following paper on this subject:—

I regret infinitely that we did not see shining on the table yesterday evening our fruits of the north alongside yours. One good reason why we have not many fine fruits is because we have neglected the culture of fruits in the north. I am in a position, however, to say now that that culture is spreading. Experiments have been made by private individuals, with such satisfactory results that now no one hesitates about starting little orchards. I have prepared some notes, but was unable from lack of time to give you any considerable work. I was delegated by the Agricultural Society to ascertain what trees we could cultivate with advantage in our part of the province. Allow me, gentlemen, to translate you in imagination into the terrestrial paradise, and thus imitate those great preachers and orators who cannot pronounce a sermon or a speech without bringing their audience back to the epoch of the deluge, or of the creation of Adam, or of the fall of the rebellious angels. But the apple has played so important a role in the fall of our first parents that it is worth our while to inquire into its origin. In the eyes of God, this fruit ought to be the most delicious and succulent, since He chose it, in preference to all others, the better to test the virtue of obedience of our first father and our first mother. In fact it is the fruit best calculated to excite the five senses of the human being. What sweet emotions do we feel at the sight of an orchard in full blossom or loaded with fruits! The perfume is intoxicating, the touch of the fruit creates a charming sensation; our hand instinctively carries the fruit to the mouth; the palate delights in its savour, and our sense of hearing is also flattered when we hear sounded the praises of the beauties of our orchard and the delectable qualities of our fruits.

After having leant her ear to the counsels of Satan as he boasted of the savour of this fruit, Eve cast her eyes on it, touched it; and, excited by the perfume, instinctively carried it to her mouth and revelled in its delicate flavor. Then it is not to be wondered at that Adam should have done likewise. But the fruit, although the cause of the fall of our first parents, remained none the

less perfect in the eyes of God, because, while the sin was condemned and punished, the fruit remained unchanged and has continued ever since to occupy a high place in man's esteem.

The apple may be cultivated almost everywhere throughout the world, but most certainly in the Province of Quebec. Nevertheless, we meet many sceptics who have lost all confidence in its culture, despite the striking examples to the contrary which stare them in the face. So much is that the case that I have not yet succeeded in convincing a certain compatriot, whom I have brought every year, for the last four years, into my orchards, and whom I have made pluck some of the finest apples. This year I was full of hope that he would unconditionally surrender and admit with enthusiasm that I had succeeded beyond all expectations in proving that the north of Montreal was suitable for the culture of the fruit. "Your apples are really beautiful, and good as well," said he, while filling his pockets, "but they will not last." He was not doubtful of the present, as you see, but of the future. We cannot count on the assistance of such people in the work of helping our country to advance in the path of progress.

My pronounced taste for arboriculture took birth while reading about the importance of Arbor Day, which feast, therefore, has in my calendar as important a place as any civil or religious festival. I had not any notion about the culture of fruit trees and ornamental trees, and could never have believed that the necessary knowledge in this department of agriculture was so easy to acquire.

Only about eight years ago, our curé, the Rev. Mr. F. X. Sauvial, and myself decided to celebrate Arbor festival as solemnly as one of the finest festivals of the year. All the pupils of our eight schools were given a holiday. Flags were hoisted, and a procession of citizens, composed of doctors, notaries, merchants, blacksmiths, carpenters and farmers, with the curé at its head, went into the forests, axe and spade on the shoulder, and returned with three hundred maple trees, one hundred soft maple and one hundred elm, and we planted them on each side of the streets of our village. To-day these trees are the pride of our village. They provide us with a grateful shade and give a coquettish appearance to the place, besides augmenting the value of our property by at least one-third. Of five hundred trees, we have had hardly to renew ten, and yet there was not one of us who could boast of possessing in any high degree any knowledge of the science of arboriculture. We were satisfied to follow the advice given in the circular which accompanied the proclamation of Arbor Day.

Our success drew our attention towards the culture of fruit trees, notably the apple tree. Some succeeded, but not one of us obtained complete success. Nevertheless the result was so satisfactory, despite the losses, that not one of us would be willing to be deprived of the results obtained, even if offered quadruple the expenses.

In order that our farmers may undertake heartily the cultivation of fruit trees, precautions must be taken to avoid any checks, as much as possible, to their efforts. To that end it is necessary, first, to supply them with fruit trees suitable for the climate; second, with an apple tree whose fruit will be in demand both in local and foreign markets; third, give all information possible to advance this culture.

I have bought apple trees from Upper Canada, the United States and the Province of Quebec. After comparing these divers purchases and testing them by results, I have come to the conclusion that we can find in the Province of Quebec all that we require; and, further, that the apple trees of our nurserymen suit our climate better than those of Upper Canada and the United States. I cannot too strongly impress on our farmers the necessity of purchasing their trees from nurserymen as close to their locality as possible; or, which is preferable in my opinion, bring their trees from a section of the province where the climate is more rigorous than their own. I would have more hope for the Province of Quebec in a hundred apple trees brought from Russia than in a hundred brought from South America, where snow and frosts are things unknown.

I would not advise our farmers to plant apple trees of which they do not know the name, or whether they suit our soil. I would also advise a farmer anxious to plant an orchard to put up first a good fence, then to prepare the soil well, and to plant his fruit trees at a distance of twenty-eight to thirty feet from each other. One of my orchards contained 150 apple trees planted in a straight line, each tree twenty-eight feet distant from the other, which space enables me to cultivate nine rows of potatoes between each row of trees, which is indispensable, because culture with the hoe ought to be done during at least the three first years which follow the planting of apple trees. The trees of the locality ought to be planted at twelve or fifteen feet distance around the orchard, especially on the north side, but I myself prefer to plant them around the four sides.

The owner of an orchard ought also to have a plan of it, that he may not buy again trees which do not suit the soil and the climate. When I find an apple tree suffering or withering, I look at my plan in order to obtain the name of the variety, and in like manner when I have a vigorous tree and good producer I hasten to make sure of the name so as to recommend it to my friends and buy others.

I propose next year to convert a border of land four feet wide alongside the trees into a terrace, raised six inches and kept in place by seven inch planks, in order to cultivate there small fruits, such as strawberries, currants, gooseberries, raspberries, etc., and my fruit trees will profit by this. I am not disposed, to advise our farmers to go in for this sort of culture on a large scale so long as we have not ascertained the names and the kinds of apple trees, which suit best each part of the Province. The rich farmer may buy as many as pleases him, this is his own affair; but the poor farmer has to use great prudence and care, and not buy before having every possible information, from experienced people.

The Agricultural clubs ought to establish in each parish a little nursery for the parish by buying grafts from our best nurserymen. On the 4th. May, 1892, I brought from the nursery of Mr. A. Dupuis of L'Islet eight hundred grafts of apple trees and plum trees, the former on Siberian roots. These grafts were planted at ten inches distant from each other, in rows of ninety feet long and three feet apart. This covered a superficie of land twenty-four feet wide, by ninety long. These scions cost me about$ 12, or one cent and a half each. I saved five hundred which the following Spring could be transported into the orchards to remain there indefinitely, representing a value of $200, because at the age of three or

four years, we have to pay for them forty to fifty cents each. That therefore is a little bit of land which has well repaid my trouble since it has gained for me $200, in three years. Besides that advantage, I had more confidence in these grafts grown on my own land and well acclimatized than in an apple tree of five or six years raised on a soil facing the south while my orchard faces the north, or in a strong clay soil while my land is light and gravelly.

Among the grafts which succeeded the best, I remarked the Hyslop, the Golden Russet, Peach-apple, the Wealthy, Duchess, Astrachan, Alexander and Fameuse, but mostly, I am sorry to say, summer apples. I should have procured only winter apples because our local market is sufficiently supplied with summer apples. If the producer must always work with his eys turned towards the markets, as Mr. Gigault, our Deputy Minister of Agriculture, told us the other day at St. Joseph de Beauce, every one who desires to plant an orchard should ask himself what are the kinds of apples most in demand by the English consumer. They are the apples of Nova Scotia, hard winter apples, able to reach the English market without being covered with bruises as the Fameuse. The following are the names: Ben Davis, Northern Spy, Canada Red, Baldwin, Golden Russet. Have our nurserymen got these kinds? If not, are they going to get them? It is important to be assured of this, because our Province looks to its interest before those of its nurserymen, and if its nurserymen will not furnish these kinds of apple trees, it is very probable that we will have recourse to the nurserymen of Nova Scotia.

It is a good thing to have several strings to one's bow, and we ought not to put all our eggs in the same basket. At present the only thing we hear talked about is cheese, to the detriment even of butter. If this agricultural industry were to fail, that would be a disaster for our Province; but if our lower Canadian farmers would apply themselves to the culture of apples with a view to export, the sugar beet, the production of bacon, tobacco, small fruits etc., the disaster would be less felt if any one of those industries should fail.

Agricultural clubs, in addressing themselves to the Agriculture Department at Quebec, would certainly receive pamphlets treating of the culture of fruit trees. Let our farmers read these pamphlets, let them be read at the meetings of these clubs and studied and weighed and discussed. Let those speak on the subject who have succeeded in the culture of apple trees, and everybody will profit.

I am sorry not to be able to include among the exporters of Canadian apples the names of our cultivators in the Ottawa valley. But at least I have the pleasure of being able to state here that doubts no longer exist in the north on the possibility of profitably growing these fruits. Many orchards have been started, and during the past three years more than five thousand apple trees have been planted in twelve parishes alone. And the moment we know definitively the kinds of apple trees best suited to our climate and the taste of the consumers, there can be no doubt that all the inhabitants of this Province will attach the greatest importance to the development of this industry.

In the meantime, the colonists of the north draw a good profit from the sale of a small fruit which may appear rather insignificant to those accustomed to the trade in large fruits. I refer to the ordinary raspberry, the raspberry of the

fields. In 1893 there were sold in the eight parishes north of St. Jerome, about $60,000 worth of these small fruits. That is a crop gathered, in the greater part, by the wife and the children, and the trade in it has continually increased the last fifteen years. Unfortunately this year the trade was almost nil because the fruit was almost destroyed. I cannot too much congratulate this fruit growing society on the noble efforts it has made to induce the farmers of this province to apply themselves to the culture of fruit which will be a source of revenue to the whole province.

I propose to insist on each of our agricultural clubs having at least its president as a member of the Pomological Society so as to entitle each club to an annual report.

Mr. President.—On behalf of the Society, let me express our thanks to Dr. Grignon for his most interesting paper. He certainly gave some figures that surprised me. I hope we will be able to carry out his suggestion with reference to the presidents of agricultural clubs becoming members of the Association.

Mr. Barnard.—I have visited two or three times the districts spoken of by Dr. Grignon, north of St. Jerome and north of Montreal. The paper of Mr. Chapais' will be found very useful in that section which Dr. L. Grignon has described. The experiments which have succeeded so well in the Lower St. Lawrence region ought to be even more successful in Dr. Grignon's district, because they succeeded under more difficult conditions.

Mr. President.—I should like to hear Mr. Chapais and Mr. Dupuis state what, in their opinion, are the six best varieties to plant in a most northern district.

Mr. Chapais.—Yellow Transparent is the earliest with us. It is the first ready—about the 15th August, and the man who would have many bushels to sell would make much money here. But we cannot send it very far because it does not keep. Then I would call for the Duchess as our first fall apple. I think it is the very best tree we have in our district. I think the Titovka is larger, but not of so nice a colour. Sometimes people like to have a big apple. After it the Alexander, which keeps much later, can be put on the market much later than the Titovka. The Fameuse with us becomes scabbed badly ; the Wealthy would be better. The Longfield is the hardiest apple with us for winter.

Mr. President.—This is a very comprehensive list. Yellow Transparent is the earliest variety to be placed on the market. The Duchess is the most admirable variety wherever grown. The Titovka, I have not had much experience with. There is no doubt about the Alexander being very profitable. The Wealthy is hardy and very profitable. As regards the Longfield, perhaps Mr. Chapais is right that for a later apple, it is the best we have.

Mr. Chapais.—I am speaking of our climate of course.

Mr. President.—Perhaps Mr. Fisk and Prof. Craig would give us their experience.

Mr. Fisk.—With regard to the Titovka, with us at Abbotsford, it is not so hardy as we should like. It has shown some indications of bark blight.

Mr. Dupuis.—The Titovka cannot be considered a perfect table fruit. It is more adapted for cooking. It is a very fine apple in appearance and a fruit

which will sell well on account of its size and appearance, but there is one variety which, I think, Mr. Shepherd, when he has more experience with it, will consider of greater value than the Titovka—that is the summer Arabka. It is hardier than the Titovka and is superior as a dessert fruit. It is almost as large and a good bearer. It is going to prove one of the desirable varieties in the northern parts of the country. With regard to the northern sections, it is in the northern part of the province where we are going more especially to find the benefit of Mr. Gibb's work in introducing Russian varieties. They will be more suitable to the northern than the western part of the province.

Mr. Chapais.—I am surprised at what you say about Red Astrachan, because at St. Roch des Aulnais there are Red Astrachan trees twenty-five years old which are never injured in the worst season. I did not put it on my list.

Mr. President.—It is not thought much of in the northwestern States, and that is because they have not the snow protection that you have.

Mr. Dupuis.—We have the snow protection for the Rhode Island Greening and Baldwin, just the same, and they do not live.

Mr. President.—Red Astrachan is much hardier than those.

Mr. President.—I think Golden Russet and McIntosh Red are good varieties. We cannot be too careful about recommending varieties for the extreme north. When we know that there are more than six very hardy varieties, I do not see why we should recommend anything that is half hardy. I am not acquainted with Titovka to a very great extent, having only fruited it once or twice, but if Titovka will not suit, I should like to hear from Prof. Craig about McMahon. It is a very hardy tree. It has stood in Minnesota and Wisconsin the most severe tests, and no doubt in the north, where we have our snow protection, it will be very successful. It is a magnificent apple. If the Titovka will not answer the purpose, there is no trouble replacing it with McMahon.

Prof. Craig.—It does seem to me, from what I can gather from the fruit exhibit from this northern locality, that many varieties of fruits will succeed in Eastern Quebec which we do not consider hardy in Eastern Ontario or Western Quebec. We ought to consider the question in all its bearings. The principal fault that I have to find with Mr. Chapais' list is that it does not include a sufficient number of highly coloured apples. They are all nearly yellow or light coloured. They are for home use, but for export we should grow a larger number of handsome apples that will catch the public eye by their appearance, apart from the quality. I would like to include in that list such varieties as Scott's Winter, Arabka, and, possibly, Canada Baldwin. I know that the Baldwin has a number of defects. At Abbotsford it is subject to sun-scalding, but on clay soil it has succeeded admirably in many places.

Mr. President.—The Abbotsford association does not recommend Canada Baldwin, but I have found it a most profitable apple. I export it largely in cases, as I do McIntosh Red. I consider the McIntosh Red the king of apples in Quebec. It originated in Dundas County, on the St. Lawrence, and the original tree was only burnt down a month ago, when McIntosh's house was burnt. The original tree was eighty years of age. This variety has been

very largely cultivated throughout Eastern Ontario and Quebec. I was very glad to hear Mr. Chapais say it is hardy. Mr. Chapais says it spots. It does, and so, too, does the Wealthy, but this exhibit is a sample out of a bushel of unspotted apples. The trees had been sprayed, of course. It commands the highest price in the London markets. I ship them in cases, and they command a very high price, because of their colour, appearance and quality. I consider the Canada Baldwin one of the most profitable varieties, and the Winter St. Lawrence another.

Prof. Craig.—I do not wish to cast a damper on our President's enthusiastic remarks concerning McIntosh Red, but I wish to impress you more and more with the idea that you should not plant that apple without making up your minds to use the spraying machine. There is no apple more susceptible to the apple scab. It is even more so than the Fameuse.

Mr. Chapais.—It was all cracked to pieces at my place.

Prof. Craig.—It is of very fine quality and appearance. The tree is of the same degree of hardiness as the Fameuse.

Mr. President.—In this list of varieties suitable for northern latitudes we have Yellow Transparent, Duchess, Titovka Alexander, Longfield, Scott's Winter and Arabka,

Mr. Fisk.—There is another variety, the Hibernal, one of the hardiest trees.

Mr. President.—What about McMahon ?

Mr. Fisk.—That is one of the hardiest we have.

Prof. Craig.—The McMahon we have grown at Ottawa, and it gives promise of being a most valuable variety. We planted a dozen trees seven years ago, and they all survived. The tree is remarkably vigorous, a particularly strong grower and a well-shaped tree. The leaves are healthy and the foliage generally luxuriant, and it does not show any signs of spotting thus far.

Mr. President.—Is it late or early winter ?

Prof. Craig.—Early winter. The quality is not high. In fact it is only a cooking apple. It could not be classed, by any stretch of the imagination, as a dessert fruit. It will be valuable in those regions where Wealthy is valuable, and possibly north also. The fruit is tender, and will need careful handling.

Mr. Hamilton.—The Gideon I think hardier even than the Duchess. It is an early and heavy bearer, and an apple of about the same quality as the McMahon. The Titovka is somewhat tender for putting in barrels. Is your Titovka, Mr. Chapais, a very upright grower ?

Mr. Chapais.—Yes, it is an upright grower.

Mr. Hamilton.—The upright grower is not perfectly hardy.

Mr. President.—The question is whether, in recommending a list for the northern latitudes, we should include Titovka.

Prof. Craig.—I do not think we need it.

Mr. Dupuis.—What has been most planted, and with most success, until now, has been the Duchess first, Wealthy second, Alexander third, McIntosh Red fourth, St. Lawrence fifth and Golden Russet sixth.

Mr. President.—Mr. Dupuis recommends Golden Russets and McIntosh Red for the extreme north. Does that meet your views?

Mr. Barnard.—I may mention one fact which requires to be considered. It is that in summer they have not the heat down there that you have in Montreal, and therefore the wood may not suffer to the same extent from the difference in temperature. Then the effect of the weather in the fall may make the climate a little more backward and better for the fruit. Trees very hardy down below are not so hardy elsewhere.

Mr. Chapais.—The limbs keep in good condition with us—better than in Montreal. That may be due to the quantity of snow.

Mr. Dupuis.—I have not much faith in the list Prof. Craig has given. I think we ought to ascertain the varieties which have been tried and known to be hardy.

Mr. President.—If you can grow Golden Russet and McIntosh Red, trees which are considered to be only half hardy, then, I say, your climate is not severe for apple trees, and the question is: Are we to be guided by your experience for the list to be adopted in St. Jerome?

Prof. Craig.—I think Mr. Dupuis can grow varieties which they cannot at St. Jerome. St. Jerome is far inland, and has not the advantage of the moist climate.

Mr. President.—I should recommend Wealthy, Duchess, Longfield and McMahon. The Society would do wrong to recommend for the northern districts varieties which in Montreal are looked upon as half hardy.

Mr. Dupuis.—What about Greening?

Mr. President.—They do not suit at all, and the Northern Spy is also unsuitable. A man planting a hundred trees of Northern Spy would be reckless.

Mr. Dupuis.—We grow the Northern Spy, but the apples are a little smaller than the ordinary Northern Spy, and the trees take a long time to fruit.

Mr. President.—There must be something in your climate that we have not got.

Mr. Chapais.—Our highest in summer is 96° and lowest in winter is 30° below. The average is 65 in summer and 16 in winter.

Mr. President.—For the extreme north I would recommend Yellow Transparent, Duchess, Wealthy, Scott's Winter, Arabka, Hibernal and McMahon.

Prof. Craig.—I think that is one of the safest lists you can recommend for trial up in the north.

Best Varieties Recommended for Home Use.

Mr. President.—That is to be recommended for the farmer to plant for home use, and not for commercial purposes. The object is to encourage the

farmer to plant out little orchards. Suppose a farmer between here and Montreal has no apple trees at all, and we recommend him to plant a small orchard, what will he plant?

Mr. Dupuis.—You do not mention the St. Lawrence in your list.

Mr. President.—Not in the northern list. It is not hardy enough. It is hardier than the Fameuse, but not as hardy as the Wealthy and Duchess.

Mr. Dupuis.—The St. Lawrence does well with me.

Mr. Barnard.—I think that the ordinary farmer of the province would plant for a small orchard just what he can sell, and he will be satisfied with the commoner kinds to begin with. There are many parts in the province where they would pay a considerable price for apples, because they cannot get them.

ONTARIO FRUIT GROWERS' ASSOCIATION.

Mr. President.—I have just received the following telegram from the Secretary of the Ontario Fruit-Growers' Association, which I would like to read:—

Fraternal greetings of the Ontario Fruit-Growers' Association. Hope to attend your next meeting. Am writing.

L. WOOLVERTON.

DISCUSSION RESUMED.

Prof. Craig.—I do not feel confident, on the spur of the moment, to suggest a list for those districts. In my annual report last year I went over the whole province as carefully as I knew how, and with the assistance of growers from the different districts, I arranged a list for cultivation in these districts. These are published in the last report. I cannot from memory recall the different varieties that I suggested for cultivation in these districts, and do not think it wise to give off-hand a list I might wish to revise later. I shall be glad to place at the disposal of the Society as many copies of the report as possible. The information contained in that is not only the result of my own observation but the experience of the best growers throughout the province.

Mr. Fisher.—I think that list was a list for markets and profit more than for private use. There are quite a number of apples worth cultivating for home use, but which are not profitable for market. When Prof. Craig sent out that circular, I think he requested that the fruit which was profitable would be considered first.

Prof. Craig.—It was in the main intended as a guide to planters who wished to set out orchards with a view to exporting the apples. Our conditions are not sufficiently diversified to justify the making of two lists. In other words, that list comprises most of the varieties we could recommend safely for home use. With regard to the summer and fall fruits, I do not think I could improve on these lists.

Mr. President.—Perhaps you had better decide to recommend the members of the Society to be guided by the last lists, and which will appear in the report now in the hands of the printer. The next question is:

WHAT ARE THE MOST PROFITABLE WINTER APPLES RECOMMENDED FOR THIS PROVINCE, EARLY AND LATE.

I suppose your list, Mr. Craig, covers that ground ?

Prof. Craig.—Yes.

Mr. Dupuis.—Red Astrachan, Yellow Transparent, Duchess, Wealthy, Alexander, McIntosh Red, Scott's Winter, McMahon, Arabka, Winter and Summer, Titovka and Longfield. Mr. Chapais will second this.

Mr. President.—That is the list we will adopt for your locality and Quebec East.

NOTES ON COUNTY HORTICULTURAL SOCIETIES.

Mr. Auguste Dupuis, L'Islet, read the following paper.

The Pomological Society of the Province of Quebec, was only established last year and already it has had three meetings—at Abbotsford, at Knowlton, and at Quebec. All those who took an interest in the cultivation of fruits were invited to attend and take part in the proceedings and discussions. Our confreres from the western part of the Province will make known to us the result of their experiences in the culture of fruit trees; which will be of incalculable advantage to us all in the eastern part of the Province.

In inviting me to this meeting, Mr. Hamilton, the Secretary-Treasurer, asked me to prepare an article for the Society. I did not deem myself competent Mr. President, to prepare an article on the subject of the proper culture of fruits, because I fear to teach that which I do not always practice myself. I will tell you what took place on the occasion of a visit to my orchard by a friend of mine. At the first apple tree which we met, he said: "that is a fine vigorous tree, why do you allow those small shoots from the root and from the trunk beneath the branches ?" At the second apple tree, he said to me: "There is a tree well loaded with fruit, but see how the bark is hardened and cracked, and the branches covered with moss and lichens." "When we came to the third apple tree, in another row, he said to me: "What an old look it has, it has no vigour, the worms are eating the root, see the dust waste of the tree-borer coming out through the holes in the bark quite close to the ground." At the fourth tree, before which my friend halted, he said, "surely it was not you who trimmed this tree ? The wounds are black. They still flow and will never be cured. The branches must have been cut off in the full flow of sap in May or June." At the fifth apple tree he said: "there is an old fellow (it was twelve years old) which it would be better to destroy. The trunk is knotty, cancerous and scabby. It has dried branches, and split branches and others cut off three or four inches from the trunk." At the sixth apple tree, which was overthrown for the want of a prop, he did not utter a word, because the fallen tree spoke for itself. At the seventh tree he said: "this one is too heavily laden with fruit, it is suffering, the leaves are getting yellow, it is planted on a sandy hill with a sub-soil of gravel-stone, and the roots have not sufficient nourishment and humidity for the tree and its roots. Why, said my friend, do you not put a good bed of straw around the roots—this was in July—to preserve its freshness ? A

bed of clay, mixed with sand, would be absolutely necessary to this tree, because that would retain its humidity, preserve its fecundity and give it vigor." At the eighth tree before which my friend paused, he saw that it suffered owing to its having been planted a little too deep, "but," said he, "in low lands of very compact clay, it is better to plant on the surface and bring in good earth to cover the roots." I did not offer to bring my friend any further. He had shown me my negligence and I brought him back. The lesson was sufficient for that day, and I remember it so well that on learning from Mr. Hamilton, that the Hon. Mr. Joly, would preside at this meeting, I made the vow not to advance in his presence theories which I had forgotten to put in practice, as he knew from his own observation during the visit he did me the honor to make me.

That is why I have decided to say a word to you on county horticultural societies, which ought to be more numerous in this Province. The Horticultural Societies, of Abbotsford, Brome, Shefford, Missisquoi and L'Islet were founded on the recommendations of the regretted Mr. Chas. Gibb, and through the influence of the reports published by the Horticultural Society, of Montreal, which was then a Provincial Society. These societies have given in their locality an extraordinary impetus to the culture of fruit in this Province, by means of their yearly exhibitions and the reunions of their members for the discussion of important subjects, such as the destruction of pernicious insects, the introduction and dissemination of fruit trees of local varieties, and the fruits of which are popular in the local and foreign markets. It is greatly to be desired that the reports of the Pomological Society, of the Province of Quebec, and of the Horticultural Society, of Quebec and Montreal, and the county societies, be published by the Government and liberally distributed to the members of the agricultural clubs which desire to be affiliated with the Pomological Society of this Province.

The reading of these reports ought to have the effect of engaging the members of some of the agricultural clubs in organizing a horticultural society.

If there had been a horticultural society in the county of Montmorency when the black knot disease attacked the fine orchards of La Cote de Beaupré, valued at $40,000 to $50,000, these fine plum orchards would have been saved, because there would have been a united effort to fight this terrible enemy of the plum and cherry trees. Such a united effort there has been in the county of L'Islet. Our society gave prizes foe the cutting and bringing to the Exposition Grounds the largest quantity of these knots. In this way we obtained good crops of plums. Since three or four years ago our farmers have delivered at the three stations of the county of L'Islet plums to the value of $10,000. I see in this meeting some of the founders of the Horticultural Society of L'Islet without whom it would not have been possible to organize that society. I will name them. They are:—

The Hon. H. G. Joly de Lotbinière; Jas. Lemoine of Spencer Grange; A. E. Barnard, Esq., director of the Journal of Agriculture; Messrs. King Bros. The regretted Col. Rhodes and Chas Gibb were also among them. I present you, gentlemen, with our programme and list of prizes for 1880 and also that of last year, with copies of the entries of the principal exhibitors. You will judge by that of the progress which has taken place.

Convinced, as I am, that the Pomological Society could do for the other

counties what these gentlemen whom I have named have done for the county of L'Islet, I beg to move that:—

The Pomological Society of the Province of Quebec admit the principle of accepting as affiliated members the Presidents of the horticultural societies and agricultural clubs of this province free of charge from this to five years hence, and that the board of directors be authorized to prepare an additional clause for the constitution of this society in that sense.

Mr. Barnard.—I have no doubt that Mr. Joly found a great deal to admire, and one thing specially worthy of our admiration is the example Mr. Dupuis has set in a district where previously nothing had been done. To-day he has an orchard there and is doing great good. This shows what one man can do. Mr. Dupuis has been entirely too modest, and really the lesson must have been given to somebody else. I do not remember the lesson, and I am under the impression that Mr. Joly has forgotten all about it.

Mr. Joly de Lotbinière.—I confess in the most solemn manner that instead of giving any lesson I received a most valuable one during the two days last Spring when I had the pleasure of visiting Mr. Dupuis. The encouragement it gave me, the example he set was of such a nature that I do not think I will ever forget that visit, and I hope that all those who take an interest in the work he has so much at heart will pay a visit to Mr. Dupuis. No doubt they will come back with the same feeling that impressed me. When I heard Mr. Dupuis describing the criticism of his friend, I wondered what his friend could have been doing with his eyes when visiting Mr. Dupuis' nursery. He must have been thinking of his own orchard, and in that case I would acknowledge that I was the friend.

Mr. Chapais.—I really think Mr. Dupuis has been fishing for compliments. But for him I would never have planted a fruit-tree.

Mr. Dupuis.—I did not think I would be charged with this. If Mr. Craig will come next Summer, I will prove to him that I have such trees as I have spoken of.

Mr. Fisher.—Perhaps Mr. Dupuis keeps those trees for an object lesson.

Mr. Dupuis.—I confess to my neglect, and the same might happen to some other people. In the rush of business we are apt to neglect something, and that is the reason why we ought to be careful, in giving advice, not to do wrong ourselves. We ought to teach by example.

Mr. President.—Instead of the climate being inclement down there, I think it is just the reverse and that part of the country is quite a Paradise. When a society like that of L'Islet can offer prizes for magnificent plums and varieties such as the Lombard, the Imperial Gage, the Greengage, the Bradshaw, Washington, Niagara, Reine Claude, Pond's Seedling, which we cannot grow in Montreal district, I am inclined to think that Mr. Dupuis' district is a small Paradise. Many apples are grown there which we cannot begin to grow profitably in the Ottawa Valley and Montreal. Instead of Mr. Craig alone, we shall all have to go down there on one of our Summer meetings.

Prof. Craig.—While Mr. Dupuis is revising his resolution, may I present the report of the committee on new fruits?

REPORT ON NEW FRUITS.

Prof. Craig read the following report of the committee on new fruits:—

Your committee beg to report that few apples either of Russian or American origin, are worthy of special commendation.

McMahon white.—Produced by A. L. Hatch, of Ithaca, Wis., is proving a hardy tree, producing freely large yellowish white handsome early winter apples.

Gideon.—Originated with Peter M. Gideon, Excelsior, Minn. Is a remarkably hardy and vigorous tree. The fruit is of the season and size of Wealthy, with less color. It will be valuable in the northern portions of the Province.

Arabka of E. & B.—Will be valuable in the same districts as the last. The tree is subject to blight, however.

Bombarger.—A German variety medium to large in size, handsome in appearance and of fair quality. It is being fruited at Ottawa and will be closely watched.

JOHN CRAIG,
Chairman.

Prof. Craig.—I have also the report of the committee of the fruits exhibited here:—

REPORT OF FRUIT COMMITTEE.

Your committee beg to report as follows:—The display of apples was gratifying in extent and variety as well as appearance and quality. The number of high colored apples exhibited assisted in making a most attractive display.

FRUIT EXHIBIT.

ABBOTSFORD FRUIT-GROWER'S ASSOCIATION.

Winter Arabka.—Large, round, dark red, of good quality.

Blunt Seedling.—Seedling of Foundling, a local variety of large size, oblate, highly colored, quality medium to good.

Antonovka.—Of large size, yellow, in fair condition at this date.

Fanny.—Medium size, oblate, dark red. A New York dessert apple, not sufficiently well known so far to recommend for general cultivation.

Red Pearmain.—Handsome, of good quality, but not profitable.

EXPERIMENTAL FARM.

Comprises twenty-five varieties, including Russians and new American varieties.

Winter Arabka.—Is large and fine in appearance; promises well as a cooking apple for northern latitudes.

Bombarger.—A lare, round-ribbed apple, handsomely striped, of fair quality. Season, November

A number of other varieties shown of this class are not worthy of recommendation.

Of the new American sorts, *McMahon White* is a large, yellow, handsome cooking, fall apple.

Fine, clean specimens of *Fameuse* are shown as a result of spraying.

C. P. Newman, Lachine, exhibits fine specimens of Pewaukee, Ben Davis. In addition two Seedlings which may be described as follows :—

No. 1 *Newman.*—Medium size, round or oval or ovate conic, skin yellow covered with dark red, handsome, flesh white, rather soft, mild, sub-acid, quality good. Season, November to December; tree 30 years old.

No. 2.—Medium to small, oblate, green ground splashed with light, flesh greenish-white, sprightly, sub-acid, fair quality.

G. B. Edwards, Covey Hill, Que., shows a number of varieties not usually grown in the northern portions, and points to the possibility of growing such varieties as the Northern Spy, King of Tompkins, Spitzenberg and Jonathan, when top-worked on hardy stocks, such as Talman Sweet or Haas. Mr. Edwards shows fine specimens of the varieties noted.

Aug. Dupuis, L'Islet County, shows Northern Spy, Wealthy and White Calville, a local variety.

R. W. Shepherd, Como, Que., exhibits fine specimens of McIntosh Red, Pewaukee and Winter St. Lawrence.

Mr. R. Brodie, St. Henri, Montreal, shows Canada Baldwin, Grimes' Golden, Golden Russet.

Mr. D. Pyke, Hudson, shows excellent specimens of Canada Red.

The exhibit of Mr. J. C. Chapais, of St. Denis, shows the effect of climate upon the keeping quality of such varieties as Duchess and Titovka, summer kinds, which are shown in fine condition; also, specimens of Hyslop Crab and Coe's Golden Drop Plum.

JOHN CRAIG,
C. P. NEWMAN,
D. PYKE,
} *Committee.*

Prof. Craig.—This exhibit demonstrates clearly to my mind that we can grow a number of these finer fruits if we take the trouble to top-graft them on hardy stocks. If we choose stocks such as Hibernal and graft on them Northern Spy and Ribston Pippin, we can grow these finer dessert apples at least in sufficient quantity for home use. Mr. Dupuis' apples demonstrate very well the effect of climate on the ripening qualities of the fruit. Many of those classed as summer apples are fall and early winter with him, and the late winter apples show the effect of insufficient summer heat to bring them to perfect maturity.

One of my objects in proposing this new fruit committee was to get the organization running in regular routine from year to year and also encourage

the exhibition of new varieties, so that they would come before the Society and be then either recommended or discharged. I move the adoption of the report.

Mr. President.—Before adopting the report, I would like to ask Prof. Craig to present to the meeting those two seedlings of Mr. Newman's. It might be in order to name those seedlings.

Motion agreed to and report adopted.

Mr. Dupuis moved, seconded by Mr. Joly de Lothbinière, that the Pomological Society of the Province of Quebec admits the principle of accepting, as affiliated members, the presidents of the horticultural and agricultural societies and farmers' clubs of this province, without charge, for the next five years, and that the board of direction be authorized to add a clause to the constitution of the Pomological Fruit-Growing Society in that sense.

Mr. Barnard.—I have a resolution which is a little fuller and may perhaps do a little better justice to the Society. Shall I submit this to the committee on resolutions?

Motion referred to the committee on resolutions.

Mr. Newman.—I visited Dr. Hoskin's orchard. He is testing a great many varieties. The most promising is Harty's seedling, being half a size larger than the Wealthy and just as fine a looking apple. It would be well if some of the northern counties would try it.

Prof. Craig.—It is a very promising tree at Ottawa, but has not fruited yet.

Mr. Fisk.—While on this subject of new fruits, undoubtedly we have amongst our seedlings many varieties which would be worthy of propagation. I would like to suggest that the Society should offer a prize for the best seedlings or any new variety. Extend the trial over four or five years if you like, and if the variety is considered worthy, it would become recognized and be supported. To take an apple and give it a name in one session, without any knowledge of its hardiness or adaptibility to the soil, is a little hasty. We want to see that new varieties are worthy of being propagated before recommending them as something permanent.

Mr. Barnard. I would support the proposition with this little change, that as there are so many different sections in the province, the same advantage might be offered to each. A prize might be given for three or four districts. The prizes need not be heavy, for if they were, a quantity of fruit would be brought in which would not be proper at all. If we offer prizes for districts, for the finer varieties of new fruit, that would bring together a great many varieties which, under other circumstanees, would not be brought before the public.

Mr. Hamilton.—With regard to not giving prizes in haste for seedlings, I would say that Mr. Newman's seedling has been well tested in his place, because the tree is very old—forty years old.

THE CULTIVATION OF FRUIT.

Mr. Hamilton read the following paper on this subject, sent in by Mr. R. Brodie, St. Henri.

A FEW PRACTICAL HINTS ON THE CARE AND CULTIVATION OF ORCHARDS.

The land suitable for orchard planting should be well drained, or have good natural drainage, free from weeds, especially couch-grass. The field for planting should be prepared the fall previous ; the land being well levelled, ploughed and marked off with deep furrous 30 feet apart, as straight as an experienced ploughman can make them. The action of the frost on these furrows, pulverizes the soil and puts it in the best condition for setting out trees in the spring. The trees should be set out 30 feet apart in these furrows, making them 30 feet apart each way, planting them no deeper than they were in the nursery rows. As long as the land is in a good loamy condition, there is no necessity to make holes four feet square, to set the trees in as was suggested at our last meeting. A man who had 500 trees to set out, and had to make holes of that size would have a graveyard look about his face before he had got very far. The trees should be cultivated with a hoed crop for the first ten years after planting, ploughing both fall and spring. Be sure and manure well either with stable manure, hard-wood ashes, or complete fertilizers suitable for fruit trees. But another point of great importance is you may give a man all the nourishing food he can take, if he does not keep a clean body he never will be a healthy man, so it is with a fruit tree, if the trees are never pruned, and are covered with bark lice, they never will be healthy trees. On the other hand, too many think that a shovelful of manure against the trunk of a large bearing tree is all that is needed ; as well ask a Scotch ploughman to do a hard day's work on the homœpathic dose of porritch one gets in hotels in these days. Orchards should have at least 25 tons of manure per arpent every three years, more often if possible.

Prune the tree into the desired shape the first two years after planting and going over them every year, there will be no need to lop off large branches at the end of ten years. The old maxim, train up a child, etc., is as good for fruit trees as it is for human beings.

For the first 12 or 15 years, or until the trees get their rough bark, look out for borers; use kerosene emulsion round the trunk.

For the bark louse use kerosene emulsion, I have added two pounds more of lime to the Bordeaux mixture with good success. I believe lime has been used with good results in California. For the bud moth, codling moth, caterpiller, etc., add Paris green to the Bordeaux mixture. It is as necessary to have a spraying pump on the farm at the present time as it is to have a plough.

To those setting out an orchard there are four points to be considered :

1. Choice of variety.
2. Cultivation and manuring.
3. Pruning.
4. Spraying.

Prof. Craig.—The question was asked whether it is best to plough the clover under or simply cut it and leave it on the ground. If the clover were sapping the moisture of the soil too much, cutting the crop might relieve the draft on the soil to a certain extent, but the object of growing a clover crop would not be so well attained as if the whole crop was ploughed under entirely. One of the benefits of a clover crop is that it acts in the capacity of a nitrogen collector. It collects nitrogen in little nodules which grow up on its roots. It is doubly beneficial in this way in gathering fertility by means of its roots and also by furnishing to the soil, when ploughed under, a certain amount of humus. I think Mr. Fisher is much better versed than I am with regard to the principles of fertilizing soils, which principles will apply to orchards as well as to all farm crops. No doubt he can give you better and more accurate information than I can. I simply stated some of the elements which the apple-tree takes from the soil and which we ought to return to the soil.

Mr. Fisher.—Prof. Craig has called upon me to answer a question rather difficult. If it were a question simply for the obtaining of fertility to the tree, I think I would have no hesitation in saying that ploughing under the clover would obtain that fertility much more quickly and completely than by simply cutting the crop and leaving it to rot on the surface. A great deal of the fertility which the clover obtains from the air is stored up in its roots. Those roots are near the surface of the soil, and in the condition in which they remain, while the clover crop continues to grow, would hardly reach the roots of the trees, but if ploughed under, the fertility stored up in the clover would be distributed by means of the moisture which would fall on the ground and be dissolved and distributed through the soil and enable the roots of the trees to obtain it more quickly and completely. If, however, a crop of vegetables is also grown amongst the trees, we must do something else to supply what that crop will take off. If the land is cropped, it will be necessary to supply a much larger amount of manure than the simple clover sod will supply, because the clover sod alone is hardly enough manure for an ordinary crop of potatoes or corn. If in addition to that crop, we have the strain on the soil of a fruit crop, we ought to do something more. Apparently a large number of our friends seem to think that cultivation of an orchard is the best system. That is to say, that the soil be constantly stirred and manured and cropped by some other crop besides the trees, so that the returns from the land might be greater, and some immediate return be obtained from that cultivation. Of course, cultivating the soil every year is an expensive operation; and if we have to charge that altogether to the trees, it is quite likely our orchard would not pay so well as it would otherwise. But if we put a crop on orchard ground, it will pay itself for the cultivation of the soil and aid us very much in reducing the cost of the orchard and making the orchard crop a paying one. It seems to me that the question is between cultivating an orchard pretty continuously or laying it down in grass where the cultivation is impossible. I have seen a great many orchards where I cannot conceive of the practical cultivation of any other crop in them. Small fruits may be raised in an orchard when the trees are small or not bearing.

But in any such orchards as at Montreal or Abbotsford, it would be practically impossible to cultivate any crop under those trees. They absolutely touch

the ground. The only crop you can get under these trees is grass. My own preference is for grass, but it should be pastured with sheep. We all know that sheep give a very rich manure and distribute that manure better than other animals. I think also the trees could be protected from sheep much more easily than from any other animal by feeding the sheep over and above their pasture. By this means we would enrich our orchards continuously. The sheep should not only get their nourishment from the grass food which the land supplies, but should be given nourishing food such as bran, meal and other grains. The nourishment that would be gained for the trees and the land would be very great because the manure from sheep thus fed would be worth a great deal more than from sheep simply pastured without additional grain feeding. I am satisfied this is the cheapest and best way of fertilizing an orchard where other crops cannot be grown, either on account of the situation or the nature of the soil. I know of some hillsides where satisfactory orchards can be raised, but where the ground is so stony that it is practically impossible for cultivation. I know of orchards again where the trees are so close together that the cultivation of other crops would be impossible. I am satisfied that the soil of an orchard could be maintained in its fertility in this way and the return from the sheep would give a fair profit on the use of the pasture. I have never pastured sheep in my orchard but have made arrangements to do so for the coming season.

Dr. Andres asked if chemical fertilizers could not be used.

Mr. Fisher.—If the sheep can supply sufficient manure to keep the orchard in good health, you can get along without expensive artificial manure. If you find the sheep do not do that, I would advocate the using of wood ashes and bone, which I look upon not only as one of the best manures for the tree, but also as useful in keeping the pasture up to the mark. The use of ashes and bone-meal would increase the pasturage very much and enable a larger number of sheep to be kept than if these manures were not used.

Mr. Barnard.—I have had to study a little the question of raising pork for the English market for bacon and hams. It is very evident, from the reports I have before me, that there is great profit, where milk is raised, from the use of the milk in the creameries. I would ask why sheep should be preferred to pigs? I have known pigs to run in orchards, and there was no inconvenience suffered. They would destroy very likely some fruit which, perhaps, sheep would not; but, whether it be sheep or pigs, I would beg to emphasize what has been said by Mr. Fisher. If fertility is required, it must be brought to the land. There is an idea that pasturing fattens the soil. It does, if food is brought to the soil. I had the pleasure some two years ago of meeting a French gentleman from Normandy who was quite an authority on fruit, and especially on cider. Observing our orchards at Cote de Beaupre, which have been in existence many years, he remarked how much we could improve our resources by putting more manure under our trees and taking a good heavy crop of hay. He said there is no inconvenience whatever in cropping the land in hay, provided we return to the soil all that we take from it; and that in Normandy for centuries they have been most successful with their apple trees, obtaining second crops. They have had heavy crops of fruit by the use of manure or artificial fertilizers.

Prof. Craig.—I think the suggestion of Mr. Barnard is all right in certain districts, but I think it would be a little dangerous to encourage this practice in the Province of Quebec and other provinces where, up to the present, we have not practiced an improved system of cultivation. We have been taking crops of hay off our orchards for years, but have not been returning to the orchards the equivalent, in fertilizing material, not alone of the fruit crop, but the hay crop as well. We have not returned sufficiently to the soil to replace what we have taken away. Where we grow two crops, we should use fertilizers so as to make an adequate return for the amount of crop taken off. I would not advocate the practice of keeping our orchards in meadow, for the simple reason that I do not think our growers and farmers would realize, as a whole, the necessity of returning a sufficient amount of fertilizers to the soil to replace what these crops took away. Another objection to trees in sod, and especially in meadow, is that you will find a larger percentage of the trees affected by borers, when growing in sod or meadow, than under clean cultivation. If the orchard is cultivated, the percentage of infested trees and fruit will be much less. Pasturing an old orchard with sheep is often the only practicable course to pursue.

Mr. Barnard.—I rise to emphasize the absolute necessity of making the land richer. When I spoke of a crop of hay being taken off, I also mentioned the fact that the land had been exceedingly heavy manured, and it is important that farmers should know the whole truth. It would be unfortunate if we condemned the process which is approved by the best experience in Europe, provided plenty of fertilizing matter is brought in. Young trees require cultivation, and when the tree has covered the soil, are you to continue cultivation, without any purpose whatever, as far as the needs of the tree are concerned? Cultivation will not fatten the soil; it will exhaust it sometimes. What the tree requires, and what the soil requires to feed the tree, is manure. If we can grow a crop of grass, the only danger would be from the borer. But we know how to treat the borer, and in an old orchard we can prevent the grass from growing about the tree. The experience of centuries in Europe, where they have been growing orchards with some success, is an example for us to do likewise and manure very heavily.

Mr. Fisher.—The difference between Mr. Barnard's suggestion and mine is very slight He suggests a crop of hay and plenty of manure. I suggest a crop of grass and the pasturing of sheep. If the sheep eat the grass on the land, the manure is bound to be there. I am sure that a great many farmers who grow hay forget to bring back manure in its place. In a large orchard the handling of hay is very troublesome. It has to be mowed by hand, and it is difficult to drive among the trees and carry a hoe and draw the hay out; whereas, when pastured, it is not taken away, there is no difficulty drawing manure, and the crop is consumed on the spot. As to other crops, the difficulty is just the same. No doubt we can grow crops of potatoes or corn and manure the ground, but I speak more particularly of those places where ordinary cropping is almost impossible, and where at the same time it is quite convenient to grow trees. In the Eastern Townships and districts from which Dr. Grignon comes, there are plenty places where trees would be grown which it would not pay to cultivate. The best plan would be to pasture them with sheep.

Mr. Barnard.—Sheep or pigs?

Mr. Fisher.—Both ; my preference is for sheep because they will keep the grass much more finely cropped. Pigs do not pasture very well. You have to ring them in order to prevent their tearing up the ground, and they do not manure as evenly.

Prof. Craig.—Would Mr. Fisher give us his ideas with regard to the amount of moisture that would be taken out of an acre of soil by a hay crop compared with the same area in pasture ?

Mr. Fisher.—That is a point I have never studied. During the early part of the season the hay would shelter the soil and keep the moisture in it, but after it has been cut and taken away the hay stubble would evaporate and dry more than the pasture would.

Mr. President.—All my orchards are in that condition. We cut the hay, and my experience is that the clover grows up very quickly aftewards. Pasturing sheep would no doubt result in the soil being dryer, and in dry seasons that would affect the growth of the trees. All my orchards are in grass, clover and timothy—mostly clover. I find that it is impossible to plough that orchard without doing damage. I attempted five or six years ago to plough a Fameuse orchard which did not seem to be thriving. The trees have gone to the bad ; the roots were damaged by the plough. The great test is how much are your trees growing every year ? That is what guides me. If I find my trees are making a growth of fifteen to eighteen inches every year, I consider they are doing all right. We cannot expect a heavy annual crop. We all agree that if we take a crop of hay off the orchard, we must return to the soil all that we take off if we want to keep our trees in vigor. I apply manure and wood ashes. I am situated so that I can get wood ashes. I apply a large quantity of wood ashes every year, and I consider it keeps up the vigor of the trees.

Mr. Chapais.—How much per acre ?

Mr. President.—I suppose I apply on an average about sixty to one hundred bushels of wood ashes and I have about thirty acres.

Mr. Fisher.—How often to the same acre ?

Mr. President.—Not more than once in three years, and in the intermediate years I give them a dose of manure. I am always guided by the fact of the growth of the tree. If I see that a tree is not growing, there is something wrong. With regard to pasturing sheep, I know of several orchards that are very successful in which sheep are pastured. The late Mr. Abbott pastured sheep in his orchards at St Anne's, and I believe his orchard succeeded very well. As regards the pasturing of pigs and hogs, I have no great experience except that I generally turn into the orchard, just before the apples are gathered, young pigs five or six months old. I met a gentleman at one of the Ontario Association's meetings and at the Dominion meeting at Ottawa, who resides near where Mr. Woolverton has his orchard at Grimsby. He attributes his enormous crops to the fact that he pastures pigs. He allows them to root up the ground, and plants acorns so that they would dig up the ground in searching for them. Moisture is retained by allowing the grass to grow. There will be less moisture if you pasture the orchard with sheep.

Mr. Fisher.—Have you many borers ?

Mr. President.—Yes; but I never lose any trees now with the borers. After the tree gets to the bearing age, we never have borers because we examine them every year. We examine them in the month of June after we get through the busy time. We examine them again in the fall when we put tar paper round the trees to protect them from the mice.

Mr. Hamilton.—I think I shall take credit for the last hour's discussion in answer to the question I put as to whether it would do as well to cut the clover and leave it on the ground. Although my orchard is comparatively young, yet I find frequently the difficulty to which Mr. Fisher alluded of making hay amongst the young trees. And as we are obliged to grow our trees low, ploughing is out of the question. Another thing is that standing hay takes a great deal of moisture out of the land. Last year, as manure was hard to get, I cut the grass and allowed it to lie. The ground was covered so much with the clover that I would like to ask the question of some persons able to explain the thing scientifically, whether it is not a fact that clover or any other crop that covers the ground close to the ground, develops nitrogen, and if it is not as well to allow the rains to wash that into the soil as to plough it under. Would not the soil get all the nitrogen that is extracted by the clover-plant from the atmosphere, just as well by allowing it to lie as by ploughing it under? My own impression is it would.

Mr. Fisher.—I confess that the question put by Mr. Hamilton is one I am not at all in a position to answer. We know that the clover-plant acquires its nitrogen from the air through its leaves. I also understand that there are certain nodules on the roots of clover in which the nitrogen is stored, and that the nitrogen is not, to a great extent, in the stem or leaves. It passes down to the root and is there stored in the nodule. Whether there is any generation of nitrogen, such as Mr. Hamilton alluded to, close to the surface of the ground, I cannot say. I know that the roots which the clover makes in the sod, just under the surface, are full of these nodules, which contain great quantities of nitrogen. My impression is that the stage of decomposition would have to be reached before the rest of the soil can get the full benefit of the nitrogen. I would like to ask Mr. President how he manages, without ploughing, to keep up a succession of clover crops.

Mr. President.—That is the extraordinary thing. I think the clover is kept up by the manure. I think the seeds of clover are in the manure. Orchards which are not manured for three or four years, and which get nothing except ashes, will run out of clover, and I have come to the conclusion that we must use manure in order to get more clover. I can show you orchards that have been in clover for fifteen years and still have clover. I can only account for it by the fact that it is due to the application of manure.

Mr. Fisher.—If you cut your hay early, there is a second crop of clover which grows up.

Mr. President.—We allow a second crop to grow up, and it is generally a very thick crop. It evidently seeds itself.

Mr. Chapais.—One of the best grasses to keep as a permanent pasturage is orchard grass. If you want to pasture sheep, it will grow as much as you like.

Mr. Dupuis.—We must not advise people to allow animals into their orchards, because they will be sure to allow the big cattle in.

Mr. Chapais.—I quite agree with Mr. Dupuis. The first thing a farmer must do is to put up a good fence around his orchard to keep the cattle out. A horse may not do much damage, if not allowed to be there too long, but cattle are very mischievous.

Mr. Dunlop.—Our remarks apply simply to the cultivation of present orchards. But if we have made mistakes in the past in that respect, we should rectify them now before planting new orchards. Our old orchards, planted forty or fifty years ago, were planted too close. The soil was in its virgin stage then, and we had no enemies. But now, when we find cultivation and spraying required, we ought not to plant our orchards so closely. Why not plant the rows at such a distance as will enable us to cultivate between them without trouble and spray the trees more easily. Fertilizers now have to be distributed by hand, which renders the work almost prohibitive on account of the expense. It is generally conceded that we can produce the finest fruit by cultivation. In the paper which provoked discussion, thirty feet apart is mentioned as a proper distance at which to plant the trees. I do not think it is, and the sooner we realize that the better. We should have the rows sufficiently far apart to enable us to use the intervening land with profit. We could cultivate small fruits and vegetables, if we should plant the rows sixty to one hundred feet apart.

Prof. Craig.—I wish to present one feature of this discussion more prominently. I asked Mr. Fisher if he thought a hay crop would draw more moisture from the soil than a pasture crop. I did not quite expect the answer he gave. It is a botanical fact and a general rule that all plants throw off moisture in proportion to their leaf surface. Tropical plants have a large leaf surface. Desert plants a restricted leaf area. The leaves have a certain number of breathing pores, which give off moisture in proportion to their number. If we grow a hay crop, we have a great deal more for surface evaporation than on a pasture crop. Therefore hay will draw out more moisture than short grass. I do not think the soil itself will throw off very much more moisture in the one case than in the other, but I think that the crop you grow on it will have the power of extracting moisture from the soil just in proportion to its leaf surface. We should bear that fact in mind in connection with cropping an orchard with hay. There is no doubt if we were to dig a foot below the surface soil of an orchard, which has a hay crop on it, we would find less moisture than if we dug the same distance under a pastured sod, because the hay crop has a greater evaporating power. As regards the collection of nitrogen, later German investigations have shown that these root nodules have the power of collecting nitrogen, found in the upper stratum or surface of the soil, from the atmosphere. This power is given, them (the nodules) by means of vegetable organisms belonging to the vegetable family of bacteria. Scientists have gone so far that they can inoculate certain soils low in nitrogen with germs of a particular bacterium and so transfer the nitrogen workers to other fields and other crops—that is transfer it from one crop to another by simple inoculation of the soil. Again referring to the relative amounts of water drawn from the soil by hay and pasture crops, it brings to our minds the fact that water is the vehicle by

means of which plant food is carried up through the tissues of the plant without a sufficient quantity of this, imperfect nutrition takes place, and a system of cultivation which will conserve the normal soil moisture. Clean cultivation does this best, pasturing comes next in order of preference while hay and grain crops, should be considered bad practice.

Mr. Hamilton.—Will the nitrogen bacteria propagate more rapidly under a crop which keeps the ground perfectly moist?

Prof. Craig.—I cannot answer from any facts I have on hand, but there is the general principle that all bacteria grow more rapidly in the presence of a moist warm atmosphere.

Dr. Andres.—I visited a good many orchards at Chateauguay Basin, owned by Robert Jack, Boulter, Read and others, and I noticed that where the trees were the largest and most crowded, there was the most trouble with insects; and it appears to me that a greater distance between the trees in planting new orchards would be advisable because ventilation also appears to be a great factor in the prevention of the growth of fungi. In a garden owned by W. A. Scott—it was an old orchard originally grown by Captain Fullerton,—was a Fameuse tree in the north east corner, which had very little spraying. It was not protected from the south west and west winds, and the fruit on that tree gave seventy-five per cent. number one. It had a south western exposure. The apples were picked a little early, just following a drought. Then he had thoroughly sprayed three times the rest of the trees in the vicinity. These trees gave him about fifty per cent. good fruit. The rest were very small. The spraying was done with a small hand pump. I wanted to ask the question whether the wind from the west and south west was the factor in keeping the front of that tree so thoroughly clear from spot.

I think the west side was surrounded by large maple trees, but early last Spring, he trimmed those trees very high so that the garden was not much protected, and one or two of the old trees he had cut down. The ventilation therefore was very good and the fruit exceptionally fine. One of his neighbours has quite a large orchard but the apples were not worth keeping. To show you how indifferent the farmers around Chateauguay Basin, were about spraying, I heard one remark to another on the train from Lachine to Chateauguay: Well, Mr. Jack, had very good luck with his apples and made a lot of money out of his orchards. The other said: Yes, because he sprayed three times this year instead of twice as last year, and now I am going to get a spraying machine. That is all right, said his neighbour; that will answer for both of us. I believe that next year the farmers there are going into spraying very thoroughly, and we will, I am sure, have better reports than we had last summer. I came across two trees of *pommes grises*, which I remembered as a boy. The flavor is just the same and the fruit perfectly green. The trees, I suppose have been there seventy-five years. The meeting then adjourned until the evening.

The Society met at 8 p.m.

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

CANADIAN HORTICULTURE.

The Dominion of Canada, which stretches between the Atlantic and Pacific ocean, towards the north, starting at the 45th degree of latitude, presents great

varieties of climate in its divers provinces. These changes of climate have a great influence on the horticulture of this country, in which we find, at its southwest extremity, the peach fruit and the vine, and then on its northern border only black currants, whortleberries and cranberries.

In the present essay I propose to treat of horticulture in this immense territory of the Canadian confederation from the point of view, first, of culture and production; second, of experiment, and third, of commerce.

CULTURE AND PRODUCTION.

The province of Ontario occupies the central of the southwest portion of the Dominion. In its divers districts are found the peach, the pear, the quince, the apple, the plum ,the cherry, the grape, and small fruits of all kinds, and melons, which are classed by some horticulturists among fruits. Numerous varieties of all these fruits are cultivated. As a matter of fact, this province displayed at the Chicago Exposition 144 varieties of apples, 67 of pears, 75 of plums, 42 of peaches, 24 of cherries, 79 of grapes, 40 of strawberries, 10 of currants, 24 of gooseberries, 7 of raspberries, 5 of blackberries, 3 of quinces. A flourishing society of fruit-growers called "The Fruit-Growers' Association of Ontario" is at work constantly to improve the culture of fruit. It receives a yearly grant from the Provincial Government, and a number of the local district societies are affiliated with it.

As regards the culture of vegetables and kitchen-garden stuff, floriculture and arboriculture, the climate of Ontario lends itself to the cultivation of all the plants of temperate climates. The province of Quebec occupies a position more northerly than that of Ontario, and does not enjoy a climate quite so favorable to horticulture. Nevertheless, this province affords a fine field for the efforts of horticulturists and arboriculturists. If one cannot grow the peach or the quince, good grapes and fine pears may be grown in the western portion, and the apple and plum reach, throughout the province, perfection in many varieties. Berry shrubs and small fruits grow there vigorously, and the strawberry and the melon, especially the latter, are produced of first quality. We can count 140 varieties of apples, 12 of pears, 14 of plums, 10 of cherries, 30 of grapes, 13 of strawberries, 6 of currants, 9 of gooseberries, 10 of raspberries and 9 of blackberries.

The province of Quebec has two provincial societies of horticulture—that of Montreal and the Fruit-Growing and Pomological Society of the Province of Quebec, besides five local district societies of horticulture, one of which, that of L'Islet County, extends its operations in the northeastern portion, the coldest of the province, which makes its work very important and interesting for the rest of the Dominion. All these societies are subsidized by the Provincial Government.

The province of Quebec is on about the same footing as the province of Ontario in the cultivation of vegetable and kitchen-garden stuff, with this difference, that the products are about three weeks behind those of Ontario. As regards floriculture and ornamental arboriculture, its field is somewhat more restricted, although still pretty extensive.

New Brunswick, which is situated to the northeast of the province of Quebec, enjoys good climatic conditions for horticulture, but the cultivation of

fruit trees has not reached much development in that province. Nevertheless, there is good work being done in that respect; and, although New Brunswick is not yet possessed of a provincial society of horticulture, it has a society of cultivators called the Farmers' and Dairymen's Association, which occupies itself with all questions relating to horticulture, as will be seen by reference to its operations for the year 1892.

Nova Scotia, which forms a peninsula at the eastern extremity of the Dominion, on the shores of the Atlantic contains the valley of Annapolis, one of the districts best suited for the growing of fruit-trees. At the Chicago Exposition this province displayed 144 varieties of apples, 23 of pears, 17 of plums, 10 of grapes, 10 of cherries, 4 of currants, 7 of gooseberries. This province has the advantage of possessing a horticultural society founded thirty years ago, called "The Nova Scotia Fruit-Growers' Association," which has done much for the advancement of this culture. In 1893, there was also founded in that province a school of horticulture affiliated to the Acadian University. This school is situated at Wolfeville and is directed by a board of directors who are members of the Provincial Fruit-Growers' Association. The course in that school is three years. The school is provided with a laboratory and its course is a very complete one.

Prince Edward Island has one of the best climates for the culture of vegetables and kitchen garden stuff, but not quite so favorable for the cultivation of fruit-trees on account probably of the excess of humidity in the atmosphere, due to the fact that this island is situated in the Atlantic Ocean, off the eastern shore of North America, and receives the first of all the saline emanations from the ocean. Nevertheless it figured not to disadvantage at the Chicago Exposition, where it displayed 30 varieties of apples, 2 of pears, 12 of plums, 4 of strawberries and 3 of gooseberries.

There remain the province of Manitoba, the territories of the Northwest, and the province of British Columbia.

The rigorous climate of Manitoba and the Northwest restricts considerably the field of horticulture in those regions, as regards the growing of fruit-trees. We find there the indigenous plum, and the berry-bearing shrubs in a wild state, and currants, gooseberries and raspberries succeed there by cultivation. Numerous experiments are being made, since some years to acclimatize certain varieties of hardy apples, among others Russian apples and Siberian crabs. But on the other hand, there are grown in these regions magnificent vegetables, and the cultivation of vegetables and kitchen garden stuff finds a soil and a climate the best fitted for these crops.

British Columbia, which is situated at the western slope of the Rocky Mountains and extends to the shores of the Pacific, enjoys climatic conditions altogether special to it. It has a magnificent future for the culture of fruit-trees, and to this culture it has given special attention since some years.

The fruits which that province sent to the Chicago Exposition attracted particular attention by their magnificent development. It was difficult to recognize some of the varieties displayed, so much did they differ by their colour and their size from the samples of the same varieties coming from the eastern provinces of the Dominion. British Columbia displayed 51 varieties of apples,

and 20 of plums. Pears, grapes and all the small fruits are also grown there. We find there also the nut growing trees, such as the hazelnuts and chestnuts, to the growth of which the climate is most favorable. There is in that province a provincial horticultural society and a horticultural board, whose work it is to investigate and combat the different parasites and diseases which attack horticulture in all its branches.

EXPERIMENTAL WORK.

In all the provinces of the Dominion, under the auspices of the Federal and local governments, experimental work is being carried on for the development of horticulture in all its branches. In order to understand the working of this system, we must bear in mind that each province is administered by a local government, whose duty it is to legislate concerning everything which is peculiarly of local provincial interest. Then there is the Federal Government, which has jurisdiction in all matters of general interest common to all the provinces. We have seen that Ontario has a society of horticulture and fruit growing subsidized by the Government of that province, and the other provinces of Quebec, Nova Scotia and British Columbia have similar local associations, likewise assisted. All these associations work with remarkable energy for the advance of horticulture and are meeting with great success, but they are necessarily local in their character, and only affect directly the localities where they operate. But above these local and provincial societies, there is a magnificent Federal organization which embraces all the provinces. I refer to the Experimental Farm of the Federal Government. There is at Ottawa, the capital of the Dominion, a general department of agriculture, at the head of which is the Federal Minister of Agriculture. The Minister of Agriculture promotes, by all the means at his disposal, the development of agriculture and horticulture, and among these is the Experimental Farm system organized by his predecessor, Sir John Carling, on the lines laid down by the Committee of Agriculture of the House of Commons, of which at the time Mr. G. A. Gigault, then a member of the House of Commons, was the Chairman. Mr. Gigault is now Deputy Minister of Agriculture of the province of Quebec.

There are in the Dominion five of these experimental farms, of which the central one at Ottawa is common to the provinces of Quebec and Ontario. This central farm has at its head the Director-General of all the experimental farms, Mr. William Saunders. In the west, in British Columbia, there is an Experimental Farm at Aggazziz. In the North-west Territories there is one at Indian Head ; in Manitoba there is one in Brandon, and in Nova Scotia there is one at Nappan, common to the three provinces of Prince Edward Island, Nova Scotia and New Brunswick. In these divers farms, experiments are made in all branches of agriculture. Besides the Director-General, Mr. W. Saunders, there are five chiefs of branches at the central farm. These divisions are: Agriculture, the dairy industy, horticulture, botany, entomology, chemistry and poultry. The divisions of horticulture, botany, entomology and chemistry, which have, as have the other branches distinguished specialists at their head, all contribute to the development of horticulture in all its details. One can easily understand that the work of men who have for their field of action the whole territory of Canada, which extends between the two oceans, with experimental farms in the various

latitudes, embracing great varieties of climate, and who have numerous assistants and correspondents acting in concert with them, must be of great benefit to the public. One can easily understand that experiments made in these conditions and under these auspices, in hundreds of different localities, must be of the greatest importance and cannot fail to produce the best results. In fact the word marvellous is not too strong to qualify the progress accomplished in horticulture during late years in Canada.

COMMERCE.

The province of Ontario, the southwest portion of the province of Quebec, and the southern portion of the province of Nova Scotia, do a large export business in certain varieties of apples. This business is principally done with England. We exported in 1892, 800,000 barrels of apples, representing a value of $1,600,000. The apple is about the only fruit exported by Canada.

In Quebec and Ontario, there are important business establishments which make a speciality of the sale of vegetable seeds and some of them cultivate certain of these grains in order to better acclimatize them. There are also in these Provinces numerous nurserymen who themselves grow trees suitable to the climate of the various Provinces and do a considerable and lucrative business—a business which however does not extend outside the Dominion, except in the case of some sales to the United States.

As Manitoba and the Canadian North West produce but very little fruit up to the present, these immense territories, the immigration into which from other countries is increasing every year in colossal proportions, provide a good outlet for the fruits grown in the other Provinces. There is thus a good trade with these regions in apples, peaches, pears, plums and grapes.

Certain counties of Ontario, such as Essex, for example, manufacture wine out of fruit of American vines and do a fairly good business in this with the other Provinces. The Reverend Trappist Fathers, of Oka, in the Province of Quebec, have also recently established large vine-yards quite close to Montreal, and make excellent wine.

There is manufactured also throughout the Dominion, a large quantity of preserved fruits and vegetables, which are an important article of trade. Preference is given to Indian corn, tomatoes, pickles and onions, apricots, cauliflower, allspice, spices, such as catnip, etc., dried fruits, preserved by divers methods and which furnish a good profit to those who carry on the industry.

Great efforts are being made, under the direction of the federal association of horticulture, established some years ago, to improve the means of carrying fruits across the sea to foreign markets, and every year progress is being made in this direction from which we may predict an excellent future for horticulture and fruit-growing in the Dominion.

Dr. Grignon.—Can we obtain apple trees from the Experimental Farm at Ottawa?

Prof. Craig.—Our distribution of apple trees is a delicate matter to handle. We do not wish to come into competition with nurserymen but, we do wish to introduce desirable varieties. Our distribution has been confined entirely to

those varieties which we have been led to believe are promising. Latterly we have been instructed to restrict the distribution very largely to scions only, and we send out scions of all fruits, as far as our supply lasts, each year to the growers who ask for them. There is no distribution of fruit trees or ornamental shrubs in the general way in which grains are sent out. There is one feature of our horticultural progress which Mr. Chapais did not touch upon. This last year there has been established in Nova Scotia, in the famed Annapolis valley, a School of Horticulture, which is the only one of its kind in America. It is devoted entirely to the development of horticulture through instruction of pupils. It is connected with the Acadian University, and is under the manage-mene of a director whose duty it is to instruct students in all the arts pertaining to Horticulture.

Dr. Grignon.—It would be well if this society would make known to the agricultural clubs that they can have all the information possible from the Experimental Farm concerning diseases in fruit-trees.

I had occasion a couple of years ago to have apple trees attacked by a disease. The ends of the branches were drying up. I sent some of the branches to Mr. Craig of the Experimental Farm. He replied immediately, and his reply was instructive. He told me it was the "blight" and that I was to cut off the ends of the branches and burn them and to be very careful in using the knife, so as not to communicate the disease by it. This information cost me nothing, and it would be well that the agricultural clubs should know that they can get such information in all these matters from the Experimental Farm.

Prof. Craig.—I have some recollection of Mr. Grignon's letter and sample of blighted apple trees, and as I was studying the subject, I recollect answering him. I may say, in support of what Dr. Grignon has already said, that we cannot be too careful in removing the branches or blighted twigs. With regard to disinfecting the knife, it is easy to plunge it into the soil after cutting the branch or have a small vessel with a weak solution of carbolic acid into which to dip the blade of the knife and thus kill the germs. But if care is taken to cut at least 18 or 20 inches below that portion of the bark which is discoloured there will be no danger of communicating the disease.

Dr. Grignon.—The reply I got was that it was nothing serious, and this year the trees gave plenty of apples and no blight. Three years ago at Ottawa, there was a report of the apple growers of the Province which would be useful for the agricultural clubs.

Prof. Craig.---The report was available to everybody who asked for it and the presidents of the agricultural societies have only to send in their names. I have still a number of copies in both English and French which I shall be glad to distribute.

NEWER INTRODUCTIONS AMONG PLUMS OF THE AMERICAN TYPE.

Prof. Craig.—I had not time to prepare a formal paper upon this subject and shall therefore take up briefly some of the more important points. It may be well to ask, what is needed in the way of plums for the Province of Quebec, at the present time? In the first place it seems to me that we need a hardy and vigorous variety. Again we need a variety whose buds will resist frost in early spring,

and are not likely to start too early in spring. We frequently lose our crop of plums by a severe frost in the spring following the blossoming period. Then we need a variety that is productive, and which is also a good shipper The plum is a difficult fruit to handle, and we require a variety sufficiently firm and thick in the skin to enable us to get it on the market in good shape. Then we need varieties useful for dessert as well as for culinary purposes. If we consider what we have, we will see that there is a crying want to be filled. If we look over a lot of the varieties of plums now cultivated in the Province we find that we have, especially in the eastern portion of the Province, a large number of the seedlings of the *prunus domestica* type. These as a rule bear a small ronnd, blue plum. They were introduced here by early settlers and have been propagated by seedlings and sucker production almost for centuries. They belong to the Damson family and are found scattered along the wayside, and no doubt Mr. Dupuis could give a great deal of interesting information on this family of plums as seen growing in L'Islet.

WEAK POINTS.

If we consider the weak points of this class, we find that the tree is somewhat tender in regard to its fruit buds. It is also, in the northern portions, tender in tree and I am sorry to say it is very liable to be attacked by the black knot. If I am not disgressing, I would like to refer our fruit-growers to the good work which the Horticultural Society of the County of L'Islet is doing in stamping out the black knot. Mr. Dupuis wrote me a year ago urging upon me the necessity of bringing before the fruit growers the virulent character of this disease in all its forms, and the united action with a view of eradicating it. At his suggestion, I prepared a bulletin and had it widely circulated, both in English and French, and from reports received, the good work started by Mr. Dupuis is being well carried out. I have no doubt that, with concerted action on the part of the fruit-growers, aided by such suggestions as we can give from Ottawa, we will see good results from our efforts, and that black knot will decrease from year to year instead of increasing. All we need to do is to cut out the knots and burn them carefully. They should be cut at least twice a year because we have two crops of spores, one maturing in early summer and the other in early spring, which carry the disease over the winter. We should cut in June, and while there may be a few knots which will escape our attention and will carry the disease over the winter; if we cut these again during early spring, the middle of June is the proper time, but that will vary according to locality, probably July down here—we will be taking the right course in order to rid ourselves of this serious disease.

To return again to the weak points of the damson plums, we will all concede that they are not sufficiently high flavored for discriminating tastes, but on the other hand they keep well and are very productive. Another class with which I am not so well acquainted, but which is found growing more or less freely in eastern Quebec, is the Orleans Plum. This fruit is also subject to the black knot. They are weak growers and have not been hardy with us in Ottawa, and I fear they would not succeed at points further north, though from reports which I have received they are grown very successfully east of Quebec—east and north.

I find they are not adapted to all soils. Then we have other classes and families of plums an example of which is found about the Island of Montreal. For further information I would refer the Society to Mr. Dunlop, who has made a particular study of this class of seedling plums for some years, and who has in his orchard a very promising and interesting collection. These are the most promising varieties of the Prunus Domestica class, as far as I can learn. We are testing them at Ottawa and hope to be able to say something regarding their merits before long.

NATIVE PLUMS.

The next class to which I wish to draw your attention, is a class native to this continent. We have of this family in cultivation three principal types, chief among which is the Prunus Americana. This Americana type is native of the north-western States and Canada. We have in Canada a variety of it which gardeners have called the black plum or P. Nigra. In this district it does not attain the size it has attained in the Western States. There is also another class native to the continent called the Chickasaw. They belong to the south and west and are not as hardy as the first mentioned class. The trees are rapid growers with peach-like foliage.

There is still another class of which we have specimens in Quebec in various portions—the Hortulana. To that class belongs the Miner with which most of you are acquainted. The wild goose or western plum also belongs to this class. I do not think we need consider these last two varieties as they have proved of little value to us in the north. We will consider the first group—the varieties of the species known as P. Americana. Among the good points which may be cited in favor of these plums are their hardiness, vigor of the tree, and productiveness. Among their weak points may be cited the fact that they are very rambling growers, the branches running off at all sorts of angles and bearing heavily they are liable to be borne down by the weight of the fruit. Some of them also have imperfect flowers—that is to say the individual flower is not able to set fruits with its own pollen. Like some strawberries these depend on another plant for fertilization, so that the fruit may be perfected. Again the flesh is apt to be soft and the pit is frequently large in proportion so that in some varieties we have almost a minimum of flesh with a maximum of stone.

I might say, before speaking of introduced varieties, that the late Charles Gibb, with his usual foresight in fruit matters, introduced into cultivation at Abbotsford fifteen or eighteen years ago a number of varieties of plums belonging to this class. He introduced a number of Wisconsin seedlings which opened people's eyes to the possible future value of this kind. Before coming to Ottawa I had an opportunity of studying these varieties in the west and began to appreciate their value before going east, and while in Iowa made a collection of the most promising kinds. These have since been introduced at Ottawa, and the last few years a good many have been fruited. The first variety I shall mention under P. Americana is one most of you know very well. I have a photograph of it here, a representation of fruit grown at Ottawa, it is called the De Soto and is found on the De Soto River in Wisconsin. It has become comparatively well known and is now very generally distributed. The tree is exceedingly hardy. It will grow where all of our common apple-trees fail. It is suited to almost all

soils. I have known it to grow and bear fruit equally well on sandy, gravel and clay soils. The photograph represents the fruit's natural size, as grown at the Experimental Farm. In quality it is good and it can be eaten either raw or cooked. One of its faults is over productiveness. If allowed to bear at will, it bears too heavily and the fruit becomes small in succeeding years. It ripens usually with us about the last week of August or the 1st of September. I think there is money in this variety.

Mr. President.—I never get that variety before the middle of September.

Prof. Craig.—I am speaking just of our own locality. It is, in my opinion, a valuable variety for almost all localities; even where we can grow such kinds as Lombard, the De Soto can be cultivated with profit. It can be put on our markets in good condition.

The next variety is what is called the Hawkeye. This originated in the State of Iowa. It is much larger than the De Soto, and is a dark-red plum, rather thick in the skin and firm in the flesh, with rather a large stone. The quality, in my opinion, is not quite as good as De Soto, but the fruit is handsomer in appearance, and on that account would sell better. It has been exceedingly productive with me. The tree was planted in 1891, and has borne now three seasons, and has borne heavier each succeeding year. The fruit has so far kept up its size. It is a variety which, if I were planting a commercial orchard, I should set very largely.

The next is called the Stoddard, and is practically the same type as the Hawkeye. I should have said, in connection with the Hawkeye, that it ripens in the first week in September. The Stoddard is about a week later; but for that it would be unnecessary to duplicate it, but as it comes late in the season I think it is wise to include it.

I find I have not an illustration of the next variety, which is called Wyant. That is also a western plum, belonging to the same class as that to which I have drawn your attention. It has a firm flesh and a free stone. You can run your knife down the suture of the plum, and it falls in half the same as a free stone peach does. It is good enough to eat raw. The tree has been hardy with me, but not as hardy as the other varieties I have mentioned, but it is likely to succeed in all the plum-growing regions of the province. It is about $1\frac{3}{4}$ inches in length, by $1\frac{1}{4}$ inches transversely. It is a long, oval plum, yellowish in appearance, with a rather well-marked suture, longer than the Hawkeye, but not as round and perhaps not as large. This also ripens with us about the first week in September, I regard this as valuable on account of its shipping qualities.

The next variety I would speak of is the Wolf, of which I have an illustration. This belongs to the same type of American plum as those already mentioned, but it is called the variety Mollis. The tree is quite hardy and distinct in character. The young shoots are purplish-red in colour, somewhat resembling the European type of plum. It bears heavily, and the fruit is exceedingly handsome. The skin is quite thick, dark red, covered with a beautiful blue bloom, but it does not cook as well as others on account of the astringency in the skin becoming prominent after boiling. It is very productive, and on account of its productiveness and attractive appearance, as well as fair quality, should be cultivated.

Another variety which has also been distributed through the agency of nurserymen and tree-dealers is the Weaver. That is exceedingly productive when planted with other kinds. Its blossoms may not fertilize themselves, so it should be planted with such kinds as Wolf and Hawkeye, in order to get full crops. This plum is also partially a free stone. I do not consider it as high in quality as Hawkeye or De Soto, but still it is very useful, and one of the latest we have. The fruit is somewhat larger than the De Soto.

I might show you this photograph of a seedling plum which was brought to my notice this year growing not very far from Ottawa. For the moment it has been named after the man in whose garden it is growing, and so is called the Snelling. It is a large red plum, very fair quality, but having only seen the fruit this year, I do not wish to say anything special about it. It is dark red in colour.

Mr. Chapais.—Would these plums ripen in our county ?

Prof. Craig.—All these varieties I have mentioned, as far as growing the trees is concerned, I have no doubt would succeed well in your locality. You may not have sufficient summer heat to ripen them to perfection, but they mature September 1st to 15th, and if you can ripen Shropshire Damsons you can ripen these plums.

Mr. Newman.—Has the Snelling a firm flesh ?

Prof. Craig.—Rather soft.

PROPAGATION.

With regard to propagating these varieties the best way is by budding or grafting upon their own stocks. The seed is easily saved and stocks may be easily grown by planting the pits in the autumn in beds or nursery rows. Sometimes they attain sufficient size to be budded the same season in August. If you are busy at that time, stocks can be taken up in the autumn and root grafted during the winter just as the apple is grafted in the winter. Another plan I have adopted is a system of crown grafting. Strong one year old, or medium two year old stocks are used. These are set in nursery rows and grafted early in spring, inserting a scion just at the collar or base of the tree. The side graft method is most convenient, and I have frequently had a growth of four or five feet in a single season. By cutting back the root when transplanting the next year its roots are thrown out from the scion, and you have a fine two years' old on its own root. These plums will do best on heavy soil, but, as I stated in the case of De Soto, they are less particular about soil than most other classes of plums. We have them growing on the farm on sandy loam of rather light character. The plums are doing well and fruiting heavily. I would advise planting them rather close, not more than 15 feet apart, and intermingling the varieties for the purpose of securing cross fertilization. I spoke of their rambling habit of growth. That necessitates a certain kind of pruning which we do not apply to other trees in our province. The branches should be shortened back annually. This I do by simply pinching off part of the young growth the second week in June. A very slight pinch will make the branch throw out collaterals and keep it in a more stocky and desirable shape. After they come into bearing this trouble will rectify itself.

PACKING AND SHIPPING.

If these varieties are grown for market, I would advise their being put up in small packages. It would not do, on account of their more or less soft character of flesh, to put them into large baskets for shipment, but they should be put up in small attractive packages. Handled in this way I have no doubt they will play a very important part in the future of fruit-growing, especially in the colder parts of the Province of Quebec.

Mr. Chapais.—I received from the Experimental Farm two years ago a plum called the Richard Trotter.

Prof. Craig.—That is the variety which was sent me for trial from Owen Sound. It was a large blue plum. It originated with a plum specialist in that district who sent it to Ottawa in order to have it tested. I sent it to Mr. Chapais for trial in this district. Owen Sound is a famous plum district in Ontario.

Mr. Chapais.—It is growing very well with me, but has not fruited yet.

Mr. President.—Is there not another plum called the Maquoketa?

Prof. Craig.—Yes. It belongs to the Chickasaw tribe. It is a small red plum, but one of the best cooking plums I know of.

Mr. President.—What is the date of ripening?

Prof. Craig.—I cannot say at this point.

Mr. President.—At Como it does not ripen until the 10th of October.

Prof. Craig.—In Iowa they ripen towards the end of August.

Mr. President.—I have fruited the De Soto for ten years, and I have trees that bore fruit, half a bushel every year.

Prof. Craig.—That is a very light crop for trees of that age.

Mr. President.—Half a bushel is not a very light crop for the size of the tree. Some may bear more than that. They were never picked until the 15th September.

Prof. Craig.—It is just possible that you may not have the true De Soto, because the way in which these varieties were propagated at first led to some mistake in regard to identity.

Mr. President.—They were some of Mr. Gibb's plums. I can speak with regard to those.

Prof. Craig.—We have three trees in the nursery at Abbotsford which Mr. Fisk is well acquainted with. They ripen early is September, not as late as the second week.

Mr. Newman.—Have you fruited any Russian plums?

Prof. Craig.—Yes, a number of them during the past three years. I am not yet justified in expressing strong approval of any varieties that have come under my notice this year. There are a few kinds worthy of mention. After three years experience with two varieties, I think they should be distributed. I refer to the Moldavka and Early Red. The first is a very large blue plum, rather poor in quality, but exceedingly handsome in appearance. The tree is hardy and bids fair to be moderately productive. Where we cannot grow the

other blue plums, it is safe to plant this. Early Red, I have fruited regularly for three years. It is a smaller plum of quality with a suggestion of bitterness. The tree is quite hardy.

Mr Fisk.—There is one of those Russian plums, the Trabische, that resembles very much the Lombard. It ripens earlier than the Lombard.

Mr. Newman.—Where can we get trees of those varieties ?

Prof. Craig.—You will have to apply to the nurserymen. We will furnish scions as far as possible.

Mr. Fisk.—These American varieties are going to be valuable for this province.

Mr. Dupuis.—Are they better than the European ?

Mr. President.—Mr. Dupuis is living in a paradise down there and can grow things we cannot grow around Montreal.

Mr. Fisk.—I saw Mr. Dupuis' plums in Quebec last fall. He exhibited some very fine Bradshaw. I have had Bradshaw for the last ten years, but cannot fruit them.

Mr. Dupuis.—Your land is too rich.

Mr. Fisk.—The American plum bears in abundance.

Mr. Dupuis.—Mr. Chapais grows the same plum.

Mr. President.—We cannot grow those plums up the Ottawa.

Mr. Chapais.—In cherries, plums, damsons and all that, we beat you altogether. Our cherries are much better in quality than yours.

Mr. Dupuis.—If you will buy our plums we will buy your grapes. I think we ought to encourage the culture of European plums. I think the Reine Claude and Greengage are better than any of those wild plums.

Mr. President.—The Greengage cannot be surpassed. I quite agree with Mr. Dupuis that we should aim to cultivate only the best fruit.

Prof. Craig.—In certain localities, it is a case of plums or no plums. If you were to depend upon Washington, Greengage and Bradshaw you would have no plums, and therefore I recommend the kinds I mentioned.

Mr. Dupuis.—Did you try to graft some of the European plums on the wild stocks ?

Prof. Craig.—Yes ; they take fairly well but the top usually outgrows the root.

Mr. Dupuis.—Of those European varieties there is a number that are vigorous growers. I do not understand how you can grow trees and make that length of wood in one year and have the wood good. You graft on plums that make 3 to 4½ feet wood in the fall.

Prof. Craig.—Yes ; there is no danger of those varieties being injured by winter.

Dr. Grignon.—We have red plums which resemble those. I have planted Damas and Reine Claude, but they have not borne yet. Our red plum I find is the best for the market. At Dr. Filiatreau's there is a Quebec Red Plum, hard thick skinned, and a good plum for the market. It ripens while it keeps. I

advise the planting of red plums in land where there are plenty of rocks, even without manure.

Mr. Dupuis.—Has the Fellemberg been tried ?

Prof. Craig.—Yes ; we have it growing but have not been able to secure any fruit. It is one of the hardiest trees we have of the European type.

Mr. Dupuis.—It would be a first-rate plum for drying. We ought to discuss that question of drying the plums. We import large quantities, which we could dry in the country.

SOME REMARKS ON PRUNING BY HON. MR. JOLY DE LOTBINIERE.

When we were at Knowlton last summer I thought it would be of some use to show some samples of bad pruning, so as to show the effect of leaving any little part of a branch you wanted to remove. I brought with me as many samples as I could. I had a number of those taken from apple-trees, so as not to limit my remarks only to forest trees, but to show that they applied equally to fruit trees. It struck me at the time that it would be well to try and secure some samples of good pruning, after showing the samples of bad pruning. At first I thought it would be very difficult to show samples of good pruning, because when one prunes well one likes to keep the tree. For some time I had a certain number of black walnuts and oaks, and had taken the trouble to prune them carefully.

I had branches of the trees cut at different times, in order to allow the roots to dry where they were too much overshadowed by the branches. I went to look for those trees, and found enough to make a collection. By looking at these samples one can have an idea of the reason why in pruning you should not leave the slightest protuberance.

Those magnificent trees that are in the cathedral yard, magnificent bass-wood trees, look as if they would live for centuries, but if you go quite close you will see that they are split to the very ground. That all comes from leaving branches like this.

Nature made great efforts to cover the wound, but before she could throw her bark over the wound it was too late. To show the desperate efforts that nature will make in order to repair these wounds, let me give you an illustration. Mr. Dupuis has alluded to a pleasant visit which I paid him last spring. We walked through the village, and I noticed two magnificent trees standing on each side of a green in front of a house. As I passed I saw that one of them was doomed to die. A branch had been removed, leaving that kind of a stump. It was interesting to see the efforts that nature had made to cover the wound. It is evident that the process took several years, as one could see by looking at the yearly rings, but the tree would rot too quickly before nature could cover the wound. We told the owner to cut the branch off, and I am convinced that, if Mr. Dupuis will invite me to pay him another visit, we will find the tree perfectly healed. When I began to take an interest in tree-culture, eighteen years ago, I was tempted to prune every tree which I saw required pruning. If you will go through the city of Quebec, you will not see one tree in a hundred well pruned. In every one you will see a number of branches remaining that should

have been removed. The smaller the branch is the smaller the wound will be. According to the authorities, the size of the wound is not material, provided you can pass your hand over the tree and not feel where the branch was. I have attempted to make a collection of trees that were more or less well pruned, giving to nature every chance to cover the wounds. It is a race between the destructive and the healing power. If you can cover the wound before the tree begins to rot, your tree will not suffer. I did not prune those trees myself.

Mr. Castell.—I was struck by the magnificent expositions of Mr. Joly, and I propose, seconded by Dr. Grignon, that in view of the great importance of good pruning in tree culture, this Association recommends that the Department of Agriculture and Public Instruction should arrange for the reproduction of the photographs of good and bad pruning, prepared by the Hon. Mr. Joly de Lotbiniere, with suitable explanations, and for these free distribution in primary schools and farmers' clubs, and also that they be incorporated with an illustration of appropriate size in the annual report of this Society.

Prof. Craig.—I had the same idea as Mr. Castell expresses. If the photographs could be sufficiently reduced and plates made of them for insertion in the report of the Society, they would be exceedingly instructive.

Mr. Joly de Lotbiniere.—Mr. Castell is at the head of the St. Hyacinthe school. He told me he would like to start a little class and wished to have specimens of forestry work, etc.

Mr. Fisher.—We ought to pass a resolution asking the Minister who has undertaken the publication of our report to accept this as a part of the transactions of the meeting and have it published in that way.

Mr. Joly de Lotbiniere.—The reason I got it made on such a large scale is because I thought it would be more useful as an object lesson.

COLD STORAGE.

Prof. Craig.—One factor which will play an important part in fruit culture is cold storage. At our Abbotsford meeting, I said this year that everything being favorable, I should attempt to carry out some experiments that would give us information in this line. I made experiments in cold storage in Montreal. I shipped from time to time baskets and boxes of apples picked in different places and packed in various ways. They were put into an apartment where the temperature was kept at 34 degrees. The collection comprised Tetofsky, Duchess, Yellow Transparent and Wealthy apples, as well as samples of peaches, plums, pears and grapes. Up to the first of December the earliest apples, the Tetofsky, were in prime condition, just as sound and perfect as when I put them in on the 25th July. The Duchess is yet in good condition and the Wealthy is, of course, all right. I have a barrel of pears in as nice and good condition as when put in. Coming down I stopped at a storage warehouse, selected a number of boxes and ordered them to be sent to the Fruit Exchange so that they would be sold and I would get an idea of the cash returns.

The pears were packed in tissue paper and put up in small boxes—fifty to seventy-five pears in each box. In early pears the experiment has been very successful.

With stone fruit, such as peaches and plums, I do not think we can hold them more than eight days with safety. After that the fruit deteriorates in quality. While it does not actually rot, yet it loses flavor and turns black, so that storage for stone fruits can only be looked upon as a means of tiding over a glut in the market for a short period. In the matter of early pears and apples, I look upon it as a most important factor. The early pears are now in good condition to put on the market and will probably command a high price just before Christmas. Later pears, such as Duchess and Beurre d'Anjou, I will keep on cold storage for some months and then will put them on the market. I give this fragmentary report now, but will give full particulars next year.

Mr. Newman.—Where is this storage ?

Prof. Craig.—The building I am using is on St Paul street. It is the Montreal Cold Storage Company.

Mr. President—There is one on St. Paul street, one on William street and one on Queen street.

Mr. Newman.—How long after picked should they be put on ?

Prof. Craig.—As soon as possible. They should be picked a little on the green side. Pears thoroughly ripe before being sent to storage did not keep as well as others picked on the green side.

Mr. Fisher.—If you pick the fruit before it is ripe and keep it in cold storage would not that interfere with the quality.

Prof. Craig.—It should be fully grown, yet not thoroughly matured before it has taken on all its colour. If picked at that time it will retain its flavor. The Bartlett pears were put in quite green, but they coloured up after being taken out so as to make them very attractive market fruit, and the flavor was perfect.

SPRAYING

Mr. President.—The Committee on Spraying to co-operate with Mr. Craig in the carrying on of experimental work during the coming year will consist of Mr. Fisher, Mr. Dunlop and Mr. Dupuis.

COMMITTEE ON RESOLUTIONS.

Hon. Mr. Joly de Lotbiniere.—I beg to present the report of the Committee on Resolutions. We have adopted eight resolutions which we respectfully submit to the consideration of the Society :

PASSED AT THE ANNUAL MEETING.

Moved by Mr. A. Dupuis, seconded by Mr. Bernard, and resolved :

That, in the public interest, the local horticultural societies, agricultural societies and farmers' clubs (cercles agricoles) should co-operate with this Pomological and Fruit-Growers' Society of the Province of Quebec, in promoting the study and practice of pomology and fruit culture.

That, for that purpose, all such societies and clubs should be represented, either by their president or another chosen delegate, in this Society.

That, in order to enable all such societies and clubs to take an active part in the proceedings of this Society and benefit by its deliberations, experiments and publications, the Honorable Commissioner of Agriculture and the Council of Agriculture be respectfully requested to make such arrangements with such societies and clubs as will entitle them to such official representation as above stated in this Society, and that the fee to be paid by such societies and clubs be fixed at the nominal sum of one dollar per annum, and that the President, Hon. Mr. Joly, Dr. Grignon and Messrs. J. C. Chapais and Fisher wait on the Commissioner of Agriculture and the Council to present this resolution.

That the President, Secretary and Director of No. 9 District (Montreal District) form a permanent advisory commitiee to aid the secretary in the discharge of his duty, with instructions to communicate with the Board of Directors in writing in relation to all matters of importance before any definite action be taken.

That the secretary be instructed to convey to His Honor the Lieutenant-Governor, our grateful appreciation of his kindness in opening this meeting and for the warm sympathy expressed by him for the success of our work.

That the secretary be instructed to convey to the Honorable Speaker and to the Honorable Members of the Legislative Council the thanks of this Society for allowing us the use of the Legislative Council Hall on the occasion of the official opening of this meeting.

That the secretary be instructed to convey to the Honorable the Commissioner of Agriculture, our thanks for the active part he has taken in promoting the work and success of this Society.

That the secretary be instructed to convey to the Local Committee entrusted with the duty of preparing for the reception of this Society the thanks of this Society.

That the secretary be instructed to convey to the press our sincere thanks for the interest taken in our meeting and for its efforts to awaken the attention of the public to our work and secure for us its co-operation.

That the thanks of the Society are hereby tendered to the retiring officers for their work during the last year.

H. G. JOLY DE LOTBINIERE,
Chairman Resolution Committee.

PRIZES FOR BEST SEEDLINGS.

Mr. Fisk moved, seconded by Mr. Barnard, that a prize be offered for the best seedlings exhibited from each of the nine districts, that such fruit be properly tested for several years before such seedling receive a name, and be formally recommended by the Pomological and Fruit-growing Society.

Mr. President.—It will be necessary, in sending out circulars offering prizes of this kind, to define what a seedling is.

Mr. Fisk.—The definition of a seedling may be referred to the committee on nomenclature. We have committees on fruits which will decide the point.

Mr. Fisher.—Is there no definition used by other societies such as the Ontario and American societies? of what constitutes a seedling? That question must have been decided before this.

Prof. Craig.—I do not know of any hard and fast rule for defining a seedling. It is generally accepted and understood to be a variety of which the origin is unknown, and which is supposed to have originated from the seed without systematic crossing, and has not yet been propagated for commercial purposes. A seedling means that it was grown from seed in contra-distinction to a variety which has been produced by crossing, and has been propagated by grafting or budding.

Mr. Joly.—We understood the importance of deciding at once what is a seedling, only we were pushed and thought it would be better to leave it to the sense of the society at large.

Mr. President.—Leave it in the hands of the committee on nomenclature or the committee appointed to examine the seedlings.

Mr. Joly.—That ought to be decided before the notice is sent. The committee will have to sit before the notice is sent.

Mr. Fisher.—Certainly, unless you accept Mr. Craig's definition.

Prof. Craig.—I would add to my definition, "that has not been propagated for commercial purposes and not exhibited as a named variety."

Mr. Fisher.—A man might very easily take the seed of an apple that he knew very well aud raise a seedling from it.

Prof. Craig.—Then strike out the word "origin unknown."

Mr. Joly.—Then by seedling will be understood a variety grown from the seed, which has not yet been propagated for commercial purposes nor exhibited as a named variety.

Mr. Fisher.—Another point in the resolution I would like to have more clearly defined is this: We offer a prize for a seedling from each district. Is that prize to be given only when the seedling is accepted by the Society after years of fruiting, or is it to be given to any seedling that appears to be the best? Are you to wait two or three years before giving a prize, or will you give a prize each year and not name the seedling until it has been tried several years and approved?

Mr. President.—We should limit the number of years, I should say two years in succession.

Mr. Fisk.—This is a matter requiring some consideration, and I think it would be better to leave it in the hands of the directors. I would suggest that a prize be given annually, with a prize at the end, either in the form of a diploma or a medal; not less than three years, not more than five years.

Mr President.—You have heard Mr. Fisk's qualification and explanation, is that acceptable?

Mr. Hamilton.—There is a point mooted and perhaps not fully expressed. A committee should be in each district to decide whether the seedling was worth

sending forward or otherwise we might get a great deal of rubbish. A man may have what he fancies is a seedling, but what on examination may turn out not to be one at all.

Mr. Fisk.—My principal object in bringing this forward is not only to obtain the best seedling, but with the view of getting a winter variety and long keeping apple. We have not got that, and it is possible we may find it among our seedlings.

Mr. President.—I think the words "at our winter meeting" should be put in The object is to get apples for long keeping. We have any quantity of summer varieties, but we all look for late keeping varieties. The objection raised by Mr. Hamilton will right itself. We may get a lot of apples not worth anything, but we may possibly get what we are looking for.

Mr. Hamilton—If the object is to find a long keeper, it would be better to limit the prize offered to an apple that will be a long keeper. There are lots of seedlings of early apples.

Mr. President.—If it is exhibited at the winter meetings, which will likely be in January, it cannot be a very early apple and be in good condition.

Mr. J. M. Fisk, seconded by Mr. Barnard, moved the resolution, amended, as follows:

That a prize be offered for the best winter seedliug exhibited from each district at the winter meeting, and that such fruit be properly tested for several years before such seedling shall receive a name and be formally recommended by the Society, and that by seedling will be understood a variety grown from the seed which has not yet been propagated for commercial purposes or exhibited as a named variety. And that a larger prize be given at the end.

Mr. Newman.—The tree ought to be a consideration in the prize.

Mr. Fisher.—That might come in in the larger prize at the end.

Mr. Hamilton.—Would it be wise to add to the resolution that the seedlings be preserved by the Society and tested again the 1st of May, and then the prize be given?

Mr. Fisher.—Would it not he better to appoint a seedling committee? I would move that a seedling committee be appointed, composed of Messrs. Fisk, Hamilton and Newman, to carry into effect the idea of the resolution.

SMALL FRUITS.

The subject of small fruits was the next item on the programme.

Mr. Dupuis.—Mrs. Paquet, of St. Nicholas, sent this year 55 barrels of gooseberries to Montreal. Mr. Paquet sent 50 bushels. I cannot tell what variety they were, but they were not large varieties. The culture of average Houghton seedlings pays better than the big, and gives less trouble.

Mr. President.—They grow better fruits in your district, generally in strawberries and raspberries.

Mr. Barnard.—The market is overcrowded. We have the wild raspberry.

Mr. President.—I have treated the subject of wild raspberries in my report on the canning industry in Ontario. The conclusions I came to were that if

factories could be established in districts for canning where the wild raspberries and strawberries abound, these fruits would pay very well, and be especially suitable for shipping long distances. The canners of Ontario are unanimous in stating that wild strawberries command much higher prices than garden strawberries.

Mr. Barnard.—I do not think there is any trade in strawberries to be counted upon, but in raspberries the question is more important. It does not pay to collect strawberries. I know of no districts where wild strawberries would be worth making a trade of, while if we can encourage a business in raspberries, which can be gathered so easily, that might become a profitable trade. I would like to ask your opinion of the value for canning of our cultivated raspberries. I would prefer the garden raspberry to the wild raspberry.

Mr. President.—Yes, the garden raspberry is quite as good as the wild raspberry.

Mr. Barnard.—As good in taste and much larger. If you can show us where we can find a market, it will be very easy to obtain a large supply of raspberries. Wild strawberries would be unfavorable to attempt as a business, but the case is different with raspberries. Another fruit growing remarkably well is the blackberry. Those give enormous returns. They are very sweet and nice, only not so good for canning.

Mr. President.—They do not seem to can them to any extent in Ontario.

Mr. Barnard.—Our efforts should be in the direction of cultivating garden raspberries of the kinds which succeed the best, and then go on with a more extensive cultivation for the purpose of canning. The day you can show a profit in producing garden raspberries, there will be any quantity supplied for the market. No doubt, 125 to 150 bushels to the acre is quite possible, if any kind of cultivation and manure is given to the plants. Mr. Dupuis can tell you that they grow well under his apple trees.

Mr. President.—Garden raspberries are very largely cultivated in Ontario for canning. Mr. Boulter, of Picton, cultivates the Cuthbert and Shaffer mixed. The latter is a black cap raspberry. They mix the two in order to get a darker colour and a wilder flavor. It would seem that the wild flavor is more appreciated than the other. Mr. Boulter has 80 acres cultivated for his canning factory. He is both a canner and a farmer. Mr. Miller, another large canner who has a factory at Picton, has a farm of 400 acres. The point I brought out was that these canning factories are successful only when they can fruit and vegetables.

There are no canning factories except some on the north shore of Lake Erie (in the great peach, plum and pear district) which devote their attention merely to fruit. But these in eastern Ontario—Trenton, Belleville and Picton—are canning vegetables and fruits in succession as they mature. They do not succeed as well unless they can spread over long seasons. They begin by canning strawberries and continue with raspberries and vegetables as they come in, but the most advantageous industry of all for the farmer is the canning of corn.

Mr. Boulter has a farm, Mr. Miller has a large farm, and both feed large herds of cattle every year. They contract with farmers to cultivate sweet corn for their canning factory. Mr. Boulter has 300 or 400 acres sweet corn cultivated

for his canning factory. Then instead of throwing away the corn husks and cobs, they utilize them. When the cob comes from the canning factory, the root of the corn is left on it. This is put into silos, and you can understand what an enormous quantity of feed can be obtained out of these cobs, from three or four hundred acres, by making ensilage. Mr. Boulter contracted for three or four hundred acres of sweet corn, and Mr. Miller exceeded that. They are farmers first and canners afterwards. They fill their silos with the refuse, go to Toronto, and buy 40 or 50 stockers, and feed them in the winter on this stuff with a little grain added. Then they ship them away in the spring.

We have a canning factory at St. Eustache for canning vegetables. It belongs to Mr. Windsor. He is a canner of lobsters and salmon in Gaspé county and New Brunswick. He comes to Montreal in summer and cans vegetables. In 1889 he established a factory at St. Eustache, and has been canning there ever since a large quantity of vegetables and fruits. But the husks and cobs of corn they have thrown on the manure piles and have never utilized them. It is an enormous amount of feed going to waste, which the farmers in St. Eustache should take advantage of.

Mr. Barnard.—Your report, Mr. President, is most useful. I know of no district which nature has served so well as Quebec with regard to vegetables. In Montreal, the Quebec vegetables are considered the very best. The little experience I have in Quebec, some six or seven years, shows me that a great deal can be done there in growing fruit and especially vegetables for the trade. The Quebec business itself is very small, but the moment we find a market outside, we can grow any quantity of small fruits and vegetables.

Mr. Dupuis.—I find the great difficulty is, when we have a nice crop, to know where to send it. This year I had plenty of currants. I sent some to the Quebec markets and the returns were very poor. I sent some to Montreal, and I got back nothing. I was told there were canning establishments there. The first time I sent the currants I was told that they had been picked with the stems on and it would be better to send them without the stems. But people do not like to pick them without the stems at the same price. I had to pay double the price for picking and I got no return. I had 400 to 500 gallons of red currants.

Mr. President.—I fancy your charge for carriage is very expensive to Montreal.

Mr. Dupuis.—Yes ; it cost about three cents per gallon.

Mr. President.—I am sorry Mr. Dunlop is not here. He is one of the best authorities on marketing small fruits we have. That is his business now entirely. He has a small farm at Outremont and deals altogether in small fruits. It seems to me that it is in a place like L'Islet where a small canning factory would be of great service. It need not cost a great deal to establish it, and need be worked only when we have fruit to can. It could consume an enormous quantity of fruit. By putting your currants into jellies and your raspberries and all such small fruits into cans, you could reach very distant markets and not be obliged to sell them at short notice.

Mr. Dupuis.—The education we have not is in the art of adulterating the jelly. They put foreign matter into jellies which prevents them from taking

our currants. They used to purchase all the currants we grew but now do not, because we cannot sell it as cheaply as the adulterated jelly.

Mr. President.—It seems to me the best grocers soon find out that the unadulterated jellies pay the best. I had a conversation with Mr. Geo. Graham, one of our leading grocers of Montreal, and he told me that while there was a great deal of adulteration, the best goods came to the front. The adulterated goods commanded cheaper markets, but the pure goods always get a better price.

With regard to small fruits, while there are special lines, such as raspberries, and while there are occasionally little places like L'Islet and some others where there is a glut in the market for a short time, I find throughout the country generally there is a lamentable lack of small fruits amongst our country people. I know villages where there are lots of good farmers, and where it is impossible to get a gallon of currants for love or money. I know of places where you could not get a gooseberry to buy in the country parts. It is true that Mr. Dupuis' district has more fruit than there is a market for, but that is just the place where a canning factory would be of immense value. But what I would like to see our Society do is to encourage our objects all over the country by showing people how easy it is for any householder, who has a few square rods of ground, to raise the necessary small fruits for his own family use and enjoy the luxury of having them. In this way general cultivation would increase, and there would be no difficulty in meeting the demand sure to arise for the marketing of their supplies in the shape of canning factories. While in certain places there is more fruit raised than the immediate locality can consume or find a satisfactory market for at the particular time, there is in the whole province at large not enough raised for the people at large.

Mr. President.—I would recommend Mr. Dupuis to communicate with Mr. Windsor, of Montreal, who is well established in canning. I brought out the fact in my report that Mr. Windsor canned 1,500 cases of apples—that is, 15,000 dozen.

He acknowledged that he got all his fruit from Ontario. We do not grow fruit for the canning factory, and there is only one. Mr. Dupuis can ship his small fruits to Mr. Windsor, and he will find a good market at once.

Mr. Fisher.—Does he take currants, gooseberries and raspberries?

Mr. President.—Yes.

Mr. Barnard.—Mr. Lefebvre stated before the Farmers' Congress last year that he purchased very large quantities of small fruits, but he had to send to Ontario and even to the States for them. It was the same thing with vegetables.

Mr. Hamilton.—The hint was thrown out a little while ago, by yourself, I think, Mr. President, that the canners found the wild strawberry very useful for the flavor they give. Mr. Barnard said that little could be done in wild strawberry. There is a strawberry largely grown, especially in France, called the Hautbois, about twenty varieties, like our wild one in flavor, and I think rather better. Now that that subject is brought up, it might be well that these might be introduced, and used as a means of flavoring, if not for other purposes. They are as easily grown as any other, and are very hardy.

Mr. President.—That is very important. Not only the canners, but the leading grocerymen have told me that the wild strawberry jam always sells far ahead of the cultivated strawberry jam on account of the wild flavor. Mr. Pyke has been preserving, on a small scale, some small fruits, and I would like to hear from him.

Mr. Pyke.—As far as strawberries are concerned, we cannot supply the demand. Mr. Graham took all we had. I had put up about two gross of 1½ pound jars, but we had only a poor crop of wild strawberries. We had a big crop last year, but not so many this year. Another year I will make more, on account of people knowing it more.

Mr. Barnard.—Three Rivers is the best market I know of for the wild strawberry. When the year is favorable and there is a glut in the market, I could purchase at 60 cents a peck.

Mr. Pyke.—I paid 10 cents a pound.

Mr. President.—How did you preserve them?

Mr. Pyke.—Pound to pound—the old-fashioned jam.

Mr. President.—Could you not manage with 50 per cent. of sugar.

Mr. Pyke.—I suppose so. Mr. Graham said that as straight jam I would get more for them, as it would be what they would recommend as first-class stuff.

Mr. Joly de Lotbinière.—The sugar is cheaper than the fruit by the pound.

Mr. Pyke.—If you take it half and half, it is only canning. It is very juicy.

Mr. President.—How did the prices you received compare with the prices of canning?

Mr. Pyke.—We did not make a great deal on that, as we only did it on a small scale. If we did it on a larger scale, everything would be cheaper. We were only experimenting. We bought our sugar by the pound and made something like ninety cents on the dozen boxes clear. We paid for the berries ten cents a pound.

Mr. Barnard.—If there was a canning establishment which paid ten cents a pound for wild strawberries, there would be a large quantity picked and sent there.

Mr. Pyke—They have to be put up in glass and not in tins.

Mr. Fisher.—How much did your jars cost?

Mr. Pyke—About five cents apiece. We got those straight from the glass factory—pound packages. We had no rubbers. People like these packages better than the gem jars, and we will try to get them arranged with a rubber or tight band. The top screws on, and we do not use any cork.

This closed the proceedings.

Pomological and Fruit-Growing Society

OF THE

PROVINCE OF QUEBEC.

SECOND SUMMER MEETING.

The opening session of the second summer Convention of the Society was held at Como on the 20th August, 1895.

The meeting was held in the School-house and was opened at 8 p.m.

The President, R. W. Shepherd, jr., Esq., occupied the chair.

Among those present were the Hon. Sir Henri Joly de Lotbiniere and Lady de Lotbiniere.; J. C. Chapais, Kamouraska ; Dr. Grignon, Ste. Adele ; Mr. Craig, of the Experimental Farm ; Giroux, of the Geological Survey ; Rev. Canon Fulton, St. Vincent de Paul ; J. M. Fisk, and Wm. Craig, jr., Abbotsford ; W. M. Pattison, Clarenceville ; A. Johnson, Cowansville ; H. W. Benyon, Montreal ; James Johnston, Montreal ; G. B. Edwards, Covey Hill ; R. B. Whyte, Ottawa ; R. Brodie, St. Henri ; C. P. Newman, Lachine ; I. J. Gibb, Como ; Major Robinson, Como ; G. R, Robertson, Montreal ; Sydney Fisher, Knowlton ; A. S. Henshaw, Montreal ; W. W. Dunlop, secretary ; Rev. J. Edgar Hill, Montreal ; Brother Norbert, Montreal ; Dr. Lalonde, Rigaud.

The ladies of Como also showed their interest in the cultivation of the fruit which tempted the "fairest of all her daughters, Eve," by appearing in a numerous contingent to grace the occasion. Mrs. and Miss Cleghorn, Mrs. R. W. Shepherd, jr., the Misses Shepherd, Mrs. Dr. Molson, the Misses Pyke, Miss McNeil, the Misses Thompson, Miss Clarke, the Misses Chapple, Hodgson and Halcro, Miss Smart, Mrs. Parke, Mrs. McNaughton, Mrs. Carmichael and Mrs. Graham were among the number.

The display of fruits is worthy of special notice. The collection from the Abbotsford Fruit Association, made up of a dozen varieties of Russian apples selected after a number of years trial, on account of different points of excellence, was very fine. Some of the more valuable were Winter Arabka, imported by the late Charles Gibb, Hibernal and Summer Arabka and Lowland Raspberry. Mr. Fisk also showed a box of Russian cherries, very remarkable at this late date. The variety is Orel No. 25, of large size and good quality. The fruit hangs to the tree so well that it is likely to be a variety of considerable market value Wm. Craig, of Gibbland, Abbotsford, had a collection of twenty varieties of the

best Russian apples taken from the orchard planted by the late Charles Gibb. These were the varieties which succeeded best after a practical test of ten years. Among the best varieties recommended by Mr. Craig are the Borovinka, Rominski, Summer Arabka, Scott's Winter (American) and Yellow Transparent. The Gibbland Farm was the homestead of the late Charles Gibb and is now the property of Wm. Craig & Son. W. W. Dunlop showed a very nice collection of fine varieties of plums. One or two seedlings, which he himself selected among those grown on the Island, are of particular merit. Among the named varieties are Prince Englebert, Lombard and Reine Claude. The President exhibited a number of varieties of summer apples and a plate of the now famous Canada Red—a most tempting collection. Mr. J. J. Gibb, of Como, also showed a very interesting collection, grown on the clayey soil of Como district. Prominent among them is the John Richardson, an apple brought into prominence by the late Mr. Gibb. His collection also included some of the better varieties of Russian apples such as Arabka and Yellow Transparent. Ottawa was represented by Mr. Whyte, director of the Ontario Fruit-Growers' Association, who showed a few varieties of plums. On the whole, the exhibit of apples demonstrated the fact that the fruit of this year, owing to the efforts of the fruit-growers in spraying, is of much better quality than in years past.

THE PRESIDENT'S ADDRESS.

LADIES AND GENTLEMEN :—

It is with mingled feelings of pleasure, pride and great diffidence. that I stand before you this evening in the capacity of President of this Pomological and Fruit-Growing Society of the Province of Quebec, at the second annual summer meeting of the members of the Society. We are assembled here to-night to deliberate and discuss the great and important subject of fruit-growing in this Province of Quebec.

As a native of this County of Vaudreuil and of this particular spot (Como), I bid you all a most hearty welcome, and I need scarcely express to you the great honor I feel that Como has been chosen, so early in the history of the Society, as one of the favored places visited by the directors and members to hold a Convention.

Last summer's session was held at the lovely town of Knowlton, in the County of Brome, in the Eastern Townships, and I am sure the hearty welcome of Mr. Sidney Fisher and his friends extended to us on that occasion, and the papers read, and the spirited and instructive discussions that followed the reading of them, must be fresh in the memory of each member who attended. I have no doubt that those here who will listen to the proceedings this evening and to-morrow, will be greatly benefited and enlightened on the great subject of fruit growing.

This Society was incorporated in 1892, on the same lines (or as near as possible) as that great and most important society, the Ontario Fruit-Growers' Association. A society which has been doing good work for many years and has steadily increased in membership and importance, and accomplished more real work and results, by implanting and instilling the desire for the cultivation

of fruit, flowers and trees, than any other society on this great Continent of America. The reports of the Ontario Fruit-Growers' Association contain most useful and instructive reading, and the monthly publication of that society, the *Horticulturist*, profusely illustrated and carefully printed, has a continental reputation.

The members of our Society have received the first report, and I am glad to learn that it has been appreciated. It must ever be the aim and desire of the directors, assisted by the members, to make the reports of the Society of a high order, and this can only be done by each one contributing to the work by means of papers on fruit growing and kindred subjects, and joining in the discussions at the meetings when occasion arrives. We want to hear from every one who can tell something he knows about the subjects under discussion, and the Society provides an able and efficient stenographer to take down every word you say to be printed in the next report, so that those who have never before had their names in print have now their opportunity. It is by the means of discussions that the thoughts and experience of individual members at such meetings as this can be recorded, and disseminated to members who are not present at the meetings.

Many members are too backward to write a paper that can help in the discussions.

Some slight attempt was made last spring to distribute among the members some new varieties of apple trees, in the shape of root grafts, for testing purposes. There was also sent to the members a small distribution of plants and shrubs from the Central Experimental Farm at Ottawa. I may say that this was only the beginning of a system of plant distribution to members, and your directors hope to continue the experiment with greater success next season, and by this means keep abreast of the times in regard to the newer varieties of fruit trees and plants, and we may expect to receive from members in remote districts, from time to time, favorable reports as to the adaptability of many of the promising fruits for these districts. I would say right here, that at Mount Victoria, Hudson, the promising winter apple, which has been brought to the notice of the fruit-growers of this province recently, under the name of Canada Red, the trees over thirty-five years planted, may be seen flourishing and yielding bountiful crops of fruit about a mile and a half from here. There has also been, since our last meeting at Quebec, very considerable correspondence with reference to the correct name of this apple, our friends in the Western States, Wisconsin and Michigan, claiming the proper name to be "Baltimore" or "Flushing." But the Ontario Fruit-Growers' Association has fully decided that, inasmuch as this apple has been cultivated so long in that province, under the name of Canada Red, that Canada Red it will remain. But the chief thing that interests the growers of apples in the Province of Quebec, is the fact that a long keeping winter apple, which sells at high prices, can be grown here with great success, and which is undoubtedly a hardy tree.

Ladies and gentlemen, I think it is right that I should tell you there resides here, at Como, Mr. I. J. Gibb, a gentleman who has always taken a great interest in fruit culture, but more especially the cultivation of flowers. The name of Gibb is very near and dear to us fruit-growers, for it was the late Charles Gibb

who, more than any other person, infused into most of us the love of the work. A man who never had an enemy—all were his friends—who devoted his means to the advancement of fruit growing in this province, and it is not too much to say, sacrificed his life for the cause by journeying to Russia and almost around the world, for the purpose of obtaining more knowledge on the subject so important to us. Charles Gibb saw the great advantage to be derived by visiting countries having a "like climate to our own"; he considered it necessary to visit Northern Russia for this purpose. The Government of Canada would not, or could not, send any one. His modesty and self-sacrifice should never be forgotten. "Some one had to go," he said, "Mr. Budd and I went." He undertook this great and very expensive journey entirely at his own expense. He accomplished much, but had he been spared a few more years what might he not have accomplished in this line?

This society has much work to do and a great *provincial* field to work in. Our orchards are few. We do not begin to grow one quarter enough fruit for our own consumption. At least seventy-five per cent of the fruit consumed in the province is imported from Ontario and the States. We do not even grow enough fruit to supply the one canning factory in the province. Mr. Windsor, the proprietor, imports the larger portion of his apples, for canning, from Ontario. Since the establishment of the Central Experimental Farm at Ottawa, and also since the late Mr. Charles Gibb's trip to Russia, we are no longer in the dark as to what fruit we can grow in the province. There is no reason why the Ottawa Valley should not produce thousands of barrels of apples, as well as plums, cherries and small fruits in abundance, all of which would be a source of great revenue to this section of the province.

The great country to the north of Montreal, in the St. Jerome district, is well adapted for apple growing, *i. e.*, hardy varieties of apples (which we know we can grow), and although there are several young and promising orchards in that district, it is for the society by such meetings as this to put the planters of orchards on the right track. It is for this that the society was established "to promote fruit culture in the province." I believe that great good must be derived from the information that will be threshed out during the discussions at these meetings and by the preservation of the ideas therein expressed, and recorded in the annual report of the society.

SPRAYING.

Professor Craig, of the Experimental Farm, addressed the meeting on this subject. He said: I need not express the pleasure that I feel at being present at this very large meeting of fruit-growers in this beautiful region. This is a section of the Dominion in which I have felt a keen interest for many years, because a relative (Mr. I. J. Gibb) of one of the best friends I ever had, in the person of the late Mr. Charles Gibb, resides here, and so connects my sympathies with the place. I also know it as a fruit-growing region possessing peculiar advantages in the way of fertile soil and favorable climatic conditions as well as good markets, and where you are only beginning, as your president, Mr. Shepherd, has pointed out, to realize the possibilities of the soil and climate from the standpoint of fruit-growers.

I hardly know this evening just in what way to take up the subject given me. I hardly know whether to address you as a body of fruit-growers having a certain amount of technical and practical knowledge of the subject, or to speak to you in a more elementary way, as I would to the members of a farmers' institute. Perhaps it would be better that I should speak briefly on the subject allotted me, and after which I shall be glad to answer such questions as will bring out the information you desire. We shall, with your permission, try to exchange information of mutual interest and benefit; for I always expect to learn as much, if not more, from an audience than I am able to impart.

I have given to the public the results and reasons of my experimental work in spraying, a number of times during the past four or five years, and the subject seems to me just now a trifle hackneyed; but as I know that the practice is still new in many localities; in order to make the treatment reasonable, if you will pardon me, I will just outline briefly the principles underlying this practice.

If we look around on the surface of the globe we see that we have two large classes of plants. Perhaps we do not at first distiuguish them very clearly or distinctly, but a little study of the vegetable kingdom reveals the fact that we have two classes of plants. One called the flowering class, the class most useful to man, which gives fruits and flowers. The other is just as numerous collectively, but so small individually that we do not see them with the naked eye, and know them chiefly through their effect on the higher class of plants, upon which they feed. This class is thus composed of parasites.

They are called parasites because they are unable, by reason of their imperfect or rudimentary organization, to take from the air and the soil in crude form the necessary food for their sustenance, as the apple or the corn-plant is able to do, and so they prey upon the apple and the corn-plant, and extract from them the nourishment which they have prepared for their own use.

If we look into the life history of these parasites we are enabled to see clearly why we should spray when we examine into their habits of development and growth. We find that they, like the flowering plants, are reproduced by means of spores which take the place or correspond to seeds. These spores are very small, light and easily carried by the winds, and like seeds under favourable circumstances they germinate and grow. With a sufficient amount of moisture and heat they sprout and grow just as does seed of wheat, oats or barley. We find that they, like other seeds, will not grow in the presence of, or if affected by certain chemical compounds or mixtures, so that this gives us the clue to their treatment. Our fathers and grandfathers used to treat their wheat with dissolved bluestone to prevent smut, and experience and practice showed that there was less smut in wheat, the seed of which had been treated with bluestone, but they did not know exactly what form of disease it was they were preventing by this treatment. Neither did they know that the smut of wheat was a vegetable parasite, a vegetable organism and a living plant just as much as the plant on which it grew. But by this treatment they simply killed the spores of the smut which were in or upon the seed wheat, and so prevented their growth and reproduction through the young wheat plant.

In the same way, in the case of diseases which attack the apple, we give a dose of bluestone in the same form, which allows of it being laid over the tree

on a thin coating or film, which prevents the germinating of these spores. Take the black spot on the apple, for example. This is carried through from one year to another by means of these spores, to prevent which we spray early in the season with a solution of bluestone or copper sulphate sprinkled over the trees, and follow it later with Bordeaux mixture. These are very elementary instruction to most of you present, but there may possibly be some who have not heard of it, and it is for their benefit particularly that I give it.

We have been carrying on this work at the Experimental Farm for the last five years and have given the results to the public from time to time by means of bulletins and reports which most of you, no doubt, have received. To those who have not received and would like to get our reports, I would say that you have only to ask for them. The Government gives them free, and any person can obtain them by writing to the Experimental Farm, the letters being also carried free of postage. These names are placed upon the mailing list, the reports will be sent free of charge, as they are issued. The information which I have already given in very brief form, you will find in our reports in full.

For the benefit of fruit-growers who have waited the results of our experiments the last three or four years, I would like to say a word or two on the latest developments in spraying. Each year we have been finding out something new, and each year our work has been aided by practical growers throughout the country. The experience of last year confirmed us in the opinion that the Bordeaux mixture was the best and cheapest agent in preventing most of these fungus diseases injurious to the fruit-grower's crops.

The season is not sufficiently advanced, at the present time, to enable me to give the results of our experiments this year. I am carrying on experiments in Ontario, and one or two points in the Province of Quebec, outside of special lines of investigation being carried on at the Experimental Farm.

In Ontario the work this year has been principally in the line of preventing diseases which affect the pear and the peach.

Our experiments in preventing the leaf curl on the peach have been inconclusive, on account of the absence of the disease, in the Essex district where peaches are grown very largely, our experiments, however, promise good results and are likely to be very useful in the future to fruit-growers in that district.

Our work this year, on the whole, had for its object the reduction of cost of spraying without lessening the effectiveness; therefore, it was on two lines—economy and effectiveness.

The first would be principally affected by the material used, and the second by the implements used, so that I have been trying to find out, not only the best mixture, but the best way to apply it.

As I have said before, the Bordeaux mixture is unsurpassed by anything we have since tried, and our work this year emphasizes the fact that the first sprayings that are made in the spring are the most effective and should by all means be carefully attended to.

If an orchardist is not able to spray early in the spring before the blossoms open, I am not quite sure that I would advise him to spray at all, especially if he is a beginner in the work, simply because if he does not get good results

from the later spraying, he may be discouraged and may also discourage his neighbors, and thus do more harm than good.

But, by all means, spray early in the season. First, use copper sulphate alone, that is bluestone dissolved in water—one pound to 25 gallons of water—in the spring before there is any sign of growth. Cover the trees very thoroughly.

The next application is made with Bordeaux mixture and Paris Green and takes place just after the blossoms fall; the third application is the same as the second, and the time of making it will depend on the season. In a rainy season it should be made earlier. If the weather keeps dry and there is less likelihood of fungus growth increasing rapidly, it may be done somewhat later, but with the Bordeaux mixture Paris Green should be applied.

I have been advocating in the past the use of ammoniacal copper carbonate—that is, a mixture of bluestone and washing soda, dissolved separately and mixed together. The precipitate formed afterwards is copper carbonate, and this is dissolved in ammonia and then called ammoniacal copper carbonate.

We use this for the later spraying, because it does not stain the foliage to the same extent.

But the results of our experiments this year seem to show that copper sulphate alone—that is, copper sulphate dissolved in water—will give equally good results. This is important, because the ammonia necessary to dissolve the copper carbonate is expensive and the manufacture of copper carbonate somewhat difficult, and the whole operation somewhat tedious.

Our experience up to date indicates that the copper sulphate alone will give quite as effective results as the ammoniacal copper carbonate.

I use it at the rate of one pound to 250 gallons of water, so that it is a very cheap spraying mixture, the copper sulphate only costing about five cents and the water simply costing the labor involved in securing it.

Mr Chapais.—We can use copper sulphate alone on the foliage?

Mr. Craig.—At that rate, one pound to 250 gallons, without any lime.

Mr. Fisk.—Will this be more successful in a wet season than the ammoniacal copper carbonate.

Mr. Craig.—I said that was used for spraying late in the season. I was speaking of copper sulphate as a substitute because of the greater cost of ammoniacal copper carbonate and the much less difficulty in preparing the copper sulphate solution.

I do not know that I would abandon ammoniacal copper carbonate entirely, but I am giving you the results of this season's work. I do not think it will be contradicted by the work of next season, and I want to give you the advantage of it as soon as possible.

Mr. Fisk.—There is a difference in the effectiveness between wet and dry seasons.

Mr. Craig.—Yes, this is natural. The more frequent the rain the more likely the mixture will be washed off, and therefore less effective. A very rainy season sometimes brings the Bordeaux mixture into a more or less soluble con-

dition, redissolves it as it were on the foliage of the tree, and sometimes causes injury. You will notice in the russeting of your apples— one side of the apple having a somewhat rusty appearance—an effect of the application of Bordeaux mixtnre. The diseases multiply more rapidly in seasons of much moisture.

On the subject of pumps. I wrote a letter on that subject the other day and have a copy of it here, but I am afraid you will find it even dryer than my remarks.

For general purposes a good hand pump is better than a horse power pump. Some of you who have extensive orchards may have been considering the advisability of buying a pump operated by horse power. I would not advise you to do it. In our experimental work during the past two years, I have found, that while the horse power pump is very useful in spraying avenues or continuous rows of plants or trees, yet in the case of larger trees where the tops need to be thoroughly sprayed, to do this it is necessary to stop and then the power also stops and the spray ceases to be effective, although there is an air chamber which is supposed to keep up the pressure for some time. In practice it is not sufficient, and when the pump is again started it takes some time to work it up again. For orchard work, therefore, I do not consider power pumps quite satisfactory.

I have used a good many hand force pumps made by Canadian manufacturers as well as some of those made by the leading United States manufacturers. The pump I had sent down here from Ottawa is manufactured by a firm in Toronto, but I do not wish it to be understood that I advertise that firm's pumps more than those of any other. As a matter of fact there are a good many reliable pumps now made in Canada. We should see that the parts which come into contact with the mixture are made of brass, so that they will not corrode, and that it is sufficiently powerful to throw a satisfactory spray, and further that it is supplied with an adequate stirring apparatus.

A piece of brass tubing connecting the nozzle with the rubber hose will be found of great advantage in directing the spray. If you simply have the nozzle, you can only hold it out to the extent of your arm. If you have a piece of tubing you can hold the nozzle well up and thus direct the spray considerably higher than you otherwise could. As in the matter of pumps there are now a large number of nozzles offered to the public.

There are two nozzles attached to this pump, one on each line of hose. The one on my left hand is called the Vermorel. That represents really a class of nozzles. They are all constructed on the same principles.

The liquid being forced into the chamber in a whirling condition when thrown out of the small orifice in the centre of the cap, is distributed in a fine spray in the form of a spreading cone. This is very economical of fluid and is useful for spraying the lower portions of the tree.

It is reasonable to suppose that the finer the spray the shorter distance it can be thrown. I, therefore, supplement this nozzle by using another which throws the spray in a fan shaped form. This is called the McGowan. The liquid is forced straight through a slot chamber round a central cylinder and comes out in a narrow stream. It is shut off by a cap which can be screwed down, making the aperture any size you like.

With a good pump equipped with these nozzles we can drive along a row of apple trees and spray one side as fast as the horse will walk. Two men are required, one man directing the horse and pumping, the other holding the nozzle. I have here a photograph which may interest you, showing the pump in operation.

This pump is fitted into the head of a coal oil barrel, being screwed down firmly.

AGITATORS.

Another pump I wish to touch upon. Bordeaux mixture, Paris Green, and most other spray substances in the water are usually held in suspension. They are not perfect solutions. The thicker and heavier portions therefore sink to the bottom, which causes the mixture to vary in strength. They require to be constantly mixed. For that purpose we need an agitator, and a mechanical one is better than other devices. The Rev. Canon Fulton has had manufactured at the St. Vincent de Paul Penitentiary, an agitator, of which he kindly sent me a sample, which has been attached to this pump.

I have not had the opportunity of seeing the agitator at work because I have been away from the farm for three weeks, but from its appearance it looks like a useful instrument. It will be on exhibition here to-morrow, and Canon Fulton will, I have no doubt, be glad to explain how it is attached and how it may be operated.

A good many pumps we buy stir the liquor by a return discharge stream.

This is done by tapping the flow, attaching to this a rubber or iron tube, the end of which is dropped into the barrel. The flow of the liquid back into the barrel is supposed to keep it sufficiently agitated.

I have not found this plan satisfactory, because, as a rule, we need all the force possible passing through the nozzles in order to make a satisfactory spray. Whenever the liquid is stirred by means of a return discharge pipe there is not sufficient power to make a good spray, so that I think the mechanical agitator is much to be preferred in the end.

Mr. President.—What is the cost of the pump you are exhibiting?

Mr. Craig.—$12 to begin with; but the extension tubes and stop-cocks which I had put in myself cost $2 additional.

KNAPSACK PUMPS.

For those who have small market gardens, it is unnecessary to buy a pump as large as that described. A very convenient form of distributing liquids is by means of the knapsack pump—a nice little vessel into which you introduce five gallons of water—you then put it on your back, walk around the garden and spray. It is good morning exercise before breakfast. For a small fruit plantation I have found it a very convenient instrument. There are several kinds. In general they are copper tanks holding from four to six gallons, supplied with

the force-pumps, and costing about $10 to $12 apiece. They are now offered for sale by most of our seedsmen.

Possibly you may infer from the emphasis I have been placing on this matter of spraying that I rely entirely upon it as a means of securing fine fruit. I would not like you to go away with that idea. I would rather like to impress upon you the fact that we have, in most of the fruit-growing sections of Canada, been growing fruit for a number of years on a very easy going *laissez-faire* sort of way. The trees were planted, we did little afterwards, but gathered the fruit, and the trees were left largely to take care of themselves. We took perhaps a crop of hay off the orchard year after year and also a crop of apples, forgetting we were thus doubly cropping the soil, and that each year when we took a crop of apples we were depleting the soil as much or more than by taking off an average farm crop, and therefore that we should manure it adequately without impoverishing it further by taking other crops off as well. It is time for us to consider carefully the whole orchard question anew. If we plant orchards let us make up our minds to keep them manured. We can prevent fungous disease and parasites by spraying from the outside, but cannot make our trees fruitful by this treatment.

We should manure and cultivate the soil and prune the trees and then spray them in order to get good fruit.

Mr. Chapais.—Did you make any experiments this year with the addition of molasses to the Bordeaux mixture. This was tried in the States?

Mr. Craig.—Yes, I have tried the addition of molasses, the object of which is not to be kind to the trees by giving them sweets, but to make the Bordeaux mixture cling more tenaciously to the leaves. I think it is more effective and useful, perhaps, if applied to potato vines than to apple-trees. I do not think we can get along with less than three sprayings whether we use molasses or not. I have been trying this year, but have not gone over the experiments with sufficient care to know exactly how they come out. So far, however, I have not been able to see any decided difference in favor of trees treated with molasses, but other experimenters speak favorably of it, and as it does not cost very much it can easily be tried. One gallon of molasses is usually added to each hundred gallons of the liquid.

Mr. Benyon.—Do not you think that attacks of parasites weaken the trees?

Mr. Craig.—Undoubtedly, and a weak tree is much more likely to be attacked than a strong, healthy one, which emphasizes the necessity of securing vigorous growth by generous manuring.

Mr. Benyon.—Do you find that the parasites attack a tree which has been grown from a root graft more than one grown from ordinary wild stock?

Mr. Craig.—I do not think we have sufficient data before us to judge.

Mr. Benyon.—Is the root grafted tree as strong as the old style of tree? As time goes on, do you not find trees subject more and more to parasites?

Mr. Craig.—That is explainable by the fact that as we increase any food plant, the enemies of that plant will also increase to a marked extent. In the past we did not grow many apple trees, and the enemies were not numerous,

but as the food plant was rapidly increased so particular parasites which feed upon it also increased and multiplied out of proportion.

Mr. Benyon.—You do not think the trees are weaker than they were. We have a great many trees in Canada dying out, the old Fameuse for instance. The trees originally were introduced from Western Europe, either Normandy or Great Britain. They did not come from a colder, but a milder climate. They have been here for a couple of hundred years and seemed to have withstood the attacks of disease and bore as good fruit as the trees which now require every attention and frequent spraying. Do you not think these trees were stronger, although they did not come from a rigorous climate than those imported from Russia and better able to withstand our climate?

Mr. Craig.—We have parts of Canada where none of the Norman or descendants of the Norman trees will stand, yet the Russians succeed. However, that is apart from the question under discussion, which is that the trees which originally came over were not attacked by parasites to the extent our trees are now. I think that is the case, but I tried to explain it by the fact that we have been planting trees much more generally. Just as the potato bug increased when the potato plant increased, so the parasites of the apple also have increased in proportion as the plants on which they feed have been increased. Our soil, a hundred years ago, was also much better than it is to-day. It was a virgin soil; it had all the original elements of fertility in it, and we had not cropped it. We have been cropping it a hundred or a hundred and fifty years in many places, and no doubt have not returned to the soil the elements we took from it. It is not a question of the relative hardiness or strength of the tree, but a question of good cultivation with all the other attendant circumstances, such as soil, climate and the relative amount of parasitic growth.

Mr. Benyon.—It appears to me, if things go on as at present, with everything that grows in the country getting weaker, and spraying and all sorts of devices required to ward off disease, there will be a hard look out for the country before long.

Mr. Craig.—That will give the better chance to good cultivators. All these fine California fruits which we see in our shop windows to-day have been grown, in some respects, under much greater difficulties than those which our fruit-growers have to contend with in this northern climate. They are grown in large quantities on comparatively small areas, but are given more care than ours with the result that they can be shipped 2,000 miles overland and sold at figures with which the Canadian fruit-grower in many instances cannot compete.

Mr. Benyon.—What is the duration of the life of an apple-tree in this country?

Mr. Craig.—That will depend upon many things.

Mr. Benyon.—Is the average 30 years?

Mr. Craig.—That would be considerably under the life of an average apple-tree. We consider that when an apple-tree reaches 20 years, it has come to full bearing, and it should at least have 20 to 30 years of that bearing period.

Mr. Benyon.—Do you know of many trees in this country that are in the neighborhood of 50 years old?

Mr. Craig.—I am not acquainted with this neighborhood, but no doubt there are many. Mr. Shepherd can tell you better than I can.

Mr. President.—There must be some seedling trees over 50 years of age at Mount Victoria. Mr. Cook planted a large orchard there over 50 years ago, and some of the original trees are still there. They must be 75 years old. They are seedlings. When those orchards were started they did not know how to graft, but planted the seeds and grew wild trees.

Mr. Chapais.—Ninety miles below Quebec, in my locality, I know an apple-tree—I think it is the *Bellefleur*—which is over 100 years old and gave last year 32 bushels of good apples.

Mr. Benyon.—It is a pity we have not more of them.

Mr. President.—The Canada Red which I mentioned in my address and are bearing at Mount Victoria are 35 years old.

Mr. Benyon.—Is that anything like the Wealthy ?

Mr. President.—No, it is a distinct apple altogether.

Mr. Craig.—The Rev. Canon Fulton informs me that in his orchards, he has a large number of trees bearing, which were planted in 1806.

Mr. Benyon.—Were they grafted ?

Rev. Canon Fulton.—No, selected seeds brought from the United States.

Mr. Benyon.—Did all those bear fruit ?

Rev. Canon Fulton.—Yes, there were two sets of seeds. One came from a Vermont garden, and were put in in 1812. Three trees out of that have stood the test of time. I saw them about ten years ago. I have trees that I know in my old orchards that are bearing to-day good, fine apples. One is 8 ft. in circumferance and 30 ft. high. It is like a pipestem and year by year, for the last ten years, its branches have been broken down with fruit. I have several of those that outlived all the pests that have come into life from the time they were planted. I have seen them stripped with caterpillars as if they had been scorched by fire, and they are still alive and bearing ; and I have trees in good flourishing condition that were certainly put in 35 years ago. We also teckon that a tree of 20 years is worth so much, and then so on until 50, and then it depends altogether upon the variety. Some are more tender than others.

Mr. Benyon.—That would be a lime soil ?

Rev. Canon Fulton.—On the same soil. Clay soil, unless it is subsoiled, is not the proper thing for apples. As far as parasites are concerned, we are not the only sufferers. It is not only in Canada that this spotting occurs. At first we thought it was organic in the tree but it seems to be more or less climatic or dependent upon climatic conditions in regard to its severity and recurrence.

Mr. Benyon.—That is what we want to know,

Rev. Canon Fulton.—Diseases may be spread by the different flies that puncture the leaf or the fruit, and the spores being microscopic are easily carried. In moist, murky weather they spread with great rapidity. Another grand reason for our having so much is our planting too closely and not allowing the air and sun to get upon the trees.

Mr. Chapais.—As to trees being less liable to get parasites on them if grown on their own root, I may say that in our district we have a lot of plum trees of the old Damson and Reine Claude, type which are growing as wild seedlings in our orchards, and they are attacked worse by the black knot—worse than the Lombard or Green Gage.

Mt. Johnson.—For the first application do you recommend this bluestone in preference to the Bordeaux mixture?

Mr. Craig.—Yes, because it is cheaper and more easily applied, and just as effective, and you can put it on much stronger at this time than later. You can use the copper sulphate solution earlier in the season as a sort of general germicide, At the rate of one pound to 25 gallons is not as strong as when you use it in the Bordeau mixture, but in this latter form it is neutralized by the lime. It is very easily applied and very effective. If you used it at that strength later on, it would burn the foliage.

Mr. President.—What is the effect if you use twice that quantity of sulphate of copper, 2 pounds to 25 gallons?

Mr. Craig.—I would not think there would be any advantage in using it at that strength because one pound to 25 gallons is quite strong enough to destroy all the fungus spores with which it comes in contact.

Rev. Canon Fulton.—If the fungus spores were destroyed in the first spraying, where do the others come from?

Mr. Craig.—I said those with which it came in contact. They do not all rest on apple trees. They may hibernate in the dead leaves which fall beneath the trees and are swept into fence corners and in innumerable other places.

Rev. Canon Fulton.—Is it not possible to use some other thing that is not poisonous at all? Could we not try lime?

Prof. Craig.—I have tried lime alone, but it has not been effective.

Rev. Canon Fulton.—Last year we were building a wall and close by there was a crab tree all spotted. It became powdered and splashed with the lime. The lime cleaned it and there was no spot. This spring it was perfectly clean as if it had been scrubbed, and to-day there is no spot upon it. There is codling moth, but no spot.

Mr. Craig.—The lime may have had a beneficial effect on the soil, and in that way helped to give the tree needed plant food. It would also destroy scale insects on the bark.

Mr. Benyon.—And if you strengthen the tree, the tree can protect itself against the parasites?

Mr. Craig.—Certainly that would be a great help and we are trying to instil that idea into peoples' minds as much as we can.

Mr. Benyon.—If you had only time to spray once what would you recommend?

Mr. Craig.—I should spray just before the blossoms opened with Bordeaux mixture and Paris green.

Mr. Benyon.—In our climate is there any danger of overfeeding trees?

Mr. Craig.—There is if the variety is inclined to be tender when this over-feeding may cause a late growth which does not mature and when the tree is young. After they come into bearing there is little danger. When the trees are young they should not be forced too much. They might, as I said, grow too late in the season, if cultivation was kept up and the wood not being thoroughly ripened, the young growth might be weakened or killed by the frost.

If you apply a fertilizer which is quite soluble, I would not apply it in the fall because the benefit of the application would be lost. It would be dissolved during winter, at a time when the roots are not active and partly washed away or dissipated by leaching.

Mr. .—You would not advise the application of mineral fertilizers?

Mr. Craig.—Not the application of soluble mineral fertilizers in the autumn. It is better practice to apply in small quantities during the growing season.

Mr. Fisk.—I am very much pleased with the address we have had from Mr. Craig, and there are one or two points with regard to pumps which it might be well to note. Probably many of our fruit-growers who are supplied with pumps have not used double pipes. In such cases where you use only one nozzle, the McGowan nozzle should be used. You can adjust it so as to spray the lower part of the tree as well as the top.

Mr. Craig has made it quite clear that we are not to suppose that by spraying alone we are going to have clean fruit. Other things must go hand in hand with spraying. You must feed the tree and cultivate it so as to give it strength to resist disease just as you have to strengthen the human system to resist consumption. A man who has disease of the lungs must not restrict himself to cod liver oil, but must have other treatment. In connection with the fungus diseases on the tree, you need to strengthen the trees by cultivation as well as by spraying. Do that when the tree is young by feeding it properly. Do not imagine that you are going to cure an old orchard which has been afflicted eight or ten years with a fungus disease and lost to a great extent its vitality and bring it back to vitality by spraying alone.

Mr. President.—Mr. Whyte is a director of the Ontario Fruit-Growers' Association, one of the most important associations on the continent of America. He is besides a man of great experience, and I would call on him to give us the benefit of his experience.

Mr. Whyte.—I do not rise to give my views on the subject of spraying, but simply to draw Mr. Craig's attention to the fact that he forgot to mention a simple form of spraying apparatus which does not make too heavy a load to carry. A hand pump can be got for $5 or $6, that is easy to use and practically efficient. It is to be found in any seedman's store now. For about $5 you can get a really good brass pump that will last many years. All you require is a wooden pail to hold your mixture. With this the proprietor of a small garden is well equipped to fight insect and fungus enemies.

Mr. President.—Suitable for an orchard of fifty trees?

Mr. Whyte.—Yes, if they are small; it is also very convenient for spraying currants and gooseberries. You can apply hellebore and Paris green and do the

work in one quarter of the time and with very much less material than when applied with a whisk.

In spraying apples there is a use not touched upon this evening and that is spraying for the codling moth. One application of Paris green after the blossoms fall is one of the most profitable operations any man can perform in a garden. I had a striking illustration of that this season.

In spraying for that purpose my material ran out before I had quite finished and several trees I did not spray. I found on looking over those trees that I had practically no clean apples, while on the others there were practically no codling moths. The presence of codling moth in the orchard is a disgrace to any apple grower, it is so easily prevented. There is an enormous loss from apples dropping to the ground, practically worthless, for you cannot sell wormy fruit. The time spent getting rid of this worm is the most profitable spent in the orchard.

Mr. Fisk.—Are four ounces Paris green sufficient for 50 gallons of water?

Mr. Whyte.—I must confess that I go by the rule of thumb. I put in an ordinary heaped teaspoonful to an ordinary wooden pail. It works well and never hurts my trees.

Mr. President.—You have been spraying for many years, what is your opinion as to the Bordeaux mixture?

Mr. Whyte,—The only thing I use the Bordeaux mixture for is our common red plum. I have never been troubled with apple spot. Have had no fungus disease in my apples worth mentioning, so I never went to any great trouble. Have tried to prevent plum spot and find it almost impossible to cure the red plum. I have about a dozen trees in my garden and do not think we get a quart of really good clean plums from them. Six years ago, we used to take a big clothes basket full from the one tree.

Spraying has not been a very great success for the plum blight with me. I always spray for gooseberry mildew.

Mr. President.—How do you account for not having the fungus?

Mr. Whyte.—I do not think it is so common about Ottawa as in other parts of the country.

Mr. President.—How about the Pearmain?

Mr. Whyte.—It has not been a great success. Duchess, Titovka, Gideon, Whitney No. 20 and Peach apple succeed better.

Mr. President.—Does the Peach apple not spot?

Mr. Whyte.—No; I have them in the garden just now, and not a spot on the whole tree.

Mr. Newman.—How long have you to catch the codling moth after the blossom falls?

Mr. Craig,—Usually about eight days in this locality. In that respect we are more favored than in Western Ontario, because the investigations of Mr. Fletcher and the observation of fruit growers have shown that in Western Ontario there are two productions in the year, of the codling moth. I noticed this very closely last year when going over the results of some spraying experi-

ments up there on pears. I found the pears that were perfectly clean from fungus disease were very much injured by insects. On examination I found the larvæ of the codling moth, and from its age it could not have been in the fruit more than two or three weeks. That was the first of September, so that the eggs must have been laid about first week of August, which led to the conclusion that the complete circle of life history was completed during the summer, and the adult emerged again and deposited eggs on the almost full grown fruit. In this locality we rarely have more than one brood, and the period during which the eggs will hatch, which is the time to apply the paris green, lasts about eight days as a rule. When the blossoms fall is the time to apply the paris green, when the eye of the apple is in such a position that most of them will catch and hold the paris green in suspension.

Mr. Chapais.—Will it do to prepare the lime beforehand, before spraying?

Mr. Craig.—I have drawn attention to the disagreeableness of this work of spraying. There are some little points which will help us if we follow instructions and begin early in spring. The copper sulphate can be dissolved in one barrel and the lime slacked in another barrel. These two are kept separate, and if we know how much each contains we can pour the requisite quantity of each into a barrel and we have enough to go on with. It means making a stock solution of the copper sulphate in one barrel and a stock solution of the lime in another. The lime will keep perfectly if covered with water, but the Bordeaux mixture will not keep more than a week. Chemical action will take place and prevent its poisonous effect on fungus spores. It is an excellent way to mix the lime in one barrel and dissolve the copper sulphate in another. Put a pound of the sulphate to a gallon of water in one barrel and the same amount of lime to another gallon of water in another barrel.

Take out 4 gallons of the copper sulphate and 4 gallons of the lime water, and after stirring and pouring them together you have enough for 50 gallons or an ordinary coal oil barrel.

Mr. Newman.—Is there any way of knowing when the Paris green is pure?

Mr. Craig.—The Department of Inland Revenue passed an act which is coupled with the inspection of food act, which imposes a fine on any one manufacturing or putting on the market Paris green which does not contain a certain percentage of arsenical acid. Any sample marked pure Paris green and which does not contain this sixty per cent of soluble acid is not pure, and any sample sent to the Department of Inland Revenue and analysed and found not pure will render the seller and manufacturer liable to a fine. There is no way in which the ordinary fruit-grower can tell this but by actual analysis, and of course that is not within his range. I think the act will have a very beneficial effect because, no doubt, in the past Paris green varied a great deal in strength?

Mr. Chapais.—Is there less danger using too much Paris green with the Bordeaux mixture than alone?

Mr. Craig.—You can use more Paris green with the Bordeaux mixture because the lime has a neutralizing effect.

Mr. Newman.—How much can be used with safety?

Mr. Craig.—To the barrel you could use as much as six ounces. I have not found that four ounces is not effective.

Mr. Fisk.—About four ounces to fifty gallons, I have some codling moths, and I find four ounces used in connection with lime in the Bordeaux mixture is not enough.

Mr. Craig.—I experimented last year to see if Paris green was just as effective with Bordeau mixture as if applied alone.

I have a row of crabs which bear profusely every year and are also very attractive to the codling moth. I sprayed one of the trees with Bordeaux mixture and Paris green, and sprayed one with Paris green alone. At the end of the season I had the fruit counted, and the number of crabs with codling moths counted on each. There was no appreciable difference—actually two-tenths per cent difference in favor of the Bordeaux mixture with Paris green.

Mr. Chapais.—When you say six ounces of Paris green per barrel, that is per bbl. of 50 gallons.

Mr. Craig.---Yes, a coal oil barrel.

Mr. Fisk.---Do you mean Imperial measure or American measure ?

Mr. Craig.---We speak by Canadian measurement which is Imperial. I think the Americans use the wine measure mostly.

Mr. Whyte.---An American gallon is 22 ounces and the Canadian 42 ounces.

Mr. Newman.---Has the spraying to be finer for the codling moth ?

Mr. Craig.---The finer the better it is for both, simply because the finer the spray, the more surface you can cover with the same amount of fluid, and the calmer the day the better. There are some practical growers here who have practical experience in this matter of spraying.

Mr. Newman.---We have some Fameuse trees about sixty years old, and this year, owing to spraying, some of the trees have given ten barrels of as fine apples as I have ever seen. I have everywhere and at all times noticed that the spraying has a wonderful effect on the fruit. It seems to protect the leaves from every insect, and at the same time keeps the spot clear. I have sprayed considerably this year. I used about 150 barrels of the mixture and was well repaid for my time and trouble.

Mr. President.---Did you spray last year ?

Mr. Newman.---Yes, but not so much, about five acres. Last year was the first year.

Mr President.---And you attribute the fine crop of Fameuse to the spraying ?

Mr. Newman.--- Yes entirely.

Mr. President.---Had you a good crop of apples last year ?

Mr. Newman. --Had a few apples last year, but it is the nature of Fameuse to bear a very heavy crop once in two years.

Mr. Benyon.---Did you set aside a certain portion not sprayed so as to compare ?

Mr. Newman.---It was not necessary as there are too many neighbors around with whom I could compare.

Mr. President.—Mr. Dunlop grows probably the finest gooseberries in the vicinity of Montreal, and is in a position to give us some experience.

Mr. Dunlop.—I have sprayed my English gooseberries for a number of years past. It is a very simple operation with gooseberries. You simply require to spray the bushes thoroughly when the fruit sets. That has always arrested the mildew on my bushes, and I have never had a failure so far in growing them. In fact I am troubled so little with mildew that I do not require to spray the whole of the gooseberries but only certain varieties, and I wait until I see the first sign of mildew and then spray.

The only precaution you need take is to be careful to spray the bushes from under. One man holds the branch and the other applies the spray. It is an effective cure for mildew. Everyone attempting to grow the English varieties should be prepared to spray when necessary.

Mr. President.—How many applications ?

Mr. Dunlop.—Seldom more than twice. It depends on the season. If the rains are frequent you may have to apply two or three times. I have made one application of spraying from under and have seen the Bordeaux mixture remain on the berries when ripe. It takes a great deal of rain to wash it off when applied from under. I have also tried liver of sulphur, but did not find it so effective, and it sometimes injured the foliage.

Mr. President.—At what time of month do you apply the spraying ?

Mr. Dunlop.—I wait until I see the first trace of mildew and then apply it

Mr. Fisk.—Do you use any arsenic for the gooseberry caterpillar in connection with Bordeaux mixture ?

Mr. Dunlop.—You can use it at the same time and save the labor of separate applications.

Mr. Benyon.---Which varieties are they that do not require spraying ?

Mr. Dunlop.---I could explain so far as I am concerned, but localities differ Some varieties will mildew in a certain location and not in another. A variety which might not mildew with me may probably mildew with you The Industry does not generally mildew but it does with me. The White Smith, which is subject to mildew with some people, is seldom affected with me. Locality and soil have a great deal to do with it. After a couple of years trial you will know what variety suits you best and plant accordingly.

Mr. Fisk.---Do you use the Bordeaux on your plums ?

Mr. Dunlop.---I have applied it with a certain addition of Paris green for the curculio, and I have seen the beetles working on plums which were coated with the mixture as freely as on trees, not sprayed, and could not perceive that the damage was any less. My experiments in this line were made at a time when the curculios were actively at work, and it is possible that an earlier spraying might have given better results, as the beetles are supposed to feed to some extent on the foliage. The Bordeaux mixture is a good preventitive of the shot hole fungus which frequently attacks the foliage of the plum,

and also, combined with the arsenites renders the latter much less liable to injure the foliage, which in some varieties is very sensitive.

Dr. Lalonde.---Which are the apple trees most affected and which are the least affected ?

Mr. President.—That is a question pretty hard to answer. I think that will come up when we discuss the next subject on the programme, namely, the best six varieties of apples for profit in the Ottawa valley.

Mr. Craig.---Why some varieties are more affected than others is somewhat difficult to answer, but why the fruit is affected is not so difficult. Those varieties which are not affected by fungus pests are usually found to have very thick, leathery skins covering the fruit and somewhat greasy in character. Notice the Gideon and most of the Russians which are less affiicted with spot ; we find they all have skins of similar character—thick and leathery. I suppose for that reason the progress of the apple spot is not able to penetrate. The foliage also is much more vigorous than the other kinds. But they have not been grown long in this climate and may develop a defect later on. We see some evidence on the Wealthy, which at first was quite free from scab, but in the past two or three years, in some localities where it is not properly manured, it shows a disposition to be affected with fungus disease the same as the others.

Mr. President.---Mr. Craig has given us a great deal of information. He has explained the working of the pump and the effect of the different nozzles. He has told us when to spray and the proportions required in the mixture, and when to spray for the codling moth. That is a very important subject which we all do not understand. The spraying in order to kill the codling moth should be done within eight days after the blossoms fall, by Bordeaux mixture and Paris Green.

The next subject for discussion is the

BEST SIX VARIETIES OF APPLES FOR PROFIT IN THE OTTAWA VALLEY.

Mr. President.---I will give you the list of varieties which I recommend for the Ottawa valley as far as my experience goes, and it is now twenty-two years since I first set out orchards. My experience is that the following six varieties are the most profitable, but there are two or three others which might be added.

The Duchess is a profitable variety, and can be grown here with great success.

The Duchess of Oldenberg is a Russian variety which was imported many years ago.

Mr. Craig.---It was imported into the State of Illinois in 1840, and reached Canada about twenty-five years ago.

Mr. President.---It is a very hardy tree, very regular bearer, and a bearer of very fine apples. But since the California fruit has been brought into our markets by means of cold storage in transit on the railways, we have not found the Duchess so profitable. I attempted last year to ship the Duchess in cases

to England. It was more profitable to send them to England in cases than to sell them in baskets in Montreal last year. I do not think it will be every year. But last year in England there was a scarcity of early apples, and the Duchess which I shipped before they were quite ripe, realized about ten to twelve shillings per case. It paid me better than selling them in Montreal at 30 or 40 cents per basket. They arrived in excellent condition. The Duchess is a peculiar apple; ripens after it is pulled and colors to some extent. The shipment was so profitable, as compared with prices realized in Montreal, that if I had a good crop this year, I should repeat the experiment. I have however very few apples this year. It is a safe apple to plant for those who wish to go in for fruit growing, but I would not recommend the farmer to plant a great many Duchess, because the market for the Duchess comes at a time when the farmer is very busy—just about this time. He is in the midst of his harvest and cannot give the time or attention necessary to realize good prices.

This is a case (shown here) similar to those I used for shipment. Each case contains 196 apples. There are four layers containing 49 apples each, each apple fitting into a square. They are picked in the orchard, put into the boxes and shipped.

The next apple in my list is the Wealthy, and the next the Fameuse. The Fameuse and Wealthy have very much the same season, the Wealthy perhaps a week or two earlier. I have shipped the Wealthy to England and also the Fameuse in boxes like this for the past ten years. The Wealthy is equally as well appreciated as the Fameuse in England and Scotland, and also in Germany and some other countries to which I have shipped them. I think the English people like the Wealthy better than the Fameuse. It has more flavor.

The Canada Red I recommend as a profitable apple. I recommend it not because I have any trees bearing in my place, but because I have sold them the last two years and I know it is a very saleable apple. I sold the Canada Red at much higher prices than the Fameuse or any other variety I have grown.

Winter St. Lawrence is a very fine apple which is in season in December. It does not succeed everywhere, but it succeeds in this district with me, and also in the Montreal district. It is a profitable apple in the Montreal district.

Canada Red will keep until June. It is a thorough winter apple; it will keep as long as the Golden Russet. I am giving you the experience I had last year. I shipped a barrel of Canada Red and a barrel of Golden Russet to Germany. The report I had was that the Golden Russet did not arrive in good condition, but the Canada Red were perfect and very much appreciated.

The next apple in my list that I consider profitable to grow—I could name a couple of apples equally profitable, but the question is what are the six best varieties—is the McIntosh Red. It has only one fault, it is inclined to spot as much as the Fameuse. I have been able to grow very fine McIntosh Red, and it is certainly one of the handsomest apples in the world. I do not think, when the McIntosh Red is well growln and highly colored, that there is such an apple in the world, such a richly coored beautiful skin and its flesh is as white as the Fameuse. The season of the McIntosh Red is the same as that of the Fameuse, perhaps a little later, and it will keep quite as well as the Fameuse. I have

shipped them in October, and had them arrive in London in excellent condition. They were exhibited in 1892 at a fruit exhibition in Lewisham, and the gentleman who exhibited them wrote me to say that the people were amazed at the color. They still had their bloom when taken out of the boxes.

The Duchess, Wealthy, Fameuse, Canada Red, Winter St. Lawrence, and McIntosh Red are, in my opinion, the six best varieties for profit in the Ottawa valley. Of course there are others that can be recommended too.

Mr. Johnson.—Canada Red, as a rule, does not grow very large ?

Mr. President.—That is not the verdict of those who grow it here. The Canada Red which is grown here, and which is known in the Western States as the Baltimore or Flushing, is a pretty large apple. I am not talking about the quality of the apple at all, but about its saleability. I would not be afraid to go into the Canada Red very largely for commercial purposes, because it is a very saleable apple. I should like to hear from Mr. Edwards of Covey Hill on this question of varieties. He has a large orchard in Huntington.

Mr. Edwards.—I would include Ben Davis and Alexander. Where do you leave them ? I agree with you, Mr. President, in your selection very well, but I have a great liking for the Ben Davis and the Alexander for profit. The Ben Davis is rather a poor apple to eat, but for color and keeping, qualities and saleability, I think it is pretty good.

The Alexander has done well with me. The St. Lawrence spots very badly with us.

Mr. President.—With reference to the Ben Davis, speaking from the stand point of the Ottawa Valley, it has not been satisfactory. We used to grow it and have given it up. We found it not a hardy tree in the nursery, and the quality of the fruit is usually bad.

Mr. Edwards.—It is of poor quality but is a good keeper.

Mr. President.—My efforts have been to grow table apples for export. Those varieties I have mentioned are table apples. I could mention 3 or 4 cooking apples, like Alexander and some others, but my efforts have been directed to growing table apples for export.

Mr. Edwards.—Ben Davis would compare favorably for keeping with Canada Red.

Mr. President.—It will keep as well as any apple.

Mr. Edwards.—Last year I had a number of barrels and barrelled the fruit in the fall. When I opened the barrels towards spring there was hardly any waste. Northern Spy does well with us, but they are so long in bearing, I would not encourage them.

Mr. President.—Can you grow King ?

Mr. Edwards.—Too shy in bearing for profit. Fine samples but very shy bearer.

Mr. President.—We cannot grow the Northern Spy here at all. I have a Northen Spy which was planted in 1874 and has never borne an apple.

Mr. Newman.—We set out about 75 trees Ben Davis, and we decided in three or four years it was not hardy enough for our section. But since then I

have noticed that it is only in wet sections they have died. The rest of the trees did very nicely. In a well drained place with northern exposure, the Ben Davis might stand very well. It grows fast and bears annually.

Mr. President.—If you put a Ben Davis away and do not look at it until June, then you think it worth bringing out. You do not want to use it when you can get other apples.

Mr. Giroux.—I have had experience growing many varieties. With regard to those the President has named, they are very good varieties, yet in my experience I find the McIntosh Red is an apple which spots nearly as bad as the Fameuse. The trees require a good deal of pruning.

Mr. President.—It is a seedling of the Fameuse they say. In a climate like ours any variety which naturally shows a top which is not bushy and requires little pruning is better adapted than a tree which requires much cutting.

Mr. Giroux.—You would not recommend Golden Russet?

Mr. President.—That is another tree which requires a good deal of pruning, but on the whole it is rather hardier than either the McIntosh or the Fameuse. Ben Davis is an apple which has been almost universally condemned on account of quality as grown in our climate where the season is short and the sun hot. I am inclined to think it is better where grown further south.

In parts of the Province where you can grow Ben Davis, I do not know of any winter apple which is more productive, which will give you more barrels of cleaner fruit, of more uniform size and with fewer rotten apples in the month of June. Ben Davis, where it can be grown, is not to be despised on account of its qualities.

Mr. Giroux.—Is it much more productive than the Canada Baldwin?

Mr. Edwards.—It comes in at a time when other apples are not to the fore.

Mr. Fisk.—That is a great point in its favor. In the month of June it makes very fair apple sauce, and one who is hungry for an apple will enjoy it.

Mr. Pattison.—I find it fully as long a keeper as the Russet. The people who buy our apples are usually those who come up the Richelieu in boats from Quebec, Three Rivers, Nicolet, and all along there. They prefer a red apple and I find they snap at these very quickly. They are mighty glad to get the Ben Davis in the spring when we cannot get anything else. Other times we would just as soon have a potato.

Mr. President.—Do you grow them very largely in your district?

Mr. Pattison.—Not very, but I find them profitable. There is a section back of us—Lake Champlain—where several apple growers think of raising Ben Davis very extensively. I heard one very extensive apple grower say if he were going to grow an apple for profit and plant a new orchard, he would give the preference to the Ben Davis before any other apple.

Dr. Lalonde.—I share your opinion, Mr. President, as to the Duchess being one of the best apples. It is certainly not attacked by parasites as some others are. The experience we have of the Fameuse ought to place it behind many

other varieties. Nevertheless the best kinds of apples I have seen at our place are the Duchess, the Fameuse, the Nonpareil, which is a tree that has always given abundant crop almost every year, the Wealthy and English Russet, I do not know anything of the McIntosh Red. I have planted some trees but they have not yet, unfortunately, produced. From the point of view of saleability, what are the trees which would be the most suitable to the farmer. The farmers should not plant a great variety of trees, but restrict themselves to two or three kinds for profit.

Rev. Canon Fulton.—I advise farmers to plant apples for feeding the animals. A good solid sweet apple is better than all the silos they can put into the farm.

Mr. Craig.—I should feel like including Yellow Transparent and Scott's Winter. The latter has been very profitable with us, the last two seasons particularly.

Mr. President.—Do you find Yellow Transparent a profitable variety ?

Mr. Craig.—If picked early enough so that you can ship it.

Mr. President.—Do you ship it in baskets ?

Mr. Craig.—No, we do not ship it very far, only to local market at St. Hyacinthe, but it stands barreling all right.

Mr. Chapais.—Do you consider it the same as Chalottenthaler ?

Mr. Craig.—I rather think it is.

Mr Chapais.—When do you pick them ?

Mr. Craig.—Before they begin to get yellow.

Mr. Halcro.—I would like to know something about St. Antoine.

Mr. Fisk.—I do not know St. Antoine. I was under the impression it was the same as we call Winter St. Lawrence.

Mr. Dunlop.—There is a local variety on the Island of Montreal called St. Antoine, but it is superseded by better varieties.

Mr. President.—Is it a good bearer ?

Mr. Halcro.—Yes, a very healthy tree, very vigorous growth and good keeping apple.

Mr. Craig.—You were discussing the question of apples for the Ottawa Valley. The Ben Davis has had some good and some bad words spoken of it. In case some people would go away with the idea that it was a good apple to plant in the Ottawa district, I do not think it would be a safe apple to plant in quantity. Mr. Pattison and Mr. Edwards are in favoured localities of the Province of Quebec. They can grow varieties in Huntington county that we cannot elsewhere. Wherever Ben Davis has been planted, it has been profitable for a very comparatively short period. It bears very heavily, and between the combined efforts of heavy bearing and the cold, which is a little too extreme, it dies very rapidly. At Abbotsford, Mr. Gibb planted a row 16 or 17 years ago. The second year after it came into bearing we had an unusually cold winter and they all perished.

No doubt it is a tree that bears very heavily and the apples keep well and will sell because they are clean, take a fair amount of color and ship well. They

make a good market apple. They are usually on the table when we have not other apples, and so we appreciate them more than we otherwise would.

Mr. President.—Mr. Bontine of Rigaud has a very nice orchard. He might give us some experience.

Mr. Bontine.—The Duchess with us does the best, and then the English Golden Russet. The Fameuse do well and the Alexander. I have some trees of other varieties but they have not yet borne fruit.

HOUSE PLANTS.

The following paper was read by Mr. George Robinson, Outremont :—

The subject of window gardening may be regarded from so many different points of view, that it is difficult to say which should have priority of consideration. The invalid who is confined to his house, grows his three or four plants on a shelf or table in the window of his room, and cares nothing for what the pedestrian in the road may think of his pets, whilst the man in health, who is able to be much out of doors, thinks as much of the external effect produced by the careful arrangement of the plants as of their culture. But whatever purpose they are for, there is much to be thought of and attended to, if good results are to be obtained, and though reading about what ought to be done, is doubtless of great assistance, there is no teaching like practical experience in overcoming difficulties as they arise and thus learning how to prevent their recurrence.

Although it would scarcely be correct to speak of house and window gardening as a new subject, it may fairly be described as in its infancy, so little has yet been done compared with what might be done. I know the excuse of most people is, we can't grow plants in our house, it is too hot, and dry ; but a look at some of the cottage windows in the suburbs of Montreal, will convince the most sceptical that it is not so much the fault of the long severe winters as negligence on the part of the owners.

Inasmuch as plants cannot grow without light it is not my intention to treat of plants in rooms or halls excepting in those places which are well lighted; it is a common error to believe that some foliage plants and most ferns will grow in dark places. Some may exist for a short time under such conditions, but it cannot be for long ; all plants must have light, though some require much more then others.

Everything must have a beginning, and domestic gardening is no exception to the rule. Plants must be obtained ; fully grown plants can be purchased, but it is far more satisfactory to have grown your own plants from seed or from cuttings, but whatever way plants are obtained they require the same care, thought, and attention, and what is done for the plants must be done regular and systematically ; it is not a matter which can be attended to for a day or two and then neglected for a week.

In potting plants for house culture care must be taken ; firstly see that you have nice clean pots both inside and outside; put plenty of drainage in; first put a large flat crock over the hole of the pot and about an inch of

broken crocks over that again; procure some suitable soil and press it moderately firm, giving a good soaking of water through a fine rosed can, after which they will want very little water until the pots begin to get full of roots, when they will require much more. There are more failures in growing plants through careless watering than any thing else I know of. I have lots of people come to me and ask, what is the matter with my plants, I look after it well and water them every morning; and another common question is how often should I water my plants, to which I always answer: water when dry and no oftener, but when you do water be sure and give enough to thoroughly saturate the soil right through and your plant will be allright. Insects should never be left to thrive on your plants or else very soon you will have all insects and no plants. The small green fly is the most troublesome pest, but a good wash under the tap occasionally will get rid of them. Scale and bugs sometimes get on a plant; get a sponge and sponge the plant, will keep them in check, and your plants will always look healthy and clean.

There are a large variety of plants that do well in a house, but it is better to have only a few and look after them well, then a lot and neglect them, so I will be brief in my selection.

In foliage plants, the Indian rubber plant, (Ficus Elastica) stands pre-eminent. Aspidistra Lurida, is also good, so are some of the palms such as the Arecas, Lantana Borbonica or Fan Palm, Kentias, and Phœnix; most of the hardier ferns are very good, as the Aspleniums, Maiden Hair, and most all of the Pteris. In flowering plants, there is more choice, but they need more care than foliage plants. The best plan is to procure young plants in the spring and keep growing all summer in a shady place and keep all the flowers picked off until coming on the fall when they will be nice sturdy plants and with care will flower well all winter; Geraniums, Primulas, Cyclamen, Begonias, Genista or Cytisus, Azalea, and Calla lilies, all do well in this way. I think bulbs should be more largely grown for house decoration than they are, as their culture is remarkably easy and their cost is trifling; Hyacinths Tulips, Narcissus, Easter lilies, Chinese lilies, Fressia's should be got as early as possible in the fall from some reliable seedsman, pot them with the top of the bulb just a little above the soil, and pot firmly; give a good watering and place in a dark cellar or cover with coal ashes until they have made root, and about three inches of top growth when they should be brought gradually to the light, and they will very soon be in flower and reward the cultivator for his or her trouble. Hyacinths can also be grown very successfully in water, using glasses made on purpose for them and giving them exactly the same treatment as if they were in pots. In evergreen bulbs, Vallota purpurea is a splendid house plant, as also is Imanto phyllum.

In conclusion, I must say, don't take too much notice of my few remarks, but use your own judgment and discretion and persevere and success will surely follow.

COLD STORAGE.

Professor Craig.—This matter of cold storage is one that is going to interest our fruit growers in the very near future. I want to tell of some experiments

I made last year with the view of finding out the effect of cold on the keeping qualities of fruit. What is meant by cold storage? It means putting fruit into a temperature sufficiently low that no chemical change, no interior change takes place within the fruit. From the time the fruit ripens on the tree there is constant chemical change, maturity is constantly going on, and the process of ripening is really a process of decay. The constituents of the fruit so change chemically that the period of perfect maturity and the period of the beginning of decay are so closely connected we can hardly separate the one from the other. The idea simply is that if we can put our fruit in temperature sufficiently low to prevent this process of ripening then we can keep it almost indefinitely. It is by that means the Californians are able to pack and ship into our markets their tender fruits grown 2000 or 3000 miles away.

Last year I tried the effect of cold storage at a temperature of 34 in preserving different fruits—peaches, plums, pears, apples and grapes, and I found that our early varieties of apples, such as Duchess, could be easily carried into midwinter by being put into storage before they were thoroughly ripe. If you allow them to ripen on the tree thoroughly, the effect of the cold will be lost because immediately you take them out they lose their character and sink down and decay. But if the apple is picked green before perfectly matured and put in a temperature of 34, no change will take place; and after being taken out of that temperature the ripening process will go on in the usual way, and it will keep for the same length of time as it would in the first place. So that we just put it in a condition when it will be perfectly dormant.

In periods of glut, when we have large quantities of Duchess, Yellow Transparent, and other perishable apples, if we had in each fruit centre a building, owned possibly by a syndicate of the fruit growers of the vicinity, where each one could store his fruit, on payment of a fee per month, he could hold his apples and other perishable fruit until the period of glut was over.

Apples could be better kept than stone fruits. Plums are probably the most unsatisfactory fruit to handle. While they did not change color, yet when I got them, after they had been in storage about a month, I found the flavor had deteriorated and was almost lost. The decay had proceeded from the stone or the centre outwards. Plums picked when ripe could not be held more than three weeks as a rule.

I had Bartlett pears and Flemish beauties in good condition the second week in February. The Duchess apples I picked out in very good good condition towards the end of March. Wealthys were quite sound at the end of March.

Mr. President.—How long would they keep after being taken out of cold storage?

Prof. Craig.—It would depend on the period of maturity at which the fruit was put in. If put in pretty green, it would keep for the natural length of time afterwards, but if put in when ripe, it would not keep very long when taken out. In the case of green fruit the coloring process goes on just as well after taken out of storage.

The Province of Ontario have taken up the subject quite actively and have pressed the matter on the Dominion Government. You know that efforts are being made by the Dairy Commissioners with the view or placing our butter on

the English market in good condition by means of refrigerator cars and cold storage treatment on the steamers. A deputation of fruit growers waited on the Dominion Government and urged the importance of their being given a certain amount of accommodation in the same line. Arrangements have been made for sending fruit instead of butter on two of the steamers. The fruit will be put up, under my direction, in the Niagara district in the beginning of September, sent to Montreal in refrigerator cars, and put on board steamer there.

Rev. Canon Fulton.—What chance has the Province of Quebec?

Mr. Craig.—The Province of Quebec has not made any move in that direction as yet.

Mr. President.—That is the work for the new Board of Directors.

Mr. Craig.—It might not be too late to move now. We are going to select two trial shipments of the earlier and perishable kinds of fruit such as pears and peaches. I am speaking of Ontario. We are not going to ship any barrels or half barrels, but intend shipping in boxes 22 ins. by 12 ins.

Each apple will be wrapped in tissue paper and the name of the variety and grower will be printed on the box. We hope to get very satisfactory results from that experiment.

I do not think it is too late for the Quebec Pomological Society to move in the matter yet because I do not know that Ontario has any corner in this matter at all. It was simply because they moved on the question earlier, and I think the Dairy Commissioner, who has charge of the shipments of butter, is willing to lend a certain amount of space to the fruit growers not only of Ontario but also of Quebec.

Mr. President.—As it is now very late, I think we had better adjourn and resume the discussion of cold storage in the morning.

The meeting then adjourned until the following morning.

COMO, Wednesday, 21st August, 1895.

The Society met at 9 a.m., the President, R. W. Shepherd, jr., Esq., in the chair.

The President read the following paper:

PACKAGES FOR APPLES.

The most convenient, cheapest and commonly used package for apples, is the barrel. It is cheapest because in no other package can the same quantity of fruit be packed up in so short a time. It is popular because in no other way can the same quantity of fruit be so easily handled and moved; also because the buyer knows he is not buying an unknown quantity. But the barrel package is open to objection because the dishonest grower (I am loath to say it but we all know it is often true) is able to work off a poor grade of fruit in the middle of the barrel, nevertheless; notwithstanding complaints of buyers as to dishonest pack-

ing, the barrel is by long odds the most convenient, and likely to continue to remain the great commercial apple package for the reason above stated.

I wish to read, here, an extract from a Glasgow paper, the *Evening Citizen*, August 2nd, 1895, on the barrel question.

REFORM IN PACKING WANTED.

(*To the Editor of the Evening Citizen.*)

Sir,—In near prospect of the annual advent of the great apple fruit trade, timely suggestions of improvement in catering arrangements beneficial to the great consuming public, apart from the workers and dealers in the merchandise, are appropriate and necessary.

The trade is a great one, and increases by leaps and bounds every year. The article itself is wanted; and annual expectations are founded upon it. The fruit is being recognised as a necessary article of family food. No other apples —for one reason or another—can substitute those of American growth. The harvest prospects of the crop in America this year are well reported of. But the barrel form (containing 120 to 140 lbs.) of package shipment is a failure; and is demoralising the trade in public estimation here.

In Canada that trade is primarily commenced by orchard contractors, and thence from them in bulk of barrels to the shippers and their consignees. The former are knavish, and the latter are unconcerned beyond their commercial computations; and both of them are ignorant and unlearned in the wants of the people here, upon whose patronage the prosperity of the trade is depending.

In packing these barrels the contractor places a few inches of select fruit on top and bottom, while the centre is filled with any sort you choose to call them. Sampling either end is no criterion of the stock. Emptying the barrel is interminable work—damaging the fruit—and packer's knavery has not even extenuating cleverness to show for it. The result is that brokers can give no guarantee under their hammer. Even three random barrels in a shipment-lot opened is no criterion—the character of a lot being so miscellaneous in itself. Dealers hesitate to purchase uncertain stock. The broker's ledger is creeping with disputed accounts in consequence of misrepresented stock, and what is worst of all and becoming fatal to the trade is, that the family man will not buy a barrel at all on account of its quantity (120 to 140 lbs.), and the uncertainty of the quality throughout the barrel.

Now, these barrels, containing 120 to 140 lbs., cost half-a-dollar each—cheap enough in themselves to the cooper, no doubt, since the evaporation of the barrel-flour trade—could be advantageously replaced by three plain, square wicker baskets or crates, containing say 40 to 45 lbs. each, and cost less money than a barrel. Such packages would be more convenient to the contractor, costing no more freight and transitage, less liable to heating and waste in respect of less bulk (the normal moisture of the ripe apple being about the same as that of the potato); but, over and above, all such packages would be more convenient for family purchase and use, and the broker, dealer, and consumer could all see and guarantee what they are dealing in; and the trade would then become a house-

hold word, and the fruit a household article beyond limited computation, because every family can eat cooked apples, and every land lessee in Ontario would grow apples, and find better financial results than by growing wheat."

But nowithstanding all that has been said in its favor, the barrel, is to my mind a barbarous package in which to pack our best, thin-skinned high quality, delicate table apples; such apples as we can grow in this province for table use, viz.: Fameuse, Wealthy, Winter St. Lawrence, McIntosh Red, etc., are much injured and bruised and unavoidably so by being packed in a barrel. The fruit must be packed tightly in order not to be slack; the cover must be pressed down with great pressure, but this is done at the expense of bruising the fruit, and thereby injuring their market value and hastening decay.

It is impossible to pack ripe Fameuse in a barrel without bruising each specimen of fruit to a greater or less degree; hence, it is that this variety is not exported in barrels to any great extent. Exporters consider the Fameuse a *risky fruit*. Moreover packed in barrels, Fameuse apples cannot (unless put up in an unripe condition) reach the English market in perfect order, or at least in the same condition they left the orchard on this side.

The Tasmanian apples are shipped to England in boxes. Boxes something the shape of those used to pack oranges in. Each specimen is wrapped in paper, and on board ship the boxes are put into cold storage. The fruit arrives in perfect condition after travelling a distance five times greater than our Canadian fruit shipped to England. The Tasmanian apples are fine well grown fruit, and command high prices in England.

I know the Tasmanian fruit reaches the other side in the spring and early summer months, but it is well for us Canadians that is so, or we would be driven out of the market.

The package, therefore, which can carry our best table apples in an unbruised condition is undoubtedly the best; and we must, if we wish to continue to grow good apples, give greater attention to the packing in boxes. The Province of Quebec apples which went to the World's Fair at Chicago, reached there in splendid condition packed in bushel boxes, each specimen of fruit wrapped in paper, with paste-board between each layer of fruit.

For some years, I have successfully used the compartment case, (similar to the one shown at this meeting). The package costs about fifty cents complete, and certainly carries the fruit in the most satisfactory manner. The advantage of the compartment case is the absolute impossibility of bruising the fruit, and the fact that all the specimens being fitted into the square of paste-board, must of course be all the same size. This is of itself a great advantage and patent to the buyer who buys for the purpose of retailing the fruit. The disadvantage of the compartment case is the extra time and care necessary to fit the apples in the paste-board squares correctly and well. It is not a work that can be done hurriedly; but if the grower packs the cases in the orchard as the fruit comes from the tree, putting the perfect and uniform specimens into the cases, and the rest into barrels, after a little practice, he will find the work go fairly well. One soon gauges the exact sizes of apple required to fit the squares. It pays, I think, to take greater care and pains in the matter of packing our best and most delicate fruit. Whether the compartment case is better on the whole, than the

system of packing adopted by the Tasmanians, I am unable yet, to determine, but I intend to try their system of packing, to ascertain if the difference in the expense cannot be brought more into line with the expense of packing in barrels.

I have not said anything about packing apples in baskets; such packing of course applies to summer and early fall fruit for our local and city markets, and cannot be adopted for exporting purposes. Our home city markets can best be served by putting attractive high colored fruit in handsome baskets, neatly covered with pink lind. Apples put thus into baskets should be *heaped up full* in order to display the fruit to greater advantage. It pays to show off your goods well. One has only to look in at the windows of the leading dry goods shops of our cities to notice how advantageously the goods are displayed to attract attention. The street vendor of fruit knows well, too, how to make his apples, pears, peaches, and other fruit look so tempting to passers by. Then why should not our farmers and fruit growers take the same trouble to attract the buyer's attention by evidence of careful packing and handsome packages?

Finally, my advice is, observe, study the requirements of the market, pack your fruit carefully and honestly, and it will *pay you* to do it.

Rev. Canon Fulton.—We are all interested, not only in the growing of the apple, but in its commercial value, and although I have always admired those boxes still I must say that I could not use them at my place. It would cost more than the whole thing is worth just to fit in those compartments and get them all right. Some years ago I had the apples packed and successfully carried in a bushel and half box, oblong cover. I have given up the basket. The baskets, in shipment, are packed one over the other so that the apples get bruised, and we have given up that style of shipment.

The Grand Trunk have raised the rate of freight, which is a very serious matter. They have raised it from 27 to 30 cents from Huntingdon to Montreal. The freight costs 30 cents, the barrel cost 28 cents in the orchard, and then there are the picking and the hauling to the railroad. My son sent in 11 barrels of Red Astrachan, and they were sold at the magnificent sum of $1.30 per barrel. They went in on the Friday and were sold on the Saturday, and I will not say anything more.

Years ago when the apples were good, I sent in those cases. I was the first to send cases, but they said they would much prefer a barrel, don't you know, but I got nearly as much for the case as I did for the barrels. I actually once got 10 shillings for a bushel and half box of very fine Alexander and I never had any trouble getting remunerative prices until late years. Of late years I must say prices have not been remunerative. I take a great deal of pains to put up a very good box, my neighbor tumbles them in any way, and they all go into the same maelstrom.

Mr. President.—What do you recommend with reference to cold storage?

Rev. Canon Fulton.—I tried cold storage in two places. First, I got a favor from the Meat Packing Co'y. They let me have a refrigerator and I sent in some Astrachan and Duchess, and I must say they kept remarkably well. I believe if we had really good cold storage, it would be all right. I sent in 130 barrels to cold storage on another occasion. Before they came out I was unwell

and not able to look after them, and I think the net result was hardly the freight on the barrels.

Mr. President,—You had a severe experience?

Rev. Canon Fulton.—I am not the only one, and I think it is nearly time we had some organization amongst fruit growers to protect themselves in marketing their fruit. I thoroughly believe in cold storage and in having some organization we could depend upon. Not only should we have cold storage, but the fruit should be kept at an even temperature. If you allow the temperature to run up and then put on cold again, you only help to destroy the apple.

In connection with cold storage, we ought to have some means of seeing that our apples are not sacrificed by having them sold, for instance, on a stormy day when there is no audience.

Mr. Chapais.—The Rev. Canon Fulton says it does not pay him to pack in those boxes, and you, Mr. President, find it pays you. It would be well to have some explanation.

Rev. Canon Fulton.—In a large orchard where we have to pick the apples and haul them about ten miles, it does not pay. If we had a river alongside of us, as Mr. President has, we would be all right. Then in the boxes used by our President, the apples must all be the same size.

Mr. President.—It is necessary to have them the same size if you pack them that way. The squares in these boxes are the same size.

Rev. Canon Fulton.—On the same tree the apples are not the same size.

Mr. President.—That is the weak point in my case, it takes so much time to select the apples. In other years, when I have a good crop, I will adopt the Tasmanian system to see if I cannot bring the expense more into line with that of the barrel packages.

Rev. Canon Fulton.—This year I saw very nice apples from California in a small box, not holding more than $\frac{3}{4}$ of a bushel, rolled up in papers. There were only 4 or 5 packages, and they went at a fabulous price for the box.

Mr. Chapais.—Even with the disadvantage you have mentioned, Mr. President, you have had some good returns from those boxes?

Mr. President.—Yes and bad ones too. When there is a glut in the market we must expect low prices.

Rev. Canon Fulton.—To prevent a glut I would have cold storage. The question is whether the Government is going to aid us in this matter. I am quite willing to pay an ordinary rate for cold storage, but they ask me 15 cents a month until the fall of the year for a barrel, which is too much.

Mr. Craig.—The Government have arranged with the cold storage company to receive the butter but have no cold storage of their own.

Rev. Canon Fulton.—They will not let apples go with butter?

Mr. Craig.—No, that would not be right. Do you, Mr. President, find the baskets satisfactory? It seems to me they are rather flat and if shipped any distance it would be necessary to pile them one over another as in the West. There they use paper compartments, fill them exactly level, which allows the baskets to be piled crossways like pyramids.

Mr. President.—The grocers to whom we sell fruit in that shape prefer to have the baskets filled to the level because they make a better show. They put them in their windows and they make a nice show. We are able to ship them in that condition by boat but could not by rail, where they would have to be piled one on another.

Rev. Canon Fulton.—We are talking of fruit growers away from the river.

Mr. President.—That is the basket I have adopted, but I do not think it would suit everybody. Those baskets cost about 80 cents a dozen. They are made at Oka by the Indians.

Rev. Canon Fulton.—Some move should be made to have the Government aid us in the matter of cold storage.

Mr. Dunlop.---I understand a move was made by the Ontario Association to get the Government to conduct the experiment. If the experiment be successful, we will be able to follow it up.

Rev. Canon Fulton.—Why not send a consignment across ?

Mr. Dunlop.—No doubt if Ontario fruit carries well, Quebec fruit will also.

Rev. Canon Fulton.—Quebec fruit ought to be better than Ontario, because the colder the climate the better the flavor of the apple. How is the fruit to be carried to the steamer ?

Mr. Craig.—On refrigerator cars. These are cooled with ice only. The steamer will have insulated compartments cooled by ice and salt. With ice and salt mixed, you can readily reduce the temperature to freezing point.

Rev. Canon Fulton.---What I wish to impress upon the Department is this, that we want some reliable cold storage in Montreal to put our fruit in at a reasonable rate, from which we could ship direct on board steamer.

Mr. Craig.---That comes directly in the province of private enterprise. As soon as the demand for such a building increases, the demand will be met. No doubt now there are cold storage companies in existence and in course of construction. The company which gave me the facilities by means of which I carried on the experiment last year have a perfectly constructed building made up of a large number of well-divided, insulated rooms, each one of which can be kept at a different temperature if desired. It seems to me the facilities were the very best. 33 to 36 degrees is the temperature usually applied to fruit.

Mr. Fisk.---You do not want to pick your fruit and be obliged to send it by train 50 miles on cold storage. Each district ought to have its own cold storage into which the fruit could be put immediately on being picked.

Rev. Canon Fulton.---If you had separate compartments in a steamer with an exhaust pump to take the air at the bottom of the steamer and a tube passing the guide ropes to let in the air from the top, you would have a uniform temperature.

Mr. Newman.---Can Duchess of Oldenberg be put on the English market by means of cold storage ?

Mr. Craig.---I do not think there is any difficulty at all.

Mr. President.---You can place it on the English market without cold storage.

Mr. Craig.---With regard to the action which the society might take in the matter by testing the point by means of cold storage on the English market, I think it very likely sufficient space can be had in some of the steamers for a small shipment from Montreal. If the society will appoint a committee to act in conjunction with myself, I will use every effort to get it as much space as possible. But you will have to make arrangements for an agent on the other side to receive the fruit, because the Government takes no expense of distribution on the other side. It merely pays the extra charge incurred by giving cold storage. The society takes the responsibility of selling the fruit and paying ordinary freight rates.

Sir Henri Joly de Lotbiniere.---Have you any idea of the cost of establishing cold storage ?

Mr. Craig.---For a district cold storage I think a building which would accommodate 10,000 barrels could be fitted up at a cost of about $2,000. It would depend somewhat on the price of lumber. That is an outside figure.

Rev. Canon Fulton.---That is using ammonia ?

Mr. Craig ---No, use salt. For the cooling by evaporation of ammonia, the machinery is somewhat expensive.

Sir Henri Joly de Lotbiniere.---No machinery required for salt and ice?

Mr. Craig.---No, except the tubes. The cooling is done by filling the tubes from day to day with a certain amount of ice and salt. The building should be made with compartments in the walls.

Sir Henri Joly de Lotbiniere.---Lined with metal ?

Mr. Craig.---Not necessarily, only wood, but the tubing runs outside the wall.

Mr. Fisk.---Have the growers in Ontario constructed any ?

Mr. Craig.---Not yet, but they are looking into the matter.

Rev. Canon Fulton.---I have sent Duchess to the Glasgow market and they arrived all right. They were sent to London and put into an improper place and came out all wrong.

Mr. Craig.---At the same time if you could hold your Duchess three weeks until after the glut is over, it would be a great advantage.

Mr. President.---With your permission I will appoint a committee to look into the subject of cold storage and report to the meeting. I would name Mr. Fisk, Mr. Dunlop and Mr. Newman to report what action the Society should take.

Mr. Fisk.---I may say that I have had very little experience packing otherwise than in barrels for local markets. I never had any experience in the export trade and consequently am not in a position to speak from actual experience on packing for distant markets. But my impression is that the box you exhibit, Mr. President, with these compartments is one which is not practicable and within the means of every grower. In the first place it requires a good deal of labor selecting apples of equal and proper size and then you want

apples put up in that style to go into the hands of specialists on the other side. Take and throw those right into the market, and I think, after deducting the cost of these cases and the expense of putting the fruit into them, you would find the return would not be very profitahle. If you have customers who will pay the extra price for apples put up in that way, well and good. I am not speaking from experience. The barrel is easiest handled. You can roll it around. If properly hooped and not too bulgy, the apple is not much injured. When a barrel bulges considerably, the fruit will be more bruised than when it is comparatively perpendicular on the outside, Another point, in the barrels the centre often is filled with trash and sent far distant, and our fruit growers will realize that honesty is the best policy in putting up fruit as well as in everything else.

Rev. Canon Fulton.---The reason the Grand Trunk put up the price of freight is because the barrels held more than 150 lbs. In the first instance the barrel only held two bushels, then the fruit growers insisted on very large barrels, and now the barrels have got so large that the freight agent of the Grand Trunk has put on 27 to 30 cents.

Mr. Edwards.---We have been rather annoyed with the raising of the freight. They have raised it from I7 to 30 cents. A few years we got it from Hemmingford to Montreal for 17 cents, then they raised it to 24 cents, then to 27 cents,, and last fall, before the winter rate came on, they made it 30 cents. I called to see if we could not get the freight back to 25 cents. Mr. Hemmingford would be willing but wants us to pay our own cartage. I said it would be a pity to make two bites of a cherry.

Mr. President.—That is the cartage in Montreal. That would be worth 3 cents per barrel.

Mr. Edwards.—I shipped through a friend a few Alexanders in barrels to Glasgow and they brought a good price, but a few years ago I sent some Fameuses and they gave a loss.

Mr. Newman.—I market my apples entirely in Montreal, either baskets or barrels. For distant shipment I realize that barrels will not answer for delicate fruit. Baskets work very nicely with Duchess and Yellow Transparent.

Mr. President.---Do you load them up as much as we do?

Mr. Newman.---Yes, but the baskets are narrower. We get them at from 30 to 60 cents.

Mr. Craig.—20 lbs. basket?

Mr. Newman.---About 7½ baskets to the barrel.

Mr. President.---I wish to make a few remarks with regard to Mr. Fisk's statement about the cases. I recognize fully that that compartment case cannot take the place of the barrel. No package can take the place of the barrel for general purposes. But my apple business is a little different from that of most of the growers in this way, that I am striving to cultivate table apples for the English market. I have worked up a trade in Montreal for supplying Montreal merchants and insurance men and agents of English manufacturers with these cases for shipment as presents to the old country. They order from me during the summer so many boxes of apples of the very best quality and

appearance for presents to their connections in the old country, and I undertake to supply them with the very best quality of fruit and ship the fruit and pay the freight and everything on the other side. I have worked up a considerable business in that way and it is growing. It is a special business of itself. I can understand the great objection to compartment cases for general commercial purposes.

Mr. Fisk.---The extra cost of packing and package would not pay, if sent to the other side on consignment.

Mr. President.---Last season I had a large quantity of apples and I attempted to ship a good many cases on consignment to be sold on their merits. The result at the beginning of the season was quite satisfactory. At the end of the season, when the markets were glutted with apples, it was not satisfactory. It is on that very question I have been corresponding with apple commission men during the winter, that they do not allow for the superior condition in which the fruit arrives in those boxes nor for the superior care with which the fruit is packed as compared with the barrel. At the beginning of the season, when fruit was scarce, my Duchess realized 12s. to 13s. a box. That was equal to about 8s. or 9s. for the apples themselves after paying all expenses. I could not have sold the same quantity of apples in Montreal last year for more than $1, so that it paid me very well to ship at the beginning of the season.

I made a few shipments of Wealthy and Fameuse as the apples became somewhat plentiful, to the English markets. My reports were very discouraging, so much so that the finest Wealthy I ever shipped were sold in Liverpool for 6s. and 5s., and the boxes laid down in Montreal cost me at least 8s. per box. There was a dead loss of 3s. per box. But I attribute that to the fact that the commission men do not protect your interests over there. The fruit is sold at auction and disposed of without any regard for your interests, but if we had agents to look after our interests, things might improve. I do not believe in shipping apples to the other side to be sold on consignment. My idea is to sell in Montreal or direct to a house on the other side.

The barrel will always be the most convenient package in which to pack apples, but for our very best quality of fruit for shipment to the other side, I do not think there is any better box than the one shown here.

Rev. Canon Fulton.---Then you fully agree with me that we ought to have an organization and an agent to look after our interests. If that were carried out, it would give an impetus to the growth.

Mr. Cross.---Have the Americans tried cold storage?

Mr. Craig.---Yes, there are a large number of establishments on the Hudson River.

Duchess apples were offered for sale in Water St. South, Chicago, in May, carried throughout the winter by means of cold storage, so that cold storage in large cities has entirely passed the experimental stage and is now a very active factor in assisting the sale of the fruit.

Mr Cross.---Will it not eventually affect prices the year round.

Mr. Craig.---It will tend to even the price up throughout the season.

Mr. Dunlop.---I may say that Mr. President's basket would be very suitable

for furnishing local supplies but not for shipment any distance. A shipping basket should be of such a shape and filled so that it will pile economically. Even Mr. President situated as he is by the river, might have some difficulty getting these apples sent by other lines of boats.

Strawberries and raspberries are all marketed in special boxes made for that purpose. They are packed generally in crates holding two dozen boxes and sent to market in that shape. I do not see any room for improvement in that respect.

With regard to currants and gooseberries, they are generally sold on the Montreal market by the pail, the ordinary wooden pail, which holds a trifle over two gallons. I tried to market the English varieties of gooseberries in small boxes. The public will take a limited quantity in small boxes, but they do not know what a good gooseberry is yet. They use them for preserving purposes and buy them in large quantities.

I have marketed a limited quantity of currants also in small boxes, but the bulk of the demand is for pail packages for preserving purposes. Currants must be ripe.

Mr. Chapais.---They are not exported to any extent ?

Mr. Dunlop.---They are not, but I had an inquiry this year for a couple of tons of currants from an American firm.

Mr. President.---How much a crate ?

Mr. Dunlop.---They buy by the pound. If we could adopt that system in Canada, it would be much more satisfactory. It is not fair to the public to sell as we do now.

Mr. Chapais.---Would baskets do for express ?

Mr. Dunlop.---The only difficulty is we can buy wooden pails for abont $1 per doz.

Mr. Chapais.---Are they pulp ?

Mr. Dunlop.---No, the ordinary inexpensive wooden pails. We calculate on getting the pails back whereas when we supply the baskets we lose them. They cost $4 to $5 a hundred. The pails cost a little more, but if we get one half back it is an advantage to us. They cost $1 a dozen in large quantities, and they hold a little over two gallons. They do not seem to be very accurate. Some people fill their pails up high, others barely to the rim, and it is not a fair way of selling.

Mr. Chapais.---In sending them by express, would it not be better to put a wooden cover on the pail ?

Mr. Dunlop.---Pails are not suitable for sending by express. They are wider at the top than at the bottom. A basket would be better for long distances and not filled up too high, so that one basket can set on another. That is the only thing I could suggest in small fruit packages, that they should be so constructed as to hold a certain quantity, so that people would pay a uniform price.

Mr. Chapais.---What about plums ?

Mr. Dunlop.---Plums are generally sold by the gallon.

Mr. Chapais.---Common plums are shipped in barrels. What would you advise for the finer plums ?

Mr. Dunlop.---There are very few plums you can ship in barrels.

Mr. Chapais.---Damson plums are shipped from our place in barrels

Mr. Dunlop.—No doubt that is most economical if you have to ship them any distance. The Americans pack plums in boxes and in fancy packages. The California fruit is put up in fancy packages.

Mr. Fisk.---How do the prices compare with our fruit ?

Mr. Dunlop.---There is no difficulty getting 40 to 50 cents a gallon for our plums. They look very inferior to California plums, but they are better. California plums have a very poor flavor.

Mr. President.---Is there much competition in raspberries from Ontario ?

Mr. Dunlop.—The whole competition is in the Ontario fruit, but it requires a very favorable season to enable Ontario growers to put raspberries on the market in good condition. It is a very perishable fruit. We occasionally get a consignment of good fruit from the west, but as a rule they are all more or less damaged when they get here.

Mr. President.---They do not carry as well as strawberries?

Mr. Dunlop.—No.

Mr. Craig.—Have you had any further experience in marketing raspberries with the stems ?

Mr. Dunlop.---As far as my experience goes, it does not pay to grow varieties which you are obliged to take off with the stems. The additional price you get is not sufficient to compensate for the increased cost of clipping the stalks. As a rule raspberries of the finest quality are soft and will not bear picking without having the stems attached, but our public does not look so much to quality as to appearance. If the fruit looks well, they will buy it without regard to quality.

SMALL FRUITS---STRAWBERRIES, RASPBERRIES, CURRANTS, GOOSEBERRIES.

STRAWBERRIES.

Mr. President.---I will call on Mr. Craig to give us his views on the cultivation of the strawberry. I visited his strawberry patch last July, and saw some excellent new as well as old varieties.

Mr. Craig,---I was just settling down to learn something from the practical fruit growers present in strawberry culture. In this locality, with excellent waterway and steamboat accommodation to Montreal, you should be able to grow perishable fruits such as strawberries and raspberries in much greater quantities than you do and be able to compete more successfully than you do

with the Ontario men. On this clay soil no doubt strawberries can be grown with great success. At Ottawa, when the farm started, some eight years ago, I may say that the piece of land selected was not an ideal piece of farm land. There was a good deal of light and some quite sandy soil. The climate is very severe, and the fruit growers who had some experience told the officers of the Farm that they might as well give up the idea of growing fruit there at all, and save some money to the Government and the people. But the Executive was rather rash, and strawberries being the first fruit from which we could get returns, it was the fruit first selected for experiment on a large scale. Although we did not expect anything very great in the way of return, yet the second year some 3500 boxes were taken off an area considerably less than an acre, and the Ottawa fruit growers were very much astonished to see the exceeding fine samples of strawberries put upon the market. These were sold at that time at nine cents a quart, and the Ottawa dealers were very glad to come to the Farm and buy them at that figure. Since that time the growers at Ottawa have awakened to the situation, and we are not the only growers by any means. Within a radius of ten miles perhaps, at a low computation, there are 50 acres of strawberries, and individual growers have four to six acres each. This just shows the benefit of example. Without going into the matter of cultivation very largely, there are just a few principles to be borne in mind that go a very long way towards success in the cultivation of strawberries. In the first place the soil should be well drained. That is the principle which should be borne in mind in connection with that fruit. A soil with a fair amount of clay is better than a light sandy soil. It gives firmer fruit and fruit which will ship better.

Growing for commercial purposes, I would always advocate growing them in rows about 3½ feet apart. Further do not be at all afraid of making the ground too rich. I do not think you can possibly do it. The strawberry is a plant that will take everything you can give it. It is a perfect gourmand in the way of manure. It will pay you to feed it very largely and with nitrogenous manure, such as barnyard manure.

In planting there is one vital principle we should remember, that the flowers are not perfect in all varieties. On some varieties we have only the female part of the blossom, and on other varieties we have only the male, so that in order to get plenty of fruit we should so plant that the two sexes will come alongside each other and fructify.

In looking over the catalogues we see certain descriptions marked "b." These are bisexual, both sexes present in the blossom, and able to produce fruits by themselves.

Another plant is marked "p," pistillate, which is the other part of the blossom.

So that we want that marked "b" and that marked "p" alongside each other—the bisexual or the staminate and the pistillate.

The pistillate are the best bearers. We usually plant a larger number of rows of these on the plantation than we do of the bisexual and the male plants.

We usually plant three rows of pistillate to one of staminate. That gives us more fruit than if we planted the same number of rows of each.

We plant in rows 3½ feet apart. The best time to plant is in the spring. Have your ground well prepared and manured, set out your plants as early as possible in the spring, one foot apart in the row and your rows 3½ feet apart.

All the treatment necessary the first year is to see that the plants do not give you any fruit. Sacrifice your fruit by taking off the blossoms. Also cut down all runners until after the fruit season is past. If you allow the plant to throw out runners, others will root and run on through the row, and the original plant will not establish itself and become strong. If you cut off the runners and remove the blossoms, the original plant will become well established and will in the season throw out much stronger runners.

After the 15th July you may allow the runners to root. You should cultivate at least once in ten days. Having the rows 3½ feet apart, you can run the cultivator up and down the rows very easily.

Place the runners in the row and let them root.

That has all to be done before the frost comes. After the frost has struck the surface of the ground, take oat straw or barley straw or something else with not too much wet soil in it and scatter it over the surface of the ground, so that the greater portion comes between the rows. Let the straw lightly cover the plants in the row. The idea is not to cover up the plants themselves, but to give the ground such a covering that in early spring or late fall, it will not thaw to that extent that it will heave and throw the plant out.

Having done that, the treatment next year will consist of either leaving the straw between the rows or removing and cultivating it. I prefer to remove the straw between the rows and cultivating until the berries begin to ripen.

The second year will give the first crop of fruit. The treatment the second year is the same as the first, not neglecting cultivation. If you can give a top dressing of manure after fruiting, so much the better. Take another crop of fruit off and then plough up the plantation. But in the meantime you should start a new plantation by taking the runners off the second year. The second crop is not quite as good as the first, and the third not as good as the second and not quite profitable.

I would not advise continuing a plantation for more than two years.

This is growing for market. For home use you can grow a larger number of plants in the same area by growing them in hills, cutting off all runners; keeping the plants confined to a limited area, you will get fewer berries but much larger fruit, and it is probably the best way of growing them for home use.

During the past five years we have tested over 200 varieties. This season we fruited 150. We are weeding out varieties each year that are not found profitable.

I should recommend, from a market standpoint, the following varieties for a plantation. I would plant Beder Wood, which is bisexual, also Warfield, and I think the Crescent.

Out of 120 varieties last year, the Crescent gave me a larger number of quarts than any other. The Pearl is not sufficiently firm for shipment.

The four I have named would probably give more berries per acre than any other varieties on our soil, but of course strawberries, like all other fruits, are variable.

The recommendation is based on the returns we have had. The dates of the blossoming of these varieties have been recorded, as well as the dates of ripening and of first fruit. Also the total yield of each variety.

For those who have small gardens for home use and care less for quantity than quality, I might name one or two varieties. I should mention Pearl as one of those of fine quality and also Prince of Berries. That is a very light bearer, but if you want a few berries of very high quality, you should grow it. The Sharpless is also of very fine quality. The Manchester on most soils rusts so badly that I would not recommend it, although some years ago it was well spoken of. The Bubach is no doubt grown by many of you and perhaps you are well pleased with it. It is one of the largest berries we can grow and is very healthy. It does not usually make many runners though and is perhaps not quite vigorous enough in that way, but I have seen it do particularly well on clay soil.

Mr. Pattison.—What is the objection to the old Wilson?

Prof. Craig.—The old Wilson is still grown in many parts of Ontario, and it has a very fine market in Montreal. I do not think it is good enough in quality. It ships well but is very sour.

Mr. Fisk.—What about the Alpine?

Prof. Craig.—It is interesting but not profitable compared with the other varieties. It is very well suited for home gardens and fruits continually through the summer.

RASPBERRIES.

Mr. Dunlop.—I have been cultivating raspberries for years past, not on a very large scale. I presume you all know that raspberries as well as other fruits require good soil, well drained and cultivated. In planting it is a common thing for some people who desire to get fruit immediately to plant out canes full length. The consequence is they are generally disappointed with the crop the next year, because it requires the full force of the root to nourish the canes that year, and few new canes are provided for the next year's crop. It is very important in planting the canes to cut them down as close to the ground as possible. They do not absolutely require to be above the ground. It is customary to leave two or three inches over ground to show where the plants have been planted.

If planted in the fall if the ground is a little heavy, it is advisable to mulch them to prevent their being heaved out by the frost.

Planting in the spring gives better results.

Most people allow too many canes to grow. In planting for commercial purposes, they are generally planted on the row system. That is to say the rows are about six feet apart according to the vigor of the varieties.

The distance between the plants generally about three feet. If you allow four or five canes to come up around each plant and thin out all the others, you will get good raspberries.

If you allow canes to grow thickly along the rows fruit will be poor. Hills of five or six canes three feet apart in rows will produce better results than more canes.

In raising plants, it is better not to raise them in your fruit plantation. If you do, it will be at the expense of the fruit.

With regard to varieties, the Cuthbert is recommended as the leading variety in the West. In fact it is more generally grown there than any other, that is to say for a late red berry.

The Marlboro does very well with me. In fact it is more profitable than the Cuthbert. It requires higher cultivation as the cane is not so vigorous a grower, but it produces fruit very abundantly and is early, coming in before the rush of Cuthberts, thus commanding a higher price.

For white raspberries like white currants there is only a limited demand, you cannot sell them in the same quantities as the red.

Golden Queen is the leading white variety now. Two or three new varieties have been brought before the public lately.

One is the Loudon and the other the Miller.

The Loudon is supposed to be going to supersede the Cuthbert, but I think that is very doubtful so far. The Cuthbert will hold its own for some time to come until it shows signs of decay.

Mr. President.---Have you any experience in the black caps ?

Mr. Dunlop.—I find they are not profitable to grow for market here. They are not in the same demand as the red. They are very productive, but the plantations last a very short time. After they produce two or three crops you have to renew the canes. The Montreal public do not seem to want the black cap as they do the red.

Mr. President.—Have you tried the Shaffer ?

Mr. Dunlop.—It is very fine for home use, but when ripe it is very soft and of a poor color. It is preferred by a great many people to the red, and for a near market may become profitable.

Mr. President.—When should we cut out the canes ?

Mr. Dunlop.—As soon as possible after they are done fruiting. It may be done at any time during the year. Some people allow them to remain during the winter, but I believe in cutting them out immediately and allow the young canes to take the whole nourishment from the roots.

Mr. Chapais.—Do you tie the canes up ?

Mr. Dunlop.—No, I shorten them in spring so that they do not require support.

Mr. President.---Do you pinch them back ?

Mr. Dunlop.---I do not do any pinching to the red or white varieties. I shorten the canes in spring cutting them back to from $3\frac{1}{2}$ to 4 feet.

Mr. President.---Do you lay down the vines in the winter ?

Mr. Dunlop.---Varieties of the hardiness of Cuthbert and Golden Queen should be laid down, as they are more or less injured each winter and it will certainly pay to protect these varieties. Marlboro is much hardier and so far has never failed to produce a full crop with me without protection.

Mr. President.---What about Caroline ?

Mr. Dunlop.---The Caroline produced remarkable crops with me for two or three years, but the berries were too soft for market and became affected with a disease of the stem of the fruit, and I was obliged to dig up my plantation.

Mr. President.---Is it a blight ?

Mr. Dunlop.---No, a disease which starts in the core of the berry, and finally the stem dries up a short distance from the core. It seems to affect two or three varieties. The Brandywine is badly affected that way. The Marlboro suffers also, but so far only to a limited extent.

Mr. Brodie.---Is there anything better than Brinckles Orange ?

Mr. Dunlop.---Not for home use.

Mr. Chapais.---Did you ever try our French yellow raspberry for our own use ?

Mr. Dunlop.---I have not.

Mr. Chapais.---It is the best berry.

Mr. Whyte.---I would like to say a word in praise of the Shaffer. I have grown it for 15 years in a private garden. A month ago I visited several commercial growers of berries in the neighborhood of Ottawa, and in every case they considered the Shaffer brought in more money than any other. You can grow it where you cannot grow a red raspberry. It will stand a lighter soil. At first people were a little shy, they did not like the color, but the moment they got them they always wanted them again. Those who grow for their own use and want a clean berry cannot have a better berry. No black or red berry can approach it.

It is a very common thing to say we can get berries by the pail so cheap, there is no need to grow them, but if people will compare these for color etc., with other berries, if they will compare them with the wild berry, they will never buy a wild berry. The difference is immense and you always have them at hand. A very ordinary patch of raspberries will supply a family with the berries for use five weeks three times a day, and the labor is small indeed. No fruit is a greater pleasure in a garden.

Mr. President.---With regard to the Shaffer I had occasion last year to visit the canning factories near Picton. Mr. Boulter, a very large canner there, was canning raspberries at the time. He was canning Cuthbert and Shaffer mixed. They were certainly very fine. He said they put the Shaffer in amongst the Cuthbert because it gave the jam a better flavor. He said they always mixed the Shaffer with the red raspberries.

Mr. Fisher.---Has there been any experience here of a disease which has affected my raspberries a good deal ? The fruit, instead of filling after being set, dries up, and I have lost a great many berries from that reason. This

season it has not been nearly so bad as the last four or five years. I sent Mr. Craig at one time some specimens and also "The Country Gentleman" in the United States. The report from that gentleman was that they had never seen the disease, and I think Mr. Craig said he had not seen much of it. I would like to know if anybody else had their fruit affected in the same way.

Prof. Craig.---It is the same disease that Mr. Dunlop spoke of as affecting the Caroline.

Mr. Chapais.---The fruit blackens ?

Mr. Fisher.---Yes and the twig seems to die out.

CURRANTS.

Mr. Whyte of Ottawa.---I have grown currants for about twenty years but it is only recently I came to see what a difference there is in currants. Everybody recognizes the differences in raspberries and gooseberries, but very few see any difference in currants. That is a very great mistake. I have grown about a dozen kinds of red currants, and I never knew what red currants were until about six years ago. I got a clipping from a friend called Moore's Ruby. For quality I do not think any red currant will compare for a moment with it. It is a large berry and hangs on long to the bushes.

Fay has been grown largely, but I find it is not a good grower. It is very much inclined to split, and once there is a large break the whole plant goes in a short time afterwards. But it gives a large crop of large berries and more to the bunch than other varieties. Last year I counted 24 currants on the stem on a bunch of Fay, and they were all large.

Another very good currant is the Wilder. On the whole it is of better quality than Fay. It is a large currant and bears well.

There are a great many others, the London Red, Red Grape, etc., which bear well, but if you can get Moore's, Wilder or Fay, there is no object in growing others.

Mr. Chapais.—What is your experience of Versailles ?

Mr. Whyte.—I find it very sour but prolific. The Cherry is a large berry but also very sour, short in the bunch, and will never compare with the Fay.

Mr. Brodie.—How does Moore's Ruby compare with the White Grape ?

Mr. Whyte.—It compares well. You and I know what the ordinary red currant is, and compare it with those I have here to see the difference. I would like to say this in defence of the currant. It is common for people to say it is a sour, poor thing compared with other fruit. But it has a very great recommendation. My attention was first drawn to that when my family passed through a severe stage of sickness. They went out into the garden and ate very freely and the refreshing acid of the currant produced such good effect that I have had no trouble whatever keeping my currant plantation since then. We go right out in the morning and eat all we feel inclined to before breakfast and the result is very salubrious.

With regard to the cultivation of the red currant, and of course this applies to white too, it is one of the simplest of all classes of fruit to cultivate. You

cut off eight or nine inches of wood, stick it in the ground, and you will have a plant next season.

When I get back I intend planting a lot of Moore's Ruby. The fall is the best time to plant them. If the soil is in any way sandy, better to cover them with a little straw. The cultivation afterwards is very simple. All you have to do is to pinch the ends out to prevent the shoots getting too long.

After that it pays to go over the currants the first week in July and with the finger pinch the tops off the branches and you get larger and much finer fruit.

It is a common thing to let currants grow as they like, but there is no fruit I know of which better repays a little care. Never allow weeds to grow and keep them cultivated.

Every fall I spread stable manure over the roots. I never use a spade but always a digging fork, because the roots are close to the ground and a spade would disturb them.

I have grown black currants but only in small quantity. Nobody eats them raw and I only grow what is required for preserving. Lee's Prolific is the best I know of. With black currants, as with the others, a little judicious pruning improves the plant very much.

You must guard against the currant worm. On the 3rd or 4th of May every year you may expect the currant worm. An application of Paris green by a spraying pump is perfect protection. I never use Paris green when the fruit is ripe. Then I put on hellebore, but for the first sprinkling Paris green is far more effective and does no harm. It is very much more durable than hellebore. If hellebore is kept exposed to the air a few days it is comparatively worthless.

I went to a druggist to get some hellebore this summer and found it in an open barrel in the cellar. I bought some and found it of very little value.

With Paris green in the spring there is no trouble. It is easily applied and perfectly efficient.

Mr. Chapais.—I applied Paris green at the rate of ½ lb. per 50 lbs. plaster with a Woodason bellows and found it very effective.

Sir Henri Joly de Lotbinière.—We have always treated with hellebore, one application.

Mr. Whyte.—If your hellebore is fresh, one application will do. I used it for years but was advised to use Paris green and will never go back.

GOOSEBERRIES.

Mr. Dunlop.---I have grown English gooseberries for a number of years. I have not been satisfied with the quality of the American varieties and have been trying to cultivate English gooseberries successfully and to select some varieties that will suit this climate. I have been pretty successful so far and am now propagating the varieties. I feel that I will be able to discard the Americans in a short time. The great trouble with the English varieties is the general impression that the mildew will attack the fruit. No doubt that is

true to a certain extent, but it depends greatly upon the variety and the situation. The English gooseberry likes a cool moist situation, and if you plant it on dry sandy soil, it is more difficult to treat, the mildew will affect the fruit and foliage. We can treat the mildew on the fruit, but when it attacks the foliage and wood, it sometimes weakens the tree so much that probably the winter will kill it. I find my soil more suitable than many for that purpose, and that is why I take advantage of it.

They have innumerable varieties in England, many of which are tender and suffer from the cold of our winter; but by selecting the hardiest varieties I hope to find some that will succeed here generally. I cannot speak very definitely with regard to the names of those varieties yet because I do not consider these few years test sufficient.

For some of the very promising ones I have no names. I got them in Montreal where they had been grown for many years, but the parties from whom I procured them could not give me the names, they were the only varieties left from importations made some fifty years ago—survivals of the fittest.

Almost every year I import a few varieties and I have found amongst those some half a dozen very promising, hardy and free from mildew. The Industry Gooseberry which was sent out to me as mildew proof is really the one which mildews the most with me. That shows what location has to do with it. It is very productive and a very fine berry.

The Whitesmith does fairly with me. One variety which was sent out to me and with which I am particularly impressed is the Fraserii. It has done wonderfully well. It was sent me from Northumberland Co., England.

I have a large white berry which I procured from a party in Hochelaga who has been growing English gooseberries for a number of years. I could not get the name. It is a larger variety than the Whitesmith, grows on an upright tree with very good head, and I am propagating that as being very promising.

Mr. Chapais.—Have you tried the Pearl?

Mr. Dunlop.—I have never fruited the Pearl, but have some young trees, it resembles the Downing in foliage and the berry is not very much larger. I have a number of seedlings raised from the seed of the Downing fertilized with English varieties. I have one berry resembling the Downing in bush, but which produces fruit twice as large as the Downing, and red in color, but do not yet know whether it will be of value.

A great point with the gooseberry is to give it good cultivation and judicious pruning.

If your ground is on the heavy side, you will not be troubled much with mildew.

The great trouble with the English gooseberry is that few varieties are actually hardy, and are liable to be injured by our winters, particularly if we do not have a good covering of snow.

Prof. Craig.—What about soil?

Mr. Dunlop.—Heavy soil is the soil for gooseberries, well drained.

Prof. Craig.—Would you advise a person who has only sandy soil to plant English varieties?

Mr. Dunlop.—No, I should not have any confidence in them?

Mr. Johnson.—Does the Red Jacket mildew?

Mr. Dunlop.—They say not. I have not tried it yet. White berries are more in demand in the Montreal markets than the red for some reason or other.

Mr. President.—We have discussed the subject of small fruits pretty thoroughly. In this district, along the Ottawa, there has been very little attempt to grow small fruits, although we are within easy access of Montreal. I hope those present from the Ottawa district will profit by what has been said and go in for the cultivation of these small fruits. There is a large field for starting plantations, we are so well situated for sending our fruit to market.

THE PLANTING AND CULTIVATION OF ORCHARDS.

Mr. Brodie.—I generally prepare the land in the fall of the year. I choose ground that is well drained or has good natural drainage.

I plough and draw the furrows 30 feet apart and as straight as possible.

In the spring we take our trees and set them 30 feet apart in these rows. That makes them 30 feet each way. After the trees are planted I like to mulch them with straw and manure about as large as a cart wheel around the trees. If the season is very dry, I water a couple of times through this mulching. In this way out of 200 trees which I set out one spring, I did not lose one.

I like to keep the trees cultivated, without a hay crop, ten or twelve years—the longer the better—until the branches intervene.

The great difficulty is to get ploughmen to plough around the trees carefully and not injure them with the whipple tree. I have never tried the new system of harness in the States without any whipple tree at all.

But I find that the hames which protrude high above the harness do injury to the branches, and I use the Canadian collar, with a buckle right over the top so as not to injure the branches.

At the end of ten or twelve years I sow grass seed and find Timothy and Clover the best. I tried orchard grass, I was recommended to use it. I paid $33 to set down four acres of this orchard grass, and I learned by experience that it is very good grass for pasture or mixed pasturages but does not do for hay. I have been able to take a second cut of orchard grass, but you cannot get as many loads of the grass as you would of timothy and clover.

Mr. President.—Do you cut the hay?

Mr. Brodie.---Yes. I like to put a cart load of manure to every three trees every second year, that is without the tail board on. There is a great mistake in people heaping the manure around the trunk. That would do well enough in the fall of the year if they would scatter it in the spring, but they often neglect to do that, so that the best way is to spread the manure beneath the tree as far as the branches extend overhead.

I generally prune in the spring of the year before the sap begins to run in the month of March.

I prune very often before the leaves come out. I find the old adage "prune when your knife is sharp" does very well.

Mr. Jack of Chateauguay advises pruning in November, and I think that is the best season if one can spare the time.

Mr. President.—What is the best time to graft?

Mr. Brodie.—It depends altogether on the earliness or lateness of the spring. I generally find that about 15th May is a good time to graft.

Mr. President.—That is too late.

Mr. Dunlop.—If you cut your scions previously and keep them dormant, you can graft up to June or later, but the best results are obtained by grafting when the buds are beginning to swell.

Mr. Brodie.---You can judge by the tree when it is time to graft. I always cut scions before the sap begins to flow at all, in the fall, and bury the scions in sawdust.

There are different systems of pruning. Some like to keep an open head and have the branches bear fruit in the centre of the tree. Mr. Jamieson came to see my orchard and did not approve of my system at all. I like to keep th trunk bare and the tree with open top.

Judging from some of Mr. Jamieson's fruit, which I saw on the market, and which was not very well colored, the sun could not get to the fruit very well.

Mr. Cross.—What preventive do you use against mice?

Mr. Brodie.—I apply tar paper around the trees every fall.

Mr. Chapais.---They sell tar paper tarred only on one side. This is the best means.

Mr. Brodie.---I find the borers harder to fight against than anything else. When they once get into a tree there is no help for it.

Mr. President.—What do you do for that?

Mr. Brodie.---It is my first experience this summer. I noticed three young healthy trees were attacked by them, as I saw the sawdust from the holes. I tried to shove in a wire and kill them, but the trees are not improved. I have never used a remedy to prevent borers before, and would like to hear from Prof. Craig.

Mr. President.---I have had a good deal of bother with the borers, but just now I have not so much. You must do something to prevent the egg from hatching, and the only way is to wash the trunk with soft soap and water, or potash and water, or some alkali of that kind. A good plan is to use soft soap. A barrel will last a year. Just take a whitewash brush and apply the soap to the trunks of the trees and let the rain wash it off. You will never find borers go where there is soft soap. When they do get into the tree, the only way to get rid of them is to shove a copper wire up the hole.

Another preventive is to put wood ashes around the tree. The beetles will not go where there is anything of that kind.

Mr. Brodie.---Where I lost these young trees with the borer, the ground was all in clean cultivation. The only way I could account for it was that along one of the line fences there were a few haw trees.

Mr. Chapais.---We find that two pounds of soda in a gallon of water and thickened with soft soap is a good wash. A piece of tar paper, tarred on the one side, tied at the bottom of the tree is a good preventive.

Mr. Dunlop.---Preventives are very good but an infallible remedy is to visit the trees once or twice a year. The egg is deposited early in June or July, and the young borer works at first upon the surface of the outer wood. You can detect it in September.

Then with the point of a penknife you can cut the worm out without doing damage to the tree. If this is done carefully each year you will soon cease to be troubled with borers.

It is astonishing how many trees you can go over in a day. Once you have confidence that you can destroy the pest, it will be a pleasure to go around and do it. It is a very small task to go over with a towel. You want to go down an inch or two below the ground to be sure, It is generally at the junction between the ground and the air that the borer begins his work.

Mr, President.---Mr. Brodie has touched on the question of pruning. Sir Henri de Lotbiniere has a great deal of experience in pruning and is prepared to give us a little address on that subject.

Sir Henri Joly de Lotbiniere.---My experience in pruning extends to forest rather than to apple trees. Nevertheless the same rules apply to fruit trees as well.

I have here some samples of bad pruning of apple trees which I took from my own orchard. I can easily illustrate the danger of bad pruning and the advantages of good pruning by showing you the results in each case. Last fall I made a collection of samples of each for the Quebec Exhibition, and on the advice of people interested I had the collection photographed. The photographs were taken half size of the samples exhibited and I draw your attention to these photographs which I now show you. They show the results of good and bad pruning. To begin with, the bad, for unfortunately there is more bad than good pruning. When I go along the road and see trees which have been planted at a good deal of expense and to which people attach a good deal of value---trees which they have planted around their homes—and see how they are neglected, see how people never think of pruning them, I feel the importance of drawing attention to the way in which a tree can be preserved in good health.

A tree growing in the open must be pruned. There is no tree growing in the open, whether a deciduous or an evergreen tree, which does not require pruning. If not pruned, the maples and other deciduous trees along the roadside will grow into a bush by spreading out their branches near the ground, and the sooner you prune them the better.

I would like to show you the results of bad pruning before showing you the effect of good pruning.

Everywhere we see stems left on the trees, protruberances of half an inch to

two inches, aud in very few instances will you see close pruning such as illustrated in the photograph.

When pruning is properly done you should not be able to feel the place where the branch was cut when you pass your hand over it. You ought not to be afraid of making a large wound, because the length of the wound is immaterial. Whether it be three feet or three inches long has nothing to do with the time it takes to heal. The sap, when it meets the top of the wound, as it returns to the ground, divides and goes on both sides, and all along the sides of the wound the process of healing takes place with the same rapidity no matter what the length of the wound.

Here is a result of bad pruning (showing photograph). Of course it is an extreme case, but I have seen stems left on trees much longer than that. Nature did everything it could to heal the wound by putting a covering of bark over it, but owing to the protruberance could not do so before the wood began to rot.

Even with the best kind of pruning, you ought to use paint to prevent the sun and rain from cracking the wound before the bark covers it.

Here is a sample of good pruning (showing photograph). The tree is pruned as close to the trunk as possible, irrespective of the length of the wound. I like to prune with a chisel as much as possible, because it does not injure the bark as much as a saw, and I can prune just as fast.

Sir Henri Joly de Lotbiniere.—There is a French gentleman, the Count de Tars, who has paid a great deal of attention to the pruning of forest trees and who wrote a very interesting book on the subject. He recommended the application of coal tar to the wound. He said it would assimilate itself with the surface of the wound and promote healing. Of course in an orchard he recommends great care not to allow the coal tar to fall on the bark and not to concentrate it on the wound. I have tried coal tar and different things and find wax the best. I think either coal tar or very thick paint or grafting wax should be used.

Mr. Fisk.—Should it be used warm ?

Sir Henri de Lotbiniere.—That is the trouble. You have to keep it a little warm.

Mr. President.---Shellac is very convenient. It is about the consistence of paint and dries at once.

Dr. Grignon.---I have pruned large branches off apple trees and found the wounds healed very quickly. I applied a kind of ointment made of wax, ashes and coal tar.

Mr. Chapais.---A mixture of clay and cow dung is very cheap and does well.

Mr. Fisk.---Mr. Brodie said he believed in the old system of pruning when your knife is sharp. In our climate the apple tree should be pruned either early in spring or late in the fall after the sap has ceased to flow. I do not think I should prune an apple tree as close as Sir Henri de Lotbiniere says we should do with forest trees. Our object is to make the wound as small as possible so that it may heal soon. If you cut level with the trunk yon expose a large

surface to be healed over. My system is to cut the branch as close as possible on the upper side, but with an angle of 45 degrees on the lower side.

I find that the trees which I cut in the winter suffer the next season. Over each wound the bark was killed, back from $\frac{1}{8}$ to $\frac{1}{4}$ of an inch when pruned in the cold weather. Wait until March anyway before you cut off a branch.

Mr. President.---What is your opinion of the shape of a young tree ?

Mr. Fisk.---The ideal is a straight stem as much as possible. In every case where you can preserve a straight centre you will suffer less from the split and overloading fruit. If you can so prune it as to have your branches start out at right angles from different points, that tree will hardly be subject to splitting of branches or breaking down.

Mr. Chapais.---Do you prefer the branches low or high ?

Mr. Fisk.---I should rather have them high, because with low branches it is impossible to get near enough to spray or cultivate. The branches near the ground are almost always more subject to fungus disease.

Mr. Chapais.—In our district we find it better to have the branches low because the snow then collects better and gives better shelter. The snow reaches as high as the middle branches.

Mr. Edwards.—The fruit does not ripen so well when the branches are low

Mr. Chapais.—I do not agree with you. We find, even with the grape vine, that if you train them low the fruit ripens earlier than when trained high.

Mr. Hodgson.—I believe in pruning young trees three to four years before allowing the branches to grow. A great many varieties we grow by grafting on to the wild stock. They stand the borers better.

Mr. President.—Were the wild trees top grafted ?

Mr. Hodgson.—Yes. I find the borers never touch the wild fruit at all.

Mr. President.—I do not agree with you there. You will find the borers all around the hedges attacking the wild thorn bush and mountain ash.

Mr. Hodgson.—I find the Duchess the only tree in which we are bothered with borers.

The President called for the report of Committee on prizes for seedling apples.

Mr. Fisk.—Last winter a committee was instructed to report.

This was done with a view of bringing forward the best seedlings in order to fill the blanks which we have at present in our late keeping varieties. In this Province we have abundance of early and summer fruit of many varieties which will fill the requirements of the market both at home aud for export. But we do lack varieties for our own market and for export late in the season. We have practically nothing in this Province to fill the place taken by the American Baldwin and Greening in the Eastern States and Ontario. Northern Spy, which is one of the leading export fruits in Ontario, is too tender for us. So is the American Greening and King, which are the three leading varieties in the export trade to England.

In Nova Scotia they have the Nonpareil and others which they export

very largely. These varieties do not succeed with us and we are in search of varieties that will suit us. Canada Red will fill the bill to some extent if it comes up to expectations.

Mr. Fisk.—I have drafted a list of prizes which will be thoroughly discussed.

The following report was submitted and adopted.

REPORT OF COMMITTEE ON PRIZES FOR SEEDLING APPLES.

Mr. President,—

A late winter apple combining size, quality, color, hardiness and productiveness of tree, is felt to be a want in the hands of the fruit growers of the Province of Quebec.

The late Mr. Chas. Gibb had hoped to secure this among the many varieties imported from Russia; but up to the present no variety has appeared which fills the requirements of an ideal late keeping apple adapted to the climatic influences of the province.

It is thought possible that this "ideal apple" may exist among our native seedlings, and in order to bring forward the best winter seedling apples grown in the province, with the view of filling the blanks in the list of our late varieties to meet the demand for the export trade as well as that of home consumption, your committee after due consideration, respectfully offer the following suggestions:

I. That at our winter meetings, three (3) prizes be offered in each district, for the best winter seedling apples.

II. That a provincial prize be awarded to the variety scoring the highest number of points in the Districts competition.

III. That a gold medal be awarded to the variety making the best record during the five years of competition, if considered worthy, the Committee to examine the tree before making this award, snbject to the following rules and conditions.

1st. Each district to compete separately, and no competitor to be allowed more than three plates in any one district competition.

2nd. Samples placed in competition to consist of twenty (20) specimens of *bona fide* seedling apples grown within the limits of the district, and before being judged t be examined by the committee on nomenclature.

3rd. All samples exhibited at winter meeting to become the property of the Society for safe keeping, and placed in charge of a committee, or individual, whose duty it shall be to care for the same in the best possible manner till the first of May, when they shall again be judged in order to award prizes.

4th. No competitor to act as judge, and all awards made by the judges to be considered as final,

5th. All competitors to give any information when required by Society, in regard to samples on exhibition, as to probable origin, age, hardiness and productiveness of tree, &c., &c.

DISTRICT PRIZES.

Dist.	No. 1.	For best 20 specimens winter seedling apples				$3.	$2.	$1.
"	2.	"	"	"	"	3.	2.	1.
"	3.	"	"	"	"	3.	2.	1.
"	4.	"	"	"	"	3.	2.	1.
"	5.	"	"	"	"	3.	2.	1.
"	6.	"	"	"	"	3.	2.	1.
"	7.	"	"	"	"	3.	2.	1.
"	8.	"	"	"	"	3.	2.	1.
"	9.	"	"	"	"	3.	2.	1.

PROVINCIAL PRIZE.

A prize of $10.00 will be awarded to the variety scoring the highest number of points in the Districts' Competition.

GOLD MEDAL.

A gold medal will be awarded to the variety making the best record during five years of competition, if considered worthy, the Committee to examine the tree before making this award.

Fruit for competition to be exhibited at the Winter Meeting to be held in January, and will be taken charge of by the Society and kept in proper storage until May following, when a Committee will award the prizes.

Signed,

ROBT. HAMILTON
C. P, NEWMAN
J. M. FISK
} *Committee.*

This district competition brings in varieties from each district. We ought to get two or three apples that might be worth naming and bringing before the Province, and which would apply to the different sections of the Province. By this means we would soon find out whether there was anything among our seedlings which could fill the bill.

Mr. President,—We should have more money. The prizes are too low.

Rev. Canon Fulton.—We have had prizes and they have been adjudged year after year, and we have had very good seedlings, but there ought to be a committee to go into the different districts in the fall of the year and look at the trees and their age and see whether they are prolific or not. I am sure that in the County of Huntington there are better apples than have ever been brought into the Province for hardiness and flavor. Mr. Edwards has been through the County and can tell more about it than anybody else in the Province.

Mr. Fisher.—I think the suggestion that the trees should be examined before awarding the Provincial prize or gold medal is a good one. Another

thing which should be given in that report of the Committee is a definition of "seedling," showing what is really meant by the term. A number of local apples are grafted and propagated that are practically for the whole Province seedlings, but in an exhibition they could not rank as such. A seedling, I believe, is an apple unnamed and unpropagated, while these apples have been named locally and propagated. Such apples could not be shown under the ordinary definition of seedling, but I think they ought to be for a provincial exhibition.

Mr. President.—I think we had better retain the present committee to carry on this work and carry out the suggestion of Mr. Fisher with regard to the definition of a seedling apple and also as to examining the trees themselves before awarding Provincial prizes. We will adjourn the discussion of this subject until we meet at Oka.

Discussion adjourned.

CANADA RED.

Mr. President called on the Committee on Canada Red to make its report.

Prof. Craig.—With regard to Canada Red we saw about 14 trees. Two of those were near the buildings and were quite thrifty. I believe last year about 14 barrels were picked from the trees, and this year, as near as I can see, they will have about five barrels more on the two.

Mr. President.—Those trees are 35 years old.

Prof. Craig.—In a field back of the buildings we saw about 12 more which seemed to be left in a half starved condition.

Mr. President.—They have had no cultivation at all.

Prof. Craig.—Grass does not seem even to grow in the orchard, it is so bare, but this year there will be about a barrel a piece on a good many. The fruit seems clean, nice fruit, and very like Scott's Winter, though they grow larger.

Mr. President.—Much larger.

Mr. Fisk.—Is the foliage healthy ?

Prof. Craig.—Yes, but they look stunted and do not seem to have a healthy growth.

Mr. President.—Were there any Fameuse and St. Lawrence there ?

Prof. Craig.---We saw a few. I saw no Winter St. Lawrence and the Fameuse were very poor. I was very much struck with the Canada Red, and think it is worth propagating.

Mr. President.---Since Mr. Matthew's death the orchard has been in the hands of several tenants and not cultivated properly. It has been neglected for the last 25 years. Do you consider the Canada Red a hardy tree ?

Prof. Craig.---I should say so. Even under the circumstances, growing wild in a way, it still bears good fruit.

Mr. President.---Mr. Wm. Thomson, who has been here for some years and owns an orchard where Canada Red are grown, can give us some information

about the profitableneas of the variety. Would it pay to grow and was it profitable fruit to sell ?

Mr Thomson.---Most profitable tree and most saleable fruit in autumn.

Mr. President.---Is it a long keeper ?

Mr. Thomson.---Yes, the longest keeper I had. It kept until June.

Mr. President.---Was the proportion of first-class fruit as great as in other varieties ?

Mr. Thomson.---I sent them down to a French gentleman in Three Rivers, and he sent me back word that it was the finest apple ever sent to him. I sent some also to St. Andrews, to Mr. McDonald, and he told me the same thing. I realized 3, 4 and 5 barrels per tree ; and they were not at all cultivated.

Mr. President.---It is very satisfactory to get these reports about a variety which we can safely say is hardy because we lack late keeping varieties which are sufficiently hardy to stand our climate.

We have found out that this apple has been able to stand most extraordinary neglect and after 35 years be profitable still.

It is a difficult tree to grow in the nursery. The scions are slender and they do not seem to start well for a few years.

Mr. Johnson.---Do you recommend them for top grafting ?

Mr. President.---I have not tried that.

Mr. Hodgson.---I have done a good deal of top grafting. They tell me they do well for top grafting.

Mr. Johnson.---The Northern Spy with us does much better top grafted than otherwise.

Mr. President.---These trees at Mount Victoria were not top grafted. Mr. Matthews put out 1200 to 1500 trees of the ordinary varieties, St. Lawrence, Fameuse, Alexander. I do not know where he got the Canada Red, but I fancy he got them from the West.

Mr. Hodgson.---They came from Rochester.

Mr. Brodie.---That shows that it is the variety and not the locality which tells.

Mr. Cross.---Canada Red is no new discovery.

Mr. President.---No, but the Canada Red, even in the Western States and Michigan, is not the same apple. This is a larger apple than that generally known in the United States. In Ontario it has been cultivated so long under the name of Canada Red that the Ontario Fruit Growers Association will not change the name. In Wisconsin, Ohio and Michigan, they say it is the Baltimore or Flushing.

Mr. Hodgson.---Some five or six years ago a man came around top grafting in the spring. He wanted to do some top grafting for me, but I said I could do it myself. I told him, however, if he had any good, hardy varieties of American to put some in. He put in one variety but it did not stand at all. He put in some of those, but I think he called them Baltimore, and they turned out to be the same as these Canada Red. But I think they were fully larger and seemed to be later in maturity.

VOTE OF THANKS.

Sir Henry Joly de Lotbiniere moved that the thanks of the Society be given Mr. Gibb for the use of the school house and to the people of Como for their generous hospitality.

He expressed the pleasure which the Society felt at the interest shown in its meetings, and felt confident that the Society would gain considerable strength and influence through this very successful and pleasant visit to Como.

Rev. Canon Fulton, in seconding the motion, also expressed his gratification over the success of the meeting and the gratitude they all felt for the exceedingly cordial and hospitable manner in which they had been received. The love of fruit growing was a bond of friendship and good fellowship which drew them all together and made these meetings more attractive each year.

Mr. President, in returning thanks, regretted that the illness of two of the oldest residents in Como---his father, who was very seriously ill, and Mr. Gibb, who was not well enough to attend the meeting---had to some extent interfered with the reception of the Society. Had it not been for this, the welcome would have been much heartier. The people of Como however had done all they could to show their sympathy with the work of the Society, and on the next visit of the Society to Como he hoped there would be nothing to mar in any way the heartiness of the people's welcome.

Mr. Fisher gave his testimony to the good work done by the Society. Many people had expressed the opinion that they had benefited largely by the meetings just held. There was quite an awakening of interest in fruit growing in every locality where the Society had held meetings, and he had no doubt the best of results would follow the meetings held in Como.

Mr. McNeill of Hudson, said the people of his vicinity felt deeply grateful to the Society for holding their meeting in Como. No doubt this would stir the people into taking more active interest in the planting and cultivation of orchards.

Rev. Father Dom Antoine of the Trappist Order then invited the Society to meet at Oka. The Rev. Father Provincial desired him to express his regret at not being able to give the invitation in person, and to inform the Society also of the great interest which the Trappist Fathers took in the work.

The meeting then adjourned.

OKA, 31st August, 1895.

The Society met in the Trappist Monastery at 8 p.m.

The Rev'd Father Antoine welcomed the Society to the monastery. He said:

Mr. President and Gentlemen,---

I feel a particular pleasure in welcoming you to our monastery. All those who honor us with a visit find always here the most cordial hospitality; but on this occasion, through your interest in agriculture, you have our special

sympathy. Everything touching agriculture is of particular interest to the Trappists. Our rule in fact requires us to give to it a part of our time and that we should hold it in honor; and besides, let me tell you in confidence, we have at Notre Dame du Lac a weakness, one which you certainly will not condemn, for everything having to do with arboriculture.

That is why I hailed with pleasure the happy idea which you have had to choose our Abbey as your place of meeting at some of your re-unions.

I thank you, Mr. President, for the honor you do us. Your visit is an encouragement to our efforts, and we shall certainly profit by your experience and counsel, and I should be only too happy if in some manner we could contribute to the success of your praiseworthy enterprise.

On glancing through your programme, I was reminded of the old adage of the Latin poet:

"Omni tulit punctum qui miscuit utile dulci."—(Horace)

"To know how to combine the useful and the ornamental is to win all suffrages." You have justly given the greatest place to those trees and bushes, the intelligent cultivation of which is of such great utility to our country people; but the conference on wayside trees to be given by one of your members, who has done so much for agriculture and who is so well authorized to speak on the subject, and the attention which you are giving the planting of quick set hedges as fences, are proofs that you know how to profit by the counsel of ancient Horace, and the suffrages of all those who desire better days for the country sides of Canada are yours.

Your grandchildren, gentlemen, as the good Lafontaine has said, will owe you many pleasant shades, and no one would forbid the wise giving themselves trouble for the pleasure of others.

Your efforts will contribute to transform Canada into a terrestrial paradise. Providence has watered it with four great rivers. Plant it with all kinds of trees beautiful to the eye, and whose fruits are agreeable to the taste, and you will make of it a country full of delight.

The efforts made with so admirable an accord by men of such undoubted competence cannot fail to be crowned with success.

You are giving your attention to the different varieties of apples. Permit me to direct your attention to one, with which you should not interest yourself, except to exclude it for ever, and that is the apple of discord, for on your union of sentiment depends the success of the noble enterprise to which you are giving, with such admirable self devotion, your science and your labors.

You will find here a modest and somewhat rustic hospitality, but that perhaps will not be displeasing to men who wish to pay honor to the life in the fields. If, however the fare be meagre and not appetizing, the welcome is sincere, and more sincere still the desire to see you return.

Mr. President, on behalf of the Society, returned thanks for the very cordial welcome extended to them. They had all looked forward with great interest to this visit. The Rev'd Father had spoken very modestly of the entertainment with which the order had regaled their visitors, but if the practical work of the

visit was at all commensurate with its social features, the conferences held in this monastery would certainly be red letter ones in the annals of the Society.

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

PLUMS IN EASTERN QUEBEC.

If some parts of our Province, by their climatic situation, find themselves rather neglected by nature and somewhat in disgrace, that is all the more reason why our Society should devote more particular attention to them than to more favored localities. It is in that view that I occupy my leisure with endeavoring to endow the part of the Province I inhabit with some fruits which may leave us less cause to envy our more fortunate neighbors. After I had put into practice the studies which I had made under a master we all regret, I found that we were not so badly off as I thought at first and could cultivate a good many fruits we used to think were forbidden to our climate. At the last meeting of this Society, I exhibited some apples which had suceeeded iu our district. This evening I shall regale you with another fruit of importance in our market and grateful to the palate.

The plums of the Counties of L'Islet and Kamouraska have for a long time attracted the attention of cultivators of fruit in the west of our Province and in Ontario.

The rigor of the climate of this region and our success in the cultivation of this fruit here have made many believe that the varieties we grow are not those grown in the district of Montreal and further West.

A number of persons have asked me for information on this subject, and I think it would be well to give this information in the report of our Society.

I have based these notes on the varieties grown in my own orchard at St. Denis, Kamouraska Co., 90 miles below Quebec, 47° 30' of latitude. These varieties I have divided into white, yellow and green plums, violet-red and violet-blue plums

White, yellow and green.

Yellow Damson, Coe's Golden Drop, Imperial Gage, Early Yellow, Yellow Orleans, Reine Claude de Montmorency.

Red violet.

Lombard Trabische.

Violet blue.

Bradshaw, Damson, Shropshire Damson, Blue Orleans, Smith's Orleans.

A short description of each of these varieties will enable us to identify them without difficulty,

Yellow Damson.---Small, oval, of a pale yellow tinted with red, flesh rich, sub-acid and very agreeable, very productive, and the fruit hangs a long time on the tree, ripens about the 10th September.

Coe's Golden Drop.---Fruit large and handsome, oval and of a golden yellow, flesh firm, sweet and rich, adhering to the stone. The tree is very vigorous but a rather shy bearer. Valuable for its fine appearance on the market and for its

late ripening. It ripens with us at the end of October, sometimes the frost comes before it is ripe, and it is therefore better to pluck it about 20th October and ripen it indoors. It will keep well until the middle of November, and then when its golden fruit reaches the market all other plums have disappeared.

Imperial Gage.---Large oval greenish, flesh juicy, rich and delicious, free stone, one of the best. Tree upright, vigorous, ripens beginning of September.

Early Yellow.---A fine plum of medium size, oval and pointed, color clear yellow, with a green bloom, flesh fine, juicy and of an agreeable flavor. Tree a little inclined to be crooked, but very productive. The fruit ripens the beginning of September.

Yellow Orleans.---Medium size, round, yellow with bloom, flesh greenish yellow, firm and of good quality. Tree very productive. Ripens middle of September.

Reine Claude de Montmorency.---Large, round, greenish, a freestone of fine quality. Tree vigorous and a heavy bearer. This variety is one of those which sells the best in England. Ripens middle of September.

Lombard.---Fruit medium, oval, and of a violet-red color, flesh yellow juicy, agreeable, adhering to the stone. Tree very productive. particularly recommended for light soil. Ripens end of September.

Trabische.---A Russian variety of recent importation which appears very hardy. The fruit is somewhat similar to the Lombard, except that it has a deeper suture. The only notable difference between the two fruits is that the Trabische ripens 8 to 10 days before the Lombard, and that the stone of the former is large, flat, oval and of a pale yellow color, that of the Lombard is small narrow and of a deep yellow.

Bradshaw.—Is also called Imperial Blue or Black. This large and very fine plum is of a dark violet blue, juicy and good. Tree upright, vigorous and productive. Ripens beginning of September.

Blue Damson.—Fruit medium, oblong, tapering towards the peduncle, dark violet blue, flesh yellow of a quality between sub-acid and sweet. Tree vigorous and very productive. This is the true market plum. Gathered eight days before ripe it can be shipped in barrels, and thus treated ripens up retaining all its good qualities.

It is with orchards of this variety that our farmers below Quebec have realized the large profits which they have made with the cultivation of plums. Ripens beginning of September.

Shropshire Damson.—Fruit a little under medium, round, of a violet black blue with a heavy bloom. Flesh yellow, adhering to the stone, very sweet and juicy, ripens end of October. Tree upright, very vigorous.

Blue Orleans.—Fruit small, round-oval, blue with bloom; flesh greenish yellow, firm, sweet and rich. Tree very vigorous, and appearing suited to nearly all soils. Ripens end of September, carries well in barrels, and is highly esteemed for cooking purposes.

Smith's Orleans.—Fruit very large and fine, oval, of a violet red color with a heavy violet bloom, flesh yellow, firm, juicy and rich. Tree vigorous and very productive. Ripens middle of September.

Among the varieties which I have mentioned, the Early Yellow, the Yellow Orleans, the Reine Claude, the Blue and Yellow Damsons, the Shropshire Damson and the Blue Orleans are of about equal hardiness and stand about the same treatment. They are reproduced by sprouts which make stronger and more vigorous trees living much longer than those of the same varieties which are grafted. These varieties to-day are to a great extent the accidental seedings which have sprung up in the old orchards and which have also given birth to varieties without name but of excellent quality which all bear the names of the parents of these seedlings, presenting slight variations easy to observe, but however remaining valuable to the cultivators of fruit in this region on account of their great productiveness and unequalled hardiness.

Some trees of these varieties and of their seedlings are over 60 years of age and still bear good crops.

As to Coe's Golden Drop, Imperial Gage, Lombard Bradshaw, Trabische and Smith's Orleans, the experience which I have had during the last six years makes me conclude that they are good acquisitions for us because they have passed through some severe winters, notably that of 1893-94 when the thermometer registered 30 below zero.

At the orchards of Mr. Auguste Dupuis, Village des Aulnais, L'Islet Co., which is higher up than my place, other varieties of plums have done well, the Reine Claude de Bavay, Washington, Pond's Seedling, &c.

Unfortunately the black knot is commencing its ravages wiih us, after having destroyed all the orchards of the Cote Beaupré and of the Island of Orleans, near Quebec Formerly in the locality where I reside it had destroyed three large orchards.

We however hope to get rid of this fungous pest by the attention and care we are taking to cut off and burn the knots as soon as they appear.

I attribute the great success we have had in the culture of plums below Quebec to the fact that notwithstanding our rigorous climate the great quantity of snow which we get provides an efficient protection to our trees. We plant the trees very close, not more than fifteen feet apart, and in this way they afford mutual protection.

In the month of July the application of three inches of straw around the plum trees prevents the fruit from falling before ripe, which frequently happens during the very hot weather if one omits this precaution.

Mr. President.—I find that Mr. Chapais has given us an extraordinary list of plums grown below Quebec. I know that at Como, and I believe also at Oka, we are not able to cultivate all the varieties he has mentioned. It seems to me the Society should go to L'Islet and Kamouraska for its next summer meeting.

Mr. Chapais.—You must come in September and see our plums.

Dr. Grignon.—What are the best three varieties of plums you can give us?

Mr. Chapais.—From the point of view of market, the plum which brings the most profit is certainly the little Domestic Blue Damson. It is hardly of average size. The tree yields enormously.

It is a seedling. There are 60 to 80 trees in an orchard where the knife has never passed, and the orchard never cultivated, and the branches are loaded down with first-class fruit. They are in clusters like grapes. Plucked eight days before maturity, it may be carried 200 miles. It ripens during the voyage and you have a plum excellent to eat. With those plums we make the most money. For the last ten years we have never got more than $6 per barrel and often only $2 per barrel. Many years ago they sold as high as $9 per barrel.

Dr. Grignon.—Can they succeed in the Ottawa valley ?

Mr. Chapais.—Certainly, in the Northern region that plum should succeed perfectly.

Dr. Grignon.---The little wild common plum does very well with us.

Mr. Chapais.---We have not got it at all. We consider the Domestic is much better. It is excellent to eat and to cook. Yellow Orleans and Blue Orleans are also two excellent market plums which almost equal the Damson. The Reine Claude de Montmorenei, for a near market, is the one which brings the best return. The Lombard would not be a market plum with us because it competes with other plums of the West, which are as good in quality and greater in quantity. Coe's Golden Drop arrives on the market the 15th November when there are no other plums. It may realize $1.50 to $2 per gallon. My trees however are yet too young for me to give you any experience. Last year at the Quebec meeting, which took place in the beginning of December, I showed 4 plums of that variety which I had kept in my cellar and were still well preserved. That is a plum that would be a good speculation for that season.

All these varieties are excellent for home use because they are all of good quality.

Trabische and Lombard are two fine plums which, while not so large as the California plums, which are very bad to eat, are fine to look at, make good preserves and give excellent results. If we had a local market near us, to which we could bring them in baskets, we could grow them profitably.

But the best are the Damson, Yellow Orleans and Reine Claude.

Where can we procure them ?

Mr. Chapais.---Mr. Dupuis of St. Roch des Aulnets has sprouts of these plums. I would advise always to obtain sprouts as they are more hardy and last longer than the grafted plum. Still I know of grafted trees 20 and 25 years old which are yet in excellent health. I do not think they ever attain the age of 80 years, as do the sprouts of the Damsons which were planted 70 years ago and still give good crops.

Dr. Grignon.---Are there some varieties less exposed to black knot than others ?

Mr. Chapais.---The Damson is most attacked by the black knot, and the orchards of Damsons have nearly all disappeared from the lower region of the Province of Quebec. We have preserved them in the County of L'Islet by taking special care. Prizes were offered for exhibits of the greatest quantity of black knots at the county fairs and these were burned. This was done during ten or twelve years. At my place where we used to take away full cart loads, now we take away five or six per season at the most. The other plums are also subject to black knot, but much less than the Damsons.

Mr. Brodie.---Is there more black knot in the cultivated lands?

Mr. Chapais.---More in the old orchards not cultivated with us.

Mr. Brodie.---Did you try the Japan plums?

Mr. Chapais.---No.

Mr. Brodie.---They succeeded well with us at Montreal. There are other kinds in the West which cannot succeed on the Island of Montreal at all. The Burbank, a Japan plum, I grafted last year, and the new wood, one year old, produced the next year.

Dr. Grignon.---Can the Bordeaux mixture destroy the black knot?

Mr. Chapais.---I have no experience in that. Mr. Craig says they tried it and obtained certain success.

Mr. Brodie.---When Mr. Craig came to my house, he tried lamp oil where the black knot commenced and it killed the knot.

Mr. Chapais.---I tried it and it killed the knot and the tree both.

Mr. Brodie.---I did not put enough for that.

Prof. Craig.---I had an opportunity this month of spending about a week in L'Islet County. I had long wished to visit this paradise of which we heard so much last fall at Quebec. I was astonished at the number and variety of plum trees grown there and grown successfully, After looking the whole situation over, I came very much to the conclusion which our President has expressed. It seems to me that success is due first to the fact that they have been growing those varieties on their own roots for a number of generations. They have also grown some of them from seed, so that the varieties have become acclimatized to that locality. It is the only place perhaps in Canada where we have such an excellent object lesson showing how plants may be acclimatized from seedling and seedling production for a long period. Again they plant very closely. The trees are, in many orchards, not more than 6, 8 or 10 feet apart, so that they afford each other mutual protection. Then some of the varieties, like the Orleans, grow very low, and as Mr. Chapais has said, they have a great depth of snow, sometimes sufficient to entirely cover these trees, so that they have very good protection during the winter. I have seen trees there having much greater breadth than height, a breadth of 15 feet perhaps, and height of not more than 8 ft.: with the branches running right out from the ground and then striking upwards, so that growing on their own roots and by seedling production they have become acclimatized. Then with their natural climatic advantages and close planting, they are able to grow varieties of plums which we in the West cannot produce successfully.

ROADSIDE TREES.

Sir Henri Joly de Lotbiniere.—I was chosen to treat this question of the planting of trees by the roadside, probably because of my love for the trees and the efforts I have made to encourage their planting as much as possible. When young I came from college where I was educated in France, and the first question I asked was, where are the trees in Canada, this land of forest? Along the highways it is rare to see fine trees. We see finer trees in France on the high-

ways th[illegible] in Canada. Of course along the Ottawa and St. Maurice we can see forests co[illegible]paratively virgin, but along our country roads we do not see trees. Naturally the first problem to those who have been educated in the love of trees as we have been in France is how best to restore the forests where destroyed and where the people suffer from lack of trees as in many of our old settlements. The question therefore of planting trees along our public roads is one I approach with pleasure and was glad to have been asked to give my views on it.

But the moment I began to study the question I received a visit from a venerable and worthy mayor of one of our parishes in Lotbiniere, who asked me what means could be taken to force the habitants to cut down their trees along the highways, so as to give the 15 or 20 feet required on public roads. You can understand the discouragement I felt, who was trying to encourage the planting of trees along the highways. We must not lose sight of the importance of the road as a means of communication. We must take note of the nature of the road and the soil along which we desire to plant trees. In the part of the country where I live I dare not encourage the planting of trees because our roads are of clay loam, very hard to keep in order in autumn and winter.

There are certain soils in which, unless we are prepared to give much greater care to the roads. we must not plant trees. The first recommendation I would give farmers is to take better care of their roads. In Ontario so well is this understood that they have a society called "the society of the friends of good roads." This society issues bulletins giving advice on the building and maintaining of clay roads where the people cannot afford to macadamize, and have no other material than the soil itself:

In planting trees along the highways we should first study the nature of the soil so as to ascertain whether there is any danger of rendering the roads impracticable by shading them completely.

The second point is to ascertain what trees will profit best in the soil in which we wish to plant them. At my place I have a terrible road over a mile long to keep in order, the soil of which is sticky loam like putty. On both sides we plant trees, but on the south we plant them much farther apart than on the north side. Then we prune the trees and lengthen the trunks as much as possible so that the wind may penetrate and dry the road. Unless the soil is completely sandy so that it absorbs the rain as it falls, I should recommend the vigorous and severe pruning of trees.

The pruning of trees is a most important question. When they are close together in the forest, they prune themselves. The branches dry up and perish for want of air and sun, so that we need not occupy ourselves with the pruning of trees when they are close together and have attained a certain height. But along the highway there is not a single tree which will not take the shape of a bush if not pruned. Except the Elm, I do not know of any tree which, if isolated, does not at once send out its branches on every side, so as to become a regular bush.

This morning at Como I spoke of the pruning of trees and showed samples to illustrate the soundness of the system recommended by Le Conte de Karr in his interesting work, which has been translated into almost every tongue. The method of pruning which he advises is to cut away the branch in such a fashion

that on passing the hand over the wound it is impossible to feel the place from which the branch was taken except by noting the absence of bark. If you leave a piece of branch one or two inches long, you will find that before nature can cover it with bark the rotteness has set in.

As to the choice of trees I will not say much, because good sense will show that the choice must depend on the nature of the soil. The Elm is a tree which I like to see planted along our waysides where feasible.

I presided many years ago at the planting of trees on Arbor day in Quebec. We started a park in an exceptionally good situation. on the glacis near the citadel, with the magnificent river at our feet, and an admirable view of the Laurentides and the Island of Orleans in the distance. We planted 1200 or 1500 trees. They started well, and we hoped to protect them by barbed wire fences which the cattle would respect. But uufortunately this was a pasture ground, and the owners of the cows broke the fences, and the cattle destroyed the trees. It is useless to plant trees if we allow cattle to destroy them.

How many people say, it is all very well to plant fruit trees which in a certain given time will give certain results, but if you plant forest trees you will never profit by them. But you have no idea how quickly a tree grows. And it is a very economical way of re-stocking with wood places where the farmers often have to leave their lands because they cannot get enough wood even for heating purposes. There is besides great pleasure in watching the little sapling grow from month to month and even day to day ; and besides if we do not live long enough to enjoy its complete fruition, others will, and our labor will not be lost.

In the Province of Quebec we endeavor to encourage the planting of trees on a large scale by offering prizes to these who plant a certain number in a given time, but we have not made any effort to encourage the planting of trees along our highways.

In certain states of the American Union what is the system adopted? In California a law was passed in 1868, under which a board of Inspectors was appointed to point out on what roads trees could be planted, the kinds that should be planted, the distances between them, and finally to make rules for the protection of the trees. One dollar for a certain time is given for every one planted, after it is four years old, and it is known to have completely taken root.

In Dakota the highways must be 66 feet wide, and the proprietors of adjoining lands are allowed to take a part of the road for the planting of trees, and own the trees which they plant. If they plant a certain proportion and give them proper care, they are entitled to an exemption of the tax for keeping the road.

In Iowa an exemption of tax is granted for planting a certain proportion of trees along the road.

In Kansas a reward is given for the planting of a certain number of trees in a certain number of years.

In Michigan the proprietors of lands touching on the public road are allowed to plant trees within a limit of 8 feet between their land and the highway.

In New York the Inspector of roads is authorized to reduce the tax for keeping the roads $1 for each four trees planted along the highway, but they must be planted according to regulations. For example elms must not be planted less than 70 feet from one another, so that when the tree is completely grown there will be ample space for the sun and air to operate on the road.

Thus these people look to the future, some generations ahead, to ensure something that will be an honor and credit to the country. All civilized countries except ours occupy themselves actively with the planting of trees.

I have a little clipping here from a newspaper showing that bicycling clubs are beginning to interest themselves in this question. Certain clubs in the United States appreciate so well the pleasure of riding through roads shaded with trees that they propose even to make subscriptions for the planting of trees along the highways. No doubt everybody appreciates the advantage of having a fine avenue of trees along the road, and the moment the planting of trees does not interfere with the good condition of a road we should do all in our power to encourage it.

Dr. Grignon.—I congratulate Sir Henri de Lothbiniere on his very interesting address and on the great interest he has always taken in the culture or ornamental and fruit trees. Where I live we celebrated the first arbor day festival ordered by the Government, and I must say, in gratitude to Sir Henry that I increased the value of my property $300 at least through the trees I planted that day.

I attach much importance to the celebration of arbor day. The practical results are not always apparent, but there is a pleasant holiday souvenir attached to it which will promote in the people respect and affection for nature's greatest ornament. I recall with pleasure the first arbor day celebrated at our place ; the curé, the merchants, the professional men and even the workmen made it a solemn festival. We hoisted flags, we went out to the woods with axe and spade, and each one brought back his tree and gave it a name. And what a change since then. Ten years ago there was not a tree in the parish. To-day every stranger who arrives is struck with the beauty of the place.

I know nothing about planting trees, yet out of 112 maples which I planted I only lost two, and I have refused $600 for my lot. The increase in value I attribute entirely to those fine trees. We also planted trees along the roads, and I have remarked that in winter, for example, the roads are better where they are lined with rows of trees than where they are not. The trees protect them in winter against the wind and snow ; and in the summer against the sun. But where the soil is heavy clay of course the trees, if planted too close together, would have a bad effect. In such soil the trees should be planted 50 to 70 feet apart, or we should plant those whose tendency is to grow rather vertically than horizontally, such as the poplars. Each parish should plant what suits it best. With us the maple succeeds best ; in other places it is the elm.

Mr. Chapais.---I give my attention chiefly to the dairy industry, but am somewhat a jack of all trades and master of none. I have taken a good deal of

interest in arboriculture. I am continually travelling and when I see a fine tree I feel a pleasure similar to that described by Sir Henri de Lotbiniere. Last year I had the advantage of being present at a conference of American foresters. They held their first meeting in Brooklyn, and passed around a short bulletin issued by the Society, which exists in the State of New York for the promotion of the planting of trees. The by-laws of the Society are calculated to encourage all the citizens to plant trees. The Society has great influence. In Brooklyn the streets are ornamented with some of the finest trees I ever saw. Detroit is another town, which, though not pretty in itself, is simply beautiful because of its trees. In the County of Essex, which I had occasion to visit this year, the first thing that struck me was the great quantity of trees bordering the public roads. I could not help thinking what a pity it was that in our Province, so well gifted by nature, we did not think of planting such trees along our roadsides.

In Ontario, as Sir Henri de Lotbiniere tells us, there is an association called the Society of the friends of good roads. Our Provincial Dairymen's Association, stimulated by the fact it was it which originated the idea in Ontario of a society of the friends of good roads, started last year to organize a similar society in this Province, and opened a book of subscriptions. I have no doubt that after Sir Henri de Lotbiniere's remarks this evening, a number of our members will join this new society which will do great good in improving our roads.

Dr. Grignon.---Can we prune these ornamental trees in the autumn?

Sir Henri de Lotbiniere.---I think the best time is now. I have tried both fall and spring and have glanced over the different books on the subject. If we take away the branch now, when the sap is coming down, the sap begins to form around the wound and the tree is in the most favorable circumstances to grow as quickly as possible. A Scotch farmer said: "If I planted my father, I would cut his head off." He was of opinion you should cut the heads off trees. For a great number of trees it is better to cut off the heads, especially the maple, but not the elms. That is when they are transplanted. In deciduous trees you should cut off a part of the head.

Prof. Craig.---There is a custom in the States of planting what are called pole trees. Young maples or elms are selected from the woods, very long and slender, the whole top is cut off, and they look like broomsticks when planted. The next year a cluster of small branches is thrown out just at the end. These grow very close together. As the tree grows and the branches increase in size, they soon begin to crowd each other, before many years some of the centre branches begin to rot, and trees treated in that way are rarely long lived, particularly elms. I have always been very much against cutting trees back so severely as that, but it is a practice much followed by professional tree planters in the States.

Mr. President.---On the other hand if you cut the roots you must cut the heads.

Prof. Craig.---There must be a balance maintained between the amount of root and the extent of head.

Sir Henri de Lotbiniere.---It is better to make the root shorter and not allow any wounded part to remain. It is wonderful what a quantity of rootlets will form in a summer at the end of a big root that has been shortened a great deal to make a perfect cut.

Mr. Brodie.—Has Sir Henri heard of planting willows in swamp land to drain the land, where there is no good facility for drainage?

Sir Henri de Lotbiniere.—I cannot say that I have. I have heard of the Eucalyptus being employed for removing the danger of fever, in the swamps around Rome, as it absorbs such an enormous quantity of moisture.

Mr. Brodie.—I had a well that was run quite dry by a willow which grew alongside it. It pumped the whole of the water right out of the well.

Sir Henri de Lotbiniere.—That is very curious.

Mr. Brodie.—The well was quite dry. I cut down the willow tree and cleaned out the well, and I found the rootlets of the willow tree just like horse hairs round the pump. After I cut down the tree lots of water came into the well again.

What is the best time to sow forest tree seeds?

Sir Henri de Lotbiniere.—The seed ripens from the middle to the end of June, and they ought to be sown at once. I have sown maple seeds on the 23 June, and they came up exactly in a fortnight—about the 7th or 5th July, and by the end of the fall they were about 12 or 15 inchss high, which was a good start for the summer. Same thing for the elm. Of course the seed of the oak, butternut and sugar maple ripens in the fall, and you had better plant it at once.

Mr. Fisher.—When does the hard maple seed ripen?

Sir Henri de Lotbiniere.---In October the ground is covered with it. In one hour I have picked up from 300 to 400 little seedlings of maple and ash out of our garden in places where we had worked the ground, and in the vicinity of which maple and ash trees happened to grow.

The Rev'd Brother M. Hilaire, of the Trappist Order, read the following paper:

THE MANUFACTURE OF CIDER.

It was with much pleasure that I accepted the invitation to give some explanations on the fermentation of cider. Not that I pretend to know thoroughly the theory of fermentation, because even to-day that is not perfectly known anywhere. Therefore it is that in those countries where cider has been made for years, even for generations, as in France, in Normandy so famous for its ciders, every day the question is discussed whether the conditions in which cider is there fermented are the best. Every year divers experiments are made and experiences acquired. Often the time thus spent is wasted; sometimes better results are obtained. But little by little the methods are changed because it is well-known that we do not obtain from the apple all it can give in strength, aroma, etc.

My personal experience only goes back a few years, nevertheless I repeat that it is with the greatest pleasure I speak to you this evening on this subject. For I also desire to take a part, though it be a small one, in this beautiful and great work which you are so perseveringly carrying out, namely, the amelioration of the working classes, particularly our farming class, by means of labor, intelligent labor, economy and sobriety.

It may be that the manufacture of cider may prove a powerful means to that end. Who does not know the immense evil wrought to society by the abuse of strong liquors. May not cider take the place with advantage of these alcohols, these whiskeys which have no other quality but that of intoxicating. Gentlemen, I am convinced that the day when we shall see the introduction of cider everywhere, we shall be able to say with justifiable pride, that we have done a real service to society.

The method of making cider has been discussed by a host of writers who have filled the world with their volumes, of which some are full of errors and others of precious information. What I am going to tell you, I have taken from the best of these authors. It will besides be an exposition of what we do here and of what is done in the great farms of Normandy.

The art of making good cider is very simple. It resolves itself into three conditions: 1st, good fruit; 2nd, great cleanliness throughout the whole work of manufacture; 3rd, to make the different drawings off in proper time.

CHOICE OF FRUITS.

The choice of fruits is of first importance, because on the quality of the fruit depends the virtue and the conserving power of the cider. Experience shows that the apples which give the best ciders are the aromatic varieties, slightly bitter, very slightly acid, and which, to a certain amount of tannin or astringent principle and mucilage or oily principle, join a very strong proportion of sugar. Thus the four elements which, by their just proportion, establish the value of the fruits of the cider press are: the sugar, the tannin, the mucilage and the malic acid.

Sugar is the most essential element. It is that which by fermentation becomes transformed, for about half its weight, into carbonic acid which disengages itself, and forms alcohol which fixes itself in the liquid in order to communicate to it force and heat, and ensure its conservation. Sugar and alcohol are therefore the principles of the life and conservation of cider---the alcohol because it kills the microbes, the organisms of fermentation; the sugar because it produces alcohol without ceasing and renourishes so to speak, the cider. Sugar is in fact the only aliment of all fermented liquors. We ought therefore on that account give preference to fruits of the greatest density.

After sugar the most essential element is tannin. You know that tannic acid is a substance of a vegetable nature, acrid to the taste, astringent and very bitter, but whose bitterness, to a great extent at least, is lost during fermentation. Four to five thousandth dissolved in the cider suffice to fix its savor, to temper the action of the alcohol on the brain and communicate to it its tonic

properties. Moreover it favors the clarification of the cider and helps with alcohol in its conservation.

In the third place comes the mucilage, which is a sweet and unctuous substance found in most vegetables and which it is very advantageous to find in apples for cider because it gives to the liquor softness and body. It helps also with alcohol and tannin to conserve the cider, by in a certain measure, opposing the turning of the alcohol into acetic acid or vinegar.

Tannin and mucilage render the cider more savory and sensibly increase its hygienic qualities. It is quite otherwise with acidity, which ought to exist in as small a quantity as possible. A little acidity is required in the juice of the apple, because without it fermentation would not take place or would be very sluggish, but only very little, 1 p.c. or 2 p.c., under pain of making the cider disagreeable to the taste, or worse, injurious to health.

And finally all other things being equal, small apples are preferable to large. They contain more of the principles useful to fermentation and amply justify the popular saying: "small apples, big cider."

To resume, gentlemen, experience warrants my laying down as a principle that the fruits calculated to give superior liquor from the points of view of hygienic quality, taste, and conservation are: 1st, fruits odorous and completely ripe; 2nd, a density of 1075 is indispensable to give the cider the quantity of alcohol necessary to its conservation. This density is ascertained by means of a little instrument called a densimeter. It has the shape of a thermometer, but the gradations are different. It is plunged into the juice of the apple, and sinks more or less according to the quantity of sugar which the juice holds in dissolution. You have but to read the degree indicated.

3rd. We cannot too diligently seek apples which contain tannin in the proportion at least of 4 to 5 p. c. of their weight.

4th. That the presence of 12 to 15 p. c. of mucilage will give to the cider later smoothness and body.

5th. That an acidity of 1 p. c. or at the outside 2 p. c., suffices to assure to the cider a good fermentation without the danger of its turning later into vinegar.

There is an enormous difference in the values of juices coming from good or bad apples, as you will see by the following table :—

	Densimeter	Tannin	Mucilage	Acidity	Water	Sugar About	Alcohol to be produced
Excellent apples	1086	5	12	1	800	179 grs	9.0
Acid "	1032	1	2	15	900	80 "	3.04

I may tell you, gentlemen, that we imported from Europe some years ago some specimens of the best varieties of apples for cider, which we have cultivated and from which we are to-day drawing grafts. We can furnish varieties the juice of which weighs as much as 1086, which is very considerable for this

country. We have also among the wild stock of the country varieties, the density of which reaches 1070, 1075, 1076, which is sufficient to make excellent cider.

CLEANLINESS.

The second essential to good cider is great cleanliness in all the work of fabrication. Do not, as is generally done, pick up with the apples, small stones, earth and branches. Without cleanliness it is impossible to make good liquor. The grinding and pressing must also be done as cleanly as possible. It is good some days before beginning the work to wash at first with hot water, and then cold water, everything that has to come in contact with either the juice or the pulp of the apples.

The apples are ground fine enough so that they will easily give their juice without crushing them into marmalade, for then they are pressed only with great difficulty. Then they are pressed so as to extract the greatest amount of juice possible. But a day or two should elapse between the crushing and the pressing. The apples are then kept in an open vat, which is called the maceration. These are the chief advantages of maceration:

1st. It has the constant effect of promoting the exit of the juice by the swelling and rupture of the membranes of the fruit, and thus materially augments the product.

2nd. It increases the aptitude of the wort for fermentation. It is admitted that the chance of success is the greater the sooner fermentation sets in, and the quicker it is done.

3rd. It develops in the pulp a reddish brown matter which dissolves in the juice and gives it its color.

4th. It allows the juice to become impregnated with the perfume of the apple. And you know, gentlemen, what an influence color and odor exercise.

In the United States and in some farms of Normandy, so much were the makers struck with these advantages, that they constructed sorts of vats (1 metre 60 and 2 metres long by 1 wide, but the height of which did not exceed 60 centimetres, hardly 2 feet) to receive the pulp of the apples during maceration. Every two hours this is stirred by wooden rakes, for iron would be decomposed by the acids.

As to the seeds, they are ground or not according to the quality of the apples. If the apples are odorous, the seeds should not be ground, because the essential oil which they contain would disguise the perfume. If however the apples are very common and have no perfume, the seeds should be ground, because such apples furnish generally a cider of a particular taste, called earthen taste, due to the soil where the apples grew. It is this taste, rather disagreeable in itself, which the oil of the seeds will cause to disappear.

On coming out of the press the juice is put into casks very clean, in which fermentation will not delay setting in if the temperature is suitable. The residue of the apples or the mush may be given to the animals, who are very

fond of it, but it must be measured out to them, for it is heavy stuff and they eat it with avidity.

In years when apples are scarce and dear, you can make small cider. After the first pressing replace the mush in the open vats, add as much water as you extracted of juice, allow it to macerate a day or two, and then press again. Put the juice in separate casks, add sugar according to the strength required, and treat exactly as in the first instance. This second cider is sometimes as good as the first.

THEORY OF FERMENTATION.

The alcoholic fermentation which converts into cider the sugared juice of the apple. is produced by the nutrition and reproduction of microscopic beings called microbes or saccharomyers, taken from the Greek words meaning "sugar" and "hate." That is to say they hate the sugar as the dog does the hare and the cat does the mouse, throwing themselves on it to reduce it to pieces and devour it. They are living beings, perfectly organized, and which feed on the elements of the apple. They are diffused by millions in the atmosphere. In the autumn especially they come and deposit themselves on the apples, grapes and all fruits containing sugar. Their number is simply incalculable. I have read somewhere that there are 16.000 known varieties of them. Thus the cause of fermentation is completely outside the juice of the fruit. It is produced by these microbes, which are picked up with the apples by millions. So small are they that crushing the apples does not do them the slightest injury. During the pressage, the flowing juice carries millions of these microbes into the liquid. That is how they are found in the juice of apples and grapes.

You know, gentlemen, that every animal which lives, breathes. There is no exception. But placed in the midst of a liquid, how can these microbes breathe?

Divine Providence has given them the wonderful faculty of decomposing the sugar so as to draw from it the air necessary for respiration. You know the chemical composition of sugar: carbon, hydrogen, oxygen in equal parts, $C^{12}\ H^{12}\ O^{12}$. The air which we breathe is but a mixture of hydrogen and oxygen. These microbes then decompose the sugar and absorb a part of the hydrogen and oxygen in the proportion of the composition of ordinary air. Thus little by little the microbes decompose nearly all the sugar but absorb only a very small quantity of it. A gas is formed, carbonic acid CO^2, which escapes from the liquid in the form of little balls of air and produces the phenomenon noticed in the fermentation of all liquid, resembling the boiling of water in a pot. There is also formed a liquid: alcohol $C^4\ H^6\ O^2$ which mixes itself with the product obtained.

This is a brief resume of the principle of fermentation. All liquors, ciders, wines, beer, whiskey, gin, alcohols of every description, take their strength from the decomposition of the sugar by the alcoholic microbes. Suppress these microbes and you suppress by one blow all intoxicating liquor. Because man, with all his intelligence, has not yet succeeded—I will not say in decomposing—but even in understanding the way in which the microbes decompose the sugar.

The theory of fermentation seems at first glance easy enough, but it is not so in practice. The sugar decomposed by the ferments comes in contact with all the substances held in dissolution in the juice of the apple. It creates several bodies besides those indicated, such as glycerin, succinate and acetic acid, etc., etc. Among these bodies, some are soluble and become mixed in the liquid and lose their influence; others are insoluble and fall to the bottom of the casks and are eliminated by the first drawing off. Sugar gives about half its weight in alcohol.

Of all the operations necessary in making cider, fermentation is at once the most difficult and the most important. It is thus with beers and wines, but in making cider a difficulty altogether special is met. It is necessary that the tumultuous fermentation should cease and the cider be clarified before the sugar is decomposed. I will shortly give the reason.

Gentlemen, I have exposed to you the theory of fermentation. In practice I would recommend the following method. On coming from the press, the juice brought to a temperature of 15 to 20 degrees centigrade, ought to be received into casks perfectly clean and as large as possible. Do not fill these casks completely, but leave a space of three to four inches. The contact of air is necessary at the outset of fermentation. Leave the bung open so as to allow the carbonic acid to escape. We may, when fermentation is established, cover the openings of the casks with wet linen. Finally these casks ought to be solidly fixed on stools in a well aired cellar.

There is nothing more variable than the space of time which elapses before fermentation sets in, and nothing more variable still than the time required for fermentation. Nevertheless it is admitted that the greater is the chance of success the sooner fermentation begins and the longer it lasts.

If then fermentation delays, we must seek means to start it. Sometimes all that is necessary is to stir the liquid with a stick, split in four parts, and thrust into the liquid through the bung. On stirring up the juice for some time it absorbs a certain quantity of air. If that means does not succeed, we draw out into a basin a certain quantity of juice, which we stir up so that it will absorb still more air. If the temperature is not sufficiently high, we heat a portion of the liquid which we then pour into the cask, and mix the whole well. The most suitable temperature is between 15 and 20 degrees centigrade. If we have some lees of cider that succeeded well the preceding year we can make a leaven of it as follows: Draw off the upper portion of the lees, air it as much as possible by beating it up in very pure air, add a little sugar previously dissolved in a small quantity of liquid, mix well the whole, raise its temperature to 20 degrees centigrade, and fermentation will very soon begin. When this fermentation becomes tumultuous, or very active, we can use this leaven to sow good ferments in our new juice.

When we have two or more casks and fermentation goes well in one of them, but does not start in the others, we may use the first as a leaven to sow the others with in the proportion of about five per cent.

If these conditions are observed, fermentation will be established in 48 hours from the putting into the casks. Two or three days after it becomes very violent, very active, or what is called tumultuous fermentation. You have only then to leave it alone. It is well to draw off, once a day, five buckets of the liquid to aerate it, and we then throw it back into the cask by a funnel.

THE DRAWINGS OFF.

Finally the third and last condition is to take the drawings off in suitable time. As soon as the active fermentation begins to slacken, the escape of carbonic acid gas is less considerable and permits the heaviest matter contained in the cider to go to the bottom, which forms the lees. The cider becomes considerably clarified. But the fermentation is not over. The cider yet contains sugar in dissolution and a little gas yet escapes. The gas is sufficient to keep to the surface a certain quantity of light matter which forms, and which is called the cap. The cider is, so to speak, between two lees, and it is then it clarifies and takes its aroma. There is hardly ever complete success without the forming of the cap.

The first drawing off must be made before the rupture of the cap. This work is very delicate and should be done with the greatest care, without breaking the cap at the surface, without disturbing the lees at the bottom, the intermediate portion must be drawn off, for the slightest movement or shock will trouble the cap and raise the lees. For these drawings off, rubber pipes are used as syphons, etc. It suffices to blow the syphon and receive the juice in casks perfectly clean and slightly sulphured. The syphon is closed before the cap can enter. After this first drawing off, we do not yet fill the casks completely, and close the bungs only partially so as to allow the gas to escape without causing a rupture of the casks. If we are careful to leave an empty space, by filling the casks only within three or four inches of the top, the gas, being heavier than air will not all go out, but will fill the space, hinder the air from coming in, and thus prevent the contact of the air with the surface of the liquid, and preserve the cider from acidifying or turning into vinegar.

One or two drawings made with the same precautions in intervals of three or four weeks, and your cider is fit for use. When gas no longer escapes, fill the casks completely, and hermetically close.

Cider improves much in bottles, but strong bottles are required. Some grammes of sugar put in each bottle will make it sparkle. Choose dry and clear weather for bottling. The most suitable time is autumn or winter; never spring, when the first leaves or first flowers come out. If there is fear of the bottles breaking, they may be kept standing, and sufficient gas will escape through the corks to prevent breakage.

By observing these different conditions, we will obtain a liquor at once thirst-quenching and pleasant to drink, and which will certainly by its hygienic qualities, advantageously replace the alcohols of commerce.

Rev. Brother Norbert of L'Instruction Chretienne, Montreal, read the following paper:—

APPLES FOR CIDER MAKING.

I claim your indulgence, Mr. President and Gentlemen, while I give you a conference on this subject, on which you invited me to speak.

Having been a pupil of the distinguished pomologist, the esteemed Brother Abel, I would like to have his experience and enthusiasm in discussing this subject, which ought to be of great interest to all.

No one ignores its important role in agriculture throughout France, especially in Brittany and Normandy, where it has an important place in all competitions and at all congresses of agriculture.

During his too brief visit to Canada three years ago, Brother Abel gave several agricultural conferences to impress the utility and necessity of teaching agriculture.

The esteemed Brother Theon, director of the school at St. Cuthbert, put himself at once at the work, at the request of the Superintendent of Agriculture, and composed a treatise on agriculture, in the place of that of Brother Abel, but re-touched to suit the requirements of this country and climate.

I was urgently requested to take part in 1893 in a pomological competition held at Plvernel, where is situated our mother house. I hastened to accede to this request. From the beginning of May to the 30 September, I went through nearly the whole Island of Montreal, and saw at two or three intervals the owners of the principal orchards. I analyzed over 80 varieties of apples by means of the densimeter. The generous and enlightened assistance of the late Mr. Bray, manager of the Grand Seminary, was very useful to me, because he alone, during the term of his office, had over 10,000 apple trees planted, mixing and multiplying at will the best varieties. I had therefore, under his sympathetic and learned direction, ample matter for study.

On the 30 September, 1893, I sent a box of 44 varieties of apples to the competition at Plvernel, France, comprising 20 varieties of cider apples and 24 other varieties.

In the lot of cider apples, the Commission distinguished a priori, because of the aggregate of their qualities, 14 varieties as particularly interesting, of which the Golden Russet is specially classed among the superior qualities. Weight of this apple, 73 gr. 3; density of the juice 1084; alcohol 10^{85}; total sugar, per litre of juice 205^{8}; acidity expressed in sulphuric acid per litre of juice 2.88; tannin per litre of juice 0.80. The other varieties sent were classed among the good and very good. I concluded from this that we can make cider of good and very good quality if we make a judicious selection among apples, sweet, sharp, sugared, perfumed, juicy, taking the richest in density, in tannin, the least acid, the most fertile, the most vigorous—the varieties, in a word, which it is well to note as worthy of being propagated, putting aside carefully those which are acid or bitter.

The apples taken on wild stock have no name, because they are not held in sufficient esteem to be used in commerce. To propagate the best species, they must be given names. The analyses being made, here are some names given by me to varieties taken from wild stock : Grise Lelandais, petite grise, gros doux, la bonne, la mouchettée, la grosse douce, la petite douce, la douce, etc., crab apples and Golden Russet excepted.

The best cider apples are the bitter sweet. Cider of best quality is obtained by the mixture of sweet apples and apples bitter sweet, each of which completes the qualities and neutralizes the defects of the other.

Acid apples used alone or in notable quantity give cider of bad quality.

How are we to judge the fruits of the apple tree ? Grate five or six of the apples, extract the juice from the pulp and measure the density. The more the must is dense, the more it is rich in sugar, and the more alcohol in the cider after fermentation

It would be very interesting to graft, following the example of the Rev'd Trappist Fathers, varieties very rich in tannin (sweet apples or bitter sweet), as that is the element which is most lacking. Brother Abel would be glad to furnish grafts and scions to those who ask for them, but they should be given to those who would utilize them at once and look after them.

The first condition in obtaining good cider is to have apples of good quality. They should be plucked in fine weather a little before they are completely ripe. They should be piled in a heap sheltered from the rain. Experience has shown that if an apple has been soaked in water 5 or 6 days, the apple tastes of water and the water tastes of cider. The apples gathered must therefore not be exposed to the rain.

They are pounded and crushed only when completely ripe, and after the rotten fruit has been taken out. It is well to let the pulp macerate a day or two before putting it into the press.

The cider casks should be extremely clean and free from all bad odor.

In order that fermentation should take place to advantage, the temperature of the cellar should be kept at about 15 degrees centimetre or 60 Fahrenheit. The densimeter enables us to follow the fermentation. An immediate drawing off is necessary when it goes on too rapidly.

We draw off the cider after the first fermentation. It must be transferred into very clean casks. The casks should be kept full except for a space about two inches, so as to hinder its turning sour The spoiled fruit and those which fell prematurely should not be mixed with the other, but a cider is made of them which is drank first.

After having measured the density of the must, if we divide by 8 the number formed by the three last figures of the indicator, we obtain approximately the degree of alcohol which the must will furnish after complete fermentation. The product of 17 by the number of degrees, gives in grammes the approximative quantity of sugar per litre of must.

A must coming from apples not selected, for example those of this Province, marked 1050 on the densimeter as it came out of the press on the 5th December, 1894. On the 12 December it indicated 1045; the 17th 1040. On the 18

December we made the first drawing off. The first January, 1895, the must marked on the densimeter 1032, and 1024 on the 29 January, at its second drawing off before being put into bottles.

This must giving 1050, will give after complete fermentation 50.8, or about 68 of alcohol. It contains 17x6 or 102 grammes of sugar per litre of juice. At the moment of bottling, the cider contained 3° of alcohol.

The froth on the surface of the cider which thickens is an agglomeration of ferments. The ferments are microscopic plants which with the assistance of air, water and heat, develop with prodigious rapidity. With a microscope you can see the life of these ferments.

Hold a lighted match over cider in fermentation and the carbonic acid escaping will extinguish it. Hold another one over the vats of the press, on the sweet cider, and it will continue to burn.

Before closing let me say a word, on the utility and necessity, and best method of teaching agriculture.

In Brittany, in order to successfully initiate the pupils in the practice of agriculture, the teacher will ask an intelligent farmer in his parish to allow his pupils to occasionally visit his farming operations, accompanied by their teacher, who will explain the why and wherefore of everything they see done. The science of agriculture is one which becomes an absorbing passion with all those who take hold of it, and now that our Bishop and public men, and teachers both religious and lay, are deeply interested in this matter, we may look to an era of great progress. Let me cite from a report of the Rev'd Cure of Montmagny, made at the first congress of the farmers of this Province in 1893:

"A reform in the primary schools (in favor of agriculture) is the more necessary that the child generally at this epoch undergoes an influence tending to turn him away from agricultural pursuits. The father who sees one of his children show some aptitude in school, will at once dream of another profession for him, as if his own ought to be followed only when there is no means of doing something else. We must then inculcate early in the young intelligence of the child the esteem and taste for agriculture.

"There is no doubt that if we teach in the primary school the elements of agriculture, and make the child love and understand his father's work in the fields, he will at once feel an interest in it, and learn the theory in school as well as the practice at home."

The Rev'd Father Burnichon, S.J., published recently a remarkable treatise entitled "The return to the fields."

Monseigneur Decelles, Bishop of St. Hyacinthe, has also written:—Every farmer who understands the dignity and the advantages of his condition is proud and happy in his state in life, and raises his children to be farmers like himself, transmitting to them the heritage he received from his fathers. His native air, the fields, his labor, the love of God and peace of heart—what a precious patrimony."

The Hon. Mr. Beaubien, in his speech of July last to the agricultural missionaries, said with reason and justice: "We have the heart of the country, we have the clergy, seized with the importance of this work, and agriculture can no longer lag behind."

Let us never forget the words of Leo XIII: "The school is the field of battle on which must be decided the supreme struggle"

Mr. Chapais.—Our Society is much indebted to the Rev'd Father, prior of the Trappist Order, for having permitted the Rev'd Father M. Hilaire to give us his extremely interesting and scientific conference on the manufacture of cider, and to the Brothers of Christian instruction, for having permitted Brother Norbert to give us his valuable experience in the analyzing of Canadian apples for the making of cider. The question of making cider is most important for the Province. We have heard economists and public men in this and other countries sounding the alarm that society in the 19th century was giving itself up to drunkenness. No doubt if we could produce in our Province cheap wines and cider, that would be a great check to the use of intoxicants such as whiskey and gin.

Mr. Newman.—My experience is that apples which ripen before the 15 September are worthless, either for cider or vinegar. The apples must be sound and it is far better they should ripen on the tree. About the best time for making cider, if not a large quantity made, is the last week in October or first week in November. The season is colder, and the fermentation is slighter for reasons not exactly known at present.

Mr. President.—Is it a sweet cider you sell?

Mr. Newman.—Yes, my principal work has been to keep it as sweet as possible and allow no fermentation.

Prof. Craig.—What anti-ferment is used to the greatest extent?

Mr. Newman.—Nothing better than salycilic acid. All the large makers in the States use it.

Prof. Craig.—Do you use boracic acid?

Mr. Newman.—I have tried it. It is mixed with salycilic acid. The cider should be perfectly clear before it goes into the barrel from the press. If you allow it to be muddy, it will ferment in the barrel more than is good for it. You require to filter it. With a large press, and grinding the apples straight from the grater into the press, it will come out clear enough as a rule, if proper care be taken. No filter perhaps in this case required. If the cellar is cold enough you may do away with the filter entirely. The cider, if it ferments very slightly, will remain clear, so that it may remain very sweet and clear until first of May, when it can be racked and changed to another barrel, and a bung with a cloth put in, so that when the warm weather comes the gas can escape without the air entering the barrel.

Mr. Brodie.—How many barrels did you make last year?

Mr. Newman.—About 25,000 gallons.

Mr. Chapais.—What variety of apples do you use the most?

Mr. Newman.—A great many Fameuse. I think half Fameuse and half wild apples. The Fameuse lack astringency but are much sweeter. For sweetness and richness nothing equals the old Pomme Gris.

Mr. President.—Can you use spotted Fameuses for cider?

Mr. Newman.—Yes. In keeping the barrels sweet, a little sulphur should

be used. The best barrel is a freshly emptied whiskey barrel—gin or brandy or whiskey. Rum is rather strong. There are some whiskies that give a flavor to the cider. If you use a barrel that was used before, it must have been bunged. If it has been standing round with the bung open, it will be pretty sure to give a woody taste. If you sulphur it and bung it tight, it will be in good order. It is always a good plan to sulphur before putting cider into a barrel.

Mr. Chapais.—I would ask Dr. Grignon if he considers that the use of salycilic or boracic acid is wholesome in the keeping of cider.

Dr. Grignon.—I do not think so because these acids are generally employed for external use in medicine. Salycilic acid is used internally for inflammatory rheumatism.

Mr. Chapais.—Do you consider it prudent to employ it from a hygienic point of view ?

Dr. Grignon.—No.

The meeting then adjourned at 11 p. m.

OKA, 21 August, 1895.

The Society met at 10 a. m.

Mr. President expressed the general satisfaction with the arrangements at the monastery. They had learned a great deal since coming here. Many of them had previously no idea of the work being done by the Trappist Order. He was obliged to absent himself and did so with much regret, and he felt bound to express his pleasure and cordial thanks for this very interesting visit and the courtesy with which they had all been treated. He called on Mr. Chapais to take the chair.

Mr. W. Mead Pattison, Clarenceville, read the following paper:

OBSERVATIONS ON OUT-DOOR GRAPES.

When asked for a paper on grapes for this meeting I felt some embarrassment in complying, as through a similar service to the Montreal Horticultural Society and F. G. A. for many years past, the subject had been dealt with year by year, so that very little fresh material is available, especially as my work in testing new varieties, as they appeared, had ceased in a great measure when the Dominion Government established their Experimental Farm at Ottawa, and the expense and labor attending the work fell into the proper channel and could be carried on with more application than it was possible for me to give it with other occupations.

At that time some 100 varieties, of 140 then tested, were in my vinery, where at present less than 50 exist. It is very gratifying to see so much attention given to this department of Pomology at the Ottawa Farm, and hope we will have the gratification of hearing at this meeting an account of some of the results.

We have climatic obstacles to encounter in our Province which render open air culture, commercially considered, unprofitable, if due return for extra labor bestowed is taken into account. Yet how much pleasure and healthfulness is derived in the home of the possessor of a few grape vines judiciously chosen and properly cared for? The thought may suggest itself to some. Why bother with trying to raise out-door grapes when they can now be bought for almost nothing on the market? Granting this, may I ask does the "market grape" supply all our wants in a grape? Fruit-growers are aware that the term implies that these are the class of grape "there is no money in." A great number of varieties of surpassing excellence could be named which cannot be procured through this channel. Are we to abandon home culture for pecuniary reasons solely, when a few varieties in the same garden can give us all we want, besides the pleasurable and healthful occupation attending them? It may seem a trifling consideration to some to say that there is enjoyment in watching the unfolding blossom and breathing its perfume, which nature has endowed it with for a wise purpose, or the exhalations given forth from the foliage of different varieties. To watch and aid the vine that it may best acccomplish the desired end.

We often hear "there is too much work attending grape culture." It was truly said by the ancients that "labor was the price the gods set upon everything worth having," and this class of objectors are the ones who may have tried to raise a vine or so on the let alone system, and are discouraged with its results.

One of the first considerations to be borne in mind, to place us on an equality with highly favored grape sections south of us, is that the vigor of the vine must be restricted from the formation of excessive foliage, and its strength diverted to the development of the fruit and properly ripening its wood and strengthening the buds that are expected to do the following season's work. This we call "summer pruning." Not a process requiring slashing and undue checking, but what can be done with thumb and finger in nipping off the extremities in season. Again, many fail through setting out feeble vines, in some cases too young or too old, a good thrifty well rooted two or three year old vine, and none other should be used. If properly set, and not stuck in the ground, fruit may appear the 2nd or 3rd year, which if allowed to mature will tend to weaken the vine, besides destroying its shape and future usefulness. If a vine is not allowed to bear at all till the 4th or 5th year, when it is well established, as we say, in proper shape, strong and vigorous, its future usefulness is insured. Some varieties have a natural tendency to overbear; to guard against this calls for some study and observation, to the end that by a proper reduction of quantity the fruit left on the vine will not only attain greater size but earliness. This is a point the most experienced are led to neglect till we pay the penalty in an impaired and enfeebled vine.

VARIETIES.

In the discovery of varieties of out-door grapes, through artificial or natural process, there has been a vast number added to the list of late years, good, bad and indifferent.

20 years ago those in cultivation in the Province of Quebec could be counted on the fingers. To-day we find 50 or more which can be classed as standards of more or less value.

To the men who have made the propagation of the grape a specialty we owe a lasting debt of gratitude. Some are now living far along in years, others have passed from their labors, actively engaged to the end of a great age. Few can form any conception of the duration and extent of their labors. One instance, of many may be here cited in the words of the venerable Prof. Munson of Texas. Of a list of 36 varieties of his he deemed entitled to be named, he says: "These varieties, which I have propagated and listed, from amongst my seedlings and hybrids are the cream from about 40,000 grown. If as many as a dozen are permanently retained I shall feel that my work has not been in vain."

Just fancy for a moment what years of labor, hopefulness, anxiety and care are embraced in this modest narrative?

This is only one case in many, besides it is a known fact that most of these men began this work at a period when the out-door grape had not the prominence it now has, and this special work, to use a familiar expression of the age, "had no money in it."

Instances could be given in which some of our greatest benefactors lived and died poor while others realized the money value of their work. One prominent originator and writer, who we are indebted to for his usefulness and work. was the late John Burr, who died two years ago in his 93rd year, devoted to the grape and his theory for its propagation to the end—and his life work may warrant a somewhat extended notice here. Mr. Burr was a man who valued every moment of his time. From early youth a lover of fruit and flowers which passion grew on him till he became one of their most zealous students and devotees. In early life a merchant in his native place, Bridgeport, Conn., but a city not being entirely congenial to his nature, as he held with Cowper,

> "The tide of life, swift always in its course,
> May run in cities with a brisker force,
> But nowhere with a current so serene,
> Or half so clear as in the rural scene."

he removed to Columbus, Ohio, then a comparatively new place in the west, but offering conditions suited to his taste. Here he began his experiments in the propagation of new fruit, resulting in the introduction of two strawberries, which are still valued in Ohio. A voracious reader and constant student of nature, his contributions to Horticultural and Botanical journals began to obtain world wide reputation and were carried on for over 50 years. After 20 years residence here, his growing family demanded a change, and he removed to Leavenworth, Kansas, where a biographical sketch says, "The fascination for producing new grapes grew on him; he devoted himself to it with energy, love and enthusiasm."

Darwin's "Origin of Species by means of Natural Selection," opened up to his mind the method of propagation he became noted for. The operation of natural laws had then given the world valuable and enduring varieties in Catawba, Concord and Delaware, and Mr. Burr concluded to take nature in

partnership in his future efforts in search of new seedling grapes, as he held "that she selected, under the environments, the portion most congenial to perpetuate its species, and never made a mistake." He conceived the system of grouping that will alone perpetuate his name. To give a more definite account of this, he planted in close proximity the varieties whose cross he thought would produce improved varieties in their seedlings. His results at first, with varieties of marked Labrusca type, not satisfying him he dug them all up and resorted to the Delaware grape, as the principal parent. In process of time, from the fruit of this combination he selected the best formed varieties and planted a multitude of their seeds. After years of perseverence and observation he selected the best products and designated them by numbers at first; thus early Victor made its appearance, followed by some eighteen varieties, which work he pursued till the time of his death. The most surprising announcement he made was that the fruit of the seeds from their seedlings was better than the first, and his varieties from these he estimated his greatest success. Through the introduction of Prof. Husmann, then of the Missouri Agricultural College, for over 15 years I had the privilege of yearly correspondence with Mr. Burr, and can say that in his selection of his seedlings he was governed to a great extent by a desire to supply our necessities in this Province. Of 7 of his seedlings he sent me for trial, 5 have been shown in my general collection of out-door grapes at the exhibitions of the Montreal Horticultural Society. Space will only allow of notice of but three of the most prominence.

Standard, black, a table and wine grape, is larger in bunch and berry, and better than Early Victor, shouldered, compact, juicy, tender and sweet, colors early but ripens slowly, ripens before Delaware and makes a fine light colored wine. Ideal—I will give Mr. Burr's description of in a letter of 1875. "No. 9, a seedling of Delaware, vine healthy, vigorous and very prolific, high refined and delicate flavor, very tender and delicious, ripens with Delaware, same color, but berry and bunch 3 times as large by weight.'

No. 18. "Eclipse" a white grape is described amongst others of Mr. Burr's collection in the Bushberg Catalogue and Grape Manual just published, as "a peculiar grape, something like Rogers Goethe, yet quite distinct and superior in quality in the opinion of some connoisseurs, who tasted it; vine vigorous, hardy and productive. Bunch large, double shouldered, not very compact, berry very large white, with a distinct black spot, flesh tender, juicy, sprightly, vinous sweet, of best quality, similar to a European grape." The Journal of Agriculture of St. Louis, Mo., says: "The Eclipse is as much superior to Goethe as Concord is to the Fox grape; it is a beautiful transparent white. It is impossible to form an idea of the exquisite quality of this grape till you have tasted it." I have grown Eclipse for 9 years and fruited it 4 seasons, and it answers the description given, though it cracked somewhat last year, so do the Lady and Worden grapes some seasons, and this may not be a lasting characteristic with Eclipse.

I have found but two of Mr. Burr's grapes in nursery catalogues, viz., Early Victor and Jewel, but probably Dr Stayman of Leavenworth, Ka., may have them all. Of other men's new varieties, should be named here, the Nectar (a black Delaware) of the late Mr. Caywood, described in former papers; has fruited

for 4 years, its only failing so far is unproductiveness. Metterney, black, from same source is a little better in this respect. Age may improve both; if so, these grapes by the originator of Duchess, Ulster and Walter, will be acquisitions here.

Of Rickett's older hybrids, "El Dorado" is still a favorite, very early and delicious. Lady, Washington, Jefferson and Undine, are still preserved for their massive compact clusters, but special care is needed to ripen them and they are not recommended for general cultivation. Rommels Early black and Woodruff's Red are still promising. Wyoming Red and Jessica have been discarded. In conclusion will say, on retiring from experimenting, I feel absolutely assured that the finest of out-door grapes can be raised successfully in favorable localities in our Province to gratify all the requirements of the family for either table or wine making.

To enumerate a few that have passed into general cultivation with the greatest satisfaction may aid the selection of intending growers, who may perhaps procure any of the varieties of leading nurserymen. They will be given in order of ripening. In black varieties, Champion, Moore's Early, Worden, Creveling, Barry Herbert. In white: Lady, El Dorado, Duchess, Martha. In red: Northern Muscadine, Massassoit, Gærtner, Brighton, Lindley, Vergennes.

Of much promise, but not generally tested through the Province or readily procurable:—

Black—Rommel's Early Black and Standard.
White—Green Mountain, Eclipse.
Red—Woodruff's Red, Ideal.

Mr. Chapais (in the chair). Mr. Pattison says that the benefactors of humanity are not always praised when living, but the work of Mr. Pattison in grape culture is well known everywhere in our Province, and we appreciate very much the conference he has given us to-day. Mr. Pattison is one of the best grape culturists we have in the Province.

Mr. Guay of Oka.—I consider that the Champion is one of the most vigorous varieties. The objection to it is that the taste is not agreeable. The Concord ripens a little later, but where the exposure is good, we can succeed with it as well as the Champion, and I think it is a better grape. There are also Moore's Early, Delaware, and in white grapes, the Duchess and Niagara, which I would recommend.

Mr. Chapais.—Among the grapes which are the best for making wine?

Mr. Guay.—Delaware is best for white wine.

Mr. Pattison.—I should like to get the preference of the brother for the grapes. Some of the varieties I have named, such as Northern Muscadine, would be perfectly worthless as a market grape. My list was drawn merely for family use. Northern Muscadine is the first grape my family go for.

Mr. Guay.—When we mix Delaware, Concord and wild grape we have excellent wine.

Mr. Chapais.—At Richmond they grow the wild grape. No doubt it is the best quality of grape we have for making wine.

Mr. Pattison.—I was told that the nurserymen had failed to domesticate the wild grape. Since then I have been in conversation with several, and they think it is not well to jump at the conclusion that it cannot be domesticated.

Rev. Canon Fulton.—It does not increase in size, but the bunches are very much improved. We had an Italian, an adept, who got a very large wild vine, and properly pruned it for a couple of years, and it certainly improved the bunch very much.

Mr. Chapais.—I have seen in the yard of the Oblate Fathers in Montreal the wild grape trained on trellises, and it bore grapes as large as Hartford Prolific, of very good texture and taste, and making splendid wine. I have seen at Richmond the wild grape growing alongside a hedge from which we took about 80 pounds of grapes, and I made with those grapes the best wine I ever did.

Mr. Fisk.—The wild grape we are growing at Abbotsford, which is recommended for wine, is one that came from St. Hilaire some years ago. It is very hardy and productive. Two years ago I took from one vine 140 pounds. In the St. Hyacinthe market two years ago it sold for wine at 4 cents per lb, when western varieties sold for 2½ to 3 cents per lb. I should be very happy to send a few vines to the Trappists, that they might try it.

Mr. Pattison.—Did you prune it?

Mr. Fisk.—Not at all. I left it without any pruning or anything.

Rev. Father Dom. Antoine.—We pay much more for wild grapes than for ordinary grapes for making wine.

Mr. Pattison.—How many years have they raised Niagara?

Mr. Guay.—Five or six.

Mr. Pattison.—Several authorities say that after a series of years it becomes unreliable and rots and falls from the bunch before it is ripe. In fact, one of the first who raised it in the Province, Mr. Jack of Chateauguay, told me two or three years ago that he was the first one they gave the vines out to so as to get certificates, and he found it was not a profitable grape and did not recommend it.

Rev. Father Dom. Antoine.—I must say that we have made wine with Champion and with grapes from Ontario, and the wine made with our own grapes was just as good. Our Champion is not the Beaconsfield, but a better variety.

Mr. Pattison.—I can give you a little account of the origin of the Beaconsfield. There was a grape grown in the South called the Talman. E. S. Stone of Charlotteton, New York, was the first one to discover the real Champion. When that was put on the market it was said to be identical with the Talman. Those adventurers from the States who came to Montreal some years ago, re-christened it. They purchased these vines from Mr. Stone and called them the Beaconsfield. At Mr. Gibb's suggestion I got the Hon. Mr. Campbell of Ohio to send me a Talman grape. I planted that grape and then one of Gallagher's grapes, and I planted the original Champion that came from Stone. I found Gallagher's grape, the Beaconsfield, and the one I got from Mr. Stone identical, but the Talman you could see at once was not the same grape. They

were loose bunches, but had the foxy, peculiar flavor which the Champion grape has. I dug up the Talman. It was not worth cultivating.

Mr. St. Hilaire, of the Trappist Monastery, Oka, read the following paper :—

ASPARAGUS CULTURE.

The asparagus is one of the most delicious vegetables, if not the best of all. It is the first early vegetable that spring brings, when everybody, tired of preserves, which are the sole resource of the winter, impatiently await its coming. During the few weeks when it appears on the market, it always sells at a high price and procures a considerable benefit to the intelligent horticulturists who cultivate it. We are therefore surprised that its culture is so little in favor.

You will reply perhaps, gentlemen, that it is solely because asparagus is scarce that its sale gives such a good result, and that if it were more extensively raised the prices would go down. Do not be deceived, gentlemen, it will take a long time, a very long time in our opinion, before the markets to which Canada has access will be so encumbered that the production of asparagus will no longer assure a large return.

In France, early asparagus made at first the fortune of the gardeners of Argenteuil, then of the neigboring localities, and finally of all the valley of Montmorency, where the farmers devote themselves to-day almost exclusively to this culture, and furnish annually millions of bundles. In a number of other places in France, the example of Montmorency has been followed, and asparagus cultivated on a grand scale. Nevertheless the price has not gone down a cent. All the countries of Europe carry off the much desired vegetable. Often it is ordered from the gardeners in advance by the Russians and the English, and is thus sold before being plucked.

Promote then, gentlemen, this culture so full of promise, and which is easy and inexpensive when understood. For there is no longer question of the expensive proceedings, little fruitful in results, which were formerly followed. No more of these deep pits so expensive to dig, filled with stones and bushes, and which devoured heaps of manure sufficient to fatten the whole farm. No more of these yearly recharges of large masses of earth passed through the sieve. No more of these complicated empirical methods, always ruinous, which in the end gave only mediocre and often valueless results. If we want to raise fine asparagus at a relatively low cost—that it which we can sell with profit—we must give up completely past errors.

To replace the old system, Argenteuil invented a method of culture both convenient and economical. This method has produced the "Early Dew" so fine and succulent, and it may be applied to all other varieties.

It is this method which I am about to explain.

The best known varieties of asparagus are :—

1st. The Green Asparagus, which most nearly resembles the wild stock. Its sprouts are thinner than those of the improved varieties, more pointed, and become colored more quickly in green.

2nd. The Asparagus of Holland, which is more luminous than the former. The sprouts, rounded at the top, are dyed at the extremity rose or violet red, so long as they have not been subjected to the action of the light.

3rd. The white asparagus of Germany which differs very little from that of Holland.

4th. The asparagus "Early Dew" of Argenteuil. This is obtained by selection of seed plots of the asparagus of Holland. The sprouts are notably larger than in the Holland variety. The extremity is somewhat pointed, and the scales with which it is supplied are strongly laid, one on the other.

5th. Colossal is very much relished in England and America, but Conovers does not, in our opinion, excel the Argenteuil.

The asparagus is composed of an underground tuber from which each year, shoots which rise vertically and form, if allowed to grow, smooth, straight, branching stems, from three to four feet high, with extremely thin leaves. The flowers are yellow, small and falling. Round berries follow of the size of a pea, becoming colored in autumn a bright yellow. These berries contain black, triangular seeds, weighiug about one pound per quart. These seeds may preserve their germinating qualities four to five years.

The sprouts gathered in the spring as they come out of the earth, are the comestible part of the plant. They are the asparagus so well appreciated on well served tables.

In making a plantation of asparagus two systems may be followed.

One is to sow the seed in order to obtain tubers, which are transplanted later into the asparagus plantation.

But if we do not wish to take the trouble of raising our plants or do not want to wait until the seeds germinate, we can buy tubers. In France the trade in tubers of asparagus has become very important. From the environs of Paris are shipped every year millions of each of the best varieties.

You must never make a "semis d'asperges à demeure" as you will only get bad results both as regards the duration of the plantation and the quality and quantity of the product.

If we prefer to grow ourselves the tubers we require, that is after all the best method.

Let us see how ought to be made our seed plot.

The seed should be chosen with most minute care. There is no guarantee except in buying from a conscientious merchant, for there is any quantity of bad seeds.

If we possess a bed of asparagus, it is better to harvest our own grain, as then we will know what we are sowing. In this case we choose the seed bearers among the plants which furnish the best asparagus, the largest and best formed. The plants should have five years' growth, as younger they do not give good seed.

We cut from these the ripe stalks, detach the berries which we rub between our hands in order to free the seeds from their covering. Then we throw the

whole into a vessel half full of water, the envelopes and light substances come to the surface, and it is easy to separate the seeds.

There only remains to spread the grain on a plank in a shady, dry and airy place, in order to dry it. Finally we put the seeds in a bag, and wait until the spring to sow it.

Let us now proceed to the establishment of seed plots.

We plough deep the square, and bury in it by this ploughing an abundant manure half decomposed, then we trace with a string parallel furrows of 2½ inches depth and ten or 12 inches apart.

Then we take vegetable mould and put about 2 inches thickness of it on the bottom of the furrows. We then deposit seeds thinly sown in these furrows which we fill up with the mould. Lastly we recover the whole with pure horse dung well crushed with the fingers. If the weather be dry, we water often to bring out the plant.

The seeds of asparagus require five or six weeks to germinate.

Once the plant appears it must frequently be freed from weeds by the hand.

We prune the plant as it grows, by taking away the stems which appear least vigorous, until we have spaced the plants about three inches.

When the plant has reached a height of 4 to 5 inches, we dress it a second time with care, and cover the soil again with a good straw covering, with which we mix some handfuls of plaster. It is essential that the plant should not suffer from insufficient manure or from the plants growing too close together.

During the rest of the summer we must water abundantly whenever necessary, and keep the ground clean by dressings done with great care, so as not to hurt the roots.

The seed plot thus passes the winter.

The following spring, before vegetation begins, that is to say in April, we pluck out very carefully the young plants, being very careful not to injure the roots, and we have tubers a year old ready to be transplanted.

That is precisely the best time to plant, because later when vegetation has begun, the re-taking of the tubers is less certain.

Let us now give the details of this planting, which is the most important part of our conference.

ASPARAGUS PLANTATION.

To make a bed of asparagus it is necessary —

1. To procure good tubers, either raised in the kitchen garden as we have seen, or purchased.

2. To choose land and prepare it.

3. To plant in fine weather. In rain or when the earth is very wet, the asparagus is apt to rot.

Choice of tubers. Take by preference those a year old. At that age the roots are not much developed and will hardly suffer from transplanting. They recover quick, and in a well managed soil, will give the third year very fine asparagus.

In two years the roots have acquired a certain length, and as they are very fragile it is difficult, if not impossible, to transplant them without loss. The tubers thus mutilated will retake badly, languish a long time, and give unsatisfactory products.

Good tubers are easily recognized. They have a large crown, the roots are thick, short and few, and two eyes, three at the most, large at the base and well rounded.

We should reject without hesitation those which have long roots, thin and numerous, with four or five pointed eyes on the crown.

It is better to plant tubers freshly plucked, but we may keep them some days, even two or three weeks, without great inconvenience before using them. In this case we spread them out in a very airy and shady place, so as to avoid the rotteness to which tubers are very subject. If they fade and shrivel a little, they will none the less recover.

When shipping tubers a distance, they should be kept in baskets so that the air may penetrate and prevent their rotting.

There need therefore be no anxiety concerning the distance and length of trip when ordering good tubers

CHOICE AND PREPARATION OF SOIL.

Asparagus requires lots of manure and loves lime. It is under the influence of this last element that it develops quickly and acquires quality, volume and color. The soils therefore preferable for its culture are those naturally calcareous, but with a judicious and not costly improvement, and with manure, we can obtain fine asparagus in all soils.

If the soil is heavy clay, it is good to give a big ploughing in the fall before the frost, and leave it thus all winter. In the spring spread over the surface sand mixed with crushed plaster, old lime cement or ashes, and amalgamate the whole by a good ploughing, taking care to extract the stones and break the clods.

In the exceptional cases where the soil retains stagnant water, it must be drained.

Autumn ploughing is only necessary where the soil is extremely compact. In soils of average consistence containing sufficient calcareous matter, one ploughing in the spring suffices. In silicious soils where asparagus thrives, one ploughing also suffices, by which we bury in the soil at the same time lime.

We cannot repeat too often that lime is the element of predilection of the asparagus. The more of it you give, the more will the product be large and succulent.

The soil should be loose at the top and firm at the bottom. In the spring ploughing before planting, the plough should not go deeper than a half of a spade.

This firmness of the soil at the bottom is one of the chief elements of success in cultivating asparagus. That comes from its mode of vegetating. In order that the roots may work well and produce vigorous shoots, they must be placed the most superficially and horizontally possible, so that they may receive the contact of air and heat. If the soil had been ploughed too deep the roots would bury themselves, would vegetate badly, and the crop would be smaller in quantity and in size.

The soil having been improved, ploughed, levelled and well purged of stones and weeds, we shall proceed to plant.

On the two sides of the prepared land, we put pickets at 3 feet from each other, the two first at $1\frac{1}{2}$ feet from the side. This distance of 3 feet will be that which separates the rows of asparagus. Shortly on each of the rows we will space the tubers at equal distances of 3 feet, taking care to plant them in quincunx form.

This spacing of three feet may seem exaggerated, but we estimate that if we have at our disposal a sufficient area, three feet is the least we should give to harvest large and numerous asparagus plants. At Argenteuil the space is 2 feet 8 inches, and when there is question of obtaining products for exhibition, the spaces are made as large as 4 and $4\frac{1}{2}$ feet.

To the right and the left of the first and last picket of each row, we measure a width of seven inches and trace it with the string. We thus obtain surfaces of 7x7 inches, or 14 inches width between the lines.

Then with the spade or hoe, we take away a thickness of 5 or 6 inches of soil over all these surfaces, and throw this earth to the right and left, so that we have little cuttings of 14 inches width, and 5 to 6 inches depth.

We then take manure well worked up, and spread it in the trenches a thickness of 2 to $2\frac{1}{2}$ inches, and amalgamate it with the earth at the bottom, which raises this bottom about an inch and a half. There will then remain a depth of 4 inches to $4\frac{1}{2}$ inches, which is more than sufficient for the plantation.

In the midst of each trench we put little sticks in each place to be occupied by a tuber.

When the sticks are in place, we deposit two or three handfuls of manure before each on the right of the trenches.

It is well to attend to all these details before planting, so that it may be promptly and well done.

We form then by hand in the midst of the trench, in the place of each tuber, a little knoll of earth about 6 inches in diameter, and $1\frac{1}{2}$ to 2 inches high. We place the tuber on the top of the knoll, and spread with care its roots all around. We spread on the roots a very light coating of earth, and make this earth adhere to the extremities of the roots by light pressure. Then we spread with the hands the little reserve of vegetable mold placed in advance on the edge of the trench over the roots already covered with a little earth, being care-

ful never to put manure on the crown. We finish by filling up the trenches with earth taken from the shelving beds, and then level the soil.

The crown of the tuber is thus covered with 2 inches of earth about, and it is important that it be not covered more, so that it may feel the contact of the air.

It is well to put a small stick according as we plant alongside the tuber, so as to mark the place and avoid injuring it when dressing.

Some days later the tubers take and vegetate in the best condition.

During the early summer it suffices to water two or three times with liquid manure if the season is very dry, and to dress from time to time so as to destroy weeds. In these dressings we loosen the earth to a depth of two inches at most, and take great care not to disturb the roots.

Towards the end of October we cut the stems about one foot from the soil, we lay bare the collar so as to leave but a covering of earth of 1½ inch about, then we spread manure well worked on the diameter occupied by the roots, being careful not to put any on the crown.

Asparagus fears neither cold nor frost, so that there is no inconvenience in uncovering it in part. The roots thus breathe freely, nothing hampers them, the soluble parts of the manure become dissolved by the action of the rain and filter into the covering of earth which surrounds the roots.

Our plantation is thus in perfect condition to pass the winter.

In April, in fine weather, when the ground is not too damp, we bury with a pitchfork with flat teeth the manure spread in the fall, then we lay bare carefully each plant, and take away close to the crown the dead stems, so that not a particle will remain, then over each plant a little re-covering of 4 or 5 inches only, and leave the plantation thus pass the summer.

It is well understood that no asparagus is harvested during the second year.

In October the stems having become dry, we cut them one foot from the soil as in the preceding fall, and uncover them and copiously manure. It must not be forgotten that asparagus is a plant most voracious of manure.

The third spring is when we begin to harvest, After having buried the manure and uncovered the plants to get rid of the dead stems, we earth up the asparagus about a foot, and do so every year while the plant lasts.

This earthing up helps powerfully the increase in volume of the asparagus, because it furnishes a resistance to the growth in height to the profit of the growth in diameter.

During the third year it is well to pluck only the finest asparagus, one or two per plant, so as not to fatigue too much the tubers.

Beginning with the fourth year we can make a complete harvest.

A plantation of asparagus, well planted and constantly cared for as we have indicated, may continue productive fifteen years and more.

During the summer of the second year, we should put stakes to the stems so as to prevent the wind from shaking the tubers, which would injure vegetation. Later on the tufts pushing out stronger and more numerous, no need for protection.

The harvesting of asparagus begins in May, and lasts six weeks to two months. By not continuing it beyond June, the following year's asparagus will be larger and earlier.

The use of the knife is bad. The knife alone destroys a part of the harvest. In cutting the asparagus, it attacks almost always one or more rudiments which are found at the foot. Further, it leaves often a bit of stem on the crown which uses sap to the detriment of the coming asparagus. Moreover it is an obstacle to those which are growing.

It is much better to break off the asparagus with the finger. We throw off the little mound to the beginning of the asparagus to be plucked, pass the finger behind, and with a sharp stroke we break it even with the crown. Thus there is nothing left on the crown, we do not destroy the rudiments which develop at the foot, their growth is not impeded, and the harvest is thus increased in volume and quality.

We must be careful not to cut the stems during the summer when they are in vegetation, as this would destroy a part of the next year's crop. They should be cut only in the fall when dead.

If we wish to add to the beauty of the products we will do well to take away the seeds as they are formed. Nothing tries a plant like the production of seed. The asparagus thus grained is always larger than that on which the seeds have been left.

We should unearth the asparagus in October at the latest. This, if done early, helps the next year's harvest as the roots exposed to the action of the air will strengthen and give finer fruit.

Immediately after the unearthing, manure with well decomposed matter. Some authorities say that manuring every two years is sufficient. We do not think so. The asparagus is greedy for manure, and the quality and quantity of its products will depend on this nourishment.

It is important that the manure be well decomposed. Otherwise when burying this manure in the spring we would be burying straw which would furnish nothing to the roots,

Some people find it hard to harvest nothing during two long years. To lessen the disappointment, we may plant between the rows a row of cauliflowers or potatoes, beets, turnips, or onions. But only one row, and that must be done away with the third year. We do not however extol this practice because we think it better to grow the asparagus alone.

All the preceding applies to cultivation in kitchen garden, and the same proceedure should be followed when cultivating on a large scale in the field. Choose the soil best suited, which will require the least improvement. A calcareous soil of average consistence will do very well, Often even on the hill-

sides there are lands so full of lime that we do not know what to do with them. With sufficient manure the valueless lands may produce fine asparagus and thus become a source of revenue.

Mr. Chapais said they were very grateful for this complete and scientific paper. Those who had never cultivated asparagus would do so when they had the principles and practice so clearly put before them, and there was no doubt considerable profit would be the result.

Mr. Brodie of St. Henri, read the following paper:—

THE NEW ONION CULTURE.

The Island of Montreal has long been noted for its market gardens, and for the good quality and great quantity of vegetables shipped by boat, and by rail to other parts of Canada and the United States.

My paper to-day takes up onion growing, and my experience with the "New Onion Culture" introduced by Mr. Greiner of Western New York, or I should say, an old system revived, for the late Mr. Cooper of St. Denis Street, Montreal, used to grow them in this manner over thirty years ago, but not in large quantities, and others have grown them for exhibition purposes.

I sowed the seed in hot-beds early in March, about three ounces of seed to a bed, thirteen feet long by six feet broad, weeding them only once, and watering them when required.

We prepared the ground the second week in May, choosing a plot of one half arpent, that had been heavily manured for cabbage the previous year. We ploughed the land about six inches deep, and having a small harrow following behind the plough smoothing down the furrow, so that there would be no need of tramping the ground with the horses harrowing after the field was ploughed. We applied four hundred pounds of special fertilizer for vegetables to this plot. We had a marker that made six rows at a time one foot apart, and we set out the plants four inches apart in these rows. Four women planted the plot in about one day and a half. The weather was very dry, but the ground was moist, and I was agreeably surprised that they took root as well as the cabbage in the next field, with this advantage, that no black flies could injure them. They grew to a large size, some weighing two pounds.

We harvested 450 bushels off the plot, but they came into competition with the imported Spanish onions that were very cheap at that time, and they lacked the bright straw color of the imported ones.

The varieties planted were the Prize taker and large White Italian. There is no better way to grow onions for home use where the onion maggot is generally more destructive than in large fields; it also saves the first weeding, which is always tedious. It is the general opinion, that onions do better, planted year after year in the same ground. This is an error. In my experience, land, heavily manured, pulverized, and cultivated with any other vegetable, will do just as well, if not better; for the onion maggot does not do so much injury in new land as in old.

The general way of growing onions: The land is ploughed and manured in the autumn. In the spring we harrow, and pulverize the ground well; I use the Acme harrow and find it the best. For sowing I use a Matthews seed drill, using four pounds of seed per arpent. The past two seasons I have given the weeding out by contract, fifty dollars per arpent to keep them clean for the season. Our average crop is about one hundred and fifty barrels per arpent; I have often had two hundred.

The cost of the crop amounts to:

4 lb. seed at $2.00 per lb	$ 8 00	
Manure	25 00	
Ploughing and harrowing	2 00	
Weeding	50 00	
Harvesting	10 00	
150 bbls. at 25c. each	37 50	
Packing and marketing	10 00	
Rent of land	20 00	
		$162 50
150 bbls. onions, $1.75 per bbl		262 50
Profit		$100 00

The best varieties for profit are the Early Red, Large Red Wethersfield, Yellow Danvers and Yellow Globe Danvers. In a dry season like this, it is best to keep the ground loose, it will prevent cracking and assist in checking evaporation. In some small gardens, I have seen much time taken up in watering, that could have been more profitably employed in loosening the surface soil and letting the moisture rise from the sub-soil.

Sow the seed as early in spring as possible. There are hardly ever any thick necks in onions sown in April, while those sown at the end of May are often a failure with them.

It is better to fertilize one acre thoroughly than spread the same quantity of manure over two acres, for it costs as much to weed and care for one acre in poor soil as for one acre in rich, and you can take as heavy a crop off one acre of heavily manured land, as you will of two acres of land lightly manured.

Some of my neighbors have grown from 1000 to 1500 bbls. of onions.

Dr. Grignon.—Can we cultivate with advantage onions in the mountains in the north?

Mr. Brodie.—I think so. I know that in the townships they are not able to compete with us. At Compton and around Sherbrooke they cannot succeed with onions.

Mr. ———.—Can a rocky soil produce onions?

Mr. Brodie.—Yes.

Mr. Decarie.—You require a dry soil or a soil well drained. The onion we have grown for years is the Weathersfield, the ordinary red onion. Then we sowed yellow onions for distant markets. They keep better than the red.

The keeping depends on the way they have been plucked and warehoused If you warehouse your onions so as to have them perfectly dry, you can answer for them until the spring.

WINTER APPLES.

The best winter varieties of apples for the Province of Quebec was the next item on the programme for discussion.

Mr. Chapais.—Last fall we made up two lists, one for the east and the other for the north, but unfortunately we have not those lists with us.

Mr. Fisk.—For my own district at Abbotsford, for winter varieties, my favorites are, first, the English Golden Russet. That is for late winter. We have for early winter, the Wealthy, Winter St. Lawrence, and for a cooking apple, the Winter Arabka. The Arabka is not a table apple, but is a very good cooking apple. For late winter, Golden Russet, Ben Davis, and possibly Canada Red should be included if it proves to be what it is represented. Canada Baldwin does very well in many places, but not with us.

Mr. Brunell.—I have kept Winter St. Lawrence until March and Wealthy until end of March. I have kept Plum Cider until April.

Mr. Brodie.—With me if we let Wealthy ripen on the trees, they do not keep very long. The same with Winter St. Lawrence. The McIntosh Red takes the place of the Fameuse, that is for the months of November and December. I would always like to have more Fameuse.

Mr. Decarie.—If the Fameuses could only become again what they were. I have kept Fameuses until April and they were still very fine. I kept them in barrels in a place not too cold but very dry.

Mr. Brodie.—For January and February I have a variety that I like, for the wants of the house, and that is Grimes Golden Pippin. Professor Saunders of the Experimental Farm likes them the best of all for dessert, but the tree is not very vigorous everywhere. With us it produces very well and every year. Pewaukee is an early winter apple, but it falls to the ground before it has a fine color. That is the defect of Pewaukee and Wealthy. The Ben Davis and the Golden Russet for the spring. I have sold Ben Davis to the 10th June.

Mr. Chapais.—Our President recommends Duchess, Wealthy, Fameuse, Canada Red, Winter St. Lawrence and McIntosh Red for his district.

Rev. Canon Fulton.—There were two barrels of apples sold to Walter Paul, for which he paid a fabulous price, $25 per barrel. They had the color of the Red Baldwin with the Ben Davis shape. Would it not be well to have a few of those trees propagated.

Mr. Dunlop.—I can make enquiries and find out what they are.

Rev. Canon Fulton.—I got two and took them home, and my son pronounced them at once Ben Davis. It has the shape of the Ben Davis but a better color.

Mr. Dunlop.—I think it rather strange a new variety of such merit should have gone out and escaped the notice of the Ontario Association.

Rev. Canon Fulton. — We have the Golden Russet in the County of Huntingdon. Northern Spy does very well. We have the Red Baldwin but it is not very much grown.

Mr. Edwards.—We claim that the Ben Davis is the first for good keeping qualities, and the Golden Russet and Northern Spy do very well. So does the American Baldwin. The Jonathan is a good winter apple, but very small. It is not well colored.

Rev. Canon Fulton.—That is the best keeping and best flavored apple in the spring.

Mr. Edwards.—They bear well with us, just in some particular neighborhood. They do not bear well generally but when we get a crop it is an excellent one. I think those are about the best winter apples we have.

Mr. Chapais.—For our district we have the English Golden Russet, which keeps to the month of June, and the Longfield, which is an early winter apple with us and the one that keeps best. I sent to Ottawa on the first of July a Longfield, which was kept in my cellar and which was in the best condition. It is rather a small but good apple, and a good keeper. Winter Arabka with us does well but the quality is not much.

Mr. Trudeau of Jacques Cartier.—I would recommend Ben Davis. I have had occasion to visit many orchards and have seen trees of all ages, and all the farmers say that Ben Davis keeps the longest and produces well every year. It is the best paying apple tree on the Island of Montreal. It is a very strong tree, produces well, and the apples keep well into June. I have had Ben Davis on the 15th June. In Mr. Pierre Voyer's orchard there are apple trees which have lasted 15 years and are well preserved—that is in the concession of St. Laurent. BenDavis and Golden Russet are the best. There are other varieties, but they only produce every 3 or 4 years.

Mr. McColl.—The apples which I find keep the best are the Ben Davis. The Northern Spy is also a fine apple, but the tree does not last long.

NEW SEEDLING COMPETITION.

Mr. Chapais.—With regard to winter apples, one of the first efforts of the Society was to seek seedlings of apple trees which would fill the blank. A committee was formed, and reported in favor of having a competition.

To our next winter session at St. Johns we invite exhibitors to bring their seedlings which they think are keeping apples. Three prizes will be offered each district. The exhibits will be put in charge of the society and kept until May. Month after month they will be examined to see their value and the prizes will be distributed to each district. At the same time each district will be invited to enter into competition for a general prize. The trees will be under the supervision of the Society during five years. Each year the orchards will be visited and the trees examined for hardiness, fertility, quality of fruit, resistance to disease, &c.; and at the end of the 5 years the apple which will have merited the prize three years out of the five, will receive a gold medal. Although

the prizes are small, the Society not having much means, the one who obtains the gold medal will be certain to make a fortune with his tree.

Rev. Canon Fulton.—Where do you propose to keep them ?

Mr. Fisher.—They will be entrusted to a committee which will take care of them, probably store them in Montreal. They may be sent to the Secretary before the meeting at St. Johns.

THE BEN DAVIS.

Mr. Brodie.—I am one of the first to grow the Ben Davis on the Island of Montreal. Those who say it can live as long as other apple trees deceive themselves, because I have some that are beginning to decline. They produce so heavily every year that on the bark black spots are showing and the trees are not likely to live long.

Mr. Fisk.—With regard to the hardiness of the Ben Davis, our experience at Abbotsford is that to succeed you require a northern or a western exposure. In a southern exposure it suffers.

Professor Craig of Ottawa read the following paper :

HEDGES AND HEDGE PLANTING

One of the first impressions received by the mind of English tourists in travelling through the better settled portions of Quebec and Ontario, is that wire or rail fences as dividing lines do not at all compare from the standpoint of beauty with the ornamental lines of living green so common in his native land

Lack of time and money frequently discourage the more strictly utilitarian Canadian farmer in this direction, and prevent him from adding to his homestead these enduring investments which nearly always give large dividends in the way of utility and beauty to the home surroundings.

In this connection I perhaps may be allowed to say a word with regard to the decoration of home grounds. Too many of our people possess the mistaken idea that our gardens and lawns should be made up of formal figures arranged in symmetrical order such as flower beds, and sheared trees set at exact distances, or so as to balance properly. Landscape gardening means the arrangement of trees, shrubs, flowers and green sward in such fashion as they shall possess landscape or nature like effects. We cannot secure these effects by using sheared trees and formal flower beds, but must place these same plant individuals in such a form as shall give them the elements of a picture. In order to answer this effect trees should not be scattered but should be grouped here and there. This with open vistas of green sward gives character and definition.

The flower border rather than the flower bed is a much better place for herbaceous and annual plants. Here we should grow them in massess freely, paying less attention to variety than to quantity. Let us have flowers then, and flowers in abundance. Let us grow them after nature's prodigal plan and

we shall secure nature's beautiful effects. Neither does the border show the effect of inattention so readily as the formal flower bed, and its soft outlines even though assisted by occasional weeds, give pleasing and restful effects.

To return to hedge plants and hedging, their principal features of usefulness may be briefly stated as follows :—

1. Ornamental boundary or dividing lines.
2. Defensive barriers.
3. Wind breaks and screens.

The planter should consider his situation and the effects he wishes to obtain before deciding upon the hedge plant which he shall use.

If for a defensive barrier, a strong growing deciduous and spiny species should be selected. If for a wind break or for ornament, among the conifers he will find desirable varieties.

PLANTING.

As in all other tree planting operations a thorough preparation of the soil will do much towards insuring the ultimate success of the hedge. Plough or dig deeply a strip 4 or 5 feet wide. In the centre of this pulverized strip set the plants in a trench which has been dug some inches deeper than the depth at which the plants are to be set. It should be filled in with a sufficient amount of good surface soil. The spaces at each side should afterwards be cultivated.

DISTANCE APART TO SET PLANTS.

Why do many of the hedges we see in the country and city present a bare and ill-clothed appearance about the base? Mainly because very large plants were used in setting the hedge. These were severely cut back, which induced a strong bushy growth about the top, but did not increase the amount of foliage about the base. I would therefore strongly advise the use of young plants, so that the hedge may be trained from the beginning with a view of obtaining a certain form. The distance apart at which the plants should be set will be governed both by the species and the ultimate height to which it is intended the hedge shall be allowed to reach, as before stated. In planting an evergreen hedge, it is especially desirable to use small stocky plants. They need very little cutting back the first year, other than that required to equalize their height At the Experimental Farm the plants in the hedge rows vary in distance from each from 15 inches to 3 feet, the former distance being applied principally to small growing deciduous trees and shrubs, and the latter to larger conifers set in the boundary hedges.

PRUNING.

The same principles which govern the operation of pruning as ordinarily practised may be applied to hedges. If we wish to increase or encourage growth the pruning should take place late in the season; on the other hand, if we wish

to check growth as in the case of a well established and vigorous hedge early summer pruning has this effect. In the case then of a young hedge started with small plants, a slight amount of pruning is necessary for the first two years. As the plants become established a more vigorous style of pruning is desirable. Our practice at the Experimental Farm has been to prune twice during the season, the first pruning taking place in June and the second in August.

As to form. The curvilinear or rounded top usually proves most satisfactory in the long run. Square or flat topped hedges are more apt to break with the weight of snow, and to show dead points of wood in the centre than the rounded top.

Hedge Plants—Deciduous.

As I stated at the outset, in selecting a tree or plant for hedging purposes one must look at the question from different points of view. Among the most desirable deciduous plants for use as ornamental dividing lines are the following;

Siberian Pea Tree (*Caragana arborescens*)). This plant is absolutely hardy, has light green beautiful foliage, bears pruning well and is readily propagated from seed, and is not only useful in Eastern Canada, but throughout Manitoba and the North West Territories.

Purple Barberry *(Berberis Vulg purpurea*). This is a purple leaved form of the common barberry, has proved quite hardy at Ottawa, and is extremely desirable as a background to the perennial border, its dark purple foliage contrasting in a pleasing manner with the green sward. It is readily propagated from suckers and offshoots.

Thunberg's Barberry (*Berberis Thunbergi*). I have no hesitation in saying that this is one of the best if not the very best low growing deciduous plant for hedging purpose which we have. Its natural habit of growth is low and stocky, so that little pruning is necessary. The light greenish flowers in early spring and clusters of scarlet fruit later in the season add to its beauty, while its foliage in the autumn is among the richest possible in regard to coloring. Propagated from seed, stolons or layers.

Golden Leaved Spirae (*spiræ opulifolia aurea).* This is a vigorous grower and should not be planted on small lawns, as it occupies too much space. It is however very beautiful in early spring and summer before the clear golden hue of its foliage becomes dimmed by autumnal change. Propagated by suckers or layers.

Among stronger growing plants which might be used for barriers I shall mention Cockspur Thorn (*Cratægus crusgalli*). Although thorns are usually credited with being very slow of growth, a hedge of this formed of two year old plants set out in 1890 has now reached a height of 4 ft. and a compact width of 3½ feet of sufficient strength to act as a barrier.

Buck Thorn (*Rhamnus fraugula*). This is a native of England, but grows vigorously in this climate. This bears pruning well, and soon forms a

strong, dense barrier. It usually flowers and fruits freely, and is readily propagated from seed.

RUSSIAN MULBERRY (*Moris hybrida*). This may be classed with the last with regard to its habit of growth, although it is even more vigorous. One of its principal defects is in its habit of growth. The leaves do not appear till the first week of June and they are the first to be destroyed by frost in autumn, so that for a long time its branches are unclothed and unattractive. Honey Locust is too uncertain in regard to hardiness to allow me to recommend it.

CONIFEROUS PLANTS.

WHITE SPRUCE (*Picea alba*). Let us not forget our own superb native spruce. Planted in 1889 at Ottawa it now forms one of the most compact and attractive evergreen hedges in the collection. Its slow growth and close habit lend themselves readily towards forming an ideal hedge. Begin the hedge with young plants, prune lightly at first and cultivate the ground carefully, and satisfactory results are almost sure to be secured.

Norway Spruce is a very much more rapid grower than the last, but I question whether it is as durable in this climate as the native.

ARBOR VITAE (*Thuya occidentalis*). Is another exceedingly satisfactory native. Many hedges are irretreviably ruined by setting out large plants which are cut back very severely. Such hedges are nearly always "leggy" and bare of foliage at the base. The pyramidal form of our native Arbor vitæ makes a trim little hedge, and one that requires a very slight amount of trimming. Hemlock is diffioult to transplant and does not take kindly to pruning, but where it succeeds is very beautiful.

COLORADO BLUE SPRUCE (*Picea pungens*) This has somewhat the habit of growth of our native spruce, and a hedge of this lovely conifer would undoubtedly be a thing of beauty. As yet the best types are much too expensive to allow of them being generally planted. I may say in closing that in the report of the Director of the Experimental Farms for 1894, will be found an aceount of the success of a large number of plants set out to test their value for hedging purposes.

Sir Henri Joly de Lotbiniere, seconded by Mr. Brodie, moved a vote of thanks to the Trappist Fathers, which was responded to by the Prior, the Rev. Father Dom. Antoine, and the meeting adjourned.

INDEX TO FRUITS.

APPLES.

CHERRIES.

CURRANTS.

GOOSEBERRIES.

GRAPES.

PLUMS.

PEARS.

RASPBERRIES.

STRAWBERRIES.