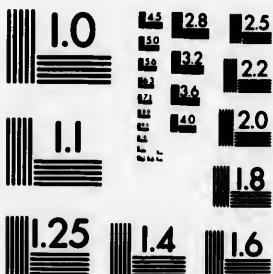
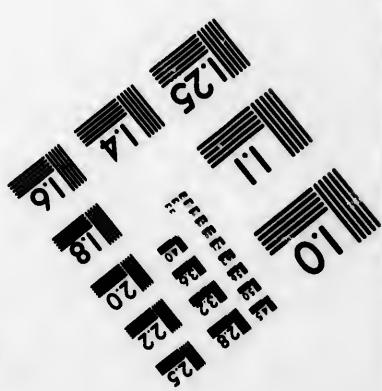


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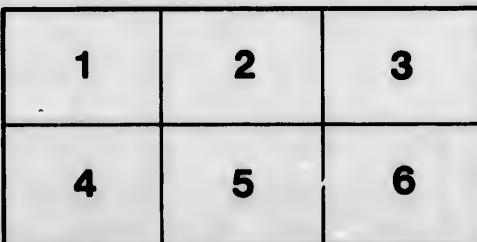
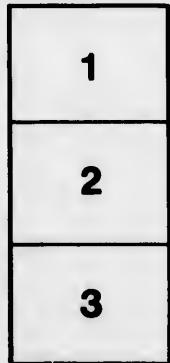
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PROCEEDINGS

OF A

CONVENTION OF FRUIT GROWERS

OF THE

DOMINION OF CANADA

HELD AT

OTTAWA



ON THE 19th, 20th AND 21st FEBRUARY, 1890.



OTTAWA:

PRINTED BY BROWN CHAMBERLIN, PRINTER TO THE QUEEN'S MOST
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INTRODUCTION.

The bringing together of the representatives of the fruit interests of the Dominion, and the interest and enthusiasm manifested in the proceedings of the Convention, cannot but be a source of gratification to all concerned.

In the winter of 1887-8 the success attending the meeting of the Montreal Horticultural Society and Fruit Growers' Association of the Province of Quebec, held in the city of Quebec, led the President of the Association, Prof. Penhallow, to suggest the desirability of bringing together, at Montreal, representatives of the various Provinces of the Dominion.

The Provincial Associations were communicated with, and were unanimous in their favour of the project. Application was made to the Dominion Government for a grant in aid of the work contemplated, and Messrs. Charles Gibb, A. McD. Allan, L. Woolverton and C. R. H. Starr took an active part in endeavouring to advance the project, but from various causes the work was not sufficiently advanced to convene the meeting during the winter of 1889.

The following summer further efforts were made, and the application for a grant received the favourable consideration of the Hon. Mr. Carling and his colleagues, an appropriation being passed granting to the Honourable the Minister of Agriculture the sum of \$2,000 "to aid in the development of the fruit industry in Canada."

Under the conditions of the grant it was found necessary to hold the Convention at Ottawa, and the organization of the meeting was, by a vote of the Provincial Associations, placed in the hands of the Montreal Society.

A committee, consisting of Prof. D. P. Penhallow, President; Messrs. R. W. Shepherd, Jr., R. Brodie, A. Joyce, Rev. R. Hamilton and W. W. Dunlop, Secretary, was appointed, with Prof. W. Saunders and Mr. P. E. Bucke, of Ottawa, as local members.

The committee was greatly aided in its work by the hearty co-operation of the various associations, and by the valuable assistance rendered by Prof. Saunders, Director of the Experimental Farms, and others.

W. W. DUNLOP,
Secretary.

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CONVENTION
OF
FRUIT GROWERS OF THE DOMINION OF CANADA.

HELD IN THE CITY HALL, AT OTTAWA, ON 19TH, 20TH AND 21ST
FEBRUARY, 1890.

FIRST DAY.

The Convention met at 3 p.m., Professor D. P. PENHALLOW, the President, in the Chair.

There were present the Honourable the Minister of Agriculture; Prof. W. Saunders, Director Experimental Farms, Ottawa; P. E. Bucke, Ottawa; Prof. J. Hoys Panton, Guelph; A. Mc. D. Allan, Goderich; Thomas Beall, Lindsay; B. Starratt, Paradise, N.S.; A. H. Pettit, Grimsby, Ont.; J. S. McMichael, Waterford, Ont.; Thomas Frankland, Stonewall, Manitoba; R. W. Starr, Starr's Point, N.S.; G. W. Henry, Port Hammond, B.C.; R. Brodie, Montreal; R. W. Shepherd, jr., Montreal; R. J. Brodie, Smith's Falls, Ont.; W. W. Dunlop, Montreal; C. R. H. Starr, Wolfville, N.S.; J. Craig, Experimental Farm, Ottawa; S. L. Peters, Queenstown, N.B.; S. D. Willard, Geneva, N.Y.; O. B. Hadwen, Worcester, Mass.; S. A. Bedford, Experimental Farm, Manitoba; N. J. Clinton, Windsor, Ont.; Linus Woolverton, Grimsby, Ont.; P. C. Dempsey, Trenton, Ont.; G. A. Drummond, Roebuck, Ont.; John D. Thomson, Domville, Ont.; O. Crosfield, J. M. Fisk, Abbotsford, Que.; John M. Denton, London, Ont.; John Croil, Aultsville, Ont.; Rev. Thomas W. Fyles, South Quebec; Rev. R. Hamilton, Grenville, Que.; G. S. Mason, Hawkesbury, Ont.; G. C. Caston, Craighurst, Ont.; A. M. Smith, St. Catharines, Ont.; Prof. R. W. Smith, Truro, N.S.; A. A. Graham, Granby, Que.; Hon. H. G. Joly, Leclercville, Que.; R. Mallory, Frankford, Ont.; G. M. Farley, Belleville, Ont.; D. Westover, Freleighsburg, Que.; W. L. Kerr, Beamsville, Ont.; J. W. Harrison, Regina, N.W.T.; W. Thompson, jr., Derwent, Ont., and others.

The meeting was opened by the Honourable the Minister of Agriculture with the following address:—

MR. PRESIDENT and GENTLEMEN,—It appears to me that I am a sort of double-barrelled gun to-day. I was honoured by the President asking me to open this meeting, but I came here a little too soon. While the Dairy Convention was going on I was called upon to speak, and I said something then about the fruit as well as the dairy interests of the country. However, Mr. President and gentlemen, I feel it a great honour in being called upon by you to open this Fruit Growers Convention. This is the first Dominion convention of fruit growers, I believe, that has been held in Canada, and I hope that it will not be the last; that as you have made a good commencement, as you have an excellent attendance here to-day with representatives present from all the different parts of the Dominion—from Nova Scotia, Prince Edward Island, New Brunswick, Ontario, Quebec, Manitoba, and the North-West Territories, and with the united action of all the gentlemen that are representing the different Provinces, I am sure the convention cannot help but result in great good for the country. The fruit interests are just beginning to be appreciated by the people in other countries, as I have mentioned here this afternoon. At the Centennial Exhibition, held in 1876 in Philadelphia, I am told Canadian fruit was

awarded a number of medals; and, as I mentioned also, the exhibit of fruit sent to the Indian and Colonial Exhibition astonished the world. There were millions of people who attended that exhibition, and they were surprised at the exhibit of fruit from Canada. I only hope, gentlemen, that you will spare no effort to produce first-class fruits in the Dominion. We have many different climates in Canada and I trust that in a very short time varieties of apples as well as well as other fruits may be found suitable to all of them. I am quite sure we will be successful with the small fruits, and I think that apples may be grown in the North-West in the same way that they are grown in Russia some six or seven hundred miles further north than we are at Regina. We may not be successful at first, but we are making the effort, and all kinds of fruit trees are being experimented with at the Central Farm near Ottawa, and also at the farm in the Maritime Provinces, at Napan, at Brandon, and at the farm at Indian Head, in the North-West Territories, and also at the farm in British Columbia. With this vast extent of country in which all varieties of climate are represented, we are testing trees in great variety from many other countries. Prof. Saunders is in communication with the principal fruit growing countries in the world, and we are experimenting with seeds from India, with trees from Russia, from Germany and from Japan. Apple trees that have been successful in Northern Russia have been brought out and are succeeding in the Western States, and I think that by continuing this line of work we shall succeed in finding fruits which will stand the climate of our north-west. I think we have been successful in bringing out a wheat, called the Ladoga wheat, from Northern Russia. That wheat has been successful. (Applause.) It has been clearly demonstrated that it will ripen about ten days earlier than the Red Fife wheat. So far as we can learn it is equal in quality to the Red Fife but; supposing it should not be quite equal, the advantage of having it ripen ten days earlier is a matter of very great importance in the North-West. (Hear, hear.) With this acquisition, and if we can produce apples and such fruit as I have mentioned in the North-West, I think it will be worth the expenditure that has been made in connection with our Experimental Farms. (Hear, hear, and applause.) These experiments are being honestly made by competent men, as I said before. We have been careful in selecting the very best men we could get in the country to take charge of the different branches, and they are conducting this work; and we have at the head of these Experimental Farms a gentleman in whom all those who have come in contact with him have confidence, and I am sure the country has confidence in him. (Hear, hear.) With these experiments honestly conducted and carried out they must be of vast benefit to all sections of the country, from ocean to ocean. (Applause.) Gentlemen, I do not know that I should take up your time any longer, and I thank you for the honour you have done me in asking me to open this meeting. The Dairy Convention has been successful, and there is every appearance, from the size of the Fruit Growers Convention, that your gathering will be equally successful. I have no more to say, beyond declaring that this convention is now open, and I wish you every success. (Loud applause.)

THE CHAIRMAN'S ADDRESS.

The Chairman, Prof. D. P. PENHALLOW, of Montreal, then delivered his opening address, as follows:—

To the Honourable the Minister of Agriculture and Members of the Convention:

GENTLEMEN.—Before proceeding to deal with these subjects which more intimately bear upon the special work of this important convention, which, as presiding officer, it falls to my lot to present to you, I venture to congratulate you all upon the successful issue of these efforts which have been directed towards bringing you together at this time and place, and under circumstances which render this the most important movement ever instituted in the Dominion of Canada for the purpose of promoting our very large and increasing fruit industry.

The present convention is the result of an effort on the part of the Montreal Horticultural Society to secure such a meeting at Montreal last winter. For various reasons the plans then made were not realized, but as we all felt the great necessity for some concerted action looking to the better development of our fruit industry, and especially of our export trade; efforts were renewed with the result now apparent. By a general vote of all the societies interested, the organization of the convention, with all the details relating to it, was placed in the hands of the Montreal Horticultural Society and Fruit Growers' Association of the Province of Quebec, in consequence of which it devolves upon me, as President of that society, to preside over the work of this meeting. We are under obligations to many members of the House for the warm manner in which our application for Government assistance was supported by them. But we are more particularly and deeply indebted to the Honourable the Minister of Agriculture, Mr. John Carling, for the encouragement and sympathy he has extended to those directly in charge of this work, and for the very active and generous support he has extended in securing a special Government grant to meet expenses necessarily incident to such an occasion. And notwithstanding the many engrossing duties of his position, he has continued to manifest a watchful and active interest in all our work up to this very date. Whatever may be the final result of our work in the next three days, the fruit growers of Canada cannot forget that Mr. Carling has laboured earnestly and generously for the promotion of their interests.

We should also acknowledge the valuable services of those members of the general executive and local committees without whose uniting efforts success could not have been secured.

On behalf of our various societies, as here represented, I desire also to extend a most cordial welcome to those representatives of kindred societies who have come to this meeting from the adjoining States of the Union. It is our hope that, as our interests are largely identical, the exchange of views to take place during the progress of this convention may result in a large measure of mutual benefit.

This is the first occasion in the history of Canadian horticulture when there have been assembled at one point skilled representatives of that most noble calling, from all parts of our widely separated Provinces. We have here to-day representatives from Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, the North-West Territories and British Columbia, and it is hoped that such a convention of widely separated interests may lead to results of the greatest importance—results which will be felt in the remotest fruit-growing district of the Dominion, and from which, as time moves rapidly onward, new influences may spring.

Our progressive neighbours to the southward, who are ever on the alert for new directions in which to apply an exhaustless energy to the development of natural resources, have for some years been carrying on a work similar to that we are now entering upon—though on a somewhat larger scale—through the medium of the American Horticultural Society, whose function it is to move about from place to place each year, and thus bring local interests into harmony with the general welfare.

Whether any such broader field of work will result from this Convention and whether such work as we are now undertaking will be extended into the future, are at present open questions, the determination of which must depend upon the nature of the results we now achieve. At present our object is attained in this meeting. When it was first proposed to hold this meeting the intention was to have it at Montreal, as the great shipping port, and whence the bulk of our fruit goes to Europe. But on consideration it was found best, for several reasons, that it should be held here at Ottawa during the Session of Parliament, and thus give to the various representatives here gathered an opportunity to hear and join in the discussions, and ultimately distribute the information obtained, among their several constituencies.

Of the various Provinces represented here to-day, we regret to find that only four have regularly organized societies, under whose direction and encouragement the fruit interests of these various sections are fostered and promoted. In Manitoba and

the North-West, where fruit culture is yet in its infancy, or not yet undertaken, the reason for this is to some extent obvious. Not so, however, with Prince Edward Island and New Brunswick, both of which are important fruit districts. It undoubtedly falls within the province of this convention, and perhaps may be considered one of our most important duties, to inquire into the causes of such a state of affairs and, if possible, suggest and encourage some improvement. British Columbia, although not as yet a large fruit-producing country, is yet fully alive to future possibilities, and the necessity of giving the industry the most careful nursing while it is in the stage of extreme infancy. There has been established there, within the last two years, a society which has at its head one of the most active and highly respected members of the Montreal Horticultural Society, Mr. J. M. Browning. Under his guidance, we may confidently look forward to the future of the society, with the feeling that it is destined to accomplish a great and important work in developing the latent possibilities of fruit culture in the far west.

If we now turn to the other extreme of this widely-extending Dominion, we find in Nova Scotia—the paradise of apples—a most active organization, known as the Nova Scotia Fruit Growers' Association and International Show Society. The name at once suggests the broad basis on which the work of this society is conducted, and our inspection of its annual reports shows that it has accomplished a vast amount of good work.

This society was established by Act of Legislature on the 10th of May, 1864, and the constitution was amended on 12th January, 1876. Its membership is not large, being only 31 in 1886, but all take a most active part in the proceedings, and feel that their personal interests and those of the society are on

The association had its origin in the great London Exhibition of 1860, at which Nova Scotia apples were exhibited and attracted marked attention. In 1862 specimens of fruit were sent to the exhibition of the London Horticultural Society, where they took one silver and some bronze medals. As a result, the society was organized in 1863 by men whose names are most intimately connected with the fruit interests of that Province.

We find it recorded in the transactions of the society that: "It had been abundantly proved from the very origin of the society that the best of apples could be raised in Nova Scotia; the difficulty all along had been in placing them in good condition in the British market. At first it had been found necessary even to preserve them, that they might appear at least of their proper size and form. Various experiments had been tried to overcome the formidable obstacles presented by the broad and stormy ocean and a land transit scarcely less destructive; but the problem was not yet satisfactorily solved. At the annual meeting of 1870 the matter was again brought to the notice of the association, a statement being made by Amos Black, Esq., one of its members, that he had in the preceding December sent two barrels of apples—Hutching's and Black Red—to Liverpool, England, and that they had arrived in perfect order. Each apple was wrapped separately in paper.

"In 1871 the association determined to petition the Dominion Parliament to place a specific duty on all foreign apples, green fruits and vegetables, as well as upon all fruit trees imported into the Province. In its work, since the date of its formation, the society has advised a wide and intelligent interest in the domain intrusted to its care and management. The subjects which have occupied its attention have been very numerous and varied; they have also been among the most important that can engage the consideration of an agricultural and horticultural region. Through its instrumentality information has been widely diffused; the fruits and other agricultural produce of the Province have been brought to the notice of even distant countries, and have created a most favourable impression as to the capabilities and resources of the colony; it has been made apparent, by the knowledge diffused, that the apples of Nova Scotia are unsurpassed, perhaps unrivalled, by those of any other part of the world; the operations of the Fruit Growers' Association have done much towards opening up and securing a permanent market for our fruit, and thus to render its cultivation a source of prosperity and wealth. Experiments have been

ken, the Edward undoubted one airs and, though abilities, is in the last two spected der his with the developing ion, we own as v. The aducted, a vast y, 1864, p is not gs, and t which specie, where organ- the fruit abund- could be od con- reserve exper- broad problem er was Amos ant two at they ent to well as e of its ain in- ention impor- region. ts and even tilities fused, of any o done d thus e been successfully made as to the kinds best adapted to our climate; the modes of transportation to distant countries have occupied the thoughts of the society, so that now our finest apples may be placed in the markets of Great Britain with their bloom and flavour almost wholly unimpaired. The ravages of insects and other pests, and the means by which they can be best counteracted, have been made the subject of careful research, and the labour has not been in vain. So the work has been prosecuted with interest, fidelity and success." This society was also one of the most active promoters of the Dominion Fruit Exhibit at the Indian and Colonial Exhibition in 1885.

Turning our attention to interests nearer our own immediate locality, we find in the Ontario Fruit Growers' Association a society of widely extended influence and importance, having in its keeping the fruit interests of one of the most highly favoured pomological districts in America. Its work has been of such a varied and important character that justice cannot be done to it in the brief space to be spared in an address of this kind, and only the more salient features can be passed in review.

The membership is now nearly three thousand. The Provincial Government has for many years given an annual grant, which has steadily increased, from a minimum of \$500 to a present maximum of \$1,800. The association was established about 1860, and since that date has been active in promoting the fruit interests of the Province. Meetings are held at various seasons of the year and in different parts of the Province; annual reports, embodying the proceedings of these meetings, are published, together with most important contributions to economic entomology.

In 1870 the society adopted the plan of distributing new varieties of fruits to various growers, for purposes of testing, a condition being that an annual report of the results obtained, should be submitted to the society for a period of five years. This plan is still in operation, and under it the sum of \$500 has been annually expended. The society holds no regular exhibitions, but it offers such special prizes as seem to be demanded from time to time.

In 1878 the *Canadian Horticulturist* was issued, under the patronage and by the aid of this association. It is the best exponent of Canadian horticulture extant, and is doing a most useful work.

In 1870 the President, Rev. R. Burnet, suggested that geological conditions should be taken into consideration as influencing the success or failure of orchards. He also suggested that there should be special encouragement given to exportation, and that more intimate inter-communication should be established with other societies at home and abroad. In 1878 he again suggested that efforts should be made to extend fruit culture in Manitoba and the North-West.

In 1883 President Saunders directed attention to the great desirability of securing fruits of a hardy nature from similar climates in various parts of the old world. As you are all well aware, this suggestion was acted upon the following year by Mr. Charles Gibb, the results of whose labours in Russia and other parts of Europe have been of the greatest value.

The society has been directly responsible for extensive improvements in and the extension of fruit culture throughout Ontario, as well as in the promotion of forestry interests. It includes among its members, originators of valuable new varieties of fruits and vegetables, in which connection the names of Saunders, Arnold, Haskins, Mills and others are most favourably known.

Through this society legislation favourable to the fruit industry of the entire country has been promoted, and it took the leading part in securing the fruit display at the Indian and Colonial Exhibition.

The Montreal Horticultural Society was incorporated in 1849. In 1878 the society was re-organized, under an amended charter, as the Montreal Horticultural Society and Fruit Growers' Association of the Province of Quebec. For many years no active work was undertaken, but in 1876 the first annual report was issued. These publications have been continued up to the present time, and constitute a complete record of the fruit culture in the Province, embracing papers of the greatest horticultural value.

At the time of reorganization the Secretary explained the reason for a change of name in the following terms:—

"Strong efforts having been put forth within the last three or four years to quicken the interest in fruit-growing in this Province, it was thought that the name chosen for the new association should be explanatory of the work the society has in view. For this reason the name chosen was that of the Montreal Horticultural Society and Fruit Growers' Association of the Province of Quebec. In purely horticultural matters the influence of the society will be mainly felt in and near this city, but in matters relating to fruit growing it is hoped that it will exert a useful and powerful influence throughout the whole Province."

The hopes then entertained as to the future usefulness of this society have been realized in the work of subsequent years. Meetings have been held in various parts of the Province for the discussion of questions bearing upon fruit culture, and the present meeting may be properly regarded as a legitimate and natural result of the policy adopted.

The Local Government has, for some years, given an annual grant of \$1,000, by aid of which the society has, for many years, held annual exhibitions at Montreal, which, for extent of display and character of the special exhibits, have been unsurpassed by any similar exhibitions in Canada. The annual prize list amounts to about \$1,400, of which about \$700 are given for flowers, the balance for fruits and vegetables. The present membership numbers about 600.

Five local societies for the promotion of fruit culture, viz.: Abbotsford, Brome, Shefford, Missisquoi and L'Islet, are operated under the patronage of this association, and practically constitute as many local divisions of it.

Much valuable work has been accomplished in the introduction and testing of new varieties; the introduction of Russian fruits; the introduction of valuable ornamental and forest trees, and in the diffusion of general information. The society also took an active part in the formation of the exhibit of fruits for the Indian and Colonial Exhibition.

It thus appears that, aside from their purely local functions, these organizations have all accomplished a large amount of most useful work in the direction of promoting the general welfare of the country, and I have deemed it of importance, at this time, to call your attention to these facts, not only because they directly bear upon the objects of this convention, but also because they are most suggestive of work which can now be undertaken in the most thorough manner, and to the execution of which the highest authority will give its sanction.

The work we are now called upon to perform is of an important character, and, although I cannot attempt to give an outline of all those subjects to be presented for your consideration, yet there are a few which, from their relation to the larger questions of export and import, I feel should be brought to your notice in a somewhat conspicuous manner.

Government statistics show that the value of exports and imports of fresh fruits from 1883 to 1888 inclusive, may be stated as follows:—

	Export.	Import.
1883	\$499,155	\$814,544
1884	173,048	778,446
1885	635,240	693,169
1886	499,598	681,740
1887	871,188	797,581
1888	<u>\$57,995</u>	<u>780,269</u>

From this it appears that the volume of imported fruits nearly equals the export, and in some years has been more than four times the amount. An allowance should be made, however, for those fruits which, like lemons and oranges, cannot be grown here, but which are consumed in large quantities. It is apparent, nevertheless, that while the Indian and Colonial Exhibition did much good in the

way of drawing greater attention to our fruits, and while, as a result, more frequent applications from England, for the shipment of apples, have been received, it has not resulted in that enlargement of our export trade which it was confidently hoped might follow. This result may to some extent be due to indifference of the producer to fluctuation of market prices both at home and abroad, and to other similar causes; but there is good reason for entertaining the belief, as will be shown in papers to be presented for your consideration, that transportation constitutes the principal factor in determining this result. As has been amply demonstrated by the Nova Scotia fruit growers, apples can be placed on the London market in prime order, but if the shipper feels that there is no dependence to be placed upon the way in which his fruit is stored and handled, and that it is largely a matter of chance whether it arrives in good order or a mass of rotten pulp, he will prefer in most cases to take his chances with the home market, where his reputation, at all events, can be maintained. This is one of the most important questions to be brought before you, as upon it the future possibilities of our fruit trade wholly depend. The question, however, is one of many aspects and requires a thorough and unprejudiced consideration of all the facts bearing upon it. While on our part it is only proper to ask that the railroads shall handle the fruit with care and forward it with despatch, and of the steamboat companies that they provide proper storage and ventilation, the producer and the shipper must, on the other hand, be willing and ready to guarantee their part in the whole process, and see that the picking and packing are properly executed. Fruit poorly packed will suffer injury under the most favourable conditions of transport. The interests of the producers and of the transportation companies are one, in the encouragement of an enlarging export, but each must do the part falling to them, and it has been felt that the importance of this subject deserved more than ordinary consideration. It is with a view to making some definite arrangement that representatives of the various railway and steamboat companies interested have been invited here to discuss this matter with you, for the same reason, also, the Dominion Dairymen's Association will hold a joint meeting with us this evening.

Another important aspect of this question is our relation to the United States. Looking somewhat more closely into the exports and imports for the past two years I find that in 1888 apples to the value of \$197,613 were exported to the United States and in 1889 this was increased to \$284,252. The bulk of these were sent from Ontario and Nova Scotia.

The imports of fruit during the same period were as follows:—

	1888.	1889.
Apples.....	66,548	40,695
Blackberries } Gooseberries }	18,133	1,094
Raspberries } Strawberries }	5,744	2,179
Cherries } Currants }	36,790	36,581
Cranberries }		
Plums }	30,452	29,532
Quinces }	22,355	22,351
Grapes, U.S.	<hr/>	<hr/>
do G.B.	<hr/>	<hr/>
	52,807	51,883

An inspection of these figures in detail shows that it is not a question altogether of import to non-producing Provinces, since some of the largest imports were to fruit-producing Provinces, and it is more probable, so far as apples are concerned at least, a question of transportation and local market values. It is, therefore, a

question if this convention should not consider some means by which any local necessity of fruit could be met by the surplusage of other Provinces, rather than from a foreign country.

In the list of imported fresh fruits there are doubtless some—excluding, of course, oranges, lemons and other sub-tropical fruits—which cannot be raised in sufficient quantity to meet the demands; but this is not true of the majority. Ontario can raise as good small fruits as New York, and so should British Columbia, and with a good soil and highly favoured localities for fruit culture I consider that our present import of \$132,000 should not only be offset by an increasing production, but be turned to an export. With the enormous population there is to the south of us, with our relatively very small population, and with our ability to produce fruit, there should be no question of import at all. I would, therefore, commend to your earnest consideration the adoption of means looking to this end.

Among other questions to be presented to your consideration will be those relating to disease and the ravages of insect enemies; the decline of orchard culture in districts where formerly it was a profitable pursuit; and the extension of orchards into those parts of the country where they are demanded by the rapid growth of population. Fortunately for the progress of the fruit industry in Canada, the Department of Agriculture, through its experimental farms, is pushing forward a most valuable work in this direction, and we may confidently look for results in the future which will be of the most important character.

Having thus brought before you some of the most prominent of the questions to be discussed here, I will not further detain you from the important work of this session, but will declare the Convention open, and ask you to give to its proceedings that close and undivided attention that its importance demands.

HORTICULTURAL WORK OF THE EXPERIMENTAL FARMS.

Prof. W. SAUNDERS addressed the convention on "Horticultural Work at the Central Experimental Farm." He said: Mr. Chairman and gentlemen,—I am very much pleased indeed to have an opportunity of appearing before this important convention of fruit growers to say a few words in connection with the work of the Experimental Farm as far as that work bears upon the important subject of horticulture. I realize the value and importance of such associations as these when I recall what good work the Fruit Growers' Associations have done in this country in the way of advancing the fruit interests. Although not a very old man, my memory carries me back to the time when, shortly after the Fruit Growers' Association of Ontario was organized, and before it received any Government aid, I remember what a struggle we had from year to year when we had no resources but the fees of the few members who paid their dollar or two dollars a year. How difficult it was to make ends meet and to keep up interest in the association at that time and to carry on the useful work which was contemplated. It may not be generally known to the members, but I think it is a matter which is worthy of mention on this occasion that it was the Hon. Mr. Carling, who now stands at the head of the Agricultural Department of this country, who incorporated the Fruit Growers' Association of Ontario and got for it the first grant of money which it received—\$500. (Applause.) I remember receiving a letter from him then—I was president of the Entomological Society at that time—in which he suggested that our society should organize under the Agriculture and Arts Act of Ontario, promising a grant of \$400. At that time the Act was being introduced by the honourable gentleman. It was giving those grants to the Entomological and Horticultural Societies which started them in their career of usefulness, and that work has gone on ever since, to the great advantage of the whole community, not only in Ontario, but in the Dominion of Canada. The reports which they have printed and circulated from time to time have found their way over the whole country, and they have had a great effect in advancing the interests of fruit culture and improving the character of the fruit grown, and placing us in a position, as fruit growers, of commanding the respect and confidence of the markets of the world.

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for our products. Now, with similar objects in view, namely, that of benefiting the whole community, the Experimental Farms have been organized and one of the objects contemplated in this organization is to advance horticulture; and I propose, during the few moments which I shall occupy your time to endeavour to give you a brief sketch of what we are doing in this respect as well as what we hope to be able to do in the future. At the Experimental Farm at Ottawa, which is the Central Farm, a large portion of the preparatory work is done, which has its bearing on the whole Dominion, for that is the distributing centre from which plants, trees and shrubs are sent to the other four farms, as well as to other points for test. One of these farms is in Nova Scotia, the second in Manitoba, the third in the North-West Territories, and the fourth is in British Columbia. Now, at the outset here it is very important that a good foundation be laid, and that foundation in the larger fruits consists, in the first place, of the ordinary standard varieties of apples, such as are grown with such advantage and profit in the western parts of Ontario. Those of you who are conversant with the climate of Ottawa know that we have here a very fair proportion of cold weather during the winter months. During the present winter two or three hundred miles west they have scarcely had any snow; but we have had continuous sleighing since November, and we expect it to continue until spring. This is the usual character of our winters. Such continuous cold weather, and especially when very low temperatures prevail, has its effect on fruit trees, and the result is, many of the more tender varieties will not endure the vicissitudes they are exposed to in this climate. Yet it may be said that the climate of Ottawa is fairly representative of the larger portions of Ontario and Quebec: for, taking the more favourable fruit areas out of Ontario, there is a very large proportion of this Province north and east where the conditions of temperature which obtain in Ottawa prevail to a like degree and stand in the way of very successful fruit culture. In the test orchard of standard varieties at the Experimental Farm many sorts will be tried which we do not expect to succeed with. This will be done so that we may be able to give the information to those who apply for it as to whether certain varieties are likely to succeed or not. Judging from the growth of the trees in the three years we have had the work carried on, there is a promise of success with a large number of varieties which it was thought likely, when the Farm was started, would not grow in the Ottawa valley. I think a very important part of our work will be to disseminate knowledge throughout the country as to what varieties will not succeed, as well as in regard to those which are successful, and thus save the people from spending their money in a useless manner. Beside the orchard of standard trees, we have a larger orchard in which there are 170 to 180 varieties of Russian and northern European trees. These are all being carefully watched, and although they have only been two years in the ground there were two trees last year which fruited and bore some nice apples. We expect during the next year that some others may be found to bear a sufficient quantity to permit of testing the quality of these fruits. All such information will be reported on from time to time, giving full information as to the most promising sorts. In every case the plain truth will be given in regard to everything tested, as far as the judgment of the officers in charge will permit, and I think that the reports we shall give from time to time as the Russian fruits progress in these orchards will be very important. There is one thing that I wish to say here as a word of caution. It is this: it is too often the case with fruit growers in the more temperate portions of the Province, in their desire to get everything that is new, to encumber their orchards with varieties which they would be better without, and I would say that there are very few of these Russian varieties of apples which it is desirable to grow in those districts where the best standard sorts can be produced, but some of them are likely to serve a most useful purpose in those districts of the country where the better and higher flavoured fruits, for which Ontario is now so noted, cannot be successfully grown. If we can place eventually such information at the disposal of every settler in the more distant settlements, which will enable him to grow fruit, even though it is not of the very highest quality, it will be much appreciated; it will add to his

comfort and to the health of his family, and give him some of the enjoyments which we are so favoured with in the older districts in which we live. Besides the tests which have been referred to of apples, similar work is being done with pears, plums and cherries. With regard to cherries, I think they are the most promising, next to apples, of all the hardy fruits with which we have to do. They grow very vigorously, and judging from the few samples of fruit we have had on the trees I think they are likely to be very acceptable indeed, and especially in those districts where fruit is scarce. The orchards occupy a considerable area. The standard varieties of apples are planted thirty feet apart, and all the other trees twenty feet. There are at least twelve or thirteen hundred in all, consisting of about three hundred and fifty varieties. Careful notes will be taken of these as they fruit, and information that is needed or thought of sufficient importance will be given to the public from time to time in the form of bulletins, which every one who desires can have on application. In small fruits also very much is being done. We have one hundred and fifty varieties of grapes of the named sorts, besides a great many new seedlings which have been originated on the farm. In currants, gooseberries, raspberries and strawberries the varieties will count probably two or three hundred more, that is, the named varieties. These are being carefully tested and compared from year to year, and as the results are noted and opinions formed the information is given to the public. In addition to this, we are endeavouring to originate Canadian varieties (seedlings produced) on the Experimental Farms. We had fruit in Ottawa last year; we fruited quite a number of seedling strawberries and raspberries, some of which are very promising. Samples of some of the best of these will be found in the exhibit when the fruit is arranged. I think I may safely say that we have among the new seedling raspberries some red varieties of remarkably good quality, which will do credit to the Experimental Farms. Several hundred of these new varieties have already been produced, and each year will see large additions to their number. After their merits have been fully investigated the best of them will be sent first to the Experimental Farms, and after that to other points, to be tested by practical fruit growers, as soon as the material for that purpose is available, and I think in this way we shall be able to produce in the course of time, not only varieties that will do us credit, but varieties that will be particularly well adapted for the colder districts, for the reason that they have originated here, and are acclimatized to their surroundings.

The continuance of such work will make Experimental Farms exceedingly interesting places for fruit growers to visit, and the interest will be increased from year to year. The Central Experimental Farm is intended to serve the purposes especially of Ontario and Quebec; the Maritime Province Farm, situated at Nappan, near the point of junction between the Province of Nova Scotia and New Brunswick, and very near the centre of Prince Edward Island opposite, will serve for these three provinces. Nova Scotia fruit has acquired a good reputation in the markets of the world, and it has gained that name from the superior quality of the productions of the famed Annapolis Valley. That is a valley which extends for about 100 miles, and varies in width from two to six miles. The idea is prevalent in Nova Scotia that if you want apples you must go to the Annapolis Valley; but recent experience has shown that this is not the only district in Nova Scotia where good fruit can be grown. In New Brunswick and Prince Edward Island there are promising orchards, and there are good grounds for the opinion that many useful and good varieties of fruit may be grown in these Provinces in sufficient quantities to supply the home demand and leave a surplus for foreign shipment. The idea that good fruit can only be grown in the Annapolis Valley is being gradually eradicated. Very good fruit is grown there, no doubt; but there are other localities in Nova Scotia, New Brunswick and Prince Edward Island where fruit can also be grown to good advantage, and this extension in the area over which fruit is grown will lead to a larger and more general consumption of fruits of every sort throughout those Provinces. When the site for the Experimental Farm was chosen at Nappan I was told there would be no use in trying to grow fruit there; but from the way the trees are thriving I am

satisfied we shall be able to show that that district is capable of growing good fruit. Passing westward, there is an Experimental Farm in Manitoba, at Brandon; and another at Indian Head, in the North-West Territories. As most of you know, there are serious climatic difficulties to contend with in the North-West in undertaking to grow fruit trees. The temperature is very low during the winter, sometimes remaining below zero for a month or more at a time. In looking over the records of temperature received from three Experimental Farms, I find that for as much as a fortnight at a time the thermometer has remained as low as 25° to 35° below zero. It requires very hardy fruit trees to stand such sustained cold. An occasional dip, followed by warm weather, does not seem to have the same effect on the vitality of the trees, as do these continuous low temperatures, especially when they are accompanied by strong drying winds. Small fruits can be grown without much difficulty in the North-West, for the reason that there is usually enough snow to protect them and they do not suffer to the same extent from the low temperature and drying winds as do the trees. Up to the time the Experimental Farm work began, I have not heard of any trees being taken to that country which were hardy enough to endure the climate. Some three years ago I visited Sir Donald Smith's place at Silver Heights, near Winnipeg, and examined the trees which were planted there. There were apple trees of the Duchess variety, which had been planted for some years, but every year they had been killed down to the snow line. When I saw these trees again last year I found very little change in them; they were about the same height as they were two years before; so that the prospect of growing the Duchess apple there is not very encouraging. I think that in the Red River Valley there always will be a very considerable difficulty in the way of growing fruit trees, for the reason that the soil is so rich and strong and deep that a late growth is sometimes induced in the autumn, and this soft new wood will not endure growth when succeeded by severe cold. I think this will not be found to be the case so often in those parts where the soil is lighter further west. On the bluffs and along the river valleys there are thousands of acres which, I hope, it may be practicable, before many years, to plant with fruit trees. We have had two summers' and one winter's experience at Indian Head and a summer's experience at Brandon, with about fifty or sixty varieties of Russian trees planted there of the harder sorts of apples, and a considerable proportion of them have passed through the very trying seasons referred to and promise fairly well. Our experience so far has, on the whole, been encouraging. The statement just made by the Honourable Minister of Agriculture, that we may be able to find an apple, as well as other varieties of fruit, that will endure in the North-West Territories, is quite likely to be verified; indeed, I think, there is good reason to believe we shall find, not only one, but a good many varieties that will succeed there. It is scarcely to be expected that the North-West will ever do much in the way of exporting fruit, but we may expect that as the taste for fruit becomes more general the demand will be greatly increased. The people will want these harder sorts for cooking, and will still desire to buy the high flavoured sorts grown in the east for the tables. If they cannot grow these hardy varieties at home, many persons will be compelled to go without fruit altogether, and that is a very great deprivation. The success of small fruits on the western farms has been more encouraging. I think there is no doubt that at Indian Head, during the coming season, we shall have quite a crop of small fruits. Gooseberries, currants, raspberries and strawberries have made fair growth, although, on account of the dry weather, they have not reached that development which is usually seen. I must also say a few words about British Columbia, for there we have a territory which, I think, will soon produce sufficient fruit for home consumption and a large surplus for export to the mining districts and small towns in the mountains, and to those parts of the Territories where fruit may not be so easily grown; also, to China, Japan and other Asiatic countries. I have never seen, anywhere, such crops of apples, pears, plums and cherries as those of British Columbia. At first I was a little doubtful in regard to the quality of these fruits, but when I visited the fairs last year at New Westminster and Ashcroft, and had opportunities of tasting the

fruit and of comparing it as well as I could from recollection with Ontario samples, they impressed me as being very good, and if they were at all inferior in quality to similar varieties grown in the east the difference was not sufficiently marked to enable me to detect it. I took such varieties as the Spitzenberg, Ribston Pippin, Fameuse and Gravenstein, and several other highly flavoured sorts for test, and in point of size they much surpass those grown in the east. The climate is of that character which induces slow and regular growth all through the season, and the growth is continuous during a long period. As a rule, the high flavoured varieties of fruit are produced of better quality as we get further north, and with the proportion of cold they get in British Columbia they are able to grow fruits of higher flavour than can be produced in the more southern districts of California. We sometimes produce large crops, but I have never seen anywhere else trees so heavily loaded with fruit as I have there. They are also free from most of the insect pests and the pear blight. They have the twig blight on the apples, but this is not a very serious trouble. I think that with a climate that will produce such crops of the fruits named, and grow, also, peaches, apricots, walnuts and many other products to advantage, which may be shipped to different parts of Canada as well as to Asiatic ports, British Columbia must soon become a fruit exporting Province. The climate is not warm enough in any part I have visited to grow good grapes; it is probable that in many localities the earlier ripening sorts may mature, but there is not enough heat during the summer to ripen the higher flavoured varieties of grapes. There will, no doubt, be a great opening there for the canning industry and the drying of fruits. Should the supply at any time exceed the demand, the surplus can easily be disposed of by the use of fruit evaporators, as the dried fruit will bear shipment to any part of the world. The object in view at all the Experimental Farms is to encourage the people to grow the very best quality of grain, and fruits and do the very best for themselves, so that they may have products of high quality to sell, which will command good prices. At the present time, while they grow plenty of pears in British Columbia, there are not very many of them that are of very good quality. People usually want, at first, something showy and big, and in almost every garden you will find such varieties as the "Belle Angevine," specimens of which will sometimes weigh as much as two pounds. By boiling a long time they may be made serviceable as a cooking pear, but as a table fruit it is a worthless sort. Better varieties are now being rapidly introduced, and the people there will, no doubt, soon be supplied with the very best sorts obtainable. An active fruit growers' association has been recently organized there, and a representative of that association, Mr. Henry, is with us to-day. I visited Mr. Henry's place last September, and was astonished at what I saw. He had Cuthbert raspberries which had made nine feet of growth in a season, and he told me that they had been gathering fruit all season off those bushes, and there was fruit still on them. I saw grape vines that had made fifteen and twenty feet of growth, while trees in nursery rows showed an annual growth of four to six feet. From this it may be inferred that orchards could be got into bearing in very much less time than can be done in the east, and that the progress of fruit-growing may reasonably be expected to be very rapid. A large orchard has been started at the Experimental Farm in British Columbia, where it is proposed to test all varieties of fruit which give promise of success, so that we may be prepared to give information with respect to the growing of fruit and other products, so that we may help the settlers to make the most of their products, and cultivate their land with the greatest advantage and profit to themselves and to the country. I have now given you a very brief outline of some of the features of the work being undertaken at the Experimental Farms bearing on the advancement of horticulture.

The convention then adjourned until 8 o'clock.

EVENING SESSION.

A joint meeting of the Dominion Dairy Association and the Dominion Fruit Growers' Association was held at the City Hall, Ottawa, on the evening of Wednesday, 19th February, Prof. Penhallow occupying the chair. The Council Chamber was well filled with members of the associations and visitors.

THE CHAIRMAN.—The meeting which we hold this evening is to be regarded as a joint convention of fruit growers and dairymen. We have amalgamated this evening to discuss those questions of common interest to us, and those questions relate to export especially, so far as concerns the handling of fruit and dairy products and shipment in cold storage in steamships. As this matter concerns the transportation companies quite as much as it does ourselves, we have made special arrangements for the representation here of the various companies concerned. I have pleasure in stating that the Allan Line is represented by Mr. Watt, the Beaver Line by Mr. Shaw, the various London lines by Mr. Gedd, and the Dominion Line is to be represented by Mr. Torrance. The Canadian Pacific Railway is represented by their local representative in Ottawa, and the Grand Trunk Railway has also a representative here, but unfortunately I have not the name of this gentleman at present. The Canadian Express Company is also represented by a letter which I have from the President, stating such features of the transportation as concern his company, and which will be read in proper course. The proceedings I think we will open by the presentation of two papers which have been prepared specially for this subject, and on the basis of these papers we hope that the representatives of the various companies and those particularly interested in the question of exportation will enter upon a free discussion. I would therefore call upon Mr. A. McD. Allan, of Goderich, to read his paper about the transportation of fruits.

MR. A. McD. ALLAN.—Mr. President and gentlemen: I have no paper on the transportation of fruit. There was some misapprehension regarding this subject, if it was understood that I would read a paper or lead off with a discussion of this subject. I did not understand it in that way until this morning. Under the circumstances, I am taken at a disadvantage. However, I am willing to do what I can towards introducing the subject in as fair and square a way as I possibly can, and I have no doubt there are parties here quite competent to correct me in any misstatements I may possibly make. I look upon the question as one of the most important questions affecting the fruit interests of this country, and looking at it in that way I am willing to allow the agents or representatives of the transportation companies who may be present to take the usual method adopted by some of them of avoiding this question, and I will begin by admitting the points that they usually advance in order to avoid the main points at issue—that is, I am willing that we shall take a certain proportion of the blame on ourselves. Indeed, I am willing possibly to go further than a good many will admit. I know I find parties not willing to go as far as I am willing to go in this respect. I believe that there are points connected with this subject that we ourselves as growers and as packers and as shippers can remedy to a very large extent, so that I am unwilling to place the entire blame upon the transportation companies by any means. There is blame enough resting there, as we shall see probably before this discussion has ended, and there are a good many points, if they are willing, they can remedy. In the first place, the blame rests away back with the fruit grower himself. The first point of blame is that the fruit grower does not grade the fruit properly to begin with. We have already discussed those subjects. We have discussed them in every hall and on every corner in every town and village in this country. We have tried our best to drum the different points into the fruit growers and farmers of this country. We have not only then to make a specialty of fruit culture, but we must grow fruits as they should be grown for the markets, and it is only in this way that shippers can get fruit of such a kind and quality as can be packed for the European and other markets. So, I say, in the first place the growers themselves are to blame for not growing the fruit properly, and the point I make there is simply this: with that

fruit that is not supplied with the necessary elements to produce fruit of proper quality that fruit will not carry as well as it would otherwise. Then the picking—I consider that probably one of the greatest secrets of the whole apple trade, and apples are the chief commercial fruit of this country. Probably the greatest secret in the whole trade is the simple secret of knowing when to pick the apples. There is a point the people have not considered sufficiently. There is a right time to pick the apples and there is a wrong time. If you leave that fruit upon the trees until you consider it is ripe then the ripening process is a decaying process, and it has gone so far that that fruit will not carry to a distant market—no, or it even will not carry to a very near market. It has lost a large proportion of its proper keeping quality. Now, that is a point that is well worth studying. I have found this frequently after picking up good windfalls that of course have fallen about the time an apple begins to get its colour, about the time the apple has reached its maturity, so far as growth is concerned. Taking these windfalls and packing them away carefully in the same cellar with picked apples, I find that the culls or windfalls will keep longer than the others. Why? Because the windfalls are picked by nature in the windstorm in proper time, and the others left too long on the tree. What we want is to have our fruit keep for the longest possible time and reach the furthest market. Then the packers are to blame. There is a certain amount of blame there for looseness in packing. The packer should be a scientific man; he should understand each individual variety he is packing, because a variety slightly spongy will require a little more to tighten the barrel properly than a variety that is crisp. There is a certain amount of give to it, and it will require little more to fill that barrel and have it tight. On the other hand, a great many packers put too much in a barrel. There is no necessity for that at all. That is not good packing. Then, passing from that, I would give certain points I would fix in the matter, perhaps not strictly according to the text given me. However, they are points that come in in introducing the subject, and should receive a great deal of care. We have heard a great deal about the packages in which cheese and butter are sold; we saw a specimen on the table to-day of a package of cheap butter—good butter made cheap on account of the package. We want the same thing in fruit; we want a good package, a neat package and a clean package, because when we go to the distant market the buyer is going to judge what is inside by the package. If he sees a good package that has caused some trouble and expense to manufacture, a neat package and a clean package, he naturally concludes that the owner of that could not afford to put up a mean, contemptible article inside. He has something worth while there, and he is very willing to buy on the chances; whereas, in the other case they would not buy; if they did so it would be at low prices. It is necessary in shipping that we should have cars perfectly clean. There is a point wherein we have found very great difficulty. As well as having cars clean, those cars should be supplied to us with dispatch. When we have fruit to ship we want the cars there, and in some sections where we have not competition we find a great deal of trouble in getting clean cars. I have seen shippers ship in cattle cars, in open cars used for shipping cattle, and they were bound to get the fruit off in some way, to save it from perishing. These are points that are necessary to be looked after, and these are points we want the railway companies to look after. We want the railway companies to look after these points in proper season, and they should know the fruit districts and the quantity which will require shipment. They can easily know in proper time about the shipping quantity from the different sections, judging from what, they can tell the amount of car room that will be required during the season. They can get these particulars for the summer, fall, and winter fruits, and know pretty near the approximate amount to be furnished, and they can judge the cars they want to supply. It is absolutely necessary to look to the supply, and have enough of the cars on hand to carry that fruit away. Then we have found fault frequently with the railway companies and other carrying companies for delay. A great deal of the delays on the railway company's hands is owing to the company's employees shunting the cars off here and there, where there is a car or two to be got here and more at

another station. There is a great deal of delay in that respect. Probably these cars are lying at the station goodness knows how long—sometimes days—and the cars will not reach the seaboard in time for shipment on the vessel. There is a great deal of unnecessary delay, I think, in a great many if not the majority of cases. Of course, the railway companies claim that they cannot, unless that they have a train-load, afford to run directly to the seaboard. Perhaps that is true. I was proposing that they should run fruit trains on certain days of the week from certain fruit points, for the purpose of reaching the seaboard in proper times for transhipment on certain vessels. The difficulty can be overcome in that way, and in discussing it amongst themselves these suggestions can be urged. There might be a remedy to some extent there at all events. I think the railway company, when they look into that matter properly, will be able to provide a remedy to some extent. If they cannot remedy the wrong totally, if the growers and shippers meet them half way or part of the way, we will be doing something. We want them to try and do something. That damage in shunting is a damage we have discussed before. I have mentioned it several times, and that damage continues, and it is a very much more serious damage than the railway companies are willing to admit. There is a damage there, and a serious damage, even if the barrels are not battered together or if they are not smashed open. They are, however, frequently broken open. That is a very common thing, and I have no doubt the agents here present will have noticed this at the point of transfer. They will have noticed that on opening the cars and transferring the goods to the vessel that there is scarcely a car without some barrel smashed open. That is done by shunting. There is damage to the fruit in the barrels, owing to rough shunting. We know how roughly they jostle us about sometimes on the passenger cars. We have suggested the remedy adopted in England of using buffers between the cars, and it seems to remedy the difficulty there most thoroughly, and the railway companies have complained of the expense of this remedy. I don't know, but I should fancy it would save them considerable in their own rolling stock, in the damage to their own rolling stock, by the adoption of some scheme in that line, let alone the damage to the goods in transhipment.

Then there is often delay and very often damage in the transfer from the railway company to the steamships. That is a point that has been discussed often, and is a point that some have paid a good deal of attention to. I could mention some steamship companies that have paid a good deal of attention to this matter and have done considerable towards remedying this defect. Still there appears to be a good deal of damage there, which I think, with proper care, might be remedied to a considerable extent. Then a leading point would be this: The accommodation of the steamship companies. I believe there is a point that a great deal can be done with respect to. The fact of the matter is, that the fruit culture of this country is practically at a standstill. Why? Simply because we are not able to take the crop and land it in the markets of Great Britain by means of steamships in anything like the condition that it is when picked or even when it reaches the seaboard. There is great damage on the ship, there is no doubt about that. There is a damage by heating. Now, it is necessary to stick as close to nature as possible, and in order to get a little closer to nature than we used to be, some of us are going to try a new form of barrel, called the ventilated barrel. Some of us who have looked into the matter have great hopes of this barrel. We want proper ventilation for our fruit. We want fresh air in the compartments of the vessel. That has got to be provided, and this fan system, as I have examined it in some of the vessels at Montreal, seems to me to be a step in the right direction, and will remedy the defect to a great extent, if not entirely. Probably if that system be carried out to perfection it will meet the point perfectly. It is an atmospheric blast that we want. We do not want ice storage. We had a test of that at the time of the Indian and Colonial Exhibition. It carried the fruit well across the ocean, but being an unnatural atmosphere, when the fruit leaves the vessel it perishes more quickly than if it had been all the while in a natural atmosphere. That can be seen by keeping fruit in an ice-house. You will find that when you take it out it will decay much more quickly than it does

when kept in a more natural atmosphere. We want the steamship companies to provide clean accommodation. There must be nothing there that will give an odour to the fruit, and there is nothing that will take an odour quicker than fruit. The moment the fruit takes the least odour, that moment it begins to decay. It will not keep under such circumstances at all. If there be any disagreeable smell on board a ship the fruit will be very apt to take it up, and anyone with a sharp taste will quickly notice it in high flavoured varieties. I refer, particularly, to vessels carrying cattle. In vessels of that description they have to be very particular indeed—in fact, I almost question whether they will be able to separate the cattle and the fruit departments so as to keep the fruit free from contamination. It is possible that they can, and I hope they can. This matter of vessel accommodation is one that we should press very strongly, and I believe that if our steamships plying between Montreal and British ports would pay more attention to this—and we have brought it before them several times—it would be an easy matter for us, as members of the Fruit Growers' Associations, to go to the people and advise them to go into fruit culture on a much larger scale than now. Moreover, we would be able not only to ship our winter fruit in much better condition than heretofore, but we would be able to ship our fall fruit and summer fruit. We ought to be able to ship those varieties. I tell you, there is more money in summer and fall apples in Great Britain than in the best winter apples, if we can land those apples there in anything like fair order. The people of Great Britain want fruit at that particular season, and they are willing to pay for it at that time. We have fine varieties of summer and fall fruit that we can ship now—varieties that would take the eye of the Britisher at once. But we must have the accommodation in order to do that. I believe we can get that in the way I have mentioned, and also by means of ventilated cars. They have cars enough of that description, and they would supply us with these if the steamships plying across the Atlantic would give us thorough accomodation in carrying the fruit. This is a matter lying with the steamship companies. If they want to extend the fruit trade of this Dominion, that is one of the most important points to take into consideration for the accomplishment of that end. If they do that it will enable us to go to the fruit growers all over the Dominion and advocate an increase of cultivation. There is no trouble in getting that if we have these arrangements satisfactorily made with respect to ventilation. I might say that the line I examined was the Beaver Line, at Montreal. I went over one of their vessels and examined their system of ventilation, as well as their system of cold air by the fan system. I must say right here that I believe in giving honour to whom honour is due, and when we are dealing with these public corporations I do not want to put one against the other, but I wish to give honour where it is due. In my experience, the Beaver Line has done more for fruit growers than any line plying across the Atlantic, simply because they have put that accommodation on their vessels. Since they have done that I have not heard a single complaint nor a bill of damages presented for a single cargo carried yet. We cannot say that of the other lines. Against the Allan Line and others, too, bills upon bills for damages have been presented. Cargoes that have been watched to their vessels and watched while being taken on were found on arrival to be damaged, and badly damaged.

MR. TORRANCE.—I would like you to establish that.

MR. ALLAN.—You can have the floor when I am through. Since the cold blast was put in the Beaver Line steamers we have not received notice of one single claim for damages. If the representative of that line is here he can say if they have received any such notice; but we have not. We have heard of innumerable cases with the other lines. Then there is another difficulty when we come to the bills of lading. The difficulties with respect to the bills of lading have no end to them. The bills of lading of the present time were evidently invented about Adam's time or thereabouts. I do not know of a more one-sided contract than the bill of lading than we are compelled to use. It is not a fair contract. The carrying company is not willing to undertake anything, and when there is a bill of damages they always meet you with this bill of lading. They are protected at once, while the poor

shipper or fruit grower, whoever he may be, who is prosecuting this business, has no remedy. I instanced in my last annual address to the Fruit Growers' Association of Ontario an actual case that occurred with the Allan Line. I took that one case as a substantial case. Two hundred barrels of apples were bought by a firm in Covent Garden, London. In the first place, they were about a month in transit, and the damage upon those 200 barrels was something like £100. I know what condition they were in. I saw them and examined them for the party who was selling, and also examined them on behalf of the parties who were buying them. I say that those apples were in the proper condition to be shipped: I saw as to the packing, and I know they should have landed in perfect order; but the result was the report we got back. I published that, and it will appear in my annual address with the names of the parties concerned. The report was that there was a large quantity of cattle manure immediately above—I presume, on the deck above—the apples. The report said over the apples, and I take that to mean on the deck above. A complaint was made to the steamship line, but they could not see where they were liable. The apples were all safe. When they were taken out, however, they were at a boiling heat. They were in cider, and hot cider at that. Still, there was nothing wrong there. No negligence—everything was done all right. In that case, however, I blamed the Grand Trunk more than I blamed the Allan Line. The Allan Line were to blame for allowing the apples to go upon the steamer in such a state, as they were evidently not in a condition to be shipped.

The bill of lading should give us the guaranteed count. I see no reason on earth why it should not; yet we are refused that all the time. If I ship ten barrels to a friend in any town in England I get a bill of lading for ten barrels. If there is any reason why I should not get a bill for 10,000 barrels if I ship them, they should give us a guaranteed count. We find a loss there, because we do not get that count. We invariably find a shortage. I do not wish to suggest where that shortage comes in; but we say this much, that we do, through an arrangement with the agents once in a while get the count. We have succeeded in getting the count, and never knew a shortage under the circumstances. I presume there was no shortage. In fact, the report we got from the vessel was, that there was no shortage. I have not known a case yet where they had a count where they did not get the proper number of barrels of apples; yet, on the other hand, where there is no count but the shipper's count marked on the bill of lading there is a shortage almost every time. It scarcely ever happens that we find the correct thing. They naturally say our account is astray then. I see no reason on earth why the railway or steamship companies should not give us a count. It is very little trouble, and it would encourage us to go on in the shipment of fruit, and encourage us to go on in the growth of fruits. We have, on the whole, lost in this very matter. It is quite a heavy loss.

Another point that works against us is this: I believe the railway companies and the steamship companies here have considerable difficulty in getting the railway companies in Britain to give the rates corresponding with the through rates that we get here. In other words, as I understand it, the railway companies in Britain charge local rates, and we can get no advantage, therefore, in going to the inland market anywhere. Frequently where we want to ship to Manchester or Birmingham or a market of that description, where it has to go from the seaboard by rail, the companies here almost always, so far as I know, repeat to us that the rate will be so-and-so, and it is local freight from the water delivered to the point where we want to ship. That is one point, but how best to call for a remedy there I don't know. I believe our companies here could do a good deal towards remedying that by working with the companies there. Probably they could do a great deal more than we could, because we cannot get hold of them on the other side of the Atlantic. That is one point. Then the bills of lading seem to be all on the side of the company. I have one here—one used by the Grand Trunk. They are not liable for delays in the carriage of perishable goods; neither are they liable for shortage. Take, for instance, a case: If you ship a car-load of apples and

they are shunted off at a station, a hundred and fifty miles away, it is a simple matter to open these cars. They are simply sealed with a little lead button and it is an easy thing for anyone to help himself to a barrel or two barrels of apples, and there will be a shortage then. It is found repeatedly that this is actually done. We have counted carefully at the shipping point and found a shortage at Montreal. What other way can we account for it? The parties say they are perfectly certain of their count, that it is correct, and it comes back that there is a shortage at Montreal. The goods must have been taken out in the meantime, somewhere during the shunting. I cannot see that it is fair that they should not be liable for the delays to some extent. It would not be fair that a railway company should be liable for delays in every case, because there are some delays that cannot be avoided, but there are some delays surely that they should be liable for—unnecessary delays. There are unnecessary delays; we know that. Another drawback is heat. A steamship company is not liable for heating the apples. If they packed them right around the boiler, they would be in fine condition when they got to the other side, yet, I presume they would tell us they are not liable for anything. They are not liable for shortage. We have heard a good deal of stealing going on up the Thames, and a great many complaints have come to us. We find that shortages are increasing in the Atlantic trade. We have wondered how that could occur. I do not know, but I do know that shortages have occurred and damages have occurred. Well now, I think I will leave it at that, in the meantime, except this point, that I think probably it is possible to lower the rates. I would like the representatives of the companies present to consider that matter. Are the present through rates on apples as low as the rates upon other corresponding goods—for instance, on flour? I understand the rates are very much lower on flour. I understood that, but I do not know how it is, and I would like some of the gentlemen present to answer that question. Are the rates not lower upon flour than upon apples? If this is so, I think that is wrong, because I think apples are a much closer freight to handle than flour. I should say apples should be much lower. The gentlemen present will be able to tell us whether they are at present. I have been told that this was so. Taking even these points I have mentioned from simple jottings I have made, I think the representatives of the railway and steamship companies should look at this matter fairly and squarely, and meet us like men, and do something towards remedying some of these difficulties. Let them do what they can. We are willing to wait. We are willing to put up and be satisfied with some improvement if we can see some improvement going on. We do want to see some improvement. We cannot go to-morrow and ask people to extend their orchard area. We cannot advise them to do such things unless we get the accommodation necessary to place that fruit in competition with other countries in Great Britain. We must come into competition with other countries. We have the fruit here. We know that there is no country in the world can grow a commercial apple, a winter apple of as high a flavour as we can in this Canada of ours. The finest apples in the world are Canadian apples. We challenge the world to meet us in any market for apples. We have the flavour, and some seem to have struck the happy medium in apple culture. We want the carrying companies to assist us in building up this trade to which there is practically no limit. After the British market is supplied I can understand that there are other markets we can go to. We are willing to meet with the fruits of other countries in all these markets and compete for a place, and I believe we can compete successfully if we can get the arrangements to suit us for fruit in transportation. (Applause).

MR. P. C. DEMPSEY.—Mr. Chairman and gentlemen,—The selecting and packing of fruit for the market is something like the old fashioned recipe for cooking the bear—"catch him first;" so we want to consider what we are to do to get the fruit first. If we cannot get good fruit it is nonsense for us to talk of selecting and packing properly for the foreign market, because our foreign markets don't want our fruits unless they are good. Attention should always be given to the thinning of our fruits. The fruits are easily thinned now, and in dealing with it we can accomplish two or three different points. One is, that when we thin out the branches and remove a large propor-

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tion of the fruit buds and a large proportion at the same time of wood buds we are accom-
plishing two objects. Another is, that we prevent our trees from exhausting themselves
in blossoming. We hear so many people say when we are looking over the country in
the spring of the year: "We are not likely to have a good crop of fruit this year.
We have an abundance of bloom, but the bloom is pale." Why is it pale? The
tree is actually exhausting itself in blossoms, and the result is there is no vitality in
them or in the tree to induce the flower to properly seed. This accounts for the
failure and people can see it in the paleness of the blossoms. The petal of the
blossom does not properly develop. Again, the colouring of our fruit comes through
the foliage. The flavour, or that saccharine matter which gives to our fruit its good
flavor, comes from the foliage, and by thinning the wood buds, we lessen the quantity
of foliage and by this means increase the size, the strength and the health of the
foliage. So this is the season of the year to thin out our fruit. We have more time
to do it now and it is easier done. I could not see how I could get at my subject
without laying the foundation first. Now, when we get the first quality of fruit we
can calculate that we are quite safe and can depend on fancy prices. I will just
quote a few of the fancy prices that have been obtained this year for certain
varieties of apples in Covent Garden, London. Qualities of Newton Pippins on the
same day varied from thirty shillings to eighty per barrel. Why should there be
such a difference? The one lot evidently was properly selected, properly packed,
and arrived in good order. I have seen barrels of apples opened there, and you
would see one barrel from which they had neglected to pick out the blemished
apples—those not fit for that market. These blemished apples ought not to be
sent there at all. Perhaps every apple in the other barrel is perfect. It does
not matter so much about the size of the class so much; consequently we
should carefully pick over our apples if we are going to ship them to England
and put in nothing but first-class specimens, uniform in size throughout the barrel
and as uniform in colour as possible. Under no circumstances should we allow ourselves
to be influenced to have poorer apples in the centre of the barrel than the
barrel is faced with. So much for selecting our apples. Now, if we go there we will
see how careful they are—that is, the growers—even in selecting their potatoes
for market. The potatoes are never sent to market in England without being rid-
dled. They send none but perfect specimens; nothing but comes up to a certain
style. All the smaller ones are out. By this means the purchaser has confidence
in the potatoes without examining them—confident that they are all going to be like
the sample. We want to have our apples all like the sample that appears on open-
ing the barrel. If they open one barrel, let that be used for an index of our ship-
ment. Now, in preparing the barrels for packing where we are packing in barrels,
for foreign shipments, we want to cut the stems off. We must not pull it out. I
have in my hand an apple from which the stem has been pulled, and the result is that
the apple has begun to decay where the stem was removed. That is invariably the
result. In a short time it will spoil. They will lay it to the bruise that always takes
place at the end of the barrel, that is caused from pressing the head on. An apple
scarcely ever takes injury from the pressing it gets. The injury is caused from
pulling out the stem. Now, by taking a pair of scissors and cutting off the stem, we
prevent the stem from pressing on the apple or cutting the skin, and we also pre-
vent it from rotting by the pulling of it out. Then they should be carefully
placed in closing the barrel. Allow me here to say, that it pays to line the
end of the barrel with paper; and white paper is better than any other. It
does not cost much. If we line the end of the barrel with paper, simply
getting this light building paper and cutting it out to the proper size of the
head of the barrel, and place it in first, they will open up very much pret-
tier and the bruises will not show as much as if you had not used the paper at
all. When we get this done, we try for foreign shipment to set our barrel on a large
flat stone or plank, so that we can shake it every time we put in a peck or half a
bushel of apples in the barrel. It does not get the same jar if it be not on something
hard. We continue this shaking until we get the barrel full, and by thoroughly

shaking them we do not have to raise the apples so high nor to press them so heavily, and consequently not to bruise them in putting on the head. Where these points are observed we find no difficulty with respect to slackening. I did have one shipment that was twenty days on the Atlantic, and they were all slack when they arrived. I fancy that accounts for a great deal of slack packing, and what will apply to foreign markets will apply to our own as well. At our home markets we can afford to take less for second quality apples. I should not ship any seconds across the Atlantic, but I would ship nothing but firsts. There is a market for second quality here, which does not amount to so much, and they can be sold cheaper. I have noticed in our markets that there is very little difference in what we realized for first and second quality. We generally mark our apples in three qualities: X, XX, XXX. The XXX is generally only fit for the foreign market. The XX we ship to our markets in Canada, and we find very little difference between the receipts from them and from the better quality. But the X, of course, has gone down so that the difference is noticed. Here is a point we want to notice very particularly in packing fruits. A certain quantity of apples went from one part of the country to Montreal this year. They were all seconds or thirds, but were marked firsts. Now this should never be done, from the fact that it has a tendency to lead dealers to suspect that all fruit growers are rogues. They are not all that. There are honest men among fruit growers as well as among other classes of people; but that man who would mark a second quality barrel of apples as first should not be countenanced by this association or anybody else. (Applause); because he demoralizes the trade and his conduct has a tendency to arouse suspicion against other fruit growers who wish to be honest. Now as to the form of package. I noticed in London the French people were shipping pears in boxes—a certain number to each box. The boxes were made to hold a certain number in proportion to the size of the fruit; but only one tier of pears was put in each box. The boxes contained 4, 6, 8 or 12 pears. Twelve was the most I saw in one case. You may have noticed from quotations in the London markets this year that a great many cases of pears were sold from 3s. 6d.—that is the lowest I heard of in selling at—to 16s. per case. Now I saw in one instance between Christmas and New Years, where a case containing four Glout Moreeau pears sold for 16s. There is 4s. apiece for pears. Will it pay us to grow them carefully and pack them carefully in any style of package we see fit to use and ship at that price? It will pay at 3s. 6d. a case well. The way this is done is to have a shallow case made, which they get up very neat and nice. They line them with cotton batting and place the pears in, and put a little tier of batting between each specimen, so there is no chance for the pears to move while in this little case. Then there is a layer of batting put over them again and tissue paper cut ornamenteally put about the border. There is a little lid with wire hinges and a hook to hold it down. This little box is easily opened and easily closed; it looks very neat, and the pears are very attractive when it is opened up. These cases are packed in larger crates, so that they are quite easily shipped—just as easily as barrels of fruits. I fancy it would pay us to send our finest apples that way. It would pay us to grow the very finest. You may have noticed that somewhere between the 12th and 15th January the last English apples were sold there. Take Cox's Orange Pippin. It is a small apple; yet these apples sell for 4 pence each. That amounts to \$25 per bushel. Only calculate for a moment if it will pay to grow apples at just a quarter of that price. We can grow in our orchards here just as fine Cox's Orange Pippins with ordinary cultivation as they can in England and Wales. I know this to be a fact, because I have shown Cox's Orange Pippins grown in my orchard against the same variety grown on the wall in England. I could not see any difference, and they acknowledged they could find no difference in the flavour. Those which were grown in the open orchard there were very inferior to ours both in flavour, form and colour. Now, what applies to Cox's Orange Pippin applies to any other variety. A question arises right here, which we had better settle at once, because it is important. Why is it there are not more of Cox's Orange Pippin and fine varieties grown in this country than there are? Do not misunderstand that question. Why is it there are

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no more? I will tell you. It takes a nurseryman four years to raise one of these trees four feet high. It is a little growing thing then. It is quite hardy, but it grows so slow that farmers will not have them. If an agent came to deliver Cox's Orange Pippin, such as the best nurserymen grow, the farmer would kick him off his premises. Thus the farmers are destroying their own trade by wanting an extra fine looking tree. They simply compel nurserymen to grow worthless varieties because they make the finest tree. We want to do away with this idea.

A MEMBER—What is the season for Cox's Orange Pippin?

MR. DEMPSEY.—December and January. It may be kept easily through January with care. It is a very fine apple in November. From all the accounts that I have been able to gather, the fruits grown in the interior of Russia are dwarf-growing. They grow low. I have a tree in my garden that is very hardy. It originated in the north of Scotland and has been producing a good crop of apples every year for the last 12 or 15 years; yet it is no bigger than a currant bush now. It makes a healthy growth every year. It is a very hardy variety, and would grow in Ottawa or anywhere in Canada. The snow protects it. Nearly the whole tree is under the snow. The apple is also very fine; but we do not want to grow such little trees. We can grow something that becomes larger and more profitable—not more productive on the whole, because you could grow these trees four feet apart, and I believe an acre of them would be remunerative. Now, I have it in my mind that nothing would pay us better than to adopt the principle of packing our fruits in these little boxes ready for the retailer to sell in this market or the Montreal market, or in any other market in the world. I am satisfied we cannot get such prices here for fancy pears and apples as in Covent Garden Market, London; but we can certainly get better prices by shipping them in that shape. The cost would not exceed ten cents for a box that would hold a dozen Bartlett pears or a dozen Flemish Beauty pears. Supposing that box would sell in our market at 30 or 40 cents, would it pay us very much more than the prices we receive by the barrel, even by leaving out all our culled fruit to feed to the pigs, such as we sometimes ship in barrels? I fancy that these little boxes can be gotten up for perhaps four cents apiece, because they can be made of a thin stuff, such as we make baskets of, and cheaper than the crate basket holding the same quantity. Now, for shipping in baskets I find invariably that the basket that is a little slanting keeps the fruit better and stands shipping better than one that is perpendicular. It should be a little slanting to the bottom and arranged some way that that part is always kept down. The fruit is wedged in that way, and if that one side can be kept down, the apples can never roll and chafe about. You can understand the advantage of having a package a little slanting where there is more than one thickness or one tier deep. Now something has been hinted about perforated barrels. I don't want to oppose any enterprise of that kind. It may be proved to be of very great advantage to us to use the perforated barrel or the open package, but that is not in accordance with my experience. I find that if our fruit is packed a little warmer than the temperature is likely to be when it leaves our hands in a close package it invariably carries better and is safer than where it is in open packages and the fruit cooler than when we pack it. When the fruit is cooler than the surrounding atmosphere, you will almost invariably find condensing moisture from the surrounding atmosphere, and the package becomes wet, and the result is decayed fruit. Almost invariably, I fancy, if our fruits could be packed in the same temperature that they would have when they are put in the hold of the ship they would carry perfectly safe, but as a general thing they go to the hold of the ship cool and they are put in this warm place. They condense a large amount of moisture, and in a short time you will find water running out of the package on board the ship. I have seen this thing, and I know what the effect is exactly. My friend, Mr. Aiken, was speaking to you about delays in shipping. Just here I want to give you an idea. The steamship companies are not all to blame, and a practical illustration is better than any other way for you to understand how these things work. A certain gentleman whom I know started out with a carload of apples last fall to come to Ottawa with them. He had a stove in the

car, and when he got to Brockville he was shunted off. He was out of wood and could not get any wood. The fellow evidently had not ever been very far from home, or something else. He was the owner of the carload of apples. They left him there until his whole carload of apples became frozen, and he had the pleasure of looking at it. He did not know how to get the wood. He did not know how to keep the fire up, although it was easy for him to smash the head out of a barrel and treat the men. Another man started out with a carload of apples, and I said to him when he was starting out: "What are you going to do?" He replied: "I am filling up these two baskets just for the men's account. I am not going to be stopped along the road at all." Sure enough, he had a few baskets of apples with him. When he got to Brockville he was shunted off. Some cars were going to Montreal and his car was going to Coteau around to Ottawa. When he was shunted off he said: "Gentlemen, you ain't going to leave me here; are you coming in to eat some apples with me?" They had a jolly time there eating apples, and his car was hitched on and he came on, while the other fellow was left there. He got out of wood, when he got on his coat and said: "Here men, come in and have some apples." In a few minutes he said: "I am out of wood," and in a few moments more he had plenty of wood thrown in. If you send a car of fruit it is shunted off at Brockville, on its way to Montreal, and it stands there four or five days for these fellows waiting to be tipped. That is the result of my experience. There is no doubt that barrels have suffered considerably after they get on board the ship, though I must confess that all I have ever shipped went in perfect order, with the exception of some that were twenty days on the Atlantic. They were all black and bad.

The PRESIDENT.—We have now listened to these two papers on the transportation, selection and packing of fruits. The gentlemen have each noted in their own way important points for consideration. The most important points that we have to take up, I think, in connection with them, are those which concern the railroad and steamship companies, and so we have representatives of these companies here who are prepared, no doubt, to give us their views on the matter. I hope that we may arrive at some satisfactory result. In discussing those papers I will ask you to bear in mind that it is our object this evening to arrive at some mutual understanding by which the difficulties presented to you may be overcome, and that the transport of fruit may be facilitated, and that the large foreign market which is now open to us, but of which we cannot avail ourselves at present, may be rendered valuable. I will, therefore, ask you to consider the points raised in these papers, and I trust those representatives of the transportation companies who are here will favour us with their views on the matter.

Mr. WATT.—**Mr. Chairman and gentlemen**—I have never had occasion to attend so large a convention as this, but I have been at conventions of the kind, in which the steamship people were made butts more or less; but there is one thing—nothing like show. A short time ago I was amongst some flour gentlemen, and there was nothing wanted but flour. The cattle men in Montreal just now are having considerable discussion. In fact, there is nothing to transport across the Atlantic but cattle and cheese. Mr. Allan objects to sending fruit with cattle. I have heard men object to sending their flour with fruit, cheese or other commodities. Each gentleman thinks his commodities are all that we have or should have. The ship is the final deliverer, so to speak. She has to stand the trouble of all previous carriers who have carried the commodities to port by rail. The goods are carried partly by rail and partly by steamship, and the steamship happens to be the last one, and she generally gets the kicks. That is her experience on that score. There is nothing which we carry as carriers which is more perishable than fruit. There is nothing more likely to suffer in course of transit. The difficulty we have is its short-lived character. The steamship people have, as a matter of course, to establish the steamship service. We begin at the beginning of the season and carry on business weekly or fortnightly the year through. You gentlemen are not ready to give us anything in May, June, July or August. You have nothing to give us in September; but in October and November you expect the whole steamship service

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at Montreal to be placed in the service of fruit. This is a very difficult thing to do—a very difficult thing, from the steamship point of view. Last year, 1889, I think we shipped only 140,000 or 150,000 barrels of fruit out of Montreal, while the previous year we shipped 260,000 barrels.

Mr. ALLAN.—The rest went by New York.

Mr. WATT.—Not at all. It was not in the country to ship; you had not the fruit to ship this season—that is perfectly well known. The New York shipments are precisely to the same effect. I only give these facts to show that the steamship people have to take a wider view than the fruit people, the cheese people or the flour people. They have to formulate their rates to all classes of traffic, and they have to assimilate their space to all classes of traffic, and do their best with this multiplicity of business that comes to accommodate the freight. In the autumn it is especially difficult. The freight, so far as material is concerned, is confined to two months, during the time during which the harvest crop moves, and the dealers in every special expect just the same service as the freight which has been giving the service during the whole season; so we have to cut down our best customers, in a certain sense and disappoint and shove them out in order to make a service for that two months' business. We want to encourage all the business we can in the St. Lawrence of this varied character, because if one class of business fails another will keep up. We want to assimilate the fruit, just as cheese, flour or other products of the country. I do not think I need answer the complaints made by Mr. Allan, as they are matters of detail that can be discussed by the parties. I believe it is true that the railway companies prefer giving bills of lading at shippers' risk; but we receive fruit on the steamships just the same as other things. We count the packages and give receipts by the package. So far as the steamship companies are concerned, I think I may say we will do our best to serve the interest of fruit growers.

Mr. BUCKE.—What is the difference between the freight on a barrel of flour and a barrel of apples?—A. I do not think we have carried flour in barrels for five or six years: but the prices in October would be about the same. You might suppose that the apples would be cheaper, but they occupy the same space. I think we would carry it no cheaper. I do not think we would ask any less, unless there were a great many barrels of apples and no flour. Broadly speaking, I should say the freight was the same.

Mr. TORRANCE.—Mr. Allan—I believe that is his name, although I have not the pleasure of his acquaintance—has made some statements which I call in question. He says he visited Montreal, I suppose in the interests of the Fruit Growers' Association, and had gone on board a steamer of one of the lines. That was all right. He did not call on me. I had not the pleasure of a visit from him. As the representative of the Dominion Line, I should have been only too glad to have gone on board one of our ships and shown him the accommodation; but he evidently did not think it worth his while. I leave it for this meeting to say if his business was in the general interest, and if he did the right thing in thus acting. He made some strong statements about the shipment of fruit. Did he ever ship a barrel of apples? The bills for a great many thousand barrels of apples have passed through my hands, and I have never seen his name. Does he ship any?

Mr. McD. ALLAN.—I think the fruit growers of Ontario will answer that.

Mr. WOOLERTON.—He is one of our largest shippers.

Mr. TORRANCE.—That is news to me. He made a statement about the damage from boilers. Was he ever on board a vessel, and has he ever seen where the boilers are? I think if he had taken the pains to look into that question he would have seen that the chance of damage from that is very slight indeed. Then he made another statement about the place where cattle are kept, and the chance of damage there was from smell. Well, I simply want to say, as far as regards the Dominion Line, we never make a practice of putting apples where we put cattle. Then about the handling of apples in Montreal, he gave the impression that they were handled better by one company than another. I would simply state the handling is the

same by them all. The fruit is delivered by the railway to the steamship companies in the usual way, and each company handles apples alike. Then he made another statement of the very great number of claims. Now, I may say, as far as I am concerned that the claims we get are very small indeed. I do not think this year a claim has come for ten barrels, as regards quantities. Then there is another statement I would like to make. The receivers of apples on the other side have frequently made the statement to the Dominion Line that no steamers arriving in Liverpool deliver their fruit in better condition. The fact is, that this winter from Portland, thousands of barrels per week were going forward by this line in preference to any other. Mr. Watt has made a statement that the steamship companies were only too anxious to do everything in their power to facilitate business, and make it as pleasant as possible for shippers. I can only say the same thing.

Mr. McD. ALLAN.—I am called upon to reply to these remarks. The first remark was that he wished to know the reason I did not visit the Dominion Line. I was not invited. I was invited to visit the other lines. He says I made a statement that apples were placed where the cattle were. I made no such statement. I do not profess to know exactly the names of the various compartments of the vessel; but I never presumed that apples were put in precisely the same compartment with cattle.

Mr. TORRANCE.—I did not mean that.

Mr. ALLAN.—They are placed in the same vessel, and what we are afraid of, and according to our reports, is that the apples are damaged in flavour. We get these reports from the other side. We get them, we think, from reliable sources, and a simple denial is not sufficient. We get these reports and we infer that there must be some way of the stench from these cattle reaching the fruit. I do not know whether the compartment is close enough or not. There must be some way of closing it, so that this stench will not reach the fruit. If there is any crevice and the smell reaches the fruit, I can assure you that it will damage it. I merely throw that out. There is no insult offered, and I think it was unmanly to get up and make the statements we have just heard, to try and creep out of this matter in the way endeavoured. We put the thing fair and square, in the hope that these gentlemen who are here representing the steamship companies will see that no crevices are left open by which the stench from the cattle could possibly reach and damage the fruit. It is of no consequence whether I know where the boilers are or not. We have the reports that the fruit is heated on arrival, and that the heat has come from the boilers. Whether the fruit has been packed exactly up to the boilers or not I do not know; but I presume it must have been sufficiently near to do a certain amount of damage. The fruit has certainly been damaged by heating. It is possible it may be in some other part of the vessel, where it is surrounded by other things, but at all events we know it has been heated. If some system of introducing the atmospheric blast, that has been spoken of, were adopted in that part of the vessel, it might remedy that. If it is cheap, it is a good thing in any case. It would satisfy the fruit growers and shippers. It would be a boon to us. It would help to carry the fruit in proper shape. There was another point that occurred to me, while one of the gentleman was speaking, that there must be considerable damage to the apples from piling them tier on tier in the hold. We have heard that complaint frequently. I intended to suggest that the steamship owners should look into that, and see if there is not some simple remedy; by relieving the pressure by means of cross bars—something that would bear up the pressure from the barrels beneath. We have had reports that the apples in the lower tiers could only be sold as "wets."

Mr. TORRANCE.—As far as regards the placing of cattle, they are placed on a different deck from the apples. It is water tight and must be tight, and it is utterly impossible for the effluvia to get down.

Mr. ALLAN.—There is no doubt but that the damage is there.

The PRESIDENT.—The object is to present these facts to the shippers, in order that we may have an impartial discussion, so as to endeavour to arrive at some means of meeting the difficulty. I trust that no statement will be made to reflect on any one.

Mr. THOMS.—When you were good enough to invite the representative of the Beaver Line to be present we felt it was a good opportunity to meet the fruit growers of the Dominion, and I am here to-night. Mr. Watts seems to have covered the steamship ground pretty thoroughly, and before going into anything further in that direction I desire to thank Mr. Allan for the kindly way he spoke of the Beaver Line. I have no bones to pick with him; anyway, not just now. It had been mentioned before that the handling of fruit at Montreal did not compare favourably with New York. Now, I have had considerable experience in New York as a steamship man, and I have no hesitation in saying that I consider the handling of fruit in Montreal is equal if not better than at any other port along the Atlantic coast. I think every care is given to it. I am satisfied that steamship men are only too glad to bring all the fruit by way of Montreal and not allow it to go to New York. They take special care in the handling. I think my friend Mr. Allan felt, a couple of years ago, that there was no place like New York, and he ventilated his ideas pretty freely. It was then I first took up the subject and introduced fans into our boats. As regards claims, we have not had a single claim for apples. The question was asked and that is the answer. Mr. Watt stated that apples were received and a receipt given on the actual count of the packages. The railway companies put in "shipper's count," but we pay no attention to that when once they reach us. You say that ventilated cars will be provided, and I am satisfied that the steamship companies from Montreal can carry the fruit forward in as good condition as it can possibly be taken across the Atlantic. It has been suggested to me that I should mention that the St. Lawrence route would compare favorably from the fact that we have several days after the steamer leaves Montreal before you are at sea, whereas you are at sea in an hour or two after leaving New York and Boston. With reference to apples, the rate being higher than on other cargoes, I think the rate on apples, considering that they take the same space, is just as low and just as cheap other cargoes. There is one point I would like to call the attention of shippers to. They do not realize the necessity of advising the steamship agent when shipments are made. A man will ship five cars, and the first intimation that the steamship company has is that there are so many barrels of apples for us at the Canadian Pacific or the Grand Trunk yards. They cannot expect that the fruit can be attended to in a hurry unless they give us some advice. If the steamship companies had advice by wire or by postal card that they had shipped the goods it enables the steamship companies to trace these cars, and the railway companies are only too anxious to assist us in getting these cars forward. In many cases they have gone to a great deal of trouble to get them forward in time for our steamers. I have no doubt the railway companies will do all they can to get these cars forward. We have every desire to get them away, to keep up our reputation on the St. Lawrence as against any other port. Regarding the statement of Mr. Allan about the tiering of apples, I might say that apples are in no case stowed in the lower hold of the steamer. The decks are 6 ft. 6 in., 7 ft. 2 in., and I think the Lake Ontario is 8 ft. 2 in. That is exceptionally high. It is not possible to get over four tiers in, and I don't think four tiers too much. They are never stowed in the lower holds. You cannot possibly get more than four on the decks. I don't know that I have anything more to say, but to thank the fruit growers for having suggested to the steamship people better modes of carrying forward their fruit. I am sure we will only be too glad to carry out their suggestions as far as we can. I thank you for the opportunity of being present.

Mr. ALLAN.—I may mention one point. When the agitation was got up some years ago for shipping by New York, I believe there was quite a large amount going by New York. The New York railways were exceedingly good to us, and forwarded everything with a view to drawing traffic. Since then we have noticed that the handling at Montreal has greatly improved. That fact shows just what agitation has done. We have done it by agitation. We want this agitation to bring us some gain.

Mr. McMILLAN.—There is another thing which ought to receive attention here. I find in the western part of Ontario, in a locality that has no railway competition,

that we do not get the same favourable rates as those localities which have competition receive. I ship a considerable quantity to the seaboard. After I ship my freight I get back from the men who receive it the way-bills. People to the north and south of me where they have competition, pay 95 cents per barrel, while we pay \$1.05. That is 10 cents a barrel difference on a lot shipment of barrels. Whenever I ship apples to Montreal I advised the steamship companies and my apples were transported more rapidly than if I had not done so. I ship all my apples by the Donaldson line, and I made an arrangement that the apples were to be shipped in the front or the rear of the vessel. I am perfectly aware that the apples packed in the centre of the vessel, unless on the upper deck, will spoil. I have crossed with fruit and with cattle, and I am satisfied that unless apples are away from the boiler you cannot adopt any means to have them perfectly safe. All the apples I shipped arrived in perfect order, and if all those who ship apples will adopt the system of notifying the steamship companies their apples will be forwarded without being kept by the railways. I think the localities which have no competition should have the same means of getting as cheap rates as those which have competition.

Mr. GEDD, representing the Donaldson, Temperley & Thomson Lines, said : This is the first time that I have had the pleasure of addressing a meeting of this kind. I was much pleased at hearing the last speaker mention one of the lines I represent in such a favourable way. As regards the rates which he spoke about, I may say that ocean rates from Montreal during the whole of the fall of the year are fixed weekly by the agents of the several lines meeting together, and this rate, in the case of apples, was made early last September, I think it was at a minimum rate of 35 cents. This was maintained during the whole season, notwithstanding that the rates on other cargoes pointed to an increase. We recognized the fact, amongst the whole of us, that to try and increase the shipment of apples to the old country it was necessary that we should have a regular rate. I can assure the gentlemen present that the rate from Montreal to the other side is the same for all shippers. There is no discrimination between any of the lines, as far as I know. There is a point or two that has been brought up by the discussion this evening, and I may mention the packing. Last fall we had a number of barrels of apples come to Montreal, and they were mostly chime hoops, and it is not possible for either the railways or the steamship companies to do justice to the shippers in these. They should see that the barrels are properly headed and the heads sufficiently strong that they won't break, because I have known a number where it was impossible to handle such barrels without knocking out the heads. The handling in Montreal is the same by all lines. We all take equally great care to see them properly handled while in our custody and to see that they are properly handled by our separate stevedores. There has been something said regarding ventilation on board steamers. This has been an important factor, and we have considered it as fully as the Beaver Line, as has been stated by Mr. Allan. They provided for ventilation in the lower holds, by which not only flour but butter and cheese are kept as cool as it is possible with the outside air. I don't say we keep ice chambers, but we do try to keep the holds of the vessels as pure as the outside air. Regarding the shipment of cattle, they have an impression that cattle and the cargo always go together. Only a few ships out of the port of Montreal do not carry cattle. Of the steamers sailing out of the port of Montreal the only ones that don't carry cattle are the mail boats. The other boats all carry cattle, and we make it a point to keep the cargoes separate from the cattle. Invariably the steamer going out has cattle on one or two decks, and the cargo is placed below, as Mr. Thoms tried to explain to you, the oar-loek deck. It is perfectly water-tight and air-tight, and no effluvia nor any of the dung from between decks can reach the apples. With regard to the complaint about delays with the railway companies, the shipper, in notifying the railway company, should take care to have the numbers and the initials of the cars, giving us the route by which they are shipped. If the shippers do this they will find that the agents at Montreal are always ready to see that their freight receives proper dispatch. But this very important item is very often left undone. Sometimes it requires repeated telegrams to tell the initials of the corporation owning the cars, so that we can trace

the cars and see that they do arrive in Montreal in good time for the steamers. It has already been mentioned that we guarantee the count, and if there is any shortage we pay it.

Mr. ALLAN.—Would your agents throughout the country, at the different points on the bills of lading taking the goods by rail to Montreal?

Mr. GEDIN.—All the railway companies, as far as I know, will grant you guaranteed bills of lading, provided you load your cars at such a station where they have a tally on your barrels. We get the repeat bills of lading guaranteed, and the steamship company checks the goods with the bills. Sometimes, as I understand it, these apples are shipped at out of the way stations, on the siding, and they are simply loaded into the cars at the shipper's direction and sent two, three or four hundred miles, and may come on the bill of lading "shippers count." I think, Mr. Chairman, these are all the points necessary for me to bring up. We shall in every way try and forward the interests of the fruit growers and shippers of Canada, and anything you want done we will only be too happy to try and do it, as far as practicable.

Mr. HUESTON, of the Canadian Pacific Railway.—I cannot state what our company can do further than what they have done in the past. If there is any suggestion that any of the gentlemen wish to make that they think will facilitate the shipping of fruit we shall only be too glad to adopt it, as far as it is practicable to do so. There have been a good many points raised by Mr. Allan. One was that there was a shortage of cars. That is a matter which theoretically looks very easy; but when you come to a practical solution it is sometimes a little difficult to meet the requirements of all the localities. We have car distributors at different points along the road, and as this is perishable freight we give it the preference over other freight. In regard to the question of granting bills of lading at shipper's count, I do not know that there is any objection to giving a clear receipt in any case, where it is practicable to count the shipment of apples. There may be some exceptions where apples are shipped from sidings where it is not practicable for our men or agents to count them; but in no case where it is practicable for them to be counted is there any objection to giving a clear receipt. I have listened with a great deal of interest to the remarks of Mr. Allan with regard to the transportation of fruit, and I shall take pleasure in placing the views expressed by him before our manager. I have no doubt that, as far as it is practicable, everything will be done to facilitate the shipment of this important freight. I do not know that there is anything further that I can state, but I shall be pleased to answer any questions that may be asked me with regard to freight.

The PRESIDENT.—We interviewed the Canadian Express Company with reference to such transportation of fruit as they are in the habit of dealing with, and I have a letter here from the President touching upon that point. It may be of some interest in this connection, although the whole volume of freight which they carry is comparatively small. The letter is as follows:—

" MONTREAL, 17th February, 1890.

Prof. PENHALLOW, McGill College, Montreal.

" MY DEAR SIR,—I understand there is soon to be a meeting at Ottawa of those directly interested in horticulture and fruit growing, the different parts of the Dominion to be represented. I am glad to know this, as it can scarcely fail to increase the interest in this important industry. For many years I have felt much interest in our local association for the Province of Quebec, and have done what I could in my small way to encourage it, and I feel sure that anything to awaken the interest of the general public will be in the right direction. I believe that the finest fruit can be grown at a profit in many parts of the Dominion. I am not aware what particular points will be discussed, but presume the growth of the different kinds of fruit, the mode of packing, the transportation and the markets will be considered. These seem to me important.

"As for myself, I do not feel competent to deal with this, except perhaps to say a word on transportation for such as may be sent by express. The Canadian Express Company, which I have represented for many years, have done much to facilitate the quick and safe despatch of the smaller and more perishable fruits, furnishing ventilated cars with proper shelving for packing the larger shipments to most distant points, all fruit being forwarded on fast express trains at rates consistent with cost, and we shall continue to do so, and will be glad at any time to meet authorized representatives in the trade for conference as to future transactions. The whole amount carried by express, however, as compared with other modes of transportation, is very small, and may not claim the attention of the meeting; but should shipments for Europe be sent *via* the St. Lawrence, we will be glad to offer the best facilities from inland to shipping point, in quantities consistent with our mode of forwarding.

"Hoping you will have a successful meeting,

"I remain, yours very truly,

"G. CHENEY,

"President."

The PRESIDENT.—I think we have heard pretty fully the views of the transportation companies concerning what facilities they offer, but it seems to me that it would be desirable if we could reach some definite conclusion with reference to the improvement of existing methods, so far as that may be possible. Undoubtedly, as far as we can judge from the evidence that reaches us from abroad, some improvement may be made at least, and if such can be made within reasonable bounds it seems to me one important object of this meeting will be accomplished. I should like to hear from some of the representative shippers, both of fruit and dairy produce, what they would suggest in connection with what has been said, and then we may possibly get from the representatives of the transportation companies some statements as to future movements.

Mr. McD. ALLAN.—In speaking of the express companies, that is one of the points we had not touched upon before at this meeting; but it is a point which has been touched upon at other meetings. It is an important point. I do not know any other way by which you can get your basketed fruit, or fruit in boxes, more completely smashed up than by sending by express. They do it most beautifully. I remember at the time of the Indian and Colonial Exhibition, the Dominion Government had their fruit all over the various Provinces, and dispatched to the seaboard by express, thinking, in the innocence of their hearts, that because the express companies charged a high rate they would take better care of the goods. What was the result? We did everything in our power to induce them to take care of the goods. The packages were labelled "To be handled with care;" "This side up." They were packages that had been specially prepared for easy and safe handling. We appealed to them personally and by letter, as Canadians, as men interested in the welfare of this country, to do what they could to place the products of this country before the world at the Indian and Colonial Exhibition in good shape. The result was, that out of two tons of grapes that might have been handled easily, and would have arrived there if handled properly in very good order, we had a mass of pulp and juice. The baskets were turned and twisted, and any side up or any end up. We saw that ourselves. We saw the agents handling them. I saw them at Goderich handling these goods, and called their attention to the fact that they were handling them as if they were stones, flinging them about in any sort of rough way. Our experience with express companies has been terrible. Our experience at that exhibition, in regard to the handling of the fruit, was most discouraging. We find the same experience has been met with by some of the shippers of small fruits. Parties sending packages of peaches or pears, how often do we get them as they were sent? How often as full as they were sent? This last summer I got three or four baskets of peaches, as we had no peaches or very little fruit of any sort in our section. The baskets were full of good fruit when they left, but when they reached me the gauze was torn off and quite a number of the peaches

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extracted. We do not find the packages specially opened and the fruit extracted in that way but we do miss packages in the count. As some of the gentlemen have suggested, if the steamship companies will give the count, and if the agents of the railway companies at the stations will take these goods and give us bills of lading on that count it will be all right. You cannot get the railway agent or any of his men to give the count; they won't do it. They have done it on rare occasions, under pressure; but as a rule they won't give you the count.

Mr. J. T. McBRIDE, of Montreal.—I have made money out of apples, and I can make more. I think, perhaps, we are a little too hard on the steamship companies and the express companies. I have shipped fruit to Liverpool and other ports, and have never asked a favour of a steamship or an express company that I did not get. Last year I had \$48,000 worth of the finest California fruit. My claims for the year were \$76. This year I shipped to Liverpool, and my claims were only \$10. They paid it at once. If they knew what we wanted, I think they would give it to us. For several years the California fruit coming down to Montreal was badly handled. For years it was badly handled in the west, and they ran a special car. They cannot always get good men. I cannot get good men in my warehouse; I make rules, and every day they are broken. I cannot get good men to pack my apples, although I pay them all they ask. Over 2,000 barrels of apples got to Liverpool rubbish. I have orders from the biggest house in Britain for apples, and they say: "If you cannot ship by Montreal, don't ship me any apples." They won't have them from New York. I have had thousands of barrels of apples arrive in New York, and I never had them handled as well as in Montreal. I think the steamship companies can keep the barrels where there is no heat. They cannot afford to give us the cattle decks, because the cattle pay far better. I have worked in the ships all night and all day, and where they knew what we want they have always given it.

Mr. STARR.—I have been very much interested in the discussion so far. I will not detain you with any remarks at any length. While I agree in the main with the first two speakers, there are some of their views to which I take decided objection. In view of the fact that so many steamship representatives have been heard to-night, possibly I might not have the same opportunity of meeting them again. I would like to ask one or two questions which possibly they can answer. One is with reference to the bills of lading. I have observed that the bills of lading contain a clause that a charge of 1s. 6d. per ton was made on all fruits of a certain class—that bears upon apples—for discharging at the docks in London. I would like to ask if this is customary with you in Montreal. Another question I would like to ask is with reference to a clause which I find in the bills of lading used by the steamship companies, that the freight is payable ship lost or not lost. This is the usual clause. If this is the case is it fair play to the shippers to insert such a clause in any bills of lading? Reference has been made to the difficulties and delays in the handling at ports, and so on. I may say that that don't apply to many cases in Nova Scotia. We have more fault to find with the steamship companies or their agents on the other side than we have with our agents in Nova Scotia, in the handling of fruit. We can ship our fruit in Nova Scotia and in four or five hours they have it in the boat. In cold weather we usually accompany the fruit and look after it. We have no fault to find with the handling of the fruit going into the boats, but we have a decided objection to the way the fruit is handled when it is being taken out of the boats. Take, for instance, a shipment of 3,890 barrels a short time ago, at London; there were 130 barrels broken open. This, it appears, was done in the discharge of the cargo, in the hurry. They handle them from six to ten at a time, and hoist them by steam winches. Coming up through the hatchways, if they catch anything they break off the hoops, the heads come off, and the apples are scattered to the four winds of heaven. If a claim is put in the steamship company claims that it is not responsible. I instructed my agents in London to enter suit against a steamship company at a cost of \$300. A short time ago an opinion of the best counsel in London was taken upon the matter. I have the written opinion of Aberley Muir, the celebrated counsel in London, as to the case in hand, that in view

of the bills of lading which were presented and the claims made, that he could not advise us, under any circumstances, to prosecute, as we had not a leg to stand upon—that, so long as we accepted these bills of lading we should have to bear the loss. There are times when we can put up with a loss of this kind. When fruit is bringing high prices, we don't mind if we lose a few dollars, but when fruit is comparatively low it is a serious matter, and if it is a matter that agitation will do anything to help I should say continue the debate, and let us have a remedy if it is possible. There are many other points in the addresses that were made which I should like to discuss, and possibly I may have an opportunity at a future session; but I shall not take up any more time to-night. I hope to hear a reply from some person present as to the question I have asked with reference to bills of lading.

Mr. WATT.—I am quite free to confess I can throw very little light on the question asked. The ship has no rights at London. She goes into port and is fastened up alongside the wharf. The dock companies discharge her and put the goods into their own storehouses and deliver to the consignees. They charge the ship so much and the shippers so much; but we are perfectly powerless. The clause referred to is put in at the instance of the receivers there. We can do business fairly well at Liverpool, but at London we can only do business as the Londoners choose to do it. If ships will consign to London they will be continually under these disabilities. As to the payment of freight whether the ship is lost or not lost, that applies to freight prepaid. If you prepay your freight, then the losses rest with the shipper.

Mr. STARR.—We are not in the habit of prepaying our freight.

Mr. WATT.—Then the clause is inoperative.

Mr. STARR.—I would gather from these remarks that Mr. Watt wishes to intimate that better facilities are offered at Liverpool than London. That has not been our experience, either in marketing or shipping. I am not here to stand up for any port or house; still, I am free to state that I have represented respectable houses in London, and my experience has not been, as it has been hinted, that if we are sending fruit to Covent Garden Market we will have to pay dear for our whistle.

Mr. GEDD.—There is just one question asked by Mr. Allan that I would like to reply to: that is, as to shipping apples to Montreal and getting a clear receipt. If Mr. Allan will take out a local shipping rate and send it to any one of the steamship companies, we, on receipt of it, will always be happy to give the shipper a clear bill of lading for what we receive. Then we guarantee quantities.

The PRESIDENT.—Have any of the shippers of dairy produce anything to say?

Mr. BRODIE.—The rough handling the fruit gets in Montreal is between the railway station and the ship. I have seen apples carted along in trucks at a rate that would shake the apples to pieces. My opinion is that there is no better way of carrying apples than in spring waggons. When these carts are loaded, these barrels roll off sometimes, and they generally have a cooper there to fix them up.

General LAURIE.—I shall not have an opportunity of speaking again, and I must ask you to pardon me if I say a few words now. I have spent a considerable time in England during the last winter, and in passing around constantly among the green grocers I did not see as many good-looking apples anywhere as I have seen here to-night. I do not say this to butter up the fruit growers, but to warn them that they are not taking the means to get their apples to London properly. If it pays to wrap up every orange in paper, which is afterwards sold for a half-penny in London, it would pay to put an apple in paper and sell it for four pence. To put a piece of paper at the top and bottom of a barrel is not, however, enough. The apples that are exhibited in London have been addressed to shipping companies, and are not acceptable because of spots and bruises. That is the fault of the shippers. A more miserable lot of apples than those offered for sale in London I have never seen. I grant you that they are nearly all labelled "American Apples," and it is in your hands to see that all apples are delivered in London so that the name of Canadian apples will rise. Have them properly marked. Nine out of ten apples are bruised or spotted this year. I have been at the Army and Navy co-operative stores, where a very large business is done, and also at the Civil Service

co-operative stores, and they told me they knew very little about Canadian goods. The quantity of American goods there is very large. One of the gentlemen told me, picking up a spotted and bruised apple, that that was as good as they could get. Why, if Canadian goods are as good as it is stated, cannot Canadians send them home in decent shape? I have taken the liberty to speak of this, having but recently returned from England. I do not know enough of apples to speak of sorts; but the vast majority of apples offered are sold as Newtown Pippins. There are as many different sorts as there are on these tables sold as Newtown Pippins. Now, I repeat, if it pays to pack oranges separately in paper and sell them for a half-penny, it would pay us to get eight times that price by taking care that our apples arrive in good shape.

The PRESIDENT.—It has impressed me, as this discussion has progressed, that one of the great difficulties of getting fruit to England properly is that our packages are too large. It strikes me, if the size of the packages were reduced by one-half, and were square in shape, it would pay us better.

Mr. SHEPHERD.—My experience has been very limited as compared with that of the large shippers in Montreal. For three years past I have been shipping fine table apples of the highest class, such as the Fameuse and Wealthy, which any gentleman would care to have on his dinner table. I do not ship in barrels. I class my apples as A1, and these are put into cases. These cases are such as were produced by the Cochrane Patent Case Company some years ago. I think it was patented, but I have manufactured boxes, not exactly like it, but which answer the purpose just as well, and they are packed as eggs are packed, in the cases, with pieces of pasteboard, with twelve to sixteen dozen apples in a case. Last year I shipped, I think, sixty or seventy cases of Fameuse and Wealthy that brought \$3 a case in Montreal. I think it pays to take special care in packing your fruit. We took the precaution in some cases of wrapping each apple in tissue paper, and the reports I have received of the condition in which the fruit arrived in England are very favourable. I received a letter a little while ago from a gentleman, stating that the fruit would be worth in Covent Garden, London, from three to six shillings a dozen. I shipped on the order of the Montreal agent, and he shipped to his agent in London, who sent back an answer to the agent in Montreal, and I saw the letter, in which the London agent stated that that fruit would be six shillings a dozen in Covent Garden.

Mr. ALLAN.—I believe the question of the package is an important one. I think a two-bushel barrel would be large enough, and I think a one-bushel barrel would pay better still. If our law, instead of requiring a three-bushel barrel, would require a two-bushel barrel, or part of it, we would be in a better position for shipping. The neater the package the better. A square package is not so good, in my opinion, as the barrel package—that is, if you are going to fill it and make it tight, and with a closed top. I would not approve of a box package.

Mr. SHEPHERD.—Of course, in a compartment case there is no possible chance of the fruit being disturbed at all. It is just like an egg case. There is no possible chance of the fruit being moved about. Of course, it would not pay to pack these cases, except with the highest quality of fruit, and mark the case A No. 1.

Mr. STARR.—There is a difficulty of crushing in these pasteboard boxes. During the summer of 1886 there were some apples sent to the Colonial Exhibition packed in these boxes, and the result was very unsatisfactory indeed. We found entire boxes in which the fruit had decayed, and the box was weakened and the fruit was crushed together. Have you found much difficulty?

Mr. SHEPHERD.—I cannot say I have experienced anything of that kind. We were particular in seeing that the case was secure, and that the apples just fitted in. You must be careful that the apples fit the squares, and they must be just of the exact size to fit the squares. That is why much time is taken up filling the cases. If it were not for that you could fill the cases much quicker. There is another advantage in it, for the reason that the purchaser knows there are no small ones in it or no extra large ones. They can be perfectly well assured that the bottom layer

is the same as the top layer. I have never experienced the objection you mention at all. I never had any complaint made about shipments in cases, and I have shipped apples for three or four years in cases.

Mr. STARR.—I would like to see the smaller package. We in Nova Scotia are accustomed to using barrels of the same size as the common fruit barrel. This is the standard our law requires. We have used half barrels, half the other size, to a considerable extent, but they are not received with favour for some reason or other. We have attempted to use the square cases. You cannot pack the boxes, and press them in and have them tight, and have them turn out in good condition. With half barrels there is no difficulty of that kind, but a very limited number of half barrels will do in London.

Prof. BARNARD.—A very important matter is the barrels. I don't fancy that the twenty-four gallon barrel is very much too large. I don't think the difficulty arises from that; but if you notice the law says that they shall be as nigh cylindrical as possible. The barrels are always made of light material, and have no centre hoops, and sometimes accidents will occur while loading them on board the ship when something will give way and the barrel will roll down. If the barrel is made strong with good hoops, so that the barrel always rolls on the hoops, there is very little reason for damages from them. If they are packed five or six deep there is very little danger of their flattening on account of the weight on the bottom ones. I contend that it is our own fault if we allow coopers to make barrels with too large a bilge. They should be made as straight as possible, so straight that the barrel always rolls on the hoops, and not on the staves. Then we will hear little complaint of bruised or slack apples in the barrel. We did not have many to ship this year, but we did ship some, and I am proud to say they arrived in perfect order. We selected the barrels. We would not use a barrel with a big bilge, and we decided not to use a barrel at all which had a large bilge after that. If the coopers don't wish to make them strong enough we don't want them. Let them keep their barrels.

Rev. Canon FULTON.—There are one or two points that have been omitted by the gentleman who has spoken. One point is as to the non-keeping of the apple. The apple on the tree, and when it is taken off, is a live, breathing thing. Our grandfathers used to put the apples in two-bushel barrels; but the greed of the consumers insisted on three bushels, and to have as large a bulge as possible. These apples are very often packed on a warm day in the fall of the year. They are heated up by the sun and then put in a hot car. From that time forward they are rapidly maturing, and by the time they are taken off the vessel they have begun to decay. I must say of the Allan Line, that I have shipped as early as any man in this room, and Mr. Smith, of that line, years ago took great pains to see that there was cold storage. I went to him two years ago and told him I was going to ship as an experiment an early apple, and wished to have a cool place provided. I shipped some of the Duchess apple, and they went home and were received in perfect order, and I was very well satisfied with the return. There was one point which Mr. Dempsey made about clipping the top of the apple. You can see, however, Mr. President, and understand that the stem being plucked out it allows the microbes to get in and begin the work of decay in the apple. If we could sterilize the apple and pack them in medium size packages there would be no trouble in taking them across the ocean. I have used a package—one of the first, I suppose, that was shipped—that held half a bushel. I packed them first in oat hulls, but the apples being of fine quality the flavour was affected. It requires a great deal of trouble—in fact, almost as much as Mr. Shepherd's package—to have them perfectly level and prevent bruises. It needs great care to get them in all right. Across the pond they say: "We much prefer to have a barrel;" but I got very nearly as much for half a barrel as they would have given me for a barrel. I am satisfied that all this difficulty would not occur if proper care were taken in putting the apple into the barrel. There is one other point I wish to speak of, although not personally interested, and that is the shipment of butter. I must say that when I was at the Paris Exhibition I got one of the creamery men to send me over twelve packages, and out of the twelve there were three that were

broken. I feel perfectly satisfied that unless you get an air-tight package and one that is secure it will be a great detriment to the community. I have been appointed lately as Protestant chaplain at the penitentiary, and there is an ingenious man there—one of my students—whom I told I was coming here, and asked him to see if he could not invent some sort of package that would do for butter. I have here two boxes that it would be worth while for any shipper to look at. They could be made of maple or some other suitable wood, and are perfectly air-tight. This box is made without a single screw. He has made an estimate of the probable cost, and I do not think it would exceed the cost of the ordinary package. It can be made in shooks so as to fit, and if you cover the butter with a layer of paraffine paper it will be perfectly air-tight. If we had as good a package as that for our apples I am satisfied that it would be a great blessing and benefit to the country.

The PRESIDENT.—Considering all the facts that have been brought forward this evening, it appears to me we may reduce the requirements of the shipper to the following terms: First, there should be special freight trains provided that will give rapid transit and gather the cars from various stations along the route, and when the train reaches proper dimensions it will go straight through. In the next place, these cars should be provided with buffers. In the next place, lower rates, and then modifications in the bills of lading. It strikes me these are all the points we can appreciate and reach a common understanding about. It also strikes me that it would be quite proper to have a committee, or any other body, appointed to take this matter in hand and make such representations in the name of this convention to the transportation companies as may be necessary for the satisfaction of the shippers in these respects. It is desirable that something should come out of this discussion. We do not want to leave it where it began. I take leave to move a committee on transportation, to report to-morrow. That committee will consist of Messrs. A. McD. Allan, R. W. Shepherd, Jr., A. M. Smith and C. R. H. Starr.

The Convention then adjourned until the following morning.

THURSDAY, 20th February.

MORNING SESSION.

The Convention assembled at 10 a.m.

The PRESIDENT.—We have received since last session a letter from the Grand Trunk Railway Company, from the traffic manager, with reference to the points that were raised. I will ask the Secretary to read that letter for the information of the meeting, and then, I think, we may refer it to the Committee on Transportation for action.

The Secretary read the letter, as follows:—

"GRAND TRUNK RAILWAY COMPANY OF CANADA.

"TRAFFIC MANAGER'S OFFICE,

"MONTREAL, February, 17th, 1890.

"DEAR Sir,—At a recent conference with Messrs. Penhallow and Shepherd, reference was made to the meeting of fruit growers proposed to be held at the City Hall, Ottawa, on 19th inst., and two following days.

"You are no doubt aware that as regards the more delicate and perishable descriptions of fruit we are able, in connection with the Canadian Express Company, to give as satisfactory despatch as practicable by passenger trains. To accommodate the fruit growers we have also organized fruit specials, to commence running so soon as the apple, &c., season sets in. These specials can be increased in number as the traffic requires and the necessary arrangements made to prevent delay in transit. We purpose this year to continue and, if needs be, extend the system, and I hope that the requirements of the case may thus be satisfactorily met.

"There are considerations connected with the gathering and packing of fruit affecting its condition on arrival at destination with which the fruit growers can

alone deal; but speaking for the Grand Trunk, I may assure you that any reasonable transportation requirements will be met by the company, and when the time arrives for resuming this year's operations we shall be happy to confer with representatives of the association, in view of meeting their wants, and making Montreal the port for fruit shipments.

"Yours truly,
"L. J. SARGEANT,
"Traffic Manager.

"W. W. DUNLOP, Secretary, City."

Mr. BUCKE—In regard to shipping rates: We have heard a good deal about shipping to the old country but there is one point that has not been touched upon, and that is the shipping of fruits from Ontario to Manitoba. The Canadian Pacific Railway rates are so high that the people cannot ship from Ontario to Manitoba, and this is a question that should be ventilated by this meeting.

The PRESIDENT.—I think that is an important point, and I think the committee will keep that fact in mind. I understand they are to have a special conference with the transportation agents and the agents of the other companies. This matter will be discussed at that conference. We will refer that letter to the Committee on Transportation.

Mr. L. WOOLVERTON.—Would it not be well to express some appreciation of the kindness expressed to us in that letter—our appreciation of the efforts made by the Grand Trunk Railway Company in making arrangements for this special train. I move that a reply be made by the secretary, expressing our appreciation of the efforts being made to accomodate the fruit shippers.

The PRESIDENT.—That might properly come in with the committee's report.

Mr. A. McD. ALLAN.—Would it not be in order to move now to add to that Committee on Transportation? We only have four members on that committee. I think we should have more. Further, a desire has been expressed on the part of the steamship companies here to meet with that committee and discuss the whole subject. I think it would be proper to ask the Chair to extend an invitation to all the representatives of the railway, steamship and express companies to meet with us. I think it is nothing but fair and right to all concerned that we should meet together and discuss the whole matter before we frame our report for the general meeting. I would suggest that the name of Mr. A. H. Pettit be added to the committee, and I suggest that some one else would name other gentlemen who would be serviceable from other districts.

Several other gentlemen were named, and the following added to the committee: Messrs. A. H. Pettit, W. L. Kew, A. G. Thorburn, Thomas Frankland.

The PRESIDENT.—In view of Mr. Allan's suggestion, I will notify the representatives of the companies interested to meet with the committee for a conference. I may say just here that in the very short space of time that was allowed us to interview these various transportation companies before leaving Montreal there were one or two of the express companies not included, unfortunately, especially the Dominion Express Company. Now their representative is here, and I hope he will take this as a special invitation to represent his company at this conference between the committee and the transportation agents. Mr. Shepherd was on the committee—the interviewing committee—in Montreal.

Mr. A. McD. ALLAN.—Some of the representatives of the various carrying companies, I understand, cannot make it convenient to be with us here this forenoon. We want the committee to meet and discuss the different points this forenoon. As it will take some time, I suggest that we proceed with work on the report in the meantime, and we can then meet the agents and go over the report. We would like to have the conference with the committee before the report is finally presented to the conference.

(The suggestion was agreed to.)

Mr. J. T. McBRIDE, Montreal, read the following paper on "THE EXPORT OF WINTER APPLES—PROFITS AND DRAWBACKS":

Regarding the profits and drawbacks in connection with the export of winter apples, allow me, as briefly as possible, to give you a few facts gained by fifteen years' practical experience in British and foreign markets.

"The most profitable apples for export are: King's, Cranberry Pippins, Baldwin's, Gravensteins, Bishop's Pippins, Ribston Pippins, and Golden Russets. Occasionally Spies and Greenings make money abroad, but, as a rule, they sell for more money in Canada.

All apples should be picked and culled with the greatest care. We are advancing in the department yearly, but still there is room for improvement. The more care in this respect the better name will our fine Canadian apples gain, and they are second to none, and the more profit will be obtainable for either local or foreign buyers. Cease to purchase fruit that has been carelessly culled before being packed. Many a buyer has ordered his men away from an orchard where the grower has carelessly picked his apples, and wisely so, for no packer can make first-class shipping stock with such fruit.

Only No 1 standard sized barrels should ever be used. They ought to be kept perfectly clean and when packed should be head-lined and distinctly branded. A fancy package will command more money than one with which less care has been taken. It is better to mark our apples No. 1 and No. 2; I mean, use a different stencil. No. 1 should be strictly choice apples; No. 2 ought to be good, clean, sound selected apples; the balance should be dried, evaporated or made into cider, for all of which a market can be found.

All shipping apples must be carefully faced, well shaken and lightly packed. A barrel that shows the least slackness on this side the Atlantic will make no money for the shipper on the other side, where they often make and sell as slack, what here would be considered tight and in firm order. Now, we have our fruit properly gathered and packed, the question is, where had we better sell. Our advice would be to sell to some one on this side of the water. When we require foreign fruit we are compelled to buy. So, if Europe wants our grains and fruit we would say come across, examine, buy, and we will ship and draw for amount, allowing no claims whatever. Take your risks, as we are compelled to do when we purchase oranges, lemons, grapes, &c.

When consigning, our apples as a rule are shipped to Liverpool, London, Glasgow and Bristol. They generally go into a dealer's hands, who hands the bill of lading to an auctioneer, by whom they are offered at first sale after being landed. The auction system is all right in itself, but the charges are far too high. Sixpence per barrel to the consignee, sixpence per barrel to the auctioneers, to which they add cartage, dock and labour dues, postage, bill stamps, cables, &c., &c., which together make another sixpence. So it costs generally 1s. 6d. to sell a barrel after it is landed, to which we would have to add 3s. 6d. to 4s. 6d. per barrel freight. As a rule, we have to pay more freight from Montreal than our neighbours have to do from New York, Boston or Philadelphia. Why is this so? Some of our worthy steamship friends will no doubt explain, but we hope soon to see a 1s. 6d. freight from Montreal to Liverpool.

Another drawback in Britain is the law, which allows a buyer to refuse any number of barrels (out of any purchase in the sale room), which he calls slack. Almost any barrel can be made to give somewhat after the way they are piled on their docks, two and three high, on their ends; also, after a rainy night or heavy fog any barrel showing the slightest moisture is called damp and wet, and sells from 2s. to 10s. per barrel less than dry tight barrels. The Canadians who have made money by consigning apples can be easily counted; those who have lost money by the same practice, their name is legion.

Our railway companies have done considerable for us by supplying better cars, in greater quantity, and granting through bills of lading; but still greater care could be taken in the loading and unloading. They should not be unloaded until the day the steamship company is ready to load, for frequently we have seen thousands of barrels on our wharves, some inside and often outside of the sheds, to be

wet, pilfered and generally disfigured, sometimes frozen, which, of course, means a heavy loss to the shippers. Our steamship companies could also assist shippers in making profits by more careful handling and judicious stowing, many a thousand barrels of apples have been ruined by being misplaced in a steamer. Wherever possible, the steamers should be ventilated, and apples should have the coolest and driest compartment on the ship, because they require it; also, because they pay a first-class freight rate. We are not complaining of our steamers' friends; they have improved greatly during past few years, and are still willing to do all in their power to meet the wants of our ever-growing trade; but we demand better positions, better ventilation and lower rates, and I believe we will secure them. There is a British law against American apples being shipped under Canadian marks and names, but last fall thousands of barrels of Michigan apples were shipped and sold as Canadian apples. This ought to be stopped. Some Maine apples, shipped this winter in the same manner, were detained in Liverpool, and thereby a loss made. Next season this ought to be looked after and prevented. Let all fruit be shipped and sold under true colours. If so our apples will command more money.

Our friends in Nova Scotia have grand apples and unsurpassed facilities for shipping. We think if they used a more modern, better barrel their fine fruit would bring still higher prices. Their apples as a rule are shipped by local speculators and growers to London and Boston to be sold on commission.

Regarding when to sell or ship apples, we would recommend, after a successful experience, sell as soon as apples are ready for shipment, or, if convenient, ship as soon as packed, and regularly. The first to market of all fruit makes most money, not the last. Then, if we wait until the close of navigation, and forward by Portland or Boston, there is great danger of frost. It is almost impossible to ship in winter without doing some damage to the apples. A frosted or heated apple will never make any money, either here or in other markets.

Mr. L. WOOLVERTON (Grimsby).—I would like to ask Mr. McBride where the change in the brand of apples was made?

Mr. McBRIDE.—Last year I brought in a great many apples from St. Louis and Michigan, in bond, and shipped them through to Montreal. A great many of the dealers, when the apples arrived at Montreal—between the unloading from the train and loading on to the vessel—would put on their own brands, and these apples were shipped on Canadian steamers as Canadian apples. These apples were not as good as ours, and when it got to be known over there what had been done, it did us a great deal of harm. The apples went to Edinburgh and sold as Canadian apples, and the sellers had to take them back, because they could not prove that they were Canadian apples. I think that this is a practice which should be stopped, and could be stopped. I am bound to say that seven-eighths of the Montreal men will not stoop to this kind of thing.

Mr. R. W. STARR (Cornwallis, N.S.)—Did you handle any Nova Scotia apples last year?

Mr. McBRIDE.—I was in your part of the country last fall and tried to see you; I went there to place an order for 25,000 barrels of your apples, but my order said they must be put up in Canadian barrels, which you could not get made in time. Our people in Liverpool would not take your apples in the Nova Scotia barrels. Your barrels are good and strong, and will do very well, but they are not presentable.

Rev. Canon FULTON.—The most important thing that has come before this convention, so far, is what Mr. McBride has just stated in reference to the propriety of having some distinction made between the Canadian and the American apple. We are troubled here by the importation, in the spring of the year, of the Missouri and Tennessee apple, which are really not fit for human food. They have the same names as our own apples; they are used as quotations, and are on our market from the beginning to the end of the season. If we are to have any credit for our apples, as we have for our cheese, these importations of American apples, which are shipped via the St. Lawrence route, should be branded by the officers of the Canadian Customs as they pass through.

Mr. WOOLVERTON.—I think we should have a Committee on Legislation. As these points come up this committee would be able to take them into consideration and suggest to us the best method for dealing with them. The sooner we have such a committee appointed the better. I would move that such committee be appointed.

The PRESIDENT.—Would you nominate such a committee, Mr. Woolverton? Think over some names, and we will then put the motion to the meeting later on.

Mr. BRODIE.—In connection with the packing of apples, I would suggest that all the apples should be branded with the packers' names. Our millers have brands for their special grades of flour, which is sold according to those brands, and why should not our apple packers have brands established, so as to enable them to get up a reputation for their apples?

Rev. Canon FULTON.—The only trouble with that would be that some of the barrels would be re-packed with apples that did not come from the particular orchard. The only way to obviate such a difficulty would be to put a card at the bottom of each barrel, inside the barrel.

Mr. A. McD. ALLAN.—I have listened to Mr. McBride's paper with a good deal of pleasure. The points he makes are most excellent. They are golden points, which should be remembered by all. His advice regarding the package is good. In my opinion we should be most particular about the package, and have it neat, tidy and clean, and presentable in the market. Such a package means money on the fruit. The point he raises about the American apples passing through Canada and going forward to British ports as Canadian apples is one that we have had a good deal of controversy on. It is a most important point indeed. I do not know whether there are any of our American friends present, but we are always willing to meet them, and we find them very fair in discussion on this point. We do claim, and I think fairly and rightly, that we have, within the limits of this Dominion, in the different sections of the country, taking all things into consideration, the finest apples in the world. It is unfair to us, then, to allow American apples of inferior quality to pass through here and be re-branded at Montreal as Canadian apples and shipped to England as such. I have known Canadian dealers who have purchased apples in Michigan, and these apples have gone forward as Canadian apples. This is a very serious injury to this country. Perhaps no one here would be able to explain scientifically why it is that Michigan apples are not as good as ours, but the fact remains all the same that they are not. They are different in grain. They grow them beautifully, they are fine-looking, probably to look at them they seem the best apple. They appear hardy and fine apples when picked, and in all external points may be equal to and sometimes excel ours, but when it comes to quality and flavour they are away behind us. It is certainly time, as Mr. Woolverton states, that this point of false branding was looked into, and if a Legislative Committee could be formed we might bring the matter to the notice of Parliament, so that it could be made law, that in passing through the Customs, or in some other way, these fruits could be branded, so as not to go forward to British ports as anything else but what they are. It is no credit to us to have them known as Canadian apples; but, on the contrary, it works us positive injury.

Mr. C. R. H. STARR, Secretary Nova Scotia Fruit Grower's Association.—In this connection I may say that we have reason to believe that Nova Scotia apples have been shipped to New York and re-shipped from there as American apples. That is putting the boot on the other foot. But in regard to re-branding American fruit as Canadian—if they wish to take credit for our apples as their own, to do us injury thereby, it is not a very desirable state of affairs; but I do not know that we can control this in any way.

Mr. B. STARRATT, Annapolis, N.S.—I was in London three years ago, and I saw there Nova Scotia Golden Russets, shipped from Annapolis County to London in barrels, re-packed and put into boxes in a fruit shop, and branded as French apples. They have an apple in France which closely resembles our Golden Russet. Whether it has the same points or not I do not know; it is the same in shape, colour and flavour, and it is apparently the same. These apples are shipped largely from France

to England. They are put up in boxes, 56 apples in a box. The boxes are arranged in two layers, the lower layer consisting of four rows, with 7 apples in a row, making 28 apples in the lower layer, and the upper layer is the same. These apples are exactly alike in shape, size, colour, and everything. You may pick up a dozen apples and you could not tell one from another apart. Fifty-six apples just fill up the box. Seven apples go into it lengthways, and I have seen our apples re-packed in these boxes as French apples.

Mr. McEWAN.—In regard to the subject of branding barrels, I do not know that we could decide upon any plan to prevent the re-branding of American apples. I think that question should properly come under the consideration of the Committee on Transportation. I think the committee consulting together and studying the matter seriously would probably recommend some plan to overcome the difficulty. I merely make that as a suggestion, so that the Committee could take it into consideration as one of their subjects.

Mr. BRODIE.—Why should not we have an apple inspector, as well as a flour inspector, in our shipping ports?

The PRESIDENT.—I may say, when the committee set about arranging for the work of this convention, we ... that we ought to have some expression of opinion, not only from our own exporters, but from some one who handled our apples on the other side of the water. The Secretary was therefore instructed to communicate with some of the large importers in England to get their views and opinions. As a result of that, we have the opinion of a large firm of importers, Messrs. Wood, Ormerod & Co., Edinburgh. The paper will be read by the secretary.

Mr. DUNLOP, Secretary, then read the following paper on

"APPLES FOR EXPORT."

"In what follows we address growers only, believing that there need be no medium between them and the distributor to the *retail* trade.

"We would urge on growers to select one or more reliable firms (according to the quantity of fruit exported) who are in contact with the retailers, and to send regularly to said firm, or firms, all the season through. The advantages are, that such consignments are not left to the mercy of the auctioneer (sometimes competing auctioneers), the market gluts are largely avoided, and, where growers pack practically the same each consignment, the brand becomes known within circles where (always supposing the fruit merits it) a demand for it, more or less steady, is created, and a good standing price secured.

"The grower is also brought into immediate contact with the *distributor* of his goods, and is therefore sure to be advised of any defect therein, when a remedy can be applied and the defect guarded against in future.

"We think there are three headings under which we may arrange the few remarks we have to offer, viz.: Quality, Packing and Varieties. And here permit us to remark that pressure on our time forbids any elaborate production and necessitates our confining ourselves to a few practical suggestions.

"Quality.—Whatever may be his wishes, the grower knows right well that he cannot grow fruit to order. Even with his best efforts to produce fine fruit he finds that each season brings him a proportion which does not fall under that heading. This brings in the question—What shall I ship, and where?

"The market prospects at home and abroad, as far as he can ascertain them, are before him, and many considerations must influence his decision.

"In shipping to Britain, however, the consideration of freight and charges, competition and the small attention paid to second-rate goods, should lead growers to be wary of shipping hither that class of apples.

"From all our experience, during the last eighteen years, we can with confidence say: If you wish to secure good results, ship only good, reliable fruit, and where choice can be added, so much the better.

"Under this heading we may include 'Condition'—that is, condition on arrival at destination, which, of course, is due to condition on leaving and packing (the latter we shall speak of later). This is all-important. The choicest fruit, out of condition, is of small value.

"It is a point, moreover, on which few suggestions of value can be given—what will and what will not stand the journey, etc., being matters which experience only can teach, coupled with careful observation.

"Here again direct communication from the distributor would be a great gain.

"We may remark, however, that neither very green fruit nor fruit almost ripe—that is just ripe—should be packed.

"The former meets a bad market because of its appearance; the latter is almost sure to be bruised and 'chippy,' and also sells at a low price.

"We now come to 'Packing.'

"It is not likely that the 'barrel' can be improved upon as a package, though the barrel itself may.

"We hear of a ventilated barrel recently invented in America, which, if all said of it is borne out in practical experience, bids fair to supersede the present close one.

"There is only one thing perhaps which may prove an objection. We refer, however, to its peculiar feature, fearing that the free passage of the air through it may cause shrivelling of its contents when kept in it for any lengthy time, and as this point is more for the retailer to decide it would not show till, say, the next season, so that growers may find it useful not to ship *all* their early consignments in this new package—should it come into use—until they are satisfied as to this possible objection. Honesty of packing, that is, 'the same quality throughout,' cannot be too strongly urged. The grower who persistently—yea, occasionally—transgresses this rule, will have cause to repent his folly. We observed a strong ease in point only last month. The apples of a well known shipper were badly topped. A high price was paid, not only because of the top, but because of the brand which usually ensured good packing. On finding out their condition below the confidence of the buyer in that brand was thus rudely shaken, and he will not be inclined to bid for the next lot shown. This is only one case in many, but it shows the necessity of *always* packing honestly—for confidence is a guarantee of price.

"We know an English grower who, with every package, sends a small printed ticket affixed, which runs 'This fruit is packed, as far as is practicable, the same throughout,' his name following; the result being—tardy, perhaps, but sure—that wherever his goods are marketed a good price is secured. Of course, the packing bears out the label. Some of our Canadian friends may emulate this idea, though with a brand instead of label, and where due care is taken we believe whoever does will not find it labour in vain.

"Another thing is the 'grading' of the fruit. This should not be over done, but where the quantity of any one variety admits of it, a judicious selection of sizes and colours will be to the advantage of the exporter.

"Each lot should be distinguished by the brand, and so advised on consignment note.

"Another point of great importance is 'tight' packing. This doubtless most growers are aware of, yet we must urge it again, as some either do not know or do not practice it.

"We remember a small lot of apples sent by a private party from New York to our care. No doubt the fruit must be crushed (so thought the sender), so when opened the barrels were but three parts full, and fit for little but the manure heap. Even with consignments of experienced shippers do the hateful 'slacks' appear, which tell so severely on the average returns. We presume that hydraulic presses are the best means for forcing the bottoms of the barrels into their places, but where they are not available we have no doubt that the ingenuity of the Canadian farmer will devise the means on being acquainted with the necessity.

"We now come to our last head, on which we shall have little to say.

"Variety is a wide subject, and one into which many considerations enter with the grower. Having informed himself (and this should be before a tree is planted) of all or most of the varieties suitable to the climate and soil of his farm, and of the cropping qualities of each—which with the *Canadian Horticulturist* in his hands, and the co-operation so willing given, of its editor and staff, he ought, with comparative ease, to do—his next consideration in choosing his stock of trees is the marketable values and keeping qualities of their produce. There are many varieties which are so well known that we need hardly mention them, such as the 'King Pippin,' 'Northern Spy,' 'Baldwin,' 'Russet' 'Greening,' etc.

"We would urge, however, that of these *quality* rather than quantity should be aimed at in their production. For while quality always commands the market, quantity alone often drags it.

"The early varieties often reach this country in a soft, sometimes almost 'mealy' condition, and many have been the disappointments over the beautiful 'Blush Pippin' and kindred varieties.

"To grow these crisper and juicier should therefore be the aim of our American friends.

"These remarks also apply to that much-prized apple the 'Snow Pippin,' which when bright, clean and sound always commands a good price; but how often does it show fair otherwise.

"The 'Ben Davis' deserves more attention, being showy and a fair keeping variety, but it needs flavour. Notwithstanding this defect, however, it secures good prices when colour and size is right.

"The 'Ribston Pippin,' too, does well when samples are fine, as Nova Scotian shippers know to their advantage.

"Another variety we should like to see more of is the 'Spitzenberg,' a really good market apple, and one in great demand, when fine as to size and colour.

"The 'Seek no Further' is a good variety also, though apt to be small.

"Then the 'Cranberry Pippin' deserves special mention, with its finely streaked cheek and agreeable flavour and good market qualities.

"Amongst the culinary sorts the '20 oz. Pippin' 'Fallawater,' and kindred varieties command a good price when size is right.

"'Sweets' seldom if ever do well, and should be discarded as indigestible rubbish by the farmer.

"To our mind there are too many varieties, and whatever the grower for private use or local consumption may think and do, we would counsel the producer for export to limit his production to comparatively few well-tried kinds, believing he will be the gainer thereby.

"We must now close our paper, conscious of many shortcomings in our handling of so large and important a subject; yet, if what we have said "helps one single fellow traveller o'er the sands of time in his life-battle," our little labour is well repaid.

"The demand for fruit is steadily increasing. Fruit as an article of food, and not merely of luxury, is rapidly going into consumption, bringing its own results.

"The field is a wide one, and the intercourse between countries and nations thus engendered cannot fail—where each conscientiously meets each—to bring a measure of prosperity and happiness to all within its pale. With our best wishes to all present,

"We are, Sir, Yours faithfully,

"WOOD, ORMEROD & CO."

Mr. P. E. BUCKE, Ottawa.—A great deal has been said about packing in barrels tightly, shipping in boxes, and all that kind of thing. I would like to ask if the experiment has ever been tried to ship apples from this country in baskets? Would it be practical to do that? I think the baskets could be made in a very attractive shape and that people would buy them.

Mr. WOOLVERTON.—That would be a difficult question with a large quantity of apples. Thousands of baskets of apples would be difficult to handle, I believe, instead, that it would be better to have the half barrel. I have tried that quite extensively in shipping to the old country and I think it is better than the basket. The half barrel for extra choice apples has been a great advantage. That has been my experience, although evidently it has not been the experience of Mr. Starr.

Mr. ALLAN.—The only way to test the basket would be by re-packing the apples in Britain. When the fruit arrives there it could be put into smaller packages of different shapes or sizes. Certainly, if you put a nice sample of fruit into a fancy package containing a small quantity it commands a higher price proportionately than in bulk. Of course, in re-packing this point has to be taken into consideration, that even with good qualities you find a few specimens which are bruised, though not hurt to a great extent, but sufficient for them not to be re-packed in the fancy packages. However, a large quantity of the fruit could be repacked, and I have known instances where fruit has arrived at its destination in such poor condition that by re-packing and placing it in fancy packages a good profit has been realized; whereas if the barrel had been sold intact for a small price it would have involved a loss to the shipper. I have known of instances where that loss was obviated by repacking the fruit in smaller packages and selling in that way. A good price has been obtained for the good fruit; whereas, in the other way a lower price would have had to be taken.

Mr. GEO. JOHNSON, Dominion Statistician, Ottawa.—I was in London, some few years ago, Mr. President, and a friend of mine in Nova Scotia sent twenty or thirty barrels of apples to me to dispose of there. I knew nothing of the apple trade, but it occurred to me, as I was cognizant pretty well with the requirements of the average London householder, that there was no place in his house for the barrel of apples, but I thought there might be a place for a smaller package. I therefore hired a room near the Monument on Fish Street Hill and set a lot of boys to work to open the barrels, pick out the poor ones, and carefully sort out the better class. They were Nova Scotia apples, and I put them into little boxes which would hold about 25. My friends passed the word round, and the apples went off like hot cakes, and I do not suppose that any consignment of apples from this side paid better than those did. They met the wants of the London householder, inasmuch as he had room in his pantry to put them in. The English people are accustomed to buy about two dozen apples at a time, living from hand to mouth, as it were. The price at which I sold them was much less than they had been accustomed to pay for their apples, but the experiment was a successful one. While I am on my feet there is one matter which I would like to bring before the members of this association. We are now engaged in making our arrangements for the census of next year, and I have thought that perhaps it would not be a poor plan if the members of the association would communicate with me by letter, giving me their views as to what points they would like brought out in the next census. We will, in twelve or fifteen months from now, begin the work of collecting. At present we are at work on the schedules, and making our arrangements preparatory to giving the enumerators the material upon which to work. I am not sufficiently familiar with the details of the apple trade, or of the fruit trade generally, to know what would be useful information for the people of this country and for the fruit growers to possess, but if the members of the association who do know these things, and are experts in the matter, would communicate with me, I think we could tabulate all their information, and in this way obtain a fruit schedule which would be useful to the community at large, and particularly so to the members of this association, as a standard by which to judge future efforts and as a means for getting this information which possibly they would not be able to obtain in so compact a form in any other way.

Mr. SHEPHERD.—I was glad to hear from the paper just read that the Fameuse sells well in England when it is crisp. I understand the English consumer wants his apple crisp; and that an apple, such as the Fameuse, is here at Christmas time, or in January, has not the particular crispness which the English consumer desires.

Now, I am of the opinion that it is impossible to ship the Fameuse to arrive in England in that crisp condition. It is impossible to ship that variety in the barrel to retain that crispness. I, therefore, still reiterate what I said last night, that the compartment case is the best package to adopt in shipping the higher qualities of apples to England—that is, apples of tender flesh, which can be easily bruised, such as the Fameuse and the Wealthy. I shipped a number of cases of the Wealthy to England. I do not know that they had ever been shipped there before; but the report I received was that the Wealthy was a superb apple. That is the English verdict. It is a delicate apple, of high flavour, and the pressure which is brought to bear in packing them in barrels destroys them; therefore, such apples as the Fameuse and the Wealthy do not carry well in barrels. I have adopted a compartment case which seems to meet the object in view. I have also shipped the winter St. Lawrence in cases. That apple will not travel 100 miles in a barrel. It is of tender texture, and does not keep very long—perhaps until Christmas. The Winter St. Lawrence, when shipped in cases, were very highly spoken of. The point I wish to make is, that for shipping the high quality apples to England one has to discard the barrel. We want to get the highest price in England, and we cannot get that unless the fruit is in first-class condition; and we cannot put these particular varieties on the English market in the condition necessary to command a high price if they are sent over in barrels. The prices which I have received for my apples in cases satisfies me that it is the right method to adopt. I grow only high class apples, and always ship to England in cases. I draw particular attention to the case, believing it is the best thing. I have no interest in it; it is not patented, but is just like an egg case, with interior compartments, holding from ten to fifteen dozen.

Senator REESOR.—Is it a square case?

Mr. SHEPHERD.—They hold seven by seven, and there are four layers of them in one case, which makes about sixteen dozen. A case of that size takes an apple of the size of a good-sized Fameuse. The twelve dozen cases take the winter St. Lawrence and the large Wealthy. I get the pasteboard made at the factories in Montreal, where they make the interior of the egg cases, marking the square of the size I want it to be on a piece of paper as a pattern for them to go by. I tell them I want so many in the trays. They furnish me the trays and the squares. The case costs me 50 cents.

Mr. JOHNSON.—Do you wrap them up in paper before putting them into the case?

Mr. SHEPHERD.—I have done so when I want to be very particular, although I do not know that it is necessary. The chief thing we have to look to is that the apples fit the squares. It takes some time to fill up the cases in the orchard. The plan I have adopted is to put two cases between a row of trees; the largest apples go into the cases, and when the men bring the baskets of apples to pack into the barrels we put on one side those that are to go into the cases. It is essential that the apples fit the squares exactly. If they are fitted in too tightly the apples are bruised on the four sides. If they are too small they rattle about in the cases, and that does not do. They have to be nicely fitted.

Senator REESOR.—Do the cases hold about half a barrel?

Mr. SHEPHERD.—Yes; about half a barrel.

Senator PERLEY.—What do the cases cost?

Mr. SHEPHERD.—I have got them at about 50 cents. A man has a small planing mill near me, and I contracted with him last year at \$30 a hundred for the boxes themselves. It is half-inch stuff, with about an eighth of an inch nailing on the boards all round. The interior will cost about 15 cents.

Mr. STARR.—Do you have the interior perforated at all?

Mr. SHEPHERD.—There is a tray put in, and the squares are put on it with the pasteboard tray over it. The tray only is perforated. There is a sufficient circulation of air through the slats in the boxes. I do not think it costs much to get up the interior in that way. Of course, the less work you give to the box manufacturer the less the cost will be to you.

Mr. BUCKE.—What will those half-barrels, or cases, fetch in the English market?

Mr. SHEPHERD.—I have never sent any over as a speculation. The fact is, I have never had enough cases to dispose of; the demand has been greater than the supply. I sold forty cases to one man in Montreal—to a gentleman who has a business connection in England. He used to ship his Montreal Fameuse always in barrels, but he has discarded shipping in barrels since the cases have been used. He bought forty cases of Fameuse and Wealthy last year, and paid me \$3 a case for them at Montreal.

Mr. BUCKE.—That would be about \$6 a barrel?

Mr. SHEPHERD.—Yes; but you must remember that the packing costs more.

Mr. BUCKE.—I think that would pay very well.

The PRESIDENT.—I have a motion which has been placed in my hands. It reads as follows:—

"Moved by Mr. L. Woolverton, seconded by G. C. Caston, that the following gentlemen constitute a legislative committee, to whose consideration all matters requiring legislation shall be referred: Rev. Canon Fulton, P. Q.; Hon. W. D. Perley, Wolseley, N.-W. T.; A. McD. Allan, Goderich, Ont.; G. W. Henry, Port Hammond, B. C.; B. Starratt, Annapolis, N. S.; L. Woolverton, Grimsby, Ont."

Is it your pleasure to adopt the motion?

Motion carried.

Mr. WOOLVERTON.—There is one subject which should be referred to this committee at once, and that is with regard to the statistics mentioned by Mr. Johnson. I think at present the statistics of fruit culture, garden and orchard products are very imperfect. We have no means of knowing the number of apples, pears and peaches produced in any of the Provinces, and although we have some knowledge of the fruit product in bulk we have nothing in detail. We know everything about wheat, barley and other field products, but with regard to the garden and orchard products we are almost ignorant, and I think that the Government should obtain this information for us. I move, therefore, seconded by Mr. A. M. Smith, of St. Catharines:

"That in the opinion of this Convention, the present statistics of the garden and orchard products of the Provinces are exceedingly imperfect, and should be undertaken upon an entirely new basis, to include a detailed statement of the various fruits, large and small, grown and exported, as well as the quantity of each imported into the country."

The PRESIDENT.—I may say that when Mr. Johnson was speaking on this matter I considered it one of the most important subjects that could be brought to our attention. Anyone who has had to deal with the question of fruit culture, and especially in its relation to disease, orchard extension, or decline, &c., must recognize the fact that we have absolutely no statistics on the subject that we can rely on. Now, if in the next census we can have a statement in reference to orchard area in the different Provinces and the amount of produce from each, it would accomplish a vast amount of good. I hope it will be possible for us to obtain some legislation looking in that direction.

Mr. SMITH.—In seconding the motion, I would say that I have been trying to get at the commercial value of small fruits for a long time, but I have had little or no success.

Mr. GEO. JOHNSON.—They were all bunched together in the last census, so much so that they are really of no value. I am at present in communication with the authorities at Washington with respect to the mode in which they deal with this question, and also with respect to dairying matters, so that in the next census we may get a detailed statement, rather than the bulk statement we have had hitherto.

Mr. BRODIE.—In connection with the census of wheat and field products, many people feared that it was simply a plan to get increased taxation, and I believe in this case it will be a pretty hard matter, in some sections of the country, to get at the facts.

Mr. JOHNSON.—I think the growth of education, during the past ten years, has been so great that we will not have the trouble which we had at the last census in inducing the people to furnish the information that we want. With the gentlemen around me to educate the agricultural communities on the subject, we will be pretty sure to have a fair statement of our fruit and other products.

Mr. R. W. STARR.—One industry has been left out of all past censuses, which I think should be taken notice of in the coming census—that is, the nursery trade. It is a great industry in the Dominion. We hope to see it larger than it is now. I think in the past we have been depending too much on our neighbours for our fruit trees, much to the detriment of the fruit growers of Canada. We want northern grown trees; we want to know what our capabilities are for growing them and what we are doing. The census should give us full returns, if a column is inserted in the schedules asking for this information.

Mr. FRANKLAND.—At the end of the annual reports published by the conventions held in the United States the association gives a list of nurseries within the bounds that the convention represents. I do not think it would be a bad idea if we were to adopt a similar plan in Canada.

THE DEVELOPMENT OF THE NOVA SCOTIA APPLE TRADE.

The PRESIDENT.—I will now ask Mr. Starr for his paper on "The Development of the Nova Scotia Apple Trade with England."

Mr. C. R. H. STARR.—Mr. President and Gentlemen,—I must apologize for not having a written paper to present to you. Circumstances have prevented me having anything more than a few notes, and you will be kind enough on that account to bear with me for any imperfections in the remarks which I might make. I assure you that as far as any figures or statements that I may present are concerned I shall endeavour to be within the mark, at all events. I find by the programme that I am to speak on the development of the Nova Scotia apple trade with England. I would say, Mr. President, that the export of apples from Nova Scotia to England began in a very small way about the year 1860. There may have been a few barrels sent over by private parties previous to that date, but they were very few. The first shipment of any large quantity was in 1867 or 1868, when four or five thousand barrels were sent to England in a sailing vessel. These, as you will observe by the reports of the Nova Scotia Fruit Growers' Association at that time, were thrown upon the London market, rather to the astonishment of the London people. The agent, who accompanied the cargo, met with a great difficulty in procuring brokers who would undertake the handling at that time, as they would not look at Canadian fruit, and although he insisted upon it that they should be sold as Nova Scotia fruit, it was not until the third cargo had been landed that he got the name of "Nova Scotia Apples" on them. The first two cargoes the brokers insisted upon calling them American fruit; otherwise, they said, they could not sell that quantity on the market; but the third cargo was put out as Nova Scotia fruit. Notwithstanding the difficulties of this experiment in the way of packages and suitable ships, the whole venture proved satisfactory, and from that shipment arose the present trade in apples from Nova Scotia. I may just say here, that although Nova Scotia apples have been sent in small quantities to Liverpool, Glasgow, Edinburgh, and even to the continent in some cases, London has been our chief market. In comparison with the circulars of sales from the various other markets, we find, as a rule, that we make better prices in London than our friends do elsewhere. Whether this is owing to the quality of our fruit or not I am not prepared to say, but I think, probably, that has something to do with it, although I am free to confess that our Nova Scotia apples in many cases are not what they ought to be, and we have the same difficulties which I have heard mentioned this morning, and have felt them from the commencement of the export trade up to the present, of getting the fruit packed and delivered on the market in an improper condition. Every one here, doubtless, knows of these difficulties, and I need not take up your time in discussing them further. I, myself, began shipping in a small way to London by sailing vessels from Halifax. We had at that time a large

trade direct with London in various commodities, and we frequently secured the poop-deck in sailing vessels to fill up with our apples. Sometimes they would carry 500 or 600 barrels and sometimes less, when they were carried in this way. For the benefit of those gentlemen present who do not know much about shipping I may say that the poop-deck is merely the quarter deck above the main deck, where we obtained much cooler storage than was possible to get in the hold among other cargo. These shipments proved very satisfactory. At that time we sold "Blenheim Pippins" and "Ribston Pippins" as high as 30s. to 35s. per barrel for the lots, and while these prices have fallen in some cases, even now we get them sometimes when we send consignments by steamships. I have a tabulated statement here, Mr. President, of the prices which we have obtained for our Nova Scotia apples in London during the last ten years. I know figures are rather wearisome, but as they will enable you to make a comparison with the prices received by shippers from other parts of the Dominion, in the discussion which follows I shall be glad to know whether we are in advance or behind other sections of the Dominion in this respect. I have mentioned here certain leading varieties of Nova Scotia apples—that is, Gravenstein, Ribston, Blenheims, Baldwins, Kings, Golden Russets and Nonpareil. I have taken the average price from sales of large quantities, but I have not considered fruit in bad condition or delivered under unfavourable circumstances, as I do not think that would be a fair criterion. I have taken the last average figures, not the highest figures by any means, because we frequently find odd barrels that run up into the "forties." A shipment of Gravensteins in the year 1880 realized, at that time, from 16s. to 16s. 6d. This price continued about the same until the year 1884, when they rose to from 17s. to 20s. on the average sales, and last year for No. 1 Gravensteins we got 22s. for the bulk of No. 1's. During the present season, I am sorry to say, Mr. President, we have been unable to supply the London market with Gravensteins, owing to their early maturity and the want of shipping facilities at the moment they were ready. This was a thing we were warned against in 1887-8, and as a consequence most of our Gravensteins went to New York. We were warned by our London friends that we were in danger of losing our customers in not continuing to supply the demand created in years gone by. The Londoners ask for Nova Scotia Gravensteins, and we were told if we could not supply them they would have to go elsewhere to try to get them. As a result, they immediately succeeded in finding them in Germany in plentiful quantities, and they secured enough to supply the demand which we failed to meet, owing to our fruit maturing too early and being too soft to ship at the time we had expected. This may apply to other leading varieties at some other time, and I therefore mention this as a warning that when we have leading varieties, for which we have created a demand, that we must not let go the main chance by simply for that season grasping at it elsewhere. Our experience has been the experience of others with different commodities in the past. Take the case of the onion. A few years ago a syndicate attempted to corner the market in onions, and they woke up one fine morning to find Egyptian onions on the market, and the result is, we have had Egyptian onions on the market ever since. That may be the case with Gravensteins in London, hereafter.

Mr. BUCKE—Are these German apples as good as your Gravensteins?

Mr. STARR.—I do not think they are, but they supplied the market this year at fair prices. I believe, also, that a quantity of Gravensteins from Denmark was sent to London, as well as from Germany. Now I come to the prices which we obtained for Ribston Pippins. During the past ten seasons they have run somewhat as follows: In 1880, from 17s. to 20s.; in 1884, from 23s. to 30s.; in 1887, from 20s. to 37s.; and during the present season they run from 23s. to 30s. Our Blenheims in 1880 brought from 17s. to 23s.; in 1884, from 25s. to 29s.; in 1886, from 16s. to 24s.; in 1887, from 20s. to 27s.; and this season from 20s. to 28s. Our Baldwins in 1880 brought from 15s. to 18s.; in 1882-3, from 22s. to 24s.; the year following from 22s. to 25s.; in 1886, from 14s. to 21s. In 1887-8 the Baldwins were very poor; they were scabby, and sold as low as from 8s. for No. 2 and very few went above 12s. The present season they are realizing from 13s. to 25s. Our Kings in 1881, fetched from 23s.

6d. to 30s.; the next year, from 25s. to 30s.; in 1884-5, from 16s. to 21s.; in 1886-7, from 15s. to 20s.; in 1888-9, from 13s. to 21s.; and during the present season, from 15s. to 30s. Golden Russets in 1882-3, brought from 26s. to 28s.; in 1884-5, from 16s. to 21s.; the year following from 14s. to 23s.; in 1886-7, from 18s. to 28s.; in 1887-8, from 20s. to 35s.—a few going as high as 40s., and during the present season Golden Russets are bringing from 20s. to 25s. Our Nonpareil, which is a splendid apple for the table, is perhaps not generally known in Ontario and other sections of the Dominion. For a long time we have regarded it as one of our best Nova Scotia apples for late shipment. The apple is much smaller than the Roxbury Russet; perhaps it is not quite so highly flavoured, and it is a question in the minds of our best pomologists whether or not it is the same apple, which has changed a little through propagation, or cultivation, or climate, or some other cause. Probably Mr. W. Starr will tell you later on that Mr. Downing, in his day, examined it thoroughly many times, and he pronounced it in every case not a Roxbury Russet, while the habit of growth of the trees and other things about it would indicate it almost to be the same. This apple we have frequently shipped from this side as late as the month of May, and we usually realized very high prices for it from April on into June. Unfortunately, however, this state of affairs does not exist now, owing to the competition which we have to contend with in green fruit from Australia, the first of which arrived in London in the summer of 1886, and has continued to arrive there in larger quantities each year. They begin to arrive about the middle or the latter part of April, and being green and fresh at that time, for us to put our previous season's fruit alongside them is like putting a fresh picked apple alongside one of those which are here in the room now. Naturally, therefore, we have a strong competitor in the Australian green fruit. We have therefore found it to our advantage to ship off the whole of our Nonpareils and put them on the market before the arrival of the Australian apples. The possibilities of the trade in Nova Scotia apples with England are very great indeed. We have great many advantages in Nova Scotia over, perhaps, all the rest of the Dominion from the very fact that our apples are grown, you may say, on the pier. At the discussion last evening on the question of transportation, and the delays of railways, etc., we Nova Scotians could not but congratulate ourselves that we were not troubled with these difficulties. As I remarked last evening, we can load our apples on to the cars in the morning and have them on the steamer in the afternoon. By running special trains for this purpose, which our railway companies are usually disposed to do, we are able to do this in the coldest of weather, even although we have not the shipping facilities at Halifax that we should have. We have been endeavouring for a number of years to procure frost-proof warehouses at the railway terminus there in order that we might send our apples to Halifax in mild weather on days previous to the arrival of the ship, so that we might know we should not be subjected to the risk of frost; but even with the lack of these facilities which we have to-day, by putting fires in the cars we are able to ship in the coldest weather and have the fruit exposed but a very short time. This is one of the advantages of fruit growing in Nova Scotia. Our seaports are open the entire winter, and we can ship our apples on the very day that the ship is ready to sail or when the fruit is just ready to ship. That is another very great point. As for our capabilities of fruit growing, I am sorry that our collection here is not larger, as we might have shown you something better as samples of Nova Scotia fruit. I may say, however, that we should be glad to have any of our friends visit us during the autumn and see the orchards. You could then better judge for yourselves than I could tell you as to what our capabilities are, what sort of a climate and soil we have for growing apples. We are pleased to know that our fruits stand second to none in the English markets, where we have taken proper care in packing and putting it on the market in good shape. My own experience in this line has been considerable. I began with my first shipments to consign, as many of you do, to brokers in the English markets, who place them on sale at auction, where they were sold for whatever they would fetch at the time they were offered. Finding this not to be very satisfactory,

we succeeded in making much better arrangements. It came about in this way: It happened to be my privilege and duty to go to London with a large consignment of potatoes. At the time when the cargo arrived potatoes were a glut on the market and prices were very dull. Things looked very blue for me. For some days previous to the arrival of the ship I was looking about me and found potatoes selling at auction at ruinously low prices. I made up my mind that if I had to sell the potatoes at the ruling prices I would be unable to pay the freight. I also looked about the markets and found large quantities of potatoes being sold at private sale—to the jobbing trade. This naturally induced me to place my potatoes in the hands of men who, I felt sure, from what I had seen, could realize the highest price. I found that by selling at private sale the prices realized were much better than by selling at auction on the same day. This led me to inquire why our apples were being sold at auction, and it occurred to me that if potatoes could be sold at private sale our apples could also be sold in that way, and we should make much better prices. No one could answer me in any other way than that it was the custom to sell apples by auction as well as other kinds of fruit. In talking with parties who were selling to the retail trade at private sale, they said they know these men who were buying potatoes also dealt largely in apples. They came to buy their supply of potatoes at private sale and then went over to the auction sale to purchase their apples. They told me that they would talk the matter over with them as to whether or not they would purchase apples at private sale—whether they were willing to buy apples in that way. The matter was discussed with their customers in my presence, and when they were asked if they would buy apples by private sale the reply invariably was, "Certainly if you Nova Scotia people or Canadians will send apples here where we know what we can get and can select what we want at private sale we should prefer doing that, and buying our supplies at any time that was convenient to us, rather than that we should go to the auction sales at certain hours and simply judge from samples as to what the bulk would be." The result was, that the next autumn we consigned our apples for private sale. This happened ten years ago. The result is, that to-day at least one-third, and in some seasons considerably more than that, of our Nova Scotia apples is being sold in England at private sale, instead of by auction, and the figures which I have given you will compare, as far as my knowledge goes, favourably with the average sales of those markets. That is one of the favourable points to our Nova Scotia apple trade, one that I think we have reason to be thankful for, and it is nothing but what any man can adopt or make arrangements for. I think the question has been alluded to before in reference to other matters in this line. Now, Mr. President, in Nova Scotia we have plenty of room for double and even treble the number of orchards that we have now, and we believe that in a very few years the quantity of fruit that we shall produce there will be double or treble our present product, which, up to the present time, our exports to London alone have been 113,000 barrels. This quantity in a few years we expect to double, and double over again as the years roll on. Thousands of young orchards are being planted to-day, and have been during the past few years. And here I may remark that I was glad of the reference which our statistician, Mr. Johnson, made to the coming census. We find a great difficulty in getting at anything like a correct statement of our fruit or orchard development. We have no means whatever of getting at the quantity of trees brought into the country. I endeavoured a few years ago, at the request of our association, to obtain some information on this point, but found it utterly impracticable to get at anything reliable. The suggestion to do this in the next census is undoubtedly a good one, and will be of great use to us if carried out effectually. Allusion has been made to the ventilated barrels for export. If you allow me a word upon that matter I would say that I have examined this ventilated barrel particularly and I quite endorse the statement made by some gentlemen here last evening, that our experience has not been in favour of an open barrel for shipping apples. If we had ships thoroughly ventilated and the circulation of pure air through the vessels, possibly the ventilated barrel would be satisfactory. But with our present facilities I imagine the air in the hold of a vessel would be much more injurious to the fruit

in an open barrel than if the barrel were closed. Another question with reference to the use of this same barrel is the danger of the fruit being frozen in an open barrel, whereas the tight barrel might be sufficient protection during the railway journey. I quite endorse the idea that for railway shipments or transportation on the decks of steamers the open barrel would be beneficial, but it is doubtful whether it would be so in the hold of an ocean ship. The varieties named here we find to be the most profitable in Nova Scotia, although there are several other varieties which are being grown in our Province, and perhaps some of these may, in years to come, prove to be quite as profitable as the varieties I have named. Mr. Dempsey last evening referred to Cox's Orange Pippin as being a desirable apple to sell. We have had some experience with it, and it is not an apple that is a satisfactory grower with us. What few we might have down there, even if they were to get a high price for them, would not be as profitable as other varieties which yield much more in quantity and are better in quality as a whole. The same thing will apply to the Newton Pippin, an apple which brings the highest price in the English market, but which varies very much, that variation being explained by many varieties being branded Newton Pippin, which are not. There are very few Newton Pippins to be had, and they are getting less and less every year, and we find them so subject to black scab as to be almost useless, although they will stand more black scab than any other variety shipped—so much so, that purchasers look for the black spot by which to identify the apple. That is the opinion of the English dealer. Mr. Allan or General Laurie spoke of the fruit of the Army and Navy stores. I examined the Newton Pippin there, and got all the information possible from them with reference to the kinds and style of package and so on. I could plainly see that there was little chance for any radical change with reference to our varieties. I quite endorse the fact that Mr. McBride mentioned this morning, that we in Nova Scotia do not use as good a class of barrel as we should. It has been my aim to induce our farmers to use a better class of barrel, but with few exceptions the difference in the cost will more than overbalance the cost in any other way. If they can secure a barrel for 15 cents or 18 cents they will pay that, instead of getting a first-class barrel. Perhaps I have said enough on this subject.

Mr. SHEPHERD.—I do not think you gave us the prices for the Nonpareils. Will you kindly do so?

Mr. STARR.—Certainly. In 1882-3 we obtained from 22s. to 30s.; in 1883-4, from 21s. to 25s., a few selling as high as 30s. a barrel; in 1885-6, from 15s. to 22s.; in 1887-8, from 17s. to 27s.; in 1888-9, from 10s. to 16s.; and this season from 17s. to 25s.

Mr. SHEPHERD.—Now, will you give us the varieties in the order of their importance and value.

Mr. STARR.—We would place at the head of the list, as the most profitable variety, the Gravenstein. Next, in some quarters, comes the Ribston. It is necessary that the Ribston Pippin should be planted on heavy clay loam. They do best on gravelly soil; they do not do well on gravelly or light soil. Golden Russets, King of Tomkins and Elenheims, perhaps, would come on a level with the Ribstons. The Nonpareil, in Annapolis County, I think Mr. Starratt will bear me out, is one of the most profitable varieties with the Gravenstein. As to the Baldwin, it is an open question with us. In some seasons it will grow very profitably, but unless the season is a long, dry and hot one, Baldwins are not as satisfactory as we would like to have them. They seem to require a longer and hotter season than we are always sure of getting. Consequently, we do not pin our faith to them always, although they are enormous yielders. In reference to the packing in cases, I think I mentioned last night that our experience with packages, other than barrels, has not been a success, although we have tested it on several occasions. The great difficulty with the case is, to secure the fruit so as to put them into squares, so that they will not move. We have not found it much of a success to put up apples in smaller packages as they appear to be only saleable at good prices about Christmas time. As a general

ference in an during pments e bene- n ship. though perhaps varieties as being not an there, is other whole. highest being There is every gh they hat pur- opini on the Army rmation o on. I eference morning, It has with few t in any they will h on this s. Will n 1883-4, to 22s.; from 17s. of their t profit- n. It is They do Russets, Ribstons. t, is one it is an unless the could like to always althoough I men- has not difficulty they will packages & general rule they are not wanted. Mr. President, I can only say that if the fruit-growers of Ontario or any other section of the Dominion, or of the world, wish to make any change in their fruit orchards and get clear of any disadvantages they may be suffering under now, by living in the interior of the country, a long way from ship-board, I would like them to come to the Province of Nova Scotia, to the Annapolis Valley, and to other valleys that are now being opened up and provided with such facilities as to enable us to export our fruit readily. Thousands of acres of land available for fruit growing are now lying in pasture or bushes. We look upon apple growing in Nova Scotia as being the leading industry, and a great industry, that will pay any practical man who devotes his whole time and attention to that business, or even a general farmer who devotes a portion of his time to it. We are glad to know that many friends are coming into the country exclusively for this purpose. One gentleman from Ontario who is sitting before me now, a gentleman who lives in Ottawa, bought a large orchard in the immediate vicinity of Grand Pré, in the land of Evangeline, which he hopes will be a great success. Alongside of him Judge Weatherland's plantation is one of the wonders to visitors. He has made it a great success; it is an orchard among the bushes. To a great extent he has succeeded by cutting away and making room for his trees, and clearing up as time will permit. He is very enthusiastic, and although not a practical horticulturist, I think he bids fair to make a success of orcharding. These are but samples of what is going on in our Province; and, as I said before, we have plenty of room for thousands more to adopt the same plan and make Nova Scotia a continuous fruit orchard from one end of the country to the other.

Mr. ALLAN.—There was one point in Mr. Starr's observations which I could not help noting. It was a very excellent one. It was the establishment at the seaboard—I think it would be better there than inland—of convenient storage houses for the purpose of storing the fruit in as natural a condition as possible. For this reason, it does not pay to ship all the varieties of fruit at the time of picking, as, for instance, the Russets. They are not wanted for immediate consumption; there is no demand for them in a British market at that particular time, and if we could regulate the traffic so as to ship these varieties in the proper season for consumption to the British markets, when they are wanted, we could, upon the average, receive a much better price. The Russet, as a rule, is not wanted until after the new year and towards the spring, so that our storage houses would come in very useful in that way. That is a matter which requires a good deal of consideration to perfect it.

Mr. C. R. H. STARR.—Will you allow me to say that a few years ago an English firm built an expensive and fine fruit house at Annapolis for this very purpose. It has, as a warehouse, been a great success. Unfortunately, the success of shipping from that end of the valley has not been as great a success as we would wish, for the reason that it is always better to get the ships to come for apples alongside the wharf. I am rather surprised you have no such facilities at Montreal.

Mr. SHEPHERD.—In this connection I may say that when you and I, as a deputation, visited the representatives of the steamship and railway lines, Mr. Sargeant, of the Grand Trunk Railway, suggested this. We mentioned the points that Mr. Allan made two years ago in regard to the port of Montreal being inferior to the port of New York; that the extra handling at Montreal—the cartage from the railway to the steamer—militated against the port; and Mr. Sargeant then said they would send the cars down to the wharves and sometimes the ships were not prepared to take them, and they had to bring the cars back again. He said they had sent the cars down three or four times before the ships were prepared to take the fruit on board. He therefore, suggested this: He said they had acquired large warehouses in Montreal alongside of which the track ran, and he suggested storing the barrels in these warehouses until the ships were prepared to receive them, and then they could be lightered down from the canal basin to the harbour. He thought less damage would be done in that way to the fruit and the cartage would be saved.

Mr. ALLAN.—That would necessitate an extra expense, however. The expense of it might be serious, but it is hard to tell.

Mr. R. W. STARR.—I would like to make a few observations on this matter. Only two years ago, in sending a lot of holiday fruit, I put among them a few barrels of extra Fallawaters, well coloured and handsome. These apples sold for 16s. a barrel; that was the highest rate I could get for them. In the latter part of February, about the 25th, I shipped some more barrels of Fallawaters, and I had three qualities. My few barrels, the extras, brought me 32s., the number 1's brought 30s. and the No. 2's 26s.; so you see what it is to keep the apples and send them to the market at the proper time. I had a fruit cellar where I could keep them; but many of our farmers having no warehouses or places to keep them, had to send them to market at the time when prices were lowest. The British consumer does not buy ahead, or the jobber does not hold heavy stocks. The result is, that if you send apples to market earlier than they are wanted they must be sacrificed. We have no such risks down by the sea as you have, only the risk of freezing, because we have only four or five hours in getting from the orchard to the ship, that is, if the cars are ready and can get them down in the proper time. The only thing we are lacking is rolling stock for the railway. We want, for the early season, ventilated cars during the hot weather, cars that will carry the fruit with the least possible liability to overheating. Then, when it gets colder we want frost-proof cars, cars that can be heated by means of lamps, stoves or some other means, in order that the temperature in the car may be kept a little above freezing point. Then we want a better and more careful system of handling and stowing, both on the cars and steamers. Then better ventilation, and greater care in discharging on the other side. We have most fault to find with the way cargoes are delivered, not the way they are taken, because almost invariably we send an agent with the cars to the steamers, and it makes a vast difference the way they are handled on arrival. With fair handling, more competition in freights, and frost-proof warehouses at the point of shipment, we should be all right.

The PRESIDENT—I think these are important points, which we might refer to the Committee on Transportation. In that connection I would make another suggestion with reference to the sale of fruit on the London market by private sale. It struck me that if there was an authorized agent there to act as agent to the Canadian fruit growers, so that all Canadian fruit could be shipped to him and under proper regulations, each man having his own brand on the barrels, and that agent instructed to effect private sales, I think the question of market price would quickly settle itself. I think that is a matter which would be worthy of the consideration of the Committee on Transportation.

Mr. Geo. JOHNSON—May I be allowed to state that during this year, in anticipation of the census, it will be very important that all persons growing fruit for export should be very particular as to the quantities and value of the fruit that they raise, more particularly so this year than in any other year. Another point I might mention is, that any letters addressed to me at the Department of Agriculture, Ottawa, should be marked "free."

The PRESIDENT.—I will now call upon Mr. Fisk to give us his paper on Russian Apples.

MR. J. M. FISK, of Abbotsford, then read the following paper:—

ADAPTATION OF RUSSIAN FRUITS TO CANADIAN REQUIREMENTS.

Mr. Chairman and Gentlemen,—No portion of the American continent is likely to be more benefited by the introduction of the Russian fruits than the northern part of the Dominion of Canada, especially that portion which lies north of parallel 46, which requires trees, not only of the very hardest types, but those which mature their fruits early in the season.

This is characteristic with most of the Russian varieties, for they prepare for the winter by thoroughly maturing the season's growth, having well-ripened terminal buds, which seldom fail to start in the spring. Our earliest and most profitable summer apples are those of Russian origin, among which are Yellow Transparent,

Charlottenthaler, Red Astrachan and Duchess; and while many growers south of us speak of the Russian varieties as being of little value, those north will continue to sing their praises, for the reason that the trees will survive the cold winters and ripen their fruits before the early frosts.

The north is essentially the home of the Russian apple; and when we come to consider that many of the varieties lately imported were selected from Northern and Central Russia, where apple-growing is made a commercial industry in a climate much colder than our own, being in a latitude six hundred miles farther north than the city of Quebec, we can readily understand the possibility of extending the area of apple culture in the Dominion much farther north than it was possible to do with our old varieties. Hence their value to us, and climates of like character.

The Duchess of Oldenburg has, for a number of years, been generally cultivated, and so widely popular has this variety become for its productiveness and hardiness, that it is often referred to as a standard in comparison with other varieties; and yet, among the later importations there are several varieties quite as productive, and even more hardy than the Duchess. This is not only my experience, but others as well.

A test case of 65 varieties was given by Mr. Gibb in a paper read at Quebec two years ago, in which he said :

"To test the hardiness of the Russian apple trees, at their worst, in bleak open prairie exposure, at the Minnesota State Experimental Station at St. Anthony, near Minneapolis, 65 varieties were planted. The soil was rich; and under good culture they made a growth, in 1886, up to 20 and even 26 inches, which, however, ripened well before winter.

"The winter of 1886-87 was unusually severe. Not one variety started from its terminal buds.

"Sixteen varieties lost 1 inch or less of growth. Duchess killed back sometimes to old wood, but usually started buds from the base of the new wood. The verdict was—16 varieties harder than Duchess."

This test was a more severe trial than anything we can give in the same latitude, owing to the fact that after making a forced growth through high cultivation they were subjected to an exposure that we do not experience in our elevated and hilly country.

We have on exhibition to-day the Arabka—with us, a midwinter fruit of good size and attractive in appearance, but coarse in texture; and like many other of the Russian apples, will prove a profitable market variety. The tree is hardy, productive, and an early bearer.

Among the Russian varieties that have fruited so far, we have failed to find what we have long been in search of, and that is, a long keeper of really good quality. Many of the most promising could be greatly improved by crossing with some of the best long-keeping varieties of good quality which are not sufficiently hardy for our needs.

This is a work that should be entered upon at an early date by our Experimental Stations.

"Our friends of the United States are ahead of us in this respect, as they have already entered upon this work.

During the past season several of the State Experimental Stations have pollinated some of the hardest of the Russians with old varieties of better quality, with what results time will tell. In any case, we are likely to share the benefit of their experiments; but it is a work that we, too, should enter upon, and be in a position to provide, from our own resources the needs of our country.

I have confined myself thus far to the Russian apple, with the view, and belief, that it will fulfil, to a large extent, the requirements of the more exposed parts of the Dominion; but I do not feel as sanguine in regard to the Russian pear, plum and cherry—partly for the reason that I have seen less of these fruits than the apple, and partly from the fact that what I have seen is less encouraging. True, many of

the pears are quite as hardy as the Duchess apple, and will make good stock to cross with other and better varieties.

The Bessemianka pear, which is thought by Mr. Gibb to be one of the best, fruited with me last season; it was ripe in August. Small in size, coarse in texture, and very perishable; not desirable for a market fruit.

The plums have not fruited with us yet, and I fear we have not yet received the best of these; while the cherries are more promising. The Vladimir is, without doubt, one of the best and, I think, will prove valuable in this country.

Before closing this short paper, Mr. Chairman, I feel it will not be amiss to refer to the noble work done by our friend, Mr. Charles Gibb, in his efforts to benefit the fruit interests of the Dominion. He has twice visited Russia, at a considerable sacrifice of time and means, in search of suitable fruits; and it is through his efforts that we are now in possession of many promising and new varieties. Ever ready with pen and counsel in all work pertaining to horticulture, his absence at this, our first Dominion Convention, is to be regretted by all who know him. "*Honor to whom honor is due.*"

Mr. WOOLVERTON.—I am glad to make the statement here that the Ontario fruit-grower is doing something in reference to Russian fruits. We have had some correspondence with an eminent Russian authority, and we are expecting to receive from him a large box of some fifty varieties of specially valuable Russian apples, and these are to be carefully tested, both by our members and at the Experimental Farm here at Ottawa, and we are very hopeful that some excellent results will come from these experiments. As soon as we have sufficient varieties we will distribute them among our members, and of those that we have not a sufficient quantity to go round they will be tested at the Experimental Farm. We are sending a consignment of our hardier fruit trees in return.

Mr. FRANKLAND.—From what part of Russia are these coming, and are they most suitable for the severe parts of the Dominion?

Mr. WOOLVERTON.—They are being collected from all parts of Russia. They are being collected by a Government officer, so that we shall have them from all parts.

Mr. ALLAN.—The consignment will include not only apples, but pears and cherries as well?

Mr. WOOLVERTON.—Yes; and Russian apricots, too.

Mr. SHEPHERD.—The question raised is a very important one. To meet the wants of Manitoba and the North-West we must look to the Russian varieties. We must get the best of apples from northern Russia. My experience with the Russian varieties is that the quality is not what they ought to be and what we expect. I do not think that they can compare with our Canadian apples in quality. Mr. Fisk has not mentioned the Switzer, which is the only apple, I think, of good quality. It is not the best, but it is a good apple, and corresponds with the St. Lawrence, and looks something like the Fameuse. It bears heavily, and is very hardy. The Yellow Transparent I do not think will pay us to grow.

Mr. ALLAN.—Referring to that point, my belief is this: That the value of the Russian varieties is going to be only in the colder sections. To many of us, who live in the most favoured sections of Canada, the Russian varieties will be of little or no value, because of their poor quality, generally. In the colder sections they will do better, and it is for this reason that the test is being made. I believe, even in the colder sections, although some of the fruit-growers think they are going to supply their own market, I do not think it is possible. The time may come when they will supply their own markets with early apples, but the real test of these varieties will not be reliable until you bring them right into bearing. It may be a hardy tree up to bearing, and then may not be hardy, because there is a drain on the tree in the bearing. No time is allowed for the tree to recuperate from the strain of bearing before the cold weather comes right in.

Mr. BRODIE.—My experience with the Yellow Transparent is different from Mr. Shepherd's. I have marketed them two years in succession, and averaged \$5 a barrel.

Mr. WRIGHT.—How does the Yellow Transparent compare with the Red Astrachan?

Mr. BRODIE.—I began selling the Yellow Transparent in the last week in July.

Mr. SHEPHERD.—I could never understand how the Yellow Transparent got the reputation of being an extremely early fruit. I never saw one on the 28th July fit to be sent to market at that time.

Mr. BRODIE.—They are early, like the Red Astrachan. There is a demand for cooking apples at that season, and they seem to meet the demand. When we get \$5 a barrel for them I think that is a pretty good test.

Mr. HENRY.—With regard to the Switzer, it is quite as hardy a tree as the Yellow Transparent; its season is late in the fall, and the appearance of the apple is a beautiful one. It has a freshness about it, and it is quite solid.

Mr. HARRISON.—With regard to the possibility of Russian fruits in the North-West, unfortunately I have not been able to verify my opinion, but I have heard on reliable authority from several sources that there is near Pilot Butte a small plantation of Russian apples which have been bearing fruit regularly for several years. I know that in our neighbourhood there are two or three apple trees which have been planted, and I think it is simply owing to the bad cultivation that they have been cut down year after year. If they had been properly planted and treated I see no reason whatever why they should not do as well as the apples at Pilot Butte.

The Convention took recess until afternoon.

THURSDAY AFTERNOON.

The PRESIDENT.—Before asking for the papers this afternoon, there are one or two other matters that call for our attention. A question has been presented which it is desired should be answered, so that the parties asking it should obtain an authoritative decision *pro or con* on this point. The question is one that has been frequently asked and involves a matter of import duty. It is: "What are tomatoes-fruit or vegetables?" There are two points of view from which we can regard that question. Scientifically speaking, the tomatoe is a fruit. There is no doubt about that. Commercially speaking, however, the tomatoe is usually regarded as a vegetable. The question is, of course, being asked by the President of the Canadian Canned Goods Association just where the line is to be drawn. They would like very much to have tomatoes classed as fruit; but I will ask for some expression of opinion, and we may enter it upon our records as an authoritative decision.

Mr. W. BOULTER, Picton, Ont.—As the one who asked that question, I may say that we, as packers, feel it would be a good time at this convention of Dominion Fruit Growers' to definitely decide upon this matter. As you have justly stated, this matter affects us very much with relation to the tariff. The question has also been asked with respect to apples: Is an apple really a fruit all through, when it is picked or when it has gone through the hermetically sealed process, as in canning fruits? The tomatoe has always been looked upon at first thought as a fruit. Commercially, as you stated, would it be changed by any process that it may be submitted to in the ordinary hermetically sealing method. This association, composed as it is of the leading fruit growers of Canada, and one that we should look up to with a certain degree of respect, may properly be appealed to on this question. Our interests are identical, and I should like this association to come to a definite conclusion. As many of you know, we are interested here in regard to the operations of the present tariff. We, as packers, are interested in that matter as well, and if this association should decide that the tomatoe is different from what has been supposed it would make a material difference with regard to the effect of the tariff upon our business.

Mr. STARR.—This question came up before the Nova Scotia Fruit Growers' Association a few years ago, in connection with our fair, and the decision then arrived at satisfied some of the exhibitors. The decision was to class as fruit such of the family as tomatoes, melons and cucumbers as were eaten raw. It was a line drawn on that basis, to class its fruits such as were placed on the table.

Prof. SAUNDERS.—This question is important when looked at from the stand-point of the duty, because if a tomatoe were a fruit it would come in free, and as a vegetable it would be chargeable for duty. It has always appeared to me, while there is no question about the tomatoe being botanically a fruit, that commercially it is a vegetable, for the reason that a very large proportion of the tomatoes are used cooked. I think there are comparatively few eaten raw, and even if there were, I scarcely think we could regard them commercially in any other sense than as a vegetable. If we class tomatoes as fruit, we must class cucumbers, squashes, and a number of other things ordinarily used as vegetables in the same way. I think it would be unwise on the part of this convention to take any action that would look like straining a point in the way of bringing in as fruit an article that would not be regarded by the ordinary public in any other light than as a vegetable.

The PRESIDENT.—When the prize list was being made out by the Executive Committee this very point was under discussion, and we took the ground then that according to the use that was usually made of it a tomatoe must be regarded as a vegetable. Hence it was excluded from the prize list.

Mr. DEMPSEY.—I have seen persons using potatoes as vegetables, and under the same head they would be counted as fruit.

Mr. GRAHAM.—Is there not one variety of tomatoe used specially for preserving purposes?

Mr. BUCKE.—I think the Solanum has always been classed as a fruit.

Prof. SAUNDERS.—That tomatoe, however, is too small for cooking purposes. It would be too troublesome to handle, but it must come in under the general head of vegetable, although usually eaten in the raw state.

The PRESIDENT.—I think we might decide the question one way or the other, for the sake of the parties interested.

Prof. SAUNDERS.—To facilitate matters, I would move: "That in the opinion of this convention tomatoes, although botanically a fruit, should be regarded, on account of the uses to which they are put, as vegetables."

Mr. DEMPSEY seconded this resolution, and it was adopted.

ORGANIZATION.

Mr. P. C. DEMPSEY.—It has occurred to me that it is very necessary this convention should be changed into a Dominion Association—the Dominion Association of Fruit Growers—and therefore I would move, without saying anything further, that a committee on permanent organization be appointed to consider this matter and to report to-morrow morning.

Mr. BRODIE seconded the resolution.

After a short discussion this motion was adopted.

PLANT PARASITES, WITH SPECIAL REFERENCE TO THOSE AFFECTING THE GRAPE, BY PROF. J. HOYES PANTON, M.A., F.G.S., Ontario Agricultural College, Guelph.

Mr. President and Gentlemen.—I am much pleased to have the opportunity of standing before you this afternoon, and for a short time trying to interest you, and to some extent instruct you, along the line of obscure plant life. I was very much pleased with the remarks of the Hon. Minister of Agriculture yesterday afternoon, when he said that he hoped the time was not far distant when he would hear more of agricultural science in the schools. The plan he suggested of having a talk once or twice in the week, say an hour spent for that purpose, I think was a most enjoyable one. The great difficulty at the present time is to have teachers that are able to do that; but I believe that difficulty will, to a considerable extent, soon be obviated. I know that there will be a text book on Agricultural Science soon in the common schools of Ontario, for it is now in press. When the teachers get that, and make this subject one of study, I can scarcely realize anything more interesting to a band of scholars than that a teacher for a portion of an afternoon take up and discuss some subject along the line of agricultural science. I am here to-day to give a talk upon some parasites, and it may afford a sample of the way in which a person could

address a number of scholars. Of course, I may be permitted, before such an intelligent class of men as are here, to be a little more technical than I would be if I were addressing pupils of say 12 to 15 years of age: but even before you, I shall try to escape being too technical for I believe, that has been the great trouble in the past in relation to the teaching of science. Men that have undertaken it have paid too much attention to the incomprehensible technical terms sometimes used, so that students and the public are apt to go away thinking that science can only be studied by those who make it a special work. Now the subject that you have set apart for me to discuss is one that until within the last few years very little was known of. But the discovery of the microscope and afterwards the simplifying of the manufacture of it has placed it within the power of nearly all persons to be able to possess such an instrument. In fact, you can get a microscope now for some \$17 or \$18 that will magnify up to 600 diameters. This is a high power, and will show all the things and far more than what I intend to speak about this afternoon. Here, at the very outset, let us try and locate where these plants are in the plant kingdom. When we look abroad we find there are two great classes of plants. There is a class that flowers and a class that does not. With those that flower we are all familiar; but it is of these obscure forms which do not flower that a great many persons are ignorant, and up to the last few years even botanists pushed them aside, saying that their life history was too complicated for the ordinary student. But now, you will find that the study of these obscure forms is becoming far more attractive to the students of plant life. I know in my experience as a teacher of science there is no subject that the student likes to hear discussed with better relish than what relates to the fungi or these forms of flowerless plants. Among these flowerless plants you find such forms as the ferns, the mosses and the sea weeds, and what I have called here the fungi. The fungi, then, belong to the flowerless plants. What makes the great difference between the flowering and the flowerless plants, aside from the great external characteristics that present themselves the moment you look at them, is this fact: that the flowering plant arises from seeds, while the flowerless plant rises from spores. Now, what is the difference between a seed and a spore? Here (pointing to the diagram) I have outlined some figures to show that difference. A seed, as a general thing, is large. It is readily seen with the naked eye. It has a distinct covering, and contains an embryo—a miniature plant. Sometimes the covering is very thick and much developed, but when the seed is surrounded by proper conditions it will grow and develop, and finally become a plant like that which bore it. Then, again, when it commences to grow, it always grows from a particular part. You would not find it growing in this seed of wheat at one end and in another seed at the other; but in all the grains of wheat you find that the tiny rootlet, the radicle, will start from a particular end. When it grows it assumes that form of plant life that we are all familiar with, bearing leaves and stalks, and green colouring matter. Now let us look at the spore. In the first place, you cannot see it. We have to get art to give us help here, and by means of a microscope we see this tiny microscopic thing called a spore. The protoplasm is surrounded by a very thin membrane. We do not find a thick case there as an external covering. Sometimes it is naked, and is then merely a clump of protoplasm (a jelly-like substance, the physical basis of life). We find when we look into it no embryo, as we see in the seed. When it begins to grow you cannot tell where it is going to grow from. It may be on the right side or left side, or underside or the upper side. There is no definite point of growth, as in the case of a seed. Then, having germinated it begins to develop a peculiar series of thread-like structures. As it grows the difference between it and a flowering plant widens, just as much as the mushroom widens from the rose, the rust on wheat from the plant upon which it grows. So you have these four points of distinction between a seed and a spore: the seed large, with a good covering, with an embryo, and growing from a distinct part; the spore minute, thin covering, no embryo, and indefinite growth. When we consider these fungi—this great comprehensive group, in which we find so many of the parasitic plants—we find plants that

are entirely different from all others. They do not possess green coloring matter—this fact shows they must feed in an entirely different way from the plants that have green colouring matter. The plants with green colouring matter can take in gases from the atmosphere, and from them elaborate products for their nourishment; or their roots going down into the soil absorb substances, and from dead inorganic matter work up compounds of a more or less complex nature. The fungi cannot do that. Having no green colouring matter they must depend on something else to make their food, and their food, therefore, consists of what we call organic material—that is, something that has been elaborated by plants before them. Thus, at the very outset we have two classes of the fungi—those that live on what may be termed dead organic matter, such as the mushrooms, living in soil very rich in manure, and another class that live on living matter—on the organized material in living plants. It is in this class you find the injurious types of fungi that are to occupy our attention for the remainder of the time. For convenience sake, those that live on dead organic matter have been called saprophytes and those that live on living matter parasites. I have thought it would be wise that we should fix our attention on some particular forms of these parasites and not wander over the whole division of the fungi. Consequently, I have taken those that affect the grape plant. But do you think for a moment that this afternoon, in half an hour or more, I could discuss the various forms of parasites in plant life that affect the grape? No; for they have made out some 104 species of fungi that affect the grape. I have just selected three, so that we might focus our attention upon these and leave the others for future study. The first one is what we call the Downy Mildew, or, technically, the *Peronospora Viticola*. Those who prefer the long name can adopt it, while those who prefer the simpler can call it the Downy Mildew. Let us look into the life history of that and see what a complicated thing it is. At a certain season of the year—in the summer months—in June or thereabouts, you may notice on the upper side of the leaves of the grape yellowish spots, having a sort of downy, white-like appearance. This is all you can see, but if you should place a thin section of this downy-looking spot under a microscope you then find that you have a beautiful little plant. Everyone of these clusters of woolly-like structure are masses of little plants. That is what is called the *peronospora*, and it is closely allied with the parasite that causes the potatoe rot, both belonging to the same genus until lately. There is a slight difference in the shape of the spores, so that latterly the potatoe rot is put in another genus (*Phytophthora*) and is not called the *peronospora* any longer. Let us look at this diagram before us. The spores fall upon the leaf, germinate and work their way in between the cells, as represented here. Here in this figure are several cells, and here is one of the threads of this obscure plant working in between them. Some of these fungi work into the cells, and others work between. This one works between the cells. Every here and there it throws out little threads. You can call them roots, but we technically call them *Hanstoria*. These dip into the cells and sap the juices of the plant. It is only a question of time when this parasite that has got into the tissue of the leaves has so exhausted the plant's vitality as to injure its vigour and finally cause its death. Now, after it has permeated between the cells and reached a considerable growth at the little openings that are found in the leaves—the openings we call *Stomata*—it throws up its fruit bearing branches that you see. This is one of the *Stomata*. Here coming up are five or six little structures and on these a sort of fruit-like arrangement. That is the fruit-bearing portion of the plant. In the potatoe rot you would only have one stem, while in this *Peronospora* you have sometimes four and five, and even eight. Let us look at that. It may affect the leaf, or it may affect the green twigs, or it may affect the fruit. Here is some fruit that has been affected. That is drawn and enlarged somewhat from nature. Here you have some of the fruit intact and some that is affected. Here is what we might have expected if it had not been attacked by this parasite. On the upper branches of this fruit-bearing portion of the plant you see a sort of oval-like structures. These are what we would call the spores. They will give rise to plants of that nature very shortly. This little thing here is about

the fiftieth part of an inch in length, while the little spores or re-productive part will be about the two-thousandth part of an inch. It is exceedingly minute. Now, let us follow the history further. These drop, after they have reached the mature condition. One is generally called a *Conidium* while many are called *Conidia*. After it has fallen on a leaf or some other part of a plant, if the conditions are favourable it will pursue further development; but if the conditions are not there it will get no further. Now, what are the conditions? For this genus, in the fungi, they are moisture and warmth. It wants a good deal of moisture. If there is no water present the spore is not going to be able to develop. It is not merely a little moisture, but something that these spores can float in. After it has rested awhile it begins to divide up, as you see in the drawing. Shortly after that these break out of this sort of structure and assume that form—a little rounded body with a couple of tails. Then this rounded body begins to move; the hair-like structures help it to move about, and if there is no water present that is not sufficient moisture to work in, it can go no further in its development. So you see how necessary it is for this form to have moisture and warm temperature. If the conditions are favourable and they are able to spin about, these little spores, technically called *Zoospores*, drop their tails and assume that form. Then it throws out a sort of tube, and you have the whole thing starting into growth. If it is upon the leaf or fruit, or any part, it will grow and develop into the plant we have already seen. But here is something peculiar—we notice there are no less than three ways in which this Conidium can develop. One way I have described, and the second way is represented here, where the whole of the contents pushes out and commences to develop in the way you see in these two figures. It does not break up into five or six parts, but it comes out and assumes this form and develops. Another form is where the whole of the protoplasm, the whole of the matter in the Conidium, comes out into the form of a tube and permeates the tissue of the plant, and repeats the life history of the fungus, as I have already described. So, from a Conidium you have three different ways in which it may develop itself: but the most common way is the one that I have described somewhat minutely at the beginning. Now is that all? That explains the development of it through the growing season, and that form of development is very rapid, so that the fungus soon spreads over a very large area. But there is another form of development. In among the tissues of the plant you will find some of the rounded bodies such as you see there. I do not like to mention the technical names, yet it seems to be almost necessary and not out of the way before intelligent men. It is here called *Oogonium* and the other organ *Antherridium*. The protoplasm of the one mingles with that of the other and you have a germ cell produced—another form of reproduction altogether.

The form I described at first when referring to spores is termed *a sexual* and what I have described now *the sexual*. This latter form carries the plant into another year: the other is a form for rapid propagation. Here is a section and these little black spots are the Oospores, or germ cells, prepared for growth next spring or summer. So much for the life history of the *Peronospora viticola*. Now, the question of greatest importance to you is how to fight against it. I cannot help but think there is a great deal of interest in knowing the life history of these parasites. It is very well to know how to kill it, but when a person knows all the outs and ins of the complicated history of these obscure forms of life it gives an interest to his labour which he otherwise could not possess. How are we going to battle against it? Many remedies have been tried and some of them have been successful. This fungus is in the tissues of the plant, so that you are not very well able to get at it. Consequently, whatever course you may pursue, it must be along the line of prevention rather than cure. You must prevent it rather than fight it when it has got there. On general principles the remedy for all these things is to have the plant vigorous. Vigour in a plant, as in the animal and in the human being, has a wonderful power to resist the attacks of disease of any kind. So on general principles we always speak of trying to have the plant as vigorous as possible. It has been found that lime has a very destructive effect. So if you have a solution of lime—of hydrate

of lime—or what is more commonly known as lime water, syringed upon the plant at the time you think these spores are making their appearance it will have a tendency to diminish their numbers. It has also been found that the use of sulphate of copper is productive of excellent results—either taking sulphate of copper alone, or it is particularly effective if it has lime with it. In that mixed form it seems to be productive of very satisfactory results. We combat them, therefore, by the use of lime or by the use of sulphate of copper and lime. Of course, one would take the precaution to remove all leaves that may be lying around and decayed fruit that has resulted from the attacks of the spores and have them destroyed; because they are carrying these spores in them. By adopting these remedies the injurious effects of this fungus may be greatly prevented,—that is, the application of hydrate of lime at the proper season of the year, the application of sulphate of copper and lime, the application of sulphate of iron, lime and sulphur, the removal of affected parts, and having varieties of plants that are not found to be liable to attack.

Let us now look at No. 2. We have what is called the Powdery Mildew, or what is technically termed *Uncinula Spiralis*, an entirely different fungus. Here you have a fungus that has quite a different form of reproduction for the propagation of the species. We have types of the fungi here well worthy of our consideration, because they appear on other plants as well. In the first place, this is not in the plant. It is on the plant; it is on the leaf, on the outside. It does not get into the leaf like the first did, or get in among the tissues among the cells, and shove its little thread-like structures into them, permeating the whole leaf and affecting it until it is destroyed. Here you have the spore falling on the leaf and growing as it were on the outside, and throwing down little sucker-like arrangements into the leaf and feeding upon its tissue. These spots when they first appear have a sort of greyish look. They have not the clear, white look that you see in the Downy Mildew. But as the time rolls on the plant has its vitality greatly impaired. What has happened? Some of these spores have got on to the plant, and as soon as they have rooted it grows in stalk-like form, not in the pretty tree-like structure that you saw in the other mildew; not coming up through the holes in the stomata, but growing from the surface, and the end of the stalks become somewhat contracted, taking a sort of oval shape. One drops off and then another, and so on. That is one form in which these reproduce themselves. A little further on in the life history of the fungus where two or three threads happen to overlap they begin there to form a peculiar structure—a sort of nut-like form. If you open up that seed-like body you will find inside of it structures as are here represented rolling out. Inside of these are innumerable spores. You see it is quite a different growth from the former. The first is a form of spore that is produced during the earlier seasons of the year to carry on the rapid growth of the plant. The last is a little later on, and is to carry the trouble into another year. In this centre you have the peculiar flask-like bodies that I described, containing spores. The former may be termed a *sexual* form, and the latter the *sexual*. How are we going to combat against this? Those who have made it a special study have found that there are certain chemicals that have a very desirable effect. One of these is sulphur. When sulphur is thrown over the leaf it has a tendency to destroy the vitality of these spores and to keep them in check. Not only sulphur, but they find that this sulphate of copper and lime is very productive of good results. To some extent also, sulphate of iron. So there are three chemicals that have been productive of good results in the case of this Powdery Mildew. Sulphur alone, or lime and sulphate of copper, or sulphate of iron. Then, again, the same remedy would come in here of destroying everything that you might imagine was affected with these spores.

We now come to our third type, *Laestadia Bidwellii*, or what is known as the black rot in grapes. This attacks more especially the fruit. The others may attack the leaves or the young shoots or the fruit, and generally the small fruit; but this comes on after the fruit has got about two-thirds its size, and the result is that it has a very injurious effect. Let us look into the life history of this. Here is an affected

branch or cluster, showing grapes that have been destroyed or injured by its attacks, as well as those that have escaped to a certain extent. It is found that at one season of the year, usually the spring, a class of spores appears; when the tissue of the grape is examined at this time we find short, thread-like structures rising, the ends of them becoming more or less contracted and finally dropping off. But there is another form: on the grapes you find blackish pimples forming at times, and the grape becomes more or less shrivelled. If you examine these pimples you will find that there are two classes of conceptacles or cavities in them. Here I have them represented as Nos. 1 and 2. When you look into No. 1 closely you will find a sort of thread-like structures, which, as they advance in growth, by-and-by give rise to these little rounded bodies. These are the spores, and there is a little opening here. They roll out, and when they reach a proper condition, give rise to fungus. You have receptacles here as in No. 2. They give rise to thread-like structures that develop into another class of spores. Sometimes these have a peculiar form. Little rounded bodies appear on the grape and issuing from them comes a sort of thread-like mass of these spores. They come squirming out like so many worms. Further on you find another class of spores in those somewhat large cavities; these bodies are somewhat flask-shaped. Inside of them are eight or nine spores and when these break up they give rise to the spores you see represented in that figure. In this black rot you find there are no less than four kinds of spores known as *Stylospores*, *Spermatio*, *Conidia* and *Sporidia* or *Ascospores*. The two last forms of fungi belong to the same group as the plum knot on the plum tree. This black rot presents an exceedingly complicated life history indeed. Here you find the threads rising from these spores becoming interlaced. They dive into the cells, not, as up here, between the cells, and they are more or less interlaced. The thread-like structures have divisions, not as here where you had a long thread-like structure without division. Now, having looked into the life history of *Laestadia Bidwellii*, what remedy can be pursued? It has been found that sulphate of iron has a good effect. It is when the grape has got about two-thirds its size before the attack is made; taking advantage of this, many have followed the plan of bagging the grapes—that is, putting bags, usually of paper, about them. Those keep the spores off, and by that means the disease is avoided. Whenever grapes are affected destroy them as far as possible.

We have now discussed three of the most common and most injurious parasites that affect the grape plant. I do not think it is necessary for me to go any further into the subject; your attention has been very close and to me the task has been pleasant. I have referred to the division into flowering and flowerless plants, the difference between seeds and spores, the two great types of fungi, those that live on dead and those that live on living matter, and then fully discussed these three living forms illustrated by the large diagrams before you, and I hope I have succeeded in making the subjects clear, interesting, instructive and practical. (Applause.)

The PRESIDENT.—I think I am expressing the sentiments of this meeting when I say we are greatly indebted to Prof. Panton for the extremely lucid way he has explained this most difficult and most intricate subject. It is a question of the greatest importance to fruit growers, and it is one that is deserving of a very large attention on the part, not only of the fruit growers themselves, but those who are officially interested in promoting the industry. I hope there will be a good discussion on this paper.

Mr. WOOLVERTON.—I found during the last summer some specimens of grapes affected with a very similar fungus to the last one described. The grapes, however, instead of being black, were brown, and I believe it is known as the brown rot on the grape. Some samples from the Province of Quebec were sent to me, and perhaps Prof. Panton could say a word with regard to that. I do not know of its being found in any part of Southern Ontario. Indeed, I do not think we have either black or brown rot to any extent in our section of the country.

Prof. PANTON.—It has not come under my observation.

Mr. WOOLVERTON.—I may say that the powdery mildew is quite common with us in the Niagara district. This last season it was very injurious. It has had a very

injurious effect on our vineyards, but we are meeting it with a good deal of success by the free use of sulphur that Prof. Punton has just recommended. We have used it quite freely and very largely in some of the vineyards, and with a considerable amount of success. Quite early in the season the first application is made and it is repeated during the season. It was found to be very effective when the sun is shining upon the plant, as then the fumes of sulphur will rise more readily and have the effect of destroying the fungus.

Mr. BUCKE.—How did you apply it?

Mr. WOOLVERTON.—It was scattered over the vines or underneath them. I believe it is sufficient if sown freely on the ground underneath the vines. The sulphurous acid, as I believe it is, will rise in sufficient quantities to destroy the fungus. We apply it freely with the hands. I believe that when the temperature is above 77 degrees that the sulphur is then found to be most effective. We are not affected to any extent with downy mildew—at all events, I have not observed it in Southern Ontario.

Mr. BAODIE.—Has any one used the Bordeaux mixture?

Prof. PANTON.—That is the mixture of lime and sulphate of copper.

Mr. FLETCHER.—Have you tried spraying sulphur on the vine?

Mr. WOOLVERTON.—No; I have not.

THE RELATION OF INSECTS TO FRUIT CULTURE, BY REV. THOMAS W. FYLES, SOUTH QUEBEC.

The subject of the relation of insects to fruit culture is worthy the consideration both of fruit-growers and entomologists. It presents a vast field for research. The more I have studied it the more its significance has widened before me, and the more conscious I have become of my inability to deal with it adequately.

Many persons regard insects simply as "bugs," in the original acceptation of the term, *i.e. terrors*, and terrors to be, if possible, relentlessly and expeditiously put out of the way. Such persons are under a great misapprehension. Probably there is no kind of insect but will be found to perform a useful part in the system of nature broadly viewed; though to the fruit-grower some kinds are inimical.

Insects seen from the fruit-grower's point of view may be grouped into five classes:

- I. Insects favourable to fruit-culture.
- II. Insects directly hurtful.
- III. Doubtful and neutral insects.
- IV. Insects directly beneficial.
- V. Insects indirectly injurious.

Of insects directly favourable to fruit-culture, various kinds of bees are among the most note-worthy. They predominate in the crowd of insect forms, with which, on sunny days, a fruit-tree in full blossom is enlivened.

The purposes for which the bee frequents the blossoms are the gratification of its own appetite with the sweet exudations from the nectaries, and the obtaining of a supply of pollen or bee-bread for the use of the larva of its species.

But while the bee is carrying out its own ends, it is helping forward materially that all-important process, the fertilization of the flowers. Reference to the accompanying diagram of a simple hermaphrodite flower will show how its work in this respect is accomplished.

At A is shown the stigma of the blossom; at BB dehiscing anthers charged with pollen-grains; at CC the nectaries. A bee working amongst the flowers comes, dusted over with pollen-grains, to a particular blossom. To get at the nectary C, it has to thrust itself between the stigma A and the anther B. In so doing some of the pollen-grains with which it was covered are transferred to the viscid surface of the stigma, where they adhere. After lapping up the supply of nectar from C, the bee quits the blossom, carrying away a fresh supply of pollen from B. From the abundance of this, other blossoms are fecundated. At intervals the insect pauses,

and passes its legs over its body to collect the still adhering pollen-grains. These it proceeds to pack into the hollow shanks of its hind legs, the corbulae or baskets, with which nature has provided it, that it may be able to convey its plunder to the hive.

The bodies of bees are particularly fitted up for the conveyance of pollen from flower to flower, for they are clothed with short, bristly hair, which has a marked set towards the point of the abdomen. In backing out from the flower a bee can hardly fail to dislodge the ripened pollen-grains, and retain them until they are brought in contact with the viscid surface of a stigma, or are swept off by the stouter bristles with which the legs of the insect are provided.

The further history of the pollen-grains left adhering to the stigma is this: In a short time they begin, by a sort of germination, to extend minute tubes down the style D, along the walls of the ovule E, through the micropyle F, into the embryo-sac, where they mingle their contents with those of the oosphere, and complete the fertilization of the flower.

The importance of this cross-fertilization of the blossoms, brought about by the agency of the bees, is beyond all human estimation. It was a saying of Darwin that 'nature abhors self-fertilization'; and certainly observation has taught us that cross-fertilization results in a supply of better fruit, and, eventually, in the production of more vigorous plants, than results from the self-fertilization of a plant by its own pollen.

By a natural law or instinct which we cannot understand, but the effects of which in the movements of the bee we observe, this cross-fertilization is kept within bounds. A bee on an expedition in search of nectar and pollen confines its attention, for the time being, to the flowers of one kind of plants; and an observer, standing by a bee-hive, will see the bees entering, some with pellets of yellow, and some with pellets of orange-red, but never any with a mixture of the three.

In the case of plants bearing unisexual flowers such as *Cucumis*, no doubt the chief means for the fertilization of the female flowers is the agency of bees. Indeed, when melons are forced under glass, and the blossoms are brought to perfection before bees are on the wing, artificial means have to be resorted to for impregnating the female blossoms.

The various kinds of pollen-collecting bees, therefore,—*Apis mellifica*, Drury; *Bombus terricola*, Kirby; *B. Pennsylvanicus*, De Geer; *B. fervidus*^a Fabricius; *B. ternarius*, Say, &c., are among the fruit-growers' most persistent and valuable insect-friends.

Next to the various species of bees that we have alluded to as friends of the fruit-grower come many of those large and beautiful insects called "humming bird moths," or "hawk moths." The hawk-moth, of whatsoever species, is provided with a long proboscis, which, when not in use, is curled up like a watch-spring, and hidden between the palpi; but, when the insect is engaged in taking food, is extended to its full length, and thrust among the filaments of the blossoms. By the disturbance of the anthers in the play of this organ, and by the rapid fanning of the wide-spread wings of the moth as it hovers over the blossoms, the pollen-grains are scattered all around, and cross-fertilization results.

A fruit-tree in full blossom does indeed present a busy and interesting scene. The honey-bees are there in full force; numerous large females of the various species of humble-bees hurry hither and thither—at this early season there are no males nor small females of their kinds—and dancing over the blossoms with easy flight are the clear-winged humming-bird moths, *Hemaris Thysbe* (Fabr.) and *H. tenuis* (Grote), and, here and there, *Amphion Nessus* (Cramer), with its rich brown dress and golden belts. The air is made vocal by the wings of the busy multitude; the tree itself blushes with the rich promise of future good; and the whole scene is one that may well gladden the heart of the beholder.

As night draws on the bees and other diurnal insects retire; but many species of noctuids come forth from their retreats, to enjoy the banquet that the open flowers afford them.

II. But while many of the insect tribes may be ranked as the fruitgrowers' friends, it must be allowed that the operations of others run directly counter to his interests.

For our present purpose, we may divide these injurious insects into—

- a. Leaf-eaters.
- b. Borers.
- c. Sap-drainers.
- d. Fruit-spoilers.

a. Of leaf-eating insects the kinds most to be dreaded are, I believe, those small but most mischievous kinds that are known as bud moths, leaf-crumplers, leaf-rollers, palmer worms, &c. Among the worst of them are:—

Imetocera ocellana (Schiff). The larva of this eats the flower buds and young fruit. It is of a dirty brown colour, and is three-quarters of an inch long when full grown. The moth is grey with white bands on the fore-wings, and in expanse of wings measures half an inch. It belongs to the Tortricina.

Phycis indiginella (Zeller). The caterpillar of this is known as the "leaf crumpler." It comes late in the summer, and passes the winter in a case made of crumpled leaves drawn together with silken threads. In early spring it comes forth to devour the tender buds and complete its growth. It is a little over half an inch long, of a greenish colour, and has a horny plate on the second segment. Its head is brown. The moth is a pretty object, having silvery white wings with brown zig-zag markings. It belongs to the Tineina, as the diminutive affix to its name implies.

Cacæcia rosaceana (Harris). The oblique banded leaf-roller is one of the worst of these small moths. The perfect insect has the outline of a lyre or a bell. It is cinnamon coloured, and is marked obliquely on the fore wings with three brown bands. The caterpillar is about three-quarters of an inch long, pale green in colour, with a brown head. It works sad destruction, gathering the young leaves together, and tangling up the flower buds and preventing them from unfolding. It even gnaws the young fruit.

Teras malivora (Le Baron). The lesser leaf folder is a pretty little moth belonging to the Tortricina. The fore part of the body and the fore wings are bright yellow; the after part of the body and hind wings are whitish. It measures half an inch when the wings are expanded. The larva is light green and has a brown head. It curls the leaf up and fastens the edges together to make itself a shelter.

Ypsolophus pometellus (Harris). "The Palmer worm" is at times very injurious. It is a social caterpillar, living with its fellows in a tent made of the leaves of a twig drawn together. The worm is pale yellowish green, with a darker dorsal line and side lines. The latter are edged above with white. It eats away the fleshy portions of the leaves. The moth is variable, but generally is ash grey dotted with black. The hind wings are glossy and slightly shot with blue.

In dealing with all these insects and with others of similar habits promptitude is the secret of success. As soon as ever the leaf buds begin to open Paris green should be applied by means of a sprinkler; and after the fruit is well set a second sprinkling may be given. Care should always be taken not to over-dose the trees. In autumn the dead leaves in the orchard may be raked up and burned—that hidden pupæ may be destroyed.

Of the grosser feeders in the orchard one of the most common is *Clistiocampa Americana* (Harris); but this is easily dealt with. In the winter the egg-masses of the species may be detected and dislodged with the thumb-nail. They should then be burned. Some of the masses will perhaps escape notice, and the unsightly webs, spun by the caterpillars, in course of time appear. The fruit grower, provided with a stick having a slight but stiff crotch or fork at one end, should go in the early morning when the dew is heavy—for at such times the caterpillars are all within the shelter of their web—and should thrust the crotch into the mass; then, by turning the stick gently a few times, the whole mass may be drawn together, detached

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with its burden, and trodden under foot. This must be done early in the season, both to save the trees and prevent the escape of the insects—for the larvae after a while abandon their web and scatter.

The communities of the forest-tree tent-caterpillar, *Clisiocampa sylvatica* (Harris), which sometimes are found on fruit-trees, form their webs on the boles or under the main limbs of the trees, and when assembled in their webs, or when on one of their processionary tours, may be crushed by means of a stout lath, or brushed over with any kind of cheap oil, which, spreading over their bodies, will choke the spiracles, and destroy the caterpillars expeditiously.

The nests of the Fall Web-worm, *Hyphantria textor* (Harris) should be cut out with pruning shears, or with a hooked knife tied to a pole, and destroyed.

The black and yellow striped caterpillars of *Datana ministra* (Drury), which, when disturbed, have the habit of throwing up the fore and hindmost parts of their bodies into a sort of precatory attitude, and the red-humped caterpillars of *Oedemasia concinna* (Abbot and Smith) are found in their early stages grouped on a few leaves. Like choice fruit, they should be carefully hand-picked and safely stowed away.

There are certain species of the Noctuids, the larvae of which are known by the name of the "Climbing Cut-Worms." Among them are *Agrotis clandestina* (Harris), *A. Cochranii* (Riley), *A. scandens* (Riley), and *A. saucia* (Hubner). They are capable of doing much mischief to young trees. They lie hid in the ground by day, and climb the trees at night. They pass from tree to tree over the surface of the ground. To guard his corn, etc., from the attacks of such insects as these, the farmer draws the light soil into a hill about the plants, for the worms cannot ascend the crumbly mounds; and a few shovels-full of light earth piled around the foot of each young fruit tree will save it from the cut-worms.

b. Our second group of injurious insects consists of the borers. The insect that is distinguished above the rest as the Borer is the grub of a beetle, *Saperda candida* (Fabricius). It is sometimes called the "Round-headed Borer." Its large head is given it for a purpose—in boring, if its head will pass there is no danger of its body being cramped in the mine. The natural food-tree of this insect is the moose-missa or mountain ash, *Pyrus Americana* (De Candolle); but it feeds with avidity upon the cultivated species of pynes. Its presence may be known by the fras ejected from its tunnel. The perfect insect makes its appearance in the beginning of June. Soft soap applied to the boles of the trees at this season, with a white-wash brush, will hinder the attacks of the beetle. This application will also stop the attacks of the Flat-headed Borer of the apple, *Chrysobothris femorata* (Fabr.), and those of *Dicerca divercata* (Say), the borer of the cherry.

Old and decaying apple and peach trees are liable to the attacks of the "Stag-beetle," *Lucanus dama* (Thunb.), the "Eyed Elater," *Alans oculatus* (Linneaus), and the "Rough Osmoderma," *Osmoderma scabra* (Beauv.). These but hasten the fall of the trees.

Of other borers the Egerians are often very destructive. *Egeria pyri* (Harris) attacks the pear-tree; *E. exitiosa* (Say), the peach-tree; *E. polistiformis* (Harris), the grape-vine; *E. rubi* (Riley), the raspberry cane; and *E. tipuliformis* (Linnaeus), the currant-bush. The imagos of all these insects fly in the day time in the summer months, and haunt the food plants of their species. An intelligent child may be readily taught to distinguish them, and to capture them with a butterfly-net.

c. Sap-drainers.—The most formidable of these, in appearance, are the Cicadas, *C. tibicen* (Linn.) and *C. septendecim* (Linn.). The kinds may be readily distinguished one from the other—in the former the eyes and the edges of the fore-wings are green; in the latter, orange-red. *C. tibicen* is sometimes found at the roots of the cherry, and of the apple, though its food-plant more commonly is the elm. *C. septendecim* is found at the roots of the apple. It drives its proboscis into the root and imbibes the sap, and, it is said, keeps on imbibing it for a period of seventeen years.

The apple, the peach, the cherry and the vine have each its peculiar aphis or plant-louse, which, spreading with parthenogenetic increase, become exceedingly injurious. The "honey-dew," which the aphides eject, covers the leaves and chokes the stomata, or breathing-pores of those organs, and seriously affects the health of the plant; whilst the aphides themselves drive their snouts through the epidermis, into the parenchyma, and draw away its life-giving juices.

The *Phylloxera vastatrix* (Planchon) of the vine seems in many parts of Europe to have triumphed over all efforts made against it. Happily, in America its natural foes keep it within bounds. One of these foes *Diplosis grassator* (Fyles), I had the satisfaction some years ago of making known.

d. Fruit-spoilers.—The last of our classes of injurious insects are the Fruit-spoilers. Of these the "Codling Moth," *Carpocapsa pomonella* (Linn.) is one of the worst. The perfect insect is a small and pretty moth with wavy-lined, satiny fore-wings, having a conspicuous bronzy spot at the inner angle. It lays its eggs in the eyes of the young fruit, preferring the early kinds. The caterpillars eat their way in, and attain their growth in about three weeks. They then leave the fruit and seek sheltered spots—usually crevices in the bark of the tree—in which to spin their cocoons, and to undergo their pupal change. This habit has suggested a means of entrapping them. Cloths tied around the stems and main limbs of the trees will attract the larvae, which will spin their cocoons within the folds of the cloths.

Anthonomus quadrigibbus (Say,) the curculio of the apple, and *Conotrachelus nenuphar* (Herbst), the curculio of the plum, are furnished with long snouts, with which they bore into the fruit to make receptacles for their eggs. The grubs mine the growing fruit. The apple curculio undergoes all its changes within the fruit and leaves it as a perfect insect. The ravages of the plum curculio cause the fruit to fall untimely. The grub when full-fed bites its way out of the fallen fruit, and buries itself in the soil, there to undergo its pupal change.

To capture the perfect insects the fruit-grower should, at the proper season, spread a sheet under the tree, and then with a fork-handle, or other stout stick, administer a sudden sharp blow to each of the overhanging limbs. This will dislodge the curculos, and they will fall upon the sheet, where they can easily be seen and secured. Leaf-eating and twig-girdling beetles, caterpillars, and other troublesome insects, may be taken in the same way.

III. There are many kinds of caterpillars that eat the leaves of fruit trees, and yet, under ordinary circumstances, can hardly be said to be injurious—that is to say when feeding upon other than very young trees. Many of them feed late in the summer, and, having done their worst, merely let in, here and there, a little more light and heat to the growing fruit. Many are among the rarest of our insects. *Eupretia stimulia* (Clemens), *Phobetron pitheciun* (Ab. & Sm.), *Gastropacha Americana* (Harris), *Tolype velleda* (Stoll), feeding on the apple tree are all rare. They are all Bombyces, and the Bombyces do not feed at all in the perfect state. Whatever good or harm they do to the trees is done while they are in the larval stage. *Liminitis ursula*, (Fabr.), *Thecla titus*, (Fabr.), *Smerinthus ceryssi* (Kirby), *Callosomia promethea* (Drury), feeding on the cherry, are also rare; and so are *Philampelus pandorus* (Hubner), *Thyreus Abbotii* (Swainson), and *Deilephila lineata* (Fabr.), feeding on the vine. Even the more common *Papilio turnus* (Linn.), *Paonias excaecatus* (Ab. & Sm.), *Platysamia cecropia* (Linn.), of the apple; *Liminitis disippus* (Godt.), *Sphinx drupiferum* (Ab. & Sm.), *Telea polyphemus* (Cramer), and *Catocala ultronia* (Hubn.), of the plum; and *Philampelus achemon* (Drury), of the vine, are not, as a rule, injurious, for it is seldom that more than two or three of the larvae are found on one plant.

A phenomenal increase of any leaf-feeding insect would, no doubt, be hurtful, and even one or two of the larger species would defoliate a young tree to a very serious extent. The presence of these intruders may be readily known by their excrements scattered under the tree. I would recommend the fruit-grower to remove carefully the rarer kinds of caterpillars, and to send them to some entomological friend.

Then there are the hosts of insects which feed on shrubs and forest trees, in which the fruit-grower has no special interest, and on the grasses and herbaceous plants which in themselves are not obnoxious to him. The name of these insects is "Legion." Lastly, there are the many insects predaceous upon these neutral insects, which neither for good nor for harm affect the fruit-grower's special interests. All these we may pass by, and come to the consideration of—

IV. Insects Indirectly beneficial to Fruit-culture.—Amongst these must be found a place for such as help to keep down encroaching and troublesome weeds that would be an eye-sore to the fruit-grower, and an injury to the orchard and garden. *Pyrameis cardui* (Linn.) feeds upon the thistle, *Vanessa milberti* (Godt.) on the nettle, *Danais archippus* (Fabr.) on the milk-weed. Each of them in its perfect state is "a thing of beauty," and, therefore, as the poet tells us, "a joy for ever;" and though the judicious fruit-grower may allow no weeds to establish themselves in his own grounds, it will not be an unpleasing reflection for him that these insects, and others of similar habits, are working at the weeds in the grounds of his slack neighbours.

But more important in their operations than these are the numerous parasitic and predaceous insects that keep down the numbers of the injurious kinds. *Asilus astuans* (Linn.), and *A. sericens* (Say), together with many kinds of dragon flies, roam the air in summer time in search of their winged prey. The larvae of the Syrphians feed on the plant-lice, or in the bodies of living caterpillars, which they ultimately destroy. The Cicindelidæ, or Tiger Beetles, and the Carabidæ, or Ground Beetles, devour vast numbers of curculio grubs. *Harpalus caliginosus* (Say) eats the cut-worms. The larvae of the Fire-fly, *Photinus pyralis* (Linn.) also feed upon underground larvae, and will even bite its way into cocoons. I have found it in the act of cleaning out a cocoon of *Nematus erichsonii*. The Lady-birds, Coccinellidæ, in all their stages, do an immense amount of good in thinning the numbers of the different species of *Aphis*. The Solitary Wasps and the Sphex-flies are also among the fruit-growers' best insect-friends. *Eumenes fraternus* (Say) stores its mud cells with paralyzed but living larvae. I once saw *Odynerus capra* (Sanss.) pounce down upon a colony of full-grown larvae of the imported currant-worm, *Nematus ventricosus* (Klug). The larvae dropped *instante* to the ground; but the wasp selected its victim, and, with its powerful jaws, nipped it at regular intervals, probably over the ganglia, throughout its length, taking all the twist out of it. It then attempted to fly off with its prey, but found it too heavy. Acting in accordance with the school-boy principle, that "the best pocket for carrying one's lunch is an inside pocket," it nipped off the thoracic segments, and proceeded to make a meal, leaving the head, fore-legs and skin. It then took up the more succulent after-part of the larvae and flew off with it, no doubt to add it to the provision it was making for its young. Insects belonging to the various genera of the Ichneumonidæ also do yeoman service. Packard tells us that "In Europe over 2,000 species of this family have been described, and it is probable we have an equal number of species in America."^{*} *Pimpla pedalis* (Cresson) is parasitic in the web-worms; *Ichneumon saturalis* (Say) in the Army-worm. *Cryptus extrematus* (Cresson) lays its eggs in considerable numbers in the larvae of *Platysamia Cecropia* (Linn.). The eggs hatch in the living larvae, and the grubs locate themselves in suitable quarters within their hosts. Each brings the end of its body—where the openings of the two principal tracheæ are found—into proximity to one of the stigmata of its host, and so is enabled to breathe. It feeds upon the juices and fatty matter of the unhappy caterpillar; and all the food it takes must be assimilated, for its stomach ends in a *cul de sac*. Think of the condition of the wretched host, with a score or two of grubs sapping its vitals. Surely the most irate, or desponding, fruit-grower, who has been ready to wring his hands, and exclaim with York, in Shakespeare's 2nd part of King Henry V.:—

"Thus are my blossoms blasted in the bud,
And caterpillars eat my leaves away."

*Guide to the Study of Insects, p. 193.

will find an anodyne for his mental sufferings in the thought that at any rate *some* of his insect foes have been condemned to the fate of Herod.

V. We have lastly to consider insects indirectly hurtful. These consist of the foes of the fruit-growers friends. The hive-bee suffers from the operations of *Galleria cereana* (Fabr.). A moth which ventures within the hive and, even when perishing under the attacks of the bees, manages to deposit eggs in nooks and corners by means of its long telescopic ovipositor. Its larvae construct silken galleries, and push their way under cover through and through the comb, working sad destruction. The humble-bees' nests are open to the visits of the cuckoo-bee, *Apatus ashtonii* (Cresson.). This insect lays its eggs in the pollen masses provided by the humble-bee for its own young. The larvae of one or two species of *Volucella* eat the young themselves. The larvae of the Musk Beetle, *Meloe austropicollis* (Say) lie in wait in the heads of flowers, especially in the catkins of the sallow. When the humble-bees come the larvae cling to them, and are carried to the bees' nests, where they feed on the bee-bread and the larvae of the bees. The humble-bee itself is assailed by parasites. The grubs of that remarkable beetle, *Stylops childreni* (Westwood), are found in its abdomen, and so are the maggots of one or two species of cynips.

Under the head of insects indirectly injurious to fruit culture we might include the foes of the foes of hurtful insects; but I must not try your patience by leading you further amid the intricacies of the marvellous machinery of nature. No man knows, and probably no man ever will know, the bearing of its every part. When we come to the subject of parasites of parasites, the recollection of the old rhyme which we have all heard speedily pulls us up—

"Big fleas have little fleas,
And little, less, to bite 'em
And these fleas have other fleas,
And so, ad infinitum."

We have seen, then, that there are many kinds of insects directly favourable to fruit culture; that the fruit-grower has many trusty allies—an active insect police—guarding his trees from the destruction that would otherwise await them; that, besides these, and the neutral insects, there are numerous others working directly, or indirectly, against him. It is important that he should be able to distinguish his friends from his foes. An episode will make this more apparent. I was once walking with a gentleman in a garden of which he was very proud. I noticed a cluster of microgaster cocoons on one of the beds; and I said, "Do you see those?" In an instant, before I could interpose, he had vindictively crushed them under foot. I said, "You have been too hasty. Those were cocoons of a species of ichneumon fly which is one of the fruit-grower's best friends. There were probably fifty cocoons in the cluster, containing insects the offspring of one mother-fly. Now, supposing half of these to have been females, and that each female would lay forty eggs, in due course of events there would next year have been 1,250 of the insects working in your favour. And if you choose to carry on the calculation, you will find that at the end of five years there would, nothing interfering, have been 488,281,250 of their descendants labouring for the fruit-growers' benefit."

A slight knowledge of entomology—sufficient to enable the fruit-grower to distinguish his friends from his foes—may now be acquired without much difficulty; and where he is in doubt as to the nature of an insect, let the fruit-grower give the insect the benefit of the doubt.

It is not now as it was twenty-eight years ago, when I commenced to study Canadian insects with nothing but my knowledge of European entomology for a guide. In 1859 Breckenbridge Clemens wrote to the editor of the English *Entomological Intelligence*, from Easton, Pennsylvania, "With us everything has yet to be done;" and in the same year Packard wrote from Brunswick, Maine, to the same editor, "You see our moths have not been worked up at all as yet." Grote tells us that in 1862 there were probably "not one hundred species named and determined in any collection." How great has been the change in the interval! Packard, Riley, Lintner, and others, have done admirable work for the advancement of Economic Entomology on this continent. In Canada, the Entomological Society of Ontario, under the fostering

care of the Provincial Government, had issued nineteen most useful annual reports. The *Canadian Entomologist*, the organ of the society, under the able editorship of the Rev. Dr. Bethune, is acknowledged to be one of the best publications of its kind. It is not too much to say that the society in spreading information concerning insecticides, &c., has saved the Dominion millions of dollars. One of the fathers of Canadian Entomology, Mr. William Saunders, has written for the Canadian fruit-grower, on "Insects Injurious to Fruits," that I know is most valuable, and the Department of Agriculture, in appointing Mr. James Fletcher as Dominion Entomologist, in connection with the Experimental Farms, has made a wise and judicious choice. Fruit-growers will find in Mr. Fletcher a safe entomological guide. Under most favourable circumstances then, those who have not already done so may, if they will, take up the study of entomology, and find it both pleasant and advantageous.

The PRESIDENT.—Before calling for a discussion on this very valuable paper, I will call for a paper on a similar subject from Mr. James Fletcher, of the Experimental Farm.

INJURIOUS INSECTS AFFECTING FRUITS—REMEDIES TO PREVENT THEIR RAVAGES: BY JAMES FLETCHER, DOMINION ENTOMOLOGIST, OTTAWA.

MR. PRESIDENT AND GENTLEMEN,—When the secretary of the Convention honoured me with an invitation to write a paper upon "The Injurious Insects which affect Fruits, and the Best Remedies to prevent their Ravages," I felt very thankful for the opportunity thus afforded of drawing your attention to a subject which my studies have convinced me are of enormous importance to all of you, as well as to the whole Dominion.

I am perfectly well aware that, in a meeting like the present, where the most advanced fruit-growers of the country are met together, much of what I am about to lay before you is well-known, but the poor condition (due to the preventible attacks of insects) of some of the fruit offered for sale in the Canadian market, as well as the frequent complaints of serious injury from well-known pests have induced me to occupy a portion of your time in trying to induce you to pay more attention to this part of your work of fruit growing.

The annual diminution of all crops grown through the agency of insects is enormous, and it is claimed averages at least 10 per cent. of all vegetable products. This percentage would in many cases be far too low, but even this is much higher than it ought and might be, if horticulturists and agriculturists would only awake from their indifference and make use of available and easily accessible information. All intelligent thinking people recognise the fact that insects play a most important role in the economy of nature; but owing to the prevailing ignorance upon these matters, which pervades all ranks of society, these small forms of animal life, so exquisitely beautified, to those whose eyes have been opened by the golden key of observation and knowledge, are by the generality of mankind regarded only with feelings of repugnance or disgust, and the study of their lives and habits is merely an object of ridicule and contempt for the simple.

The fruit-grower is brought into very close contact with his friends and foes of the insect world, and it is of paramount importance that he should be able to recognise which are which. The actual benefits derived from insects are considerable; perhaps the most important of these is in their capacity as Nature's scavengers—the means always at hand of removing from the face of the earth anything useless or objectionable. To the fruit-grower they are important as parasites of other insects which are injurious, and as pollinizers of his fruits, direct connection having been traced between bad fruit harvests and the occurrence of cold, wet periods, during which insects are inactive, at the time the fruit trees were in blossom. In addition to the above direct benefits derivable from insects, mention may be made of such useful products as honey, wax, silk, ink galls, cochineal and shellac; but the benefits which we receive from insects must always appear insignificant as compared with the injuries they inflict upon our crops. It will probably never be possible to

entirely protect crops from injurious insects, nor would it very likely be for the best interests of agriculture, for insects have a definite mission to perform in nature, and any interference with the laws of nature must be done with extreme caution—
insects act as Nature's pruners, preventing too luxuriant a growth of wood or foliage or too profuse a production of fruit.

The practical entomologist endeavours to find remedies which will prevent as much loss as possible, and this, at the least expenditure of time and money. To attain this end he finds that the knowledge of most use is that which teaches him the life-history of the different insects to be studied. By this means he knows at what stage of their development his foes may be most advantageously attacked. By this knowledge, too, the eyes of the farmer are frequently opened to the fact that insects which he supposed were injuring his crops, were present as friends preying upon his enemies. It would be bad taste on my part to occupy more than a few minutes of your time to-day. I know that you have more papers presented than can possibly be read. I shall, therefore, merely direct your attention to some of the best methods of treating insects injurious to fruits, which have been developed during the last few years, and I have no doubt that some of the practical orchardists and fruit-growers present, whom I know to have used these methods, will, by giving their experience, carry the point I wish to make far better than if I were to read an elaborate paper, which, perhaps, might tire you. I have stated that a knowledge of the life-history of insects is of very great importance when we wish to check their ravages; for notwithstanding the enormous number of insects, there being no less than 25,000 described species in North America, it is only a small proportion of these which need be studied by the horticulturist, and the number of first-class pests, with whose habits he should be familiar, or which, at any rate, should be known by name, so that information may be asked for in a definite manner, is much smaller than the number of names of the varieties of any of our fruits. Further than this, he will find upon examining the subject that the injuries committed by insects upon his fruit crops are susceptible of classification, so that they be successfully treated by the modification, according to circumstances, of three or four standard remedies. The reason of this was stated in my Annual Report for 1885, as follows:—

"If you examine a large number of different insects you will find that they all may be roughly divided into two large groups, by the form of their mouth parts. These two groups are: 1. Those which possess jaws, by means of which they consume the substance of their food; and (2) Those which have instead a hollow tube, by means of which they suck up their food in the shape of liquid juices. Now, it is apparent that for insects of the first group, as the Colorado Potato-Beetle, which consumes the whole substance of its food-plant, all that is necessary is to apply to the foliage some poisonous material, which will not injure the plant, but which, being consumed with the leaves, will destroy the insects devouring them. Such poisonous materials we have in the various arsenical compounds which I shall mention later.

"For the second group, however, which do not masticate their food, these remedies are useless, for the insects having their mouth-parts in the shape of a hollow tube, as we find in the *Aphides*, or plant-lice, can pierce through these poisonous applications on the surface of their food and extract the juices upon which they live from the interior of the leaf. With such insects it is necessary to make use of remedies which act by mere contact with their bodies, and do not require to be eaten at all. For this purpose, coal oil (petroleum) and carbolic acid, as well as the vegetable insecticides known as Hellebore and the Persian and Dalmatian insect powders, and tobacco, are most useful. These remedies, too, as they will destroy all insects, are of much wider application than the poisons mentioned above."

Methods of treatment known as preventive remedies are those by which substances are applied to crops to prevent the female insects from laying their eggs upon the plants which it is desired to protect. Under this head come such remedies as putting alkaline washes upon the trees to prevent borers, and the application of kerosene emulsion or sand saturated with kerosene around cabbages or upon onion beds, to prevent the attacks of the root maggot. The class of remedies, however, to

which I now desire particularly to draw your attention is the spraying of arsenical insecticides upon fruit trees. The results have been so satisfactory to all who have experimented with them that I cannot understand why they are not more generally used. During the last two or three years careful experiments have been carried out to test the efficacy of these remedies. The result of these investigations is that they are pronounced to be perfectly safe and sure remedies if certain precautions are taken in their application. There is of course danger in using arsenic in any form; at the same time, with ordinary and proper care arsenic may be used satisfactorily and good results will follow. For the successful use of these substances, I think it is necessary to have a force pump of some kind and a spray nozzle. A very suitable sort of force pump may be obtained complete with a cyclone nozzle, the most useful form of nozzle, for about \$4.50. This will give the gardener and fruit grower an instrument with which he can spray a small number of trees. If he has a large orchard it will be necessary for him to procure one of the larger and more expensive machines made in the United States. Here in Canada in most of the large cities you can obtain a small force pump for \$5.00, which with spray nozzles of two sizes and a light extension bamboo rod, will give you all the apparatus necessary for spraying trees as large as either apple or pear trees grow in this country. There is a combination of the Riley cyclone nozzle, known as the New Zealand Triplet. This has been tried in Australia with very good success. I believe with a force pump and a spray nozzle any fruit grower will be fitted out to prevent at least seventy-five per cent. of the loss to his plums and apples if he will follow the instructions given in the numerous publications which have dealt with those subjects. There is just one more point I should like to speak of, and that is: How to spray. A great many have reported against spraying the arsenites upon orchard trees, because they found their trees injured by the arsenic in the mixtures used. This has resulted from the fact that the spraying was not done properly, and with this, as with everything else, when you attempt to do it without knowing how, you are liable to fail. In spraying a tree the spray should be directed to one spot only until the liquid begins to drop from the leaves. You should not drench your trees. The cyclone nozzle prevents you spraying in the wrong way, if you use it as above directed. In that way you have a sufficient quantity of poison on your plant to protect it against the attacks of injurious insects, and at the same time you do not run the risk of destroying your foliage. With regard to the proper time for spraying, of course you must be guided very largely by circumstances. If you are spraying for the codling moth, and know something of its habits, you will know that the egg is laid inside the flower, or at any rate whilst the calyx of the flower is turned up. Afterwards, as the apple increases in size and weight, it turns over and hangs down. It would be impossible to spray so that the poison should fall inside the calyx after it has turned down. You must not, however, spray the trees until the flowers are mature and the ovaries are fertilized, or you will run the risk of destroying the fruit-growers' good friends, the bees. Directly the petals of the flowers begin to drop off you will be perfectly safe in spraying your trees. In spraying plum trees for the eurulio, there is no advantage in spraying too soon. It is best to spray for the first time when the plums are about the size of small peas, and again a second time about a fortnight later. By spraying the trees, a fine coating of the poisonous material is deposited over every part of the tree, on the foliage, the twigs and the fruit. The eurulio feeds not only on the leaves and young plums, but also on the green bark and the young twigs. When the parent beetles come to the trees to feed, even if they only consume a small portion of the plant, they are sure to eat with it some of the arsenic. This poison does not act very rapidly, and death may not result for a day or even two, but it is sure in the end. I am decidedly in favour of using weak mixtures, with, if necessary, two applications, by which better results will be secured than by putting on strong mixtures, and running the risk of injuring your trees. With regard to the strength of mixtures, I have found the following satisfactory: With Paris green, 1 lb. to 200 gallons of water for apple, cherry and plum trees; 1 lb. to 250 gallons of water for pear trees, and if used upon

peach trees, not stronger than 1 lb. to 300 gallons of water. The spraying upon plum and cherry trees should be repeated two or three times, at intervals of about ten days, as the curculio continues laying its eggs for some time. A most important precaution that must be taken is to keep the mixture thoroughly stirred all the time, or the heavy powder will sink to the bottom, and as the supply of liquid is used up, it will be too strong at the bottom. London purple, one of the arsenical compounds which is much used, I have found less satisfactory than Paris green, from the fact that the arsenic which it contains is in a much more soluble form, and as London purple is a by-product in the manufacture of aniline dyes, the amount of this soluble arsenic contained varies in amount in different samples, and the results obtained are therefore uncertain.

Another most useful remedy which has lately been brought into prominence is the kerosene emulsion, which can be used against all such insects as hibernate upon the branches of fruit trees, as scale insects, aphides and bud-worms. It is difficult to mix kerosene with water to dilute it; it must first be emulsified and then diluted. The usual formula is that advised by Prof. Riley, the U. S. Entomologist, and consists of $\frac{1}{2}$ lb. soap, boiled in 1 gallon of water until it is quite dissolved; it is then turned boiling hot into 2 gallons of kerosene, and is then churned by means of a syringe or force pump for about 10 minutes, when the emulsion comes. The emulsion is then to be diluted with nine times its quantity of water before using it. I have no doubt that many of you have used these remedies, and I merely wish to bring them up formally for discussion, believing that they form a subject of great interest to you all.

The PRESIDENT.—Mr. Fletcher's paper is now open for discussion. It is a very large subject, and one of very great importance.

MR. HAMILTON.—In what proportions should Paris green and kerosene emulsion be mixed with water so as not to be injurious?

MR. FLETCHER.—There are various proportions recommended, some of them much stronger than I have ever advised myself; but I have found good results can be got with the following proportions: Upon apple and plum trees, which will stand a stronger mixture than pears or peaches: one pound of Paris green to two hundred gallons of water. That is the proportion as to Paris green. I have never recommended the use of London purple, because the strength is not necessarily defined. London purple is a waste product, and the amount of arsenic in it is not regular; but in Paris green, which is a manufactured article, made according to a set formula, it is different, and if used in the proportion given, I think will be found satisfactory. Some people recommend to use it stronger but I have found that it gives satisfactory results with very few instances of injury. The kerosene emulsion is made from two gallons of kerosene in one of water in which half a pound of any kind of soap has been dissolved. This gives you the emulsion, which must afterwards be diluted, one part with nine of water. The soap is dissolved by boiling it in water, and when it is at the boiling point you take it off the fire and turn in the kerosene. It is then violently agitated with a syringe or force pump, and in about five or six minutes you get an emulsion like cream. After two or three minutes there is an apparent union, but this is not to be trusted, because directly you put in the cold water it separates at once. After it separates you may do a great deal of injury if you use it upon some plants. The kerosene floats on the top and the soap and water stand below. The mixture must be thoroughly emulsified. You test it on a piece of glass. If you can smear it over the glass it is perfect. Then reduce it with nine parts of water to one of the emulsion. This formula, which originated at Washington, has been given in almost all the horticultural journals and also in my reports to the Department of Agriculture which I shall be glad to send to any one who cares to have them.

MR. HENRY.—Out in British Columbia some insect or disease has caused a great many black spots on the young apple trees. It causes the death of a great many of them. Of course, we are not informed in these things out there, and we would like to know what the cause is that makes these black spots on the young apple trees. We see them first early in the spring.

Mr. FLETCHER.—It would be difficult, sir, to give a definite answer to such a question without seeing the specimens. If specimens can be sent to me I may possibly be able to give you an answer. I have seen in Vancouver Island such a disease as you mention. This is possibly a bacterial disease, such as we have in the pear blight; at the same time, they have in British Columbia a species of the flat-headed borer and other borers which attack the apple. They have several injurious insects there. With regard to remedies for the borers, we must know something of their life history, and the time that they appear in the perfect state. The beetles fly to the trees and deposit their eggs in the crevices of the bark, and the borer, which is hatched, undermines the bark and destroys the tree. It is a simple matter to apply to the trunks of the trees, at the season of egg-laying, a weak solution of soft soap, add warm water to it and keep it stirred until it is of a convenient consistency, and then apply it with a whitewash brush and scrub the trees. Prof. A. J. Cook, of Michigan, added to this mixture a small quantity of carbolic acid, and, he thought, with good results. A great difficulty I find is to get fruit-growers to use the solutions and weak mixtures as I recommend them. In mixing a quarter of a pound of Paris green to fifty gallons of water you will be surprised to find what a little this quantity is. But if you put in a little more you may do damage to your trees. In the soap wash for borers, above mentioned, a small quantity of carbolic acid is all that is wanted to give the odour which is found to be obnoxious to most insects, and prevents them from going to the trees to lay their eggs there.

Senator REESOR.—Do you say that that quantity of Paris green is equally effective upon potato bugs?

Mr. FLETCHER.—No, sir; I believe it would answer the purpose, but it would take longer to do it. I generally put a spoonful of Paris green into a tinpail of water for the potato beetle. The potato is a coarse growing plant, and one not easily injured by arsenic. With regard to the susceptibility to injury in certain plants, we find that of the fruit trees mentioned the apple is the least susceptible to injury, the cherry and plum more so, while the peach is extremely susceptible, so that in some experiments made by Prof. Forbes, of Illinois, one pound to 450 gallons of water left a decided injury on the edges of the peach leaves.

Mr. PERRY.—Would a solution of Paris green for the apple be sufficiently strong for the plum?

Mr. FLETCHER.—You must use less for the plum than the apple.

Prof. WILLARD.—Unfortunately, I did not get the benefit of the last paper that was read or discussed, but hearing the terms Paris green and London purple used reminded me so forcibly of the fact that I had had my fingers badly burned by trifling with London purple, I simply wanted to warn the gentlemen present regarding its use. I have used Paris green for a great many years, and during the last two seasons I have taken to use London purple somewhat, but last year we made a very sad mistake in using it so much so that I should think the trick cost me five or six hundred dollars. I don't think I would much care to go through the same experience again. All I have to say is that it is much more soluble in water than Paris green, that its strength varies a great deal, and the man who uses it don't want to let the man that he hires use it, because if he does he certainly will suffer. I am very careful with my Paris green, and also with the London purple, to have the packages put up by the druggist and weighed out precisely, so that we shant make any mistakes, but we all make this mistake: Last year we put up our London purple in four-ounce packages. We had two spraying machines, one of which would hold about 100 gallons of water and another one that would hold about 50 gallons, and the intention was to have used the one holding 100 gallons entirely upon our plum trees; but a mistake being made one day, the machine that held 50 gallons was run into the field, and the eight-ounce packages were put into it, as was required, and the result was the defoliation absolutely of one plum orchard, a loss which we cannot quite measure yet, I can tell you next year about it. I think some of the trees will die as a result of it. We certainly lost \$500 worth of plums by the operation. We used the machine holding 50 gallons of water that was using four ounces,

on pear trees, and within three days, with the Bartlett pears, I saw evidences of the leaves being burned. I said to myself: If these leaves were injured, which were never injured before, by the use of Paris green, there is a certain plum orchard that will be injured in the same proportion, because the foliage will not stand what the pear tree will. It is a sensitive foliage. The result was, that the orchard suffered a good deal. I made up my mind that hereafter London purple would find some other fellow to use it, and any of you who want the experience can try it, but no more London purple for me.

Mr. WOOLVERTON.—I have had a little experience, too, with Paris green and London purple. I use ten or fifteen pounds every year in my orchard, and I might have something to say in addition. I have had some unfavourable results by using Paris green. I am very careful, as a rule, not to use too much of it. I only use about three ounces to forty gallons of water, and surely that is on the safe side. But I find the difficulty is this: that a man in adding the Paris green to each successive barrel or puncheon of water does not consider the amount of sediment remaining from the preceding barrel that is already in, and the result is that after a day or two his solution is getting constantly stronger and stronger, and the result has been that one season a large quantity of fruit was lost. So I think it is necessary to speak a word of warning in regard to this matter, that in adding the successive quantities to the barrel it is well to remember that it is a substance that is rather heavy and inclined to settle to the bottom, and it may become much stronger than we imagine. I can also corroborate what has been said regarding London purple, and that with somewhat of the same proportions I have had serious results to the foliage of apple trees. The kerosene emulsion, that has been spoken of by Mr. Fletcher, I have used a good deal with the Bartletts with excellent success, applying about the first of June.

Mr. FISK.—I am interested in this. I have had some experience myself. Unlike Mr. Willard, I have not burned my fingers with London purple. The last two seasons I have sprayed with London purple, using one pound to one hundred gallons of water, and so far I don't see any bad results to the foliage. I have seen great evil result from the destructive work of the insect. I was spraying for a bug that attacked my orchard three years ago, I think it was in 1878. It was a small insect, about a quarter of an inch long, with a long head, which, I think, Mr. Fletcher told me turned to a moth. However, this insect attacked my orchard and my neighbour's orchard three years ago. The foliage was badly eaten, and I resorted during the next season to the use of London purple. I put it on very early, spraying three times that spring. I succeeded in saving my orchard from defoliation, while my neighbour's orchard was totally defoliated. Last year I sprayed again, and had a fair crop of fruit, and my neighbour's orchard was defoliated for the third time. There was one remarkable feature which struck me in regard to this insect, and that is that it did not attack the Red Astrachans. I had in my orchard one row of Red Astrachans and the foliage was not attacked by these insects, and my neighbour's Red Astrachan trees were never injured. I would like to know if any other gentleman has had the same experience. I would like to know why this insect discards the Red Astrachan.

Mr. BRODIE.—I have used both Paris green and London purple. I used the latter on hills of potatoes and got them burned. For a number of years I have used Paris green on a thirty-acre orchard, and I have used an ounce to eight gallons of water, and have used a force pump attached to an empty coal oil barrel on a spring waggon. I have not the cyclone nozzle to my spraying apparatus, but I have one which does very good work. We have to be careful that the leaves don't fall into the barrel. I have used the apparatus for the codling moth and the caterpillar. While my neighbours are going through their orchards killing caterpillars with their hands I only apply Paris green. We have to go through a second time, sometimes.

Mr. FISK.—If you had a strainer at the end of your tap at the bottom of the barrel the leaves would not interfere with the flow.

Mr. FLETCHER.—Do you stand your barrels upright?

Mr. FISK.—Yes.

Mr. FLETCHER.—The most convenient way is to place the barrel on its side. Now, I think probably the difference is this: The London purple you cannot rely on as being of a certain strength. There is no doubt very much more arsenic in London purple, which is in a soluble form, than in Paris green. I never saw the advantage at all of using London purple. Paris green itself is extremely cheap, so there is no advantage in using London purple on the score of economy; the one advantage is its colour. It is unlike any vegetation and you can see when your tree is sprayed. With London purple it is difficult to make a mistake and spray a tree twice, unless you are very careless indeed. But with Paris green, if you are running down a row and are called off, it is an easy matter to spray a tree twice, and if you do you may put on too much and injure your trees. This is owing to the colour of the Paris green. If you use a small quantity of flour with the Paris green you will have a certain amount of colour, as well as render the poison more adhesive. Mix your Paris green with a little water first, and then put in the flour and get it thoroughly stirred. One important fact in making the mixture of Paris green is, you must remember that it is a mixture only, and not a solution. It is almost insoluble in water. What you have is a mixture with Paris green in suspension. It is consequently necessary to keep the mixture all the time agitated. This is generally done by having an agitator attached to your pump, which may be made in a simple way by attaching a bar to the handle of the pump which is attached to a cross-bar in the barrel, and when the pump handle is in use the mixture is sufficiently disturbed to keep the Paris green thoroughly mixed. The pump I have used works to the bottom of the barrel, and it is perfectly easy to clean out the barrel every time I use it, although, of course, after a continuous use of the barrel, if it is not washed out the Paris green would accumulate around the edges and in the barrel to an extent to be hurtful.

Mr. STARR.—I find that it is quite necessary for me practically to test all these arsenical poisons. I have just as much trouble in finding the strength of Paris green as I had of London purple. The trouble is just this: there is such a demand for Paris green now that it is becoming adulterated, the same as any other substances which you buy. The dishonest men adulterate with something else. Some years ago I found it was necessary to spray some trees for canker worms. I took some of the Paris green I had been using in previous years and went over the trees. I kept the right strength, and to accomplish the work I found I had not enough to go on, and the next day secured some more, making it of the same comparative strength, and in a day or two I found I had done no good whatever. The canker worms were still going on. It is necessary in advance to test the strength of the Paris green on the foliage and trees, and from the experiments I got the strength I required. In using London purple I to-day would rather take it than take the Paris green sold, because I think it is no more difficult to find the strength of it than it is to find the strength of Paris green. I even think that it is more easily commingled with water, and not so liable to settle as Paris green.

Mr. PETTIT.—I would like to ask if that kerosene emulsion referred to is strong enough for Thrip on the grape leaves.

Mr. FLETCHER.—I have never made the actual experiment, but I believe it would be the most efficient remedy, and have advised its use in my reports. Mr. John Lowe, the Deputy Minister of Agriculture, informs me that he has procured good results by dusting the vines with powdered sulphur. In hot weather there is an odour given off which keeps the insects away. I believe the kerosene emulsion would be found the most convenient remedy for this insect.

Mr. FTSK.—Last year I tried the kerosene emulsion on the grape vines for the Thrip with good results.

Rev. Mr. FULTON.—I have used London purple, and I have such an arrangement as has been described for stirring the mixture in the barrel. After putting the London purple in the barrel and mixing it up, and if the barrel was not emptied properly at the end, there is a deposit of particles that do not dissolve, and the result is, that towards the end the trees are injured. The remedy that I insisted upon was,

that the stuff should be ground up in the mortar and make it all the more liable to dissolve. If this is not done it gets hard and insoluble. The London purple is more soluble than Paris green.

Mr. HAMILTON.—I think there is some misunderstanding as to what spraying really is. I saw some people spraying in the gardens among potatoes, and they literally deluged the plants. Under such circumstances there is little reason that the spraying does not work effectually. I was doing a portion of my garden with Paris green, and came near the end of my Paris green, it was running out, and I put in a less quantity of Paris green, and the work was done more effectually than with the larger quantities. I think if the spraying is done in such a way as it will best fall on and not run off, that a very small quantity of Paris green is necessary. With regard to the use of sulphur on grapes, about thirty years ago I had a large viney, and to destroy Thrip I used to close up the house at 4 p.m., moisten the ground all over and start a fire in the house, and with a little sulphur burned I filled the house with sulphur fumes, and there was not a sign of Thrip. The result is, I never had any trouble with Thrip.

Prof. SHUTT.—I fear members of the Convention might go away with the impression that while London purple is not definite in strength that Paris green can always be depended on. This is not the case. Very often commercial samples of Paris green contain as much as 25 per cent. of gypsum, which, of course, has no value as an insecticide.

Mr. FLETCHER.—The statement made was that the amount of arsenic in Paris green was much more definite than in London purple. I believe Paris green contains about 60 per cent. of arsenical material. It does not matter what the other 40 per cent. is made up of. But what I wish to state is merely that Paris green is much more definite in its strength than London purple, that it is a good remedy, and that it will pay fruit-growers to use it. I had a series of analyses made some year or two ago by the Department of Inland Revenue, and the percentage of adulteration varied from 1 to 10 per cent. in Paris green; and in the London purple, on the other hand, the amount of arsenic varied from 60 to 18 per cent. in the series of experiments that were made. Of course, I do not recommend the London Purple at all because of the uncertainty about it; but good results have been obtained by it. All I said was, if you want to get the pure article and know what you are using buy Paris green; although a little higher in price than London Purple, it is more reliable.

Prof. SHUTT.—I have no doubt we very often get the pure article. What I want to point out is, that we do not always get 100 per cent. of Paris Green, and the consequence is that the strength as an insecticide is lessened.

Prof. SHUTT then read his paper on the "Composition of Apple Tree Leaves."

THE COMPOSITION OF APPLE TREE LEAVES.

Agricultural chemists throughout the world are, and have been now for some years, directing their attention towards the solution of questions concerning the growth and bringing to perfection of plants and animals which serve for the use of man. With regard to plants—and by that term I include all farm crops—analyses have been made of all their parts, so that their composition is, to-day, pretty well known.

Field experiments and experiments in water culture—in which the various salts required by the plants are dissolved in water—have also been made, enabling us, at the present time, to state definitely what special fertilizing constituents are valuable for the growth of certain crops, what classes of soil are most suited to cereals, the leguminous plants, and so on.

But as yet it appears that little has been done in this direction for the fruit-growers, and the reason for this is not difficult to find. In all experiments of this nature it is necessary to weigh and analyse an aliquot part of the final product of vegetable growth in order to arrive at the amount of plant food absorbed from the

soil and other sources, and in this way ascertain the extent to which the soil has been exhausted and the special inorganic and organic elements which enter into the composition of their tissues. In the case of farm crops which are reaped annually this is comparatively an easy task, but it is obvious that in the case of fruit trees—both small and large—this of necessity cannot easily be done. As, however, it is as highly important to the fruit-growers to know what kind of food and what class of soils are best suited to produce the largest amount of fruit as it is to the farmer to be in possession of such information respecting his crop, it is but the duty of those engaged in working out these problems to direct their study, as far as in their power lies, towards the solution of such difficult questions.

It was with a view of throwing some light upon this abstruse subject, of proposing some rational mode in the application of fertilizers to orchards, that the work included in this paper was undertaken.

Now, it must not be thought that even if we knew the exact composition of all the parts of the tree (and as long as the fruit is hanging it remains part of the tree), and also the total weight of those component parts as well as a knowledge of the composition of the soil in which the tree was growing that the whole question would be settled. Until a few years ago it was thought that such data were sufficient to guide the agriculturist in manuring certain fields for certain crops, but later facts evolved by patient experiments, conducted most carefully over many years, have now proved this theory fallacious. I might illustrate this by reference to the cereals and leguminous. The former contain but half the nitrogen of the latter, yet notwithstanding this fact, and all that it seems to imply, it is found that the application of nitrogen is specially beneficial to the cereals, but of little or no value to the leguminous, especially after a certain stage of their growth. Without going into the reasons, or rather theories, which have been advanced to account for this state of affairs, I will ask you to bear these facts in mind, and at the same time to remember that *ex nihilo nihil fit*, that we have to draw upon the soil, the air and water for the constituents of plant food, and that the soil, generally speaking, is the only one of the three we can modify or alter in composition by mechanical or chemical agents. The climate, including degree of frost, amount of rainfall, snow, sunshine, &c., all these are important factors in agriculture. But as we have no control over the elements, the line of experiment seems rather in making choice of and breeding from such varieties, whose qualities, dependent upon heredity and environment, make them seem specially adapted to the climate immediately under consideration, and then finding out by all the means at our command, and then applying those elements of plant food best suited to their growth and development.

In this series of experiments five well-known and hardy varieties of apple trees were selected and the leaves gathered at two stages of their growth, viz.: 25th May and 20th September. The leaves in all cases were taken from two or more trees, so that their analysis should reveal the fair average composition of the leaf of that variety at that particular stage of the tree's growth. Upon the first date some difficulty was experienced in a few instances in getting sufficient leaves for analysis without seriously denuding the tree of foliage, so that these first specimens represent leaves in a stage of development. On 20th September all the leaves were still quite green, and their life apparently unimpaired and vigorous.

Mr. John Craig, Horticulturist to the Central Experimental Farm, has kindly furnished me with the following descriptions of the apple trees under discussion:—

Duchess of Oldenburgh.—Tree is vigorous and hardy, forming a roundish, upright head. Bears young, and abundantly. Young shoots, smooth, reddish. Leaves, medium-sized, firm and glossy. September.

Tetofsky.—Tree upright, very hardy, vigorous. A young and annual bearer. Young shoots, stout, reddish-brown. Leaves, very large. August.

Wealthy.—Hardy, vigorous and healthy. Spreading, open head. Bears young; is an abundant and annual bearer. Shoots, dark, medium. Leaves, medium. October.

Fameuse.—Tree, moderately vigorous and hardy, round-topped, spreading. Young shoots, reddish-brown. Fairly young annual bearer.

Northern Spy.—Rapid, upright growth. Tardy and moderate bearer. Young shoots, large, dark reddish-brown. Winter.

The following table shows the composition of the leaves, together with such other data as may help to elucidate the question under consideration. After the column containing the name of the apple tree and the date when the leaves were gathered are three columns, representing in percentages the composition of the leaf—the water, organic matter and mineral constituents. Then follow six columns, showing the percentages in the ash of its chief inorganic components. The percentages of nitrogen in the dry organic matter are then given, followed by columns depicting the amounts of nitrogen, phosphoric acid and potash contained in 1,000 lbs. of the green leaf, and which serve to illustrate the absolute and relative values of the leaves as a fertilizer, as well as to show the quantities of these materials taken from the soil for the growth of the leaves.

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Composition of the Leaf, Percentage Composition of Important Constituents in Ash.

NAME.	COMPOSITION OF LEAVES.				PERCENTAGE COMPOSITION OF IMPORTANT CONSTITUENTS IN ASH.				WEIGHT OF FERTILIZING CONSTITUENTS IN 1,000 LBS. OF LEAVES.			
	Wheat Gathered.	Mositure of Green Matter.	Phos. Acid. $\frac{1}{4}$	Protin.	Lime.	Magnesia.	Oxide of Iron.	Silic.	Nitrogen in Organic Matter.	Lbs. of Nitrogen in 1,000 lbs. Leaves.	Lbs. of Phos. Acid in 1,000 lbs. Leaves.	Lbs. of Potash in 1,000 lbs. Leaves.
1889.												
Duch. of Oldenburg.	May 25..	70.91	25.67	9.29	9.25	21.50	9.56	.92	2.87	7.65	2.31	2.21
Tetotsky.....	do 25..	72.11	25.40	2.49	8.32	14.33	7.52	.81	1.16	2.84	2.20	3.56
Wealthy.....	do 25..	71.25	26.84	1.91	8.45	10.49	6.02	8.49	1.44	2.96	1.79	1.94
Fameuse.....	do 25..	75.45	22.01	2.54	11.61	9.51	16.26	10.84	1.61	1.04	3.01	2.94
Northern Spy.....	do 25..	72.04	25.62	2.34	13.33	14.00	12.43	1.92	1.39	2.99	7.66	3.11
Average.....	.....	72.36	25.31	2.33	10.47	10.82	17.40	9.77	1.49	1.67	2.94	7.42
1889.												
Duch. of Oldenburg.	Sept. 20..	57.30	38.73	3.95	8.00	6.35	34.80	5.62	1.33	1.00	2.46	9.61
Tetotsky.....	do 20..	60.49	35.87	3.64	5.93	11.02	33.59	5.55	1.19	1.28	5.89	1.18
Wealthy.....	do 20..	60.02	36.53	3.45	5.23	13.09	22.40	5.22	1.08	.80	2.36	2.15
Fameuse.....	do 20..	63.45	33.15	3.40	5.64	13.65	26.35	4.16	1.56	1.05	2.50	1.80
Northern Spy.....	do 20..	62.30	34.85	2.85	9.31	14.04	22.40	3.50	1.50	1.57	2.84	1.91
Average.....	.....	60.71	35.83	3.46	5.82	11.63	27.91	4.81	1.41	1.14	2.48	8.87

Moisture.—With the exception of the Fameuse, the percentage of water in all the specimens taken 25th May lies between 70·94 and 72·11—practically, between 71 and 72. The Fameuse is more succulent, and contains 75·45 per cent. water. In the leaves gathered 20th September we find a general diminution in the percentage of water, the loss being in the neighbourhood of 12 per cent. It is interesting, and perhaps instructive, to note that with regard to the amount of water, the leaves of 25th May fall into the same order with those of 20th September, the Duchess of Oldenburgh containing least and the Fameuse most water, showing clearly that while all have followed the general law in loss of moisture each has retained its own characteristic individuality.

Average percentage of water in young leaf.....	72·36
do do maturer leaf.....	60·71

Organic Matter.—This includes all the combustible material of the leaf, and is composed of carbon, oxygen, hydrogen and nitrogen. In the leaves of 25th May, those of the Duchess of Oldenburgh and of the Wealthy, the percentages of organic matter are almost the same and head the list. The Tetofsky and Northern Spy also contain almost identical amounts, or somewhat less than the two first mentioned, while the Fameuse contains the smallest quantity of organic matter. This order is preserved in the leaves plucked 20th September. From an inspection of these two columns it will be observed that there is a general diminution of water and increase of organic matter as the season advances, and that any special variety preserves its relative position to other varieties in this respect throughout the season.

Average percentage of organic matter in young leaf.....	25·31
do do maturer leaf.....	35·83

Ash.—The percentage of all the inorganic or mineral constituents of the leaf are found in this column. With the exception of the "Wealthy" we find the amounts of ash of the leaves of 25th May closely approximating one another. The leaves of the Wealthy fall about, 5 per cent. below the others in ash constituents. In those of the 20th September we find a general increase in the percentage of ash, amounting from, 5 to 1·5 per cent. over those of 25th May.

Average percentage of ash in young leaf	2·73
do do maturer leaf.....	3·46

Phosphoric Acid.—With regard to the composition of the ash as detailed in the columns following it is difficult to discover in many cases what principle, if any, underlies the distribution of the mineral constituents throughout the tissues of the leaf during its growth. Without reading too much, however, into the results of a single analysis, an inspection of this column shows most clearly that the young leaf contains in its ash a much larger percentage of phosphoric acid than the maturer one—in some instances the phosphoric acid in the latter is but one-half, or even less, than that of the younger leaf. This would lead us to suppose that as the season advanced there was a retrograde movement of the phosphoric acid of the leaf to other parts of the tree. As the seed is well known to contain a relatively large quantity of this acid we may legitimately be allowed to think that the food elaborated in the leaf found its way finally, in part, at all events, to the fruit and other portions of the tree. And this undoubtedly expresses a truth (though probably not the whole truth), for we observe that the average number of pounds of phosphoric acid per 1,000 pounds of the younger leaf is higher than the corresponding number for the maturer leaf, viz.: as 2·45, 1·94, and this in spite of the fact that the percentage of ash in the latter is considerably higher than in the former.

Average percentage of phosphoric acid in the young leaf	10·47
do do maturer leaf	5·82

Potash.—It would not be safe from the results tabulated to advance strongly any theories regarding the disposition of this important element in the leaf. The percentage of potash in the young leaf is somewhat lower than that in the maturer leaf. When we, however, consider the increased amount of ash in the latter we find that per 1,000 pounds the older leaves contains 1·5 pounds more potash than the

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younger leaves. On comparing the amounts of potash obtained in these analyses with the quantity as found in leaves of other trees, it is at once apparent that the leaves of the apple tree are exceptionally rich in this material.

Lime—The average percentage of lime in the ash of the young leaf is 17.40, while that of the mature leaf is 27.91, an increase of 10 per cent. This increase would appear also to be regular throughout the varieties examined. Thus the Duchess stands first in percentage of lime in both lists, followed closely by the Tetofsky, and so on.

Magnesia—While the percentage of lime increased during the growth of the leaf, the analytical data show that the percentage of magnesia decreases during that period. Thus, in the young leaf we have magnesia 9.77 as the average percentage, and in the mature leaf this number is reduced to 4.81. This fact is the more remarkable and interesting when we remember that the percentage of phosphoric acid diminished in the same ratio during the same period. It seems quite possible that these two elements of plant food are intimately related in the economy of the plant, and that in the elaboration of the plant food within the tissues and the distribution of this food to the different parts of the plant these two play a very important role.

Oxide of Iron and Silica—Throughout the whole series the amounts of these constituents are seen to be very similar, and the average in the young and mature leaf closely approximate each other. The iron after it has performed its functions in the chlorophyll of the leaf appears to remain in the leaf, and from the figures in the table it is seen that there is no extra deposition of silica in the cells of the leaf as it grows older.

Nitrogen—The only constituent of great importance that remains to be discussed is nitrogen. The differences in the amounts of nitrogen contained in the organic matter of the leaves of the different varieties examined are so small that one would not be warranted in drawing any conclusion therefrom as to differences in this constituent between the varieties. On taking the averages, however, of nitrogen of the leaves in the two stages of their growth, a considerable difference is at once apparent—a difference that corresponds to 3 per cent. of albuminoids. The figures are:—

Nitrogen in young leaf	2.94	corresponding to 18.61 per cent albuminoids.
do	mature leaf 2.48	do 15.50 do

The amount of nitrogen per one thousand pounds of the mature leaf is 8.87 per cent. as against 7.42 in the young leaf. This is due to the increased percentage of matter in the older leaf. It is evident from these results that changes which affect the relative percentage of nitrogen in the organic matter take place in the leaf during its development—but what these changes may be is beyond the scope of the present paper to discuss.

Phosphoric acid, potash and nitrogen are the three constituents which above all others must be put back into the soil if we are to preserve its fertility. Plants of certain orders require more of one or other of these than plants of other orders. Some soils are specially rich or poor in one or more of the materials—and consequently in the rational mode of application of fertilizers much intelligence and patience must be exercised.

That the leaves of the apple trees draw a large amount of food from the soil annually has been shown. This must be replaced in excess for the vigorous growth of the tree. The leaves of the tree play no unimportant part—respiration and digestion are their two chief functions—which, if they do not perform well, the tree cannot live and bring to perfection its fruit. Therefore, when we feed the leaves we are indirectly feeding the fruit.

The results of this work seem to point in the direction of mineral fertilizers, and specially of potash, as being more particularly required for the growth of the leaves, and, therefore, for the vigorous development of the tree, including an abundant crop of fruit.

A heavy dressing of wood ashes (which may be procured in many parts of Canada at a very low price) or of kainit or other form of potash is, therefore, to be recommended for orchards.

The value of the leaves composted—a process to be advised as more economical than burning—is also well established by the data afforded by this work.

R. BRODIE.—I agree with the gentleman that potash is the best fertilizer for apple trees. I found that ashes have done the best. We find many of our farmers selling their ashes to enrich the farms of their friends of the neighbouring Republic. In this enlightened time we should not find the farmers doing what their forefathers in 1804—those who lived along the St. Lawrence—refused to do.

Mr. WOOLVERTON.—I agree with Mr. Brodie and the writer of the paper in regard to the use of ashes as a fertilizer. In my orchard I used them extensively, and in the winter time when I am not employed I employ teams the whole season collecting ashes for my apple orchard. Indeed, I had almost become discouraged of ever obtaining a sufficient supply of fertilizers for the orchard without great expense until I found out the value of wood ashes. I found the results exceedingly satisfactory. I am very glad that Prof. Shutt has given us this valuable paper on the analysis of the apple leaves, and we will value it very much in our report as a paper to be referred to. We will be very glad on some future occasion to get from this gentleman an analysis of the apple itself which we can rely upon, because it is sure to be useful to us.

Prof. SHUTT.—I intended to say a few words upon that. I only had time this year to make an analysis of the leaves. We shall eventually analyse the whole tree. I fully appreciate what Mr. Woolverton says, viz.: that it is necessary to obtain the analysis of the apple and of the whole tree before we can begin to make any very definite and decisive deductions as to the best fertilizers for orchards.

Mr. PETTIT moved the following resolution seconded by Mr. HENRY: "That the Dominion Government be petitioned to re-impose the duty on fruits imported from the United States."

In support of the resolution Mr. Pettit said: We must all acknowledge that the policy of the present Government of the Dominion is a policy of protection, and why the fruit interests of this country have been left unprotected it is a difficult matter to say. Living as we do in so close connection with our friends across the river, in a climate much warmer than ours, they take advantage of the markets of the Dominion to the detriment of the fruit growers of this Dominion. I think it is a subject, now that we have met here together as fruit growers from all parts of the Dominion upon which we should express our feelings, and ask our Government to place these duties the way they were before. I think if one branch of industry in this Dominion needs the fostering care and protection of the Government all branches should receive the same care, and I think in this respect we can fairly and properly ask our Government to place the fruit-growers of this Dominion in the same position as other branches of industry enjoy. I beg to move the resolution which I have just read.

Mr. HENRY.—In British Columbia we feel the need of this very much. We are just beginning to get started in growing small fruits. Previous to this the inhabitants of British Columbia have had to get their supply from California, and we are beginning now to grow sufficient of these perishable fruits to supply the people there. If we cannot compete with California and Oregon as to prices, the trouble is they have got so far advanced in the industry that their fruit comes into the market about two weeks earlier than ours; consequently, they have the advantage of their own market, and after that they supply our market, and it meets the first fruit which we grow and brings down the prices, and this is very much against us. We consider if there should be a duty on foreign fruit, evaporated and canned fruit, we should be protected in fresh fruits.

The CHAIRMAN. I understand that it is the desire of the mover of this motion that if this motion be adopted and the committee appointed they shall interview the Minister of Customs to-morrow.

Mr. ALLAN.—I would make this further remark, which I think is a very important point, which comes up in the consideration of this resolution and it is this: A point was mentioned here before that American apples are purchased by Canadian shippers. These are shipped through here by American shippers and are sent on to Great Britain as Canadian apples, and receive a much higher price as Canadian apples than they would as American apples. Now, these duties would, to a large extent, if not entirely, obviate the difficulty, and I look upon this point as an important one.

The PRESIDENT here read the resolutions.

Prof. SMITH.—The Nova Scotia Association passed a unanimous vote against the imposition of the duties. I happened to be present when the resolution was passed. The resolutions set up that the re-imposition of the duties would be of the greatest injury to the fruit growers of Nova Scotia.

Mr. PETERS.—It seems to me that a resolution so important as this can well afford to lie on the table till next session. There are questions involved in that which will largely affect New Brunswick, and questions which I would like a little time to consider. I do not think an ill result will follow deferring the matter, because I think the question is of very great importance. I can very well understand the view of the gentlemen of Ontario, but there is one thing—if that resolution was passed it would very largely affect the Maritime interests, particularly New Brunswick. At the present time, in New Brunswick, we are shipping eight or nine thousand dollars worth of strawberries to Portland and Boston, and if there was an imposition of the duty we would be shutting ourselves out of these markets, and thrown on our own local markets. I think we should defer this matter, and consult with the delegates from the different Provinces and compare notes before taking a vote. I should feel very much better, and be able to give an intelligent reason for my vote. I move that the matter be deferred until the evening session.

The CHAIRMAN suggested to the mover of the resolution that the matter be deferred until the evening session.

The Convention adjourned until 8 p.m.

EVENING SESSION.

THURSDAY, 20th February, 1890.

The Convention resumed at 8 o'clock.

The PRESIDENT.—The first paper that I will call for is one that was left over from the morning session—"Fruit Culture in New Brunswick," by Mr. S. L. Peters, of Queenstown.

Mr. PETERS.—I regret to say, Mr. President, that Mr. F. P. Sharpe, of Woodstock, one of the delegates, who was invited to attend the Convention in the interest of the Province of New Brunswick, was not able to come, on account of sickness in his family, so that I am here alone.

FRUIT CULTURE IN NEW BRUNSWICK.

It is my purpose, so far as I may be able to give the gentlemen who are present at this convention of fruit growers, a plain statement of our present position in Fruit Culture. I could wish that an abler pen had undertaken the task, but having been delegated by my fellow-citizens to represent this interest at the present meeting, I trust I may be pardoned for intruding my observations, and to some extent my personal opinions and experience, on the distinguished body of gentlemen present who compose this convention. It is only within the last thirty years that New Brunswick orchardists have begun to pay much attention to the cultivation of improved or grafted fruit. Previous to that time we were content to grow and use the common seedling apple produced from trees which sprang up in our fields, and from thence transplanted to what was then known as the orchard. In some cases the fruit possessed merit, and when this occurred the kind was often

propagated by grafting in the neighbours' grounds, but if of the more ordinary kind the tree was permitted to stand and produce its fruit all the same. The growers, acting on the principle, eat the best first, and the poor ones will be good when there are no others; and I ought, in justice to our sister Province of Nova Scotia, to say that as the yield of our own orchards was not nearly sufficient to supply the demand of our home markets, the citizens of that fine Province (charitably disposed, as they have ever been, towards us) supplied the deficiency with a quality greatly similar to our own production. But while I make this reference to the condition of things as they have existed, I desire to place it on record that New Brunswick orchardists are under a very great obligation to our Nova Scotia friends for the advancement we have made in fruit culture, while the inhabitants of our cities have shown their appreciation of their foresight, skill and labour by a more liberal purchase and consumption of the magnificent and palatable fruit with which they have supplied our markets. There is a feeling, however, among our people, that our friends across the bay, seeing that we have been good customers so many years, should in their shipments send us a larger proportion of No. 1's.

Within the period named, I am glad to say that we have made some progress. The old orchards are dying out through neglect, because their fruit was unsaleable, and new ones are taking their place, made up of grafted trees, which produce the best of their kind. To the gentleman who was invited to be present with us as my co-delegate great credit is due for the valuable assistance rendered by him in promoting this industry in the Province. His action has been energetic, his labours unremitting; and I am sure my fellow citizens at home would bear testimony to the fact that to him belongs the honour of awakening our people to the great possibilities within our reach in the culture of the apple and plum. His very extensive nurseries have been drawn upon by the people to a large extent for their new orchards; while the product of his magnificent plum orchard is to be found in their season in all our cities and large towns.

I regret to say that we are not yet in a position to supply our home markets with even the soft autumn fruit, while in winter-keeping varieties we are sadly deficient. There exists a prevailing impression among our nurserymen (and we have a number of them) that winter fruits cannot be successfully grown with us. I think this impression is not wholly warranted, and for the purpose of dispelling that impression and giving ocular demonstration of the position I take in the matter, I have taken the pains to place before this Convention some samples of winter fruit grown by myself. It may be true that they may not be equal to samples grown in those provinces of apple-growing districts 'The Annapolis and Cornwallis Valleys of Nova Scotia or the western portions of Ontario and the favoured districts of Quebec,' yet I submit they are sufficiently fine to warrant their extended cultivation in such districts of our Province as may be found favourable to their production. The samples shown are the products of trees secured from Nova Scotia nurseries and from Rochester, N.Y., U.S.

Beginning at a point say twenty miles distant from the city of St. John, on the valley of the St. John River, and following it until Sheffield, in the County of Sunbury, is reached, a distance of some forty-five miles, lies a tract of beautiful country, which, in my judgment, will successfully produce the best varieties of winter fruits; and had our people the courage to place even a moderate acreage under cultivation we might be in a position in a few years to supply at least a portion of the winter fruit required in our provincial markets. But in speaking of our possibilities, I should be doing an injustice to New Brunswick did I not state that the early autumn fruits are very successfully grown throughout the entire valley of the St. John, from the point first mentioned until the Grand Falls is reached, a distance of some 200 miles. Nor is their successful culture confined to this district alone, but in the slopes along the valleys of the numerous tributaries of the St. John are to be found many orchards bearing autumn fruits of good quality.

Among the leading varieties of autumn and early winter fruits grown are the Duchess of Oldenburgh, Early Harvest, Red Astrachan, Emperor, Fameuse, St. Lawrence. As an autumn fruit, with us, the Duchess stands in the front rank, and when grown in orchards, where the trees are planted sufficiently far apart to admit the sun's bright rays, command a ready market at fair-paying prices. It is one of our most prolific and early bearers. The Red Astrachan is not nearly so extensively cultivated, but is a good fruit with us and commands ready sale. The Emperor has probably seen its palmy days in the St. John market, where, possibly, from its immense size and beautiful appearance, more than for its quality, it had a fine sale for a few years. Buyers now pass it by to a very large extent. As an early winter apple the Fameuse has no superior. The great drawback to its extended cultivation is its tendency to scab, and I shall be very much gratified indeed if, in the experience of any gentleman present, we may be able to learn a remedy. So far as my own experience goes I may say that the liberal application of wood ashes has proved very beneficial, but by no means a complete remedy.

In the cultivation of winter fruit I have succeeded well with the Russet, Northern Spy, Bishop's Pippin, Rhode Island Greening and Tolman Sweet. The trees of these varieties are perfectly hardy and have proven good bearers. My methods of cultivation may not be in accord with that of gentlemen present, but as an old "saw" has it: "In a multitude of councillors there is safety!" I will venture to give it, hoping that by the friendly criticisms it may evoke, to learn of its errors, and how in the future a better method may be adopted. In planting out a young orchard I would insist upon having the land in a good state of cultivation to start with. After planting the trees would soon down to timothy and clover, after the first year, taking care that every year, for at least five, the soil about the trees to be thoroughly worked with a spading fork for say 3 feet from the tree, and sufficient manure added to give the young tree a good, strong, healthy growth, but not to encourage an overgrowth. My reason for preferring the fork to the plough and cultivator is to prevent the marring of the tree in any way, which it is almost impossible to prevent by their use. A young tree with its bark torn off, if even to a small extent, is badly handicapped in the race for life and productiveness. Cared for in this way, and proper attention to pruning. I find no difficulty to make plenty of wood growth and preserve the tree in proper shape and condition to fruit heavily. After the trees have come nicely into bearing I have not thought it absolutely essential to continue the cultivation about them every year, and have, as rule, kept the whole orchard in grass, top dressing liberally, as well to increase the yield of hay as the yield of fruit.

In the matter of pruning and the proper time to prune there is such a diversity of opinion among the best orchardists that I shall scarcely venture an opinion; but by your permission will state my practice: Beginning with the young tree, there is never very much difficulty in forming it in any desired shape. My preference is for a medium low tree, and I therefore encourage the branches to spread as much as possible, when the limbs are raised sufficiently high to enable the cultivating process to be conveniently done. I avoid, as far as possible, the cutting of any large branch, believing it to be everyway better if the branch needs removing to do so when it is small. If the tree, during its growth, makes too much foliage in the centre, I prefer to prune the main branches to cutting them off. There does not seem to be any difficulty to secure the healing of a small wound, while a larger cutting always remains a wound, and often a dangerous one to the life of the tree. When the small branches only are removed we have experienced no bad results, if done between the 1st of April and the 1st of June. However, I am open to conviction, and shall be glad to have the experience of others present on the subject. With our trees in bearing our thoughts very naturally turn on the subject of marketing the fruit, and as this part of my subject is fraught with the deepest interest to both the producer and the consumer, I trust I may be pardoned a few plain words in reference to it. The orchardist, with his fruit carefully gathered, has now passed the lines which strictly apply to cultivation and production; his work in that line is completed the very moment his fruit is nicely cared for in the fruit house. He then assumes (and very

properly so) the role of the merchant or manufacturer to a very large extent. Assuming, then, these premises to be correct, the first thing that naturally would force itself on his attention would be the package in which to market his fruit. For size and convenience of handling there is perhaps no superior to the standard apple barrel; it is strong, will stand rough handling, and is not expensive, and presents, when new, a rather neat appearance.

Packing will now be next in order, and just then is the time when the owner should recall to his mind that most beautiful bible admonition, "Do unto others as ye would have them do unto you," and if acting upon its teaching, I venture the assertion that we should not hear any complaints of deceptive, or, if you please, dishonest packing. It is my judgment that no orchardist can afford to pack his fruit deceptively, and if any portion of the barrel is to be a little better than the other, let it be those in the centre. Having done this he is not afraid or ashamed to place his name upon the barrels, with the grade of apple and kind it contains. In doing so he feels every inch a man, strengthened by the approval of conscience to battle for the right, and making for himself a reputation in his business, which will go far to secure financial success, and giving to Canada a status in the foreign fruit markets of the world which will insure the ready sale of our products at the highest quotations. Our interests are too great, our reputation for fair and honourable dealing too sacred and important; to permit a package of Canadian fruit to be placed upon foreign market which has not been properly graded and honourably packed. In giving expression to these opinions with reference to foreign markets, permit me to add that the same conditions require to be fulfilled and with quite as much thoughtful care, in grading and packing for our home markets. I sincerely trust that this convention will give its undivided support to this matter.

In the culture of the plum we have been fairly successful, and in addition to other growers, Mr. F. P. Sharp, of Upper Woodstock, has a very fine orchard of some three acres in extent, and grows from 4,000 to 6,000 boxes, containing one peck each, per year. These are shipped to our leading provincial markets in considerable quantities, while many of them find their way to the cities of Portland and Boston.

Mr. Sharp's method of culture has been generally adopted in this Province by plum growers, which may be briefly described by saying that he is an advocate of close planting and high culture, and laying down his trees in the autumn.

His culture is confined to three or four leading varieties, prominent among which is the Moor's Arctic, a very hardy plum, with fruit of good size, and commands a good price in the market. Orchardists in other sections of the province, particularly along the valley of the St. John and its tributaries, meet with fair success in its culture also, by adopting Mr. Sharp's method; while a few succeed well by allowing the trees to remain without disturbance and in an upright condition during the winter.

Pears are not extensively cultivated. A few trees, however, are to be found in some of our best orchards, which have largely been planted as an experiment.

I have been quite successful in growing the 'Flemish Beauty,' 'Clapp's Favourite' and 'Bartlett.' I have some three other varieties, but the trees have not yet fruited. The two first varieties come to great perfection, and are exceedingly fine in flavour.

Our small-fruit culture is quite an important industry with us, and consists of the cultivation of the "Strawberry," "Raspberry," "Gooseberry," "Currant" and "Blackberry." In my reference to these small fruits and their culture in New Brunswick, permit me to say that the name of D. P. Wetmore, Esq., of Clifton, deserves especial mention as being the pioneer in their cultivation. His extensive fruit gardens are the subject of very general admiration, and at certain seasons of the year present a scene of great beauty and activity. I may be pardoned from further personal reference to growers, as the limits of this paper would not admit of it. I may say, however, that we have a goodly number of gentlemen engaged in the business of producing small fruits for our markets, and who find it both pleasant and profitable.

It would make this paper much too lengthy if I were to enter upon the modes of cultivation adopted in small fruit culture. It may fairly be presumed that all present are familiar with their cultivation and the requirements connected therewith.

Our small fruit is largely marketed in quart boxes, packed in crates of various sizes, containing from 18 qts. to 54 qts. each. To give you some little idea of the extent of this cultivation with us, I may say that in the village of Clifton alone there is under cultivation some ten acres of strawberries, giving a net income of about \$4,500 per year over expenses incurred in picking and shipping. The cultivation of all the smaller fruits are very successfully prosecuted in various sections of our Province.

I have thus briefly referred to some of the points of general interest in our provincial fruit culture, and not desiring to weary you, I will close by expressing my most sincere desire that the results of our present meeting may have the effect of giving an increased interest to a very pleasant line of our farm husbandry, and through the information imparted by the valuable papers read, and the discussions thereon, we shall be able to make fruit culture much more profitable in the future than in the past.

The PRESIDENT.—This paper is now open for discussion.

Mr. ALLAN.—Are the trees you plant standards, half standards or dwarfs?

Mr. PETERS.—Standards.

Mr. ALLAN.—What distance are they apart in the orchard?

Mr. PETERS.—Mr. Sharpe is an advocate of close planting. He insists upon planting 1' feet apart. I plant my orchard from 25 to 30 feet. Near the city of Fredericton a gentleman put out 4,000 trees, and put them so close together that he had to take out every other tree to give them a little sunshine. As a rule, 25 to 30 feet will suffice.

Mr. ALLAN.—We go so far as to say that in standard trees in practice we find with many varieties that 40 feet is not too close. In giving advice, I tell people to err on the right side and to plant them 40 feet apart. The New Brunswick system of cultivation does not strike me as a proper system, according to our ideas. We believe in cultivating the young orchard for the first two years, and working it to hoed crops. If the orchard becomes too heavily wooded my system is to seed down with clover, but still to keep the top dressing and use wood ashes and night soil. I certainly admire the picture which Mr. Peters drew of a New Brunswick apple packer. It is a beautiful picture, but if presented in our Province to the ordinary apple packer it would startle him. There is great need of impressing upon the people generally the necessity of careful packing. It is a most important point to be taken into consideration, and we cannot speak of it or press it too earnestly upon the people.

Mr. WOOLVERTON.—I quite agree with Mr. Allan as to planting the orchard—that is, in rich soils and with most varieties that grow to a large size. I have Greening apple trees on light soil—a deep, sandy loam—and they are of a good age, seventy or eighty years old. They are planted that distance apart, and the branches are interlaced that distance, so that it is quite evident that they are not too far apart. For smaller growing varieties that would be too far; 30 feet might be sufficient, and on certain soils. With regard to the mode of pruning, I do not think so much of making the trees spread and keeping the top as I once did. I want to study the natural growth of the trees, and, if the tendency is upright, to favour that, and thin out merely to give development to the trees. If we interfere with the natural growth of the tree we shall find trouble in keeping out extra shoots and sprouts from the centre that will be sure to spring out. Mr. Peters was saying something about the difficulty of curing large cuts. We believe that to make large cuts is a great mistake; it is almost a death blow to the tree the way many orchardists do. Where it is necessary to cut I certainly think the tree should be covered with some coating to prevent the action of the weather and the air upon the wood. A covering of some kind of varnish, shellac or paint, would answer the purpose. Mr. Peters, I think, did not intend to say that the standard barrel was a two-bushel barrel.

Mr. PETERS.—That is what we consider the standard barrel. We take the Nova Scotia barrel as a standard.

Mr. R. W. STARR.—The size is 26 inches over 19 inches bulge, and 17 inches head, inside measurement. It is the standard flour barrel size, holding two and a half bushels.

Mr. WOOLVERTON.—It holds nearly three bushels.

Mr. STARR.—It would hold more than three bushels of grain, but two and a half of apples.

Mr. C. R. H. STARR.—The same barrel in New York will hold 180 lbs. of potatoes.

Mr. BORTHWICK, Ottawa.—I had some apples from Nova Scotia last season, and the size of the barrel is two and a half bushels.

Mr. ALLAN.—The intention of the Government in framing the Act by which the size of the barrel is regulated was that it should contain three bushels. The size is so given by the Dominion Act. I do not think it is quite a three bushel barrel, but that was the supposition in framing the Act.

Mr. R. W. STARR.—The standard bushel of the Dominion is the Imperial bushel level filled. Under the Dominion statute there are no heaped bushels. The standard apple barrel will hold three of these Imperial bushels.

Mr. PETERS.—We do not measure in that way. We are compelled to give full measure.

Mr. KEW.—I was glad to hear the remarks to-night in reference to planting. The first orchard I planted was sixteen or seventeen years ago, and the piece of land figured out conveniently at 28 feet one way and 38 the other to get the rows. I thought at the time the rows were pretty wide apart, but the trees were small. We did not put anything between them; still, we had plenty of room to cultivate. We cultivated the land thoroughly for ten years, and then seeded it down after that time. It has never been ploughed since. Those trees planted sixteen or seventeen years ago—Greenings and Baldwins—now have their limbs interlaced 2 or 3 feet, quite agree with Mr. Peters in his system of growing trees. I believe in a tree of medium height, growing the limbs near to the ground, but not too near that you cannot get round conveniently for picking. When loaded with fruit the lower limbs will be near the ground. I have lost faith in severe pruning. It was thought in our neighborhood that we could not grow apples unless we cut and slashed the tree every year. I believe, and my belief is based on my own experience and that of other growers, that the tree should be thoroughly trained during the first five or six years. There is no trouble, if the orchard is properly tended to, in forming that tree for its lifetime. I think I never had occasion to cut a limb off of any of my trees after they had been planted six years except there may have been a case now and then when the limb would meet with some damage—either the wind or ice would break it—and then I would cut it off for appearance sake, but I always made it a practice to bind the wound, and that wound had never taken any water. Binding will always prevent water getting in and decaying the limb. So far as regards the distance and trimming, I believe we cannot grow fruit without the wood, and the more wood you cut away the less blossoms you will have; and suppose the tree does over blossom, the fruit of itself will naturally thin out. Last year, I took out of that orchard planted sixteen or seventeen years ago, an average of 100 barrels to the acre. In regard to the cultivation I let a large number of hogs run in the orchard. I raised considerable coarse grain, and buy a good deal. I believe that letting the hogs run in the orchard is the most convenient, thorough and profitable way of cultivating the orchard, and there will be no necessity for manuring. I think the system of keeping large grown hogs in the orchard every year is a good one. I take them out when I am picking, and when I pack I draw the apples under cover. I pick into barrels, and a man can draw as many barrels in a day as eight men can pick. It is then possible for me to pack in any kind of weather. As soon as the apples are out of the orchard the hogs eat up the refuse, and when winter comes on my orchard is clean. In regard to plums, I do not think much of the one that Mr. Peters recommended. I do think, however, that he recommended it as an

extra variety. Mooer's Arctic was introduced into our locality, and our impression is that it is no better than the ordinary wild plum. I do not know that I have anything further to say in regard to apple culture.

Mr. SHEPHERD.—How large is your orchard?

Mr. KEW.—I have 25 acres altogether.

Mr. JOHN DENTON.—I think, in growing young orchards, either apple or pear trees, if the fallen fruit were kept off the ground in a large measure the attack of insects would be repelled. The principal fruit which I raise is pears, but I have an apple orchard as well. The pears which we raise we do not find it necessary to spray. We are troubled very little with the codling moth. In one part of our orchard we have left some Snow trees, and the codling moth is beginning to work on the pears in the immediate vicinity of these apples, and in no other place. I attribute this to the fact that the ground is not kept clear of the fruit. I think if a person started a new orchard he should see to it that the fruit is kept from the ground, and thereby he would prevent the attack of the codling moth. The reason our pears are kept so clean is that they are more valuable and as soon as they are full size they are sent into market.

Mr. PETTIT.—We cannot obtain any such results in strawberries, but he has not given us particulars with respect to his method of cultivation. He has either an extra soil for strawberries, or else he has a very good market—a market which I regret we do not live near or to. I am sure it must be the production or the superior market that has enabled him to realize \$500 per acre. It might be the cultivation, but I am inclined to think he does not want a better market.

Mr. PETERS.—We think we grow a superior fruit, and thus far have had no difficulty in finding a market for all we produce. We are not able to find here a market for all our product; but this village I have spoken of finds a market for nearly all its strawberries in the United States. There is scarcely any of the fruit of that village put on our St. John market, unless the prices there are greater than the prices obtained in the United States.

Mr. SMITH.—What is about the average price paid per quart?

Mr. PETERS.—The growers outside of this village are fully able to supply our provincial market, and if these strawberries were placed upon the market it would cause a glut, so that we would not get more than 5 cents per quart. One year, for about two days, we had a glut in the market, and I think we then sold to buyers from the United States, who were making syrups, at 5 or 6 cents per pound. I may say that the American fruit is imported by our merchants earlier in the season, when we cannot produce them; but I have known the American fruit on our market to be selling from 12 to 14 cents per quart and our own fruit in the same market at the same time bringing 20 cents, and quick sales.

Mr. A. M. SMITH.—What is the average price?

Mr. PETERS.—About 9 cents per quart, taking the season through, after expenses are paid. I have realized 10 cents for my whole growth; but from 8½ to 9 cents is considered a good thing.

Mr. STARRATT.—Is that gross price or net price?

Mr. PETERS.—Net. It costs about two cents per quart to pick them. Mr. Wetmore has got a name in the Boston market, and has no difficulty in finding a ready sale for all that he can produce.

A MEMBER.—Have you any growth of trees there?

Mr. PETERS.—I may say that we have a fairly good growth; but I have not examined the trees sufficiently here to be able to make a comparison. We have not a very rapid growth, and we do not want it. We want sufficient to keep the tree in good health, but not an overgrowth, so that the wood is matured at the end of the season. With regard to packing, I will just relate one circumstance which occurred this present autumn: A clergyman and his wife were staying with me for a few days attending a general meeting of the church, such as we have in New Brunswick,

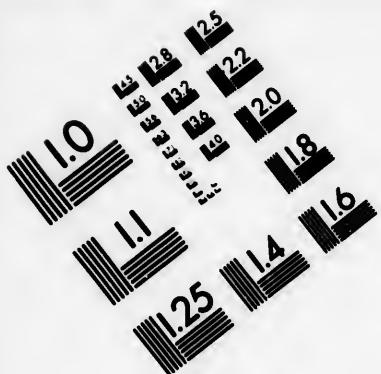
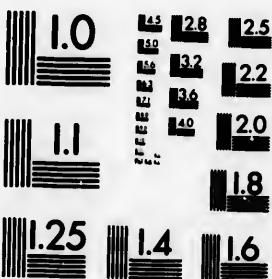
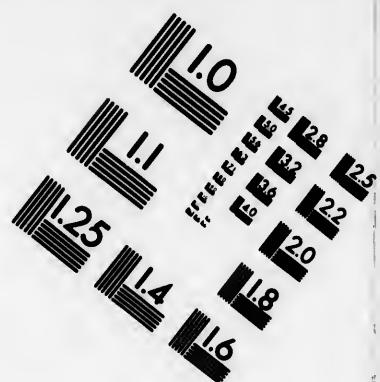


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and we had the Fameuse apple on the table. The lady said, "Now Mr. Peters, I want you to pack us a barrel of those apples." The husband said, "If we get a barrel of this kind, we will eat them up and have nothing left for the winter. Let us divide it." So they had a barrel filled with one-third Russets, one-third Yellow Bellflower and the other third Fameuse. I saw them about a month afterwards, and they said: "Those apples were very fine, and are all gone. They were just as good in the middle of the barrel as on top." That is the way I like to pack my apples. I said: "Your husband could tell you why I did that." He said: "You have me in a corner." Then I said: "I was in business in St. John with another brother, and whenever we would open a barrel that was the same all the way through we had the habit of saying: 'The man who packed that barrel belonged to the right church.'"

Mr. PETTIT.—What was the number of quarts to the acre?

Mr. PETERS.—That is strawberries. I remember a half acre being cultivated in the district of this village, and four thousand five hundred quarts were marketed from half an acre. I would not be afraid to make that statement at home, where I am known, and I trust you will accept it; but if an average per acre were given, I should say that 6,000 quarts is considered good.

Mr. BUCKE.—I think it is a pity that the production of large fruit in New Brunswick is so very low. I see the exports from New Brunswick last year were 3,000 bushels, while from Nova Scotia it was 302,000.

FACTS AND THEORIES RELATING TO THE PERIOD OF LIFE AND TENDENCY TO DEGENERATE OF FRUITS AND VEGETABLES: BY O. B. HADWEN, WORCESTER, MASS., EX-PRESIDENT WORCESTER COUNTY HORTICULTURAL SOCIETY.

Man can understand, to a certain extent, the organism of flowers—their petals, stamens and pistils, and their functions, and the microscopic pollen or fructifying particles, which the scientific horticulturist makes use of in cross-fertilizing or hybridizing, tending to produce new and distinct varieties—a process which, under his skilful guidance, seems destined to end only with creation itself. He sees the offices of insects in transporting the pollen from flower to flower, thus, without the aid of man, producing seeds containing germs in numberless variety, yet keeping each variety distinct. In the apple and pear no two seedlings thus far appear to be alike; there is but one Baldwin apple, and one Bartlett pear, and but one of each of the hundreds of sorts that have been designated by name. While horticultural science assures us of the germinal principle of seeds, we are as yet unlearned in the method by which the qualities of flowers and fruits are transmitted from one to another through the pollen, but this remains to be ascertained hereafter.

The study and practice of horticulture have a tendency to raise man to a higher level; it quickens and intensifies his senses of sight, smell and taste, and increases his capacity for the enjoyment of life. How readily the eye of the horticulturist detects upon our tables new flower, fruit or vegetable. How quickly he scents its fragrance, and how fastidious and sensitive is his taste when a new fruit is brought to the test, and how diplomatic, yet emphatic, is his language if it is found deficient in any particular.

The philosophy and science of horticulture seem to have been understood even in the remotest ages; they are mentioned by Confucius, who lived 550 years before the Christian era. He speaks of seed planting thus: "Let it be sown and covered up, the ground being the same, and the time of sowing likewise the same. It grows rapidly up, and when the full time is come it is all found to be ripe. Although there may be inequalities of produce, that is owing to the difference of soil, as rich or poor; to the unequal nourishment afforded by the rains and dews; to the different ways in which man has performed his business in reference to it."

The Greeks, even as far back as the fifth century, were not strangers to horticulture; they speak of the details of its practice with as much intelligence, precision and enthusiasm as do many at the present day. Many of the same general principles seem to have been understood and applied. Fruits were grown from seed,

though not probably by artificial cross-fertilization, as now practised. One of their poets gives the following description of his fruit garden :

"The branch here bends beneath the weighty pear,
And verdant olives flourish round the year ;
The balmy spirit of the western gale
Eternal breathes on fruits untaught to fail :
Each dropping pear a following pear supplies—
On apples, apples ; figs on figs arise ;
The same mild season gives the blooms to blow,
The buds to harden and the fruits to grow."

The term "degeneration," in its larger definition, when used with reference to fruits and vegetables, is generally understood to apply to those kinds which, having been cultivated for a longer or shorter period of time, and having had their day and generation, seem to have run out, and no longer to retain their original characteristics.

Nature seems to have endowed every plant known in the vegetable kingdom with an allotted term or definite period of life; especially when growing in its native climate and soil, and surrounded by conditions not unfavourable to its life, growth, maturity, and method of reproduction.

In attempting the inquiry into the period of longevity of fruit-bearing trees, and fruits growing thereon, together with the fruit-bearing bushes, shrubs, canes and vines, I find but few data relating to the subject, and must rely largely upon my personal observation and experience, and my own recollections of the past fifty years, but too short by several hundred years for a broad understanding of the subject.

All the fruit-bearing plants are naturally grown from seed, planted by the intricate processes of nature, and by art of man. The seed contains all inherent natural forces requisite for reproducing its kind; and the seed plant seems endowed with the vitality and functions requisite for, and pertaining to, its growth, maturity, and reproduction during its destined period of life.

The time allotted for the continuance of plant life seems as variable as the external features of the plant itself. While the limit of human life may be three score years and ten, in tree or plant life we know it may be many times three score years. The average life-time of the lower animals is well known; but comparatively little is known of the life of fruit-bearing trees, and even less regarding the time our popular varieties of fruits will continue to be produced in perfection under the prolonged cultivation by the art of the sagacious horticulturist.

The causes, natural and artificial, of fruits degenerating and becoming unworthy of cultivation are at present but imperfectly understood, as the many sorts seem to be subjected to many varying conditions. In the case of each, we have to consider its natural hardiness, and longevity, the influences of soil and climate, the stimulating effects of liberal cultivation, the mysterious influences of engrafting, both as to stock and scion. All these, and similar questions, underlying the subject, are so clouded and obscure that we can neither fully explain nor comprehend them. Nevertheless, there are some facts that seem to throw a little light upon the subject. While, perhaps, it is utterly impossible to fully verify the causes that seem to augment the degenerating tendencies in fruits, the facts we rely upon seem apparent, and although the evidence by which we trace the causes seems partially circumstantial, yet it is unequivocal, so far as it goes, and cannot well be set aside, in communities where cultivation has been pursued for fifty years or more by "the art which doth mend nature."

The pear trees grown from seeds which were planted by the earliest settlers of this country were of a robust habit of growth, attaining large size and great age, and have outlived many generations of men; and of those known to have borne fruit as early as 1663, some are still alive. The pear tree is indigenous in sections of the northern temperate zone, flourishing as far north as the fifty-seventh degree of latitude, and is grown in this country from the British provinces to Mexico. In acclimating and growing the pear in a warmer climate its primitive habit of long life seems to be partly lost or impaired. Growers long since abandoned planting the seeds from the original fruit, using instead the seeds of the engrafted sorts,

which are of a more tender habit, by this practice breeding into the pear tree an inherent tendency to shortness of life. The continued process of engrafting and forcing by high cultivation and also growing in an impoverished soil—each and all may exert some influence in the direction of degeneracy; and it is certainly evident that the trees are everywhere tending to earlier fruitage and shorter life.

The almost universal practice of propagating desirable sorts by engrafting or budding has undoubtedly the effect of gradually, but surely, working a serious injury to some fruit-bearing trees. The tendency of continuously planting the seeds of improved sorts is very much the same as what is called in cattlemen's *parlance* "in-and-in breeding," which, if long continued in a given line, is a sure and constant cause of degeneration or running out.

Now, if the tree from any cause is losing its natural stamina and force, or becomes defective or diseased, the weakening of its natural functions very soon becomes manifest in the fruit. The St. Michael, in its day the glory of the pears, has now become wholly unworthy of cultivation. Sometimes it seems to recuperate in new countries and thrives for a time in a virgin soil, but soon relapses into its now normal condition. The Flemish Beauty affords another illustration of degenerating tendency. It was first brought into notice in 1834, and promised well for many years, but has now become unworthy of continued cultivation.

In the catalogue of trees grown in the nursery of the late William Kenrick in the year 1838 (he being then one of the prominent nurserymen in Massachusetts), I find, in the class termed "Old Pears," twelve sorts, of which not one has been shown on this society's tables for years. In class second, termed "New Pears," I find eighty-seven, of which seventeen varieties only are seen at our exhibitions, and but four of these are generally approved, viz., the Bartlett, Bose, Seckel and Angouleme, and the rest are only occasionally shown. In the list of new pears received in this country from Europe in the years 1834 to 1836, consisting of a hundred and forty varieties, which have been tried by our cultivators and (most of them) shown on our tables within the past forty years, I find but two that are now considered worthy of cultivation; and Mr. Kenrick mentions a hundred other sorts received but not tried.

In the catalogue of the late William Prince, of Flushing, N.Y., for the year 1839, designating by name three hundred and thirty-seven varieties, I find but thirteen varieties that are seen on our tables. Then we are made aware of the very numerous sorts of pears which were being brought into notice forty or fifty years ago—more than three hundred and fifty varieties—out of which less than twenty are on our premium list for the present year, and the other three hundred and thirty have practically gone out of cultivation. In the meantime, very many more sorts have been introduced, in large part seedlings of American origin; and out of this vast number twenty-five varieties would be quite as many as are worthy approval and encouragement.

Now, it would be unfair to state that this very large number found unworthy of cultivation have degenerated; doubtless many causes contributed to influence their rejection. Some were found poor growers; the fruit in many cases lacked the qualities essential in good pears; some seemed naturally predisposed to blight and other disease; and many seemed unsuited to the soil and climate.

But it appears, although difficult to prove, in the case of some sorts once highly esteemed for general cultivation, but now become degenerate, that the tree has already lived the time allotted by nature, and its production of fruit in its enfeebled condition is prolonged only by nursing or by engrafting on other and vigorous stocks. This suggestion opens quite another phase of the question, viz.: To what extent can fruitage be prolonged by the process of engrafting or budding?

There was formerly an adage: "He who plants pears plants them for his heirs," while now he who plants pears gathers a crop in a few years; and the trees mature, bear fruit and die, even before he passes away. But it can easily be demonstrated that the natural lives of the original sorts of pear trees have been longer than the joint or aggregate lives of several generations of men; and also that the product

of fruit from an original stock can be artificially prolonged by grafting to an undetermined extent.

The apple trees that were grown from seed planted by the early settlers, and cultivated as early as 1663, in many instances proved long-lived, some reaching the age of 200 or more years. These trees attained great size, and bore immense crops of natural fruit. I know of apple trees still bearing good crops that have every appearance of being 150 years old; and I know of grafted apple trees more than sixty years old that are still productive and unimpaired. On the other hand, I can point to an orchard which was set forty-five years ago, and has received high cultivation, that has already become old and worthless, having no force to make healthy wood or bear fruit. And apple orchards in some of the north-western States do not average more than twenty years in bearing. The apple is naturally long-lived, both tree and fruit.

The process of degeneration or decay of the apple seems to be less rapid than that of the pear. Out of sixty varieties, mostly of American origin, grown fifty years ago, more than forty are now grown and esteemed. In fact, I can recall but few sorts once extensively grown that are proving worthless; and in reviewing the history of the apple it must be admitted that it is not only the most valuable fruit in this section of the country, but also long-lived, and is manifesting at present but few signs of decay.

The Early Harvest and the Newton Pippin seem to be on the wane, and a few more are tending in that direction. On the other hand, the Rhode Island Greening, known in cultivation for 150 years, is seemingly as good as ever, both in tree and fruit, and promises to last for a long time. The Costard, one of the oldest apples still grown in England, was recorded in the thirteenth century.

Among the fruits that were formerly plentiful, the peach is the best demonstration of degenerating tendencies. It is the one that seems least able to withstand the departure from its normal condition occasioned by grafting, and modern usage, and the effects of climate.

In former years the peach was grown from the stone exclusively, and grafting was not practised. Then the trees not only escaped disease, but withstood the vicissitudes of the climate unimpaired, and produced abundant crops. The ground under them, within the memory of many now present, used to be literally covered with luscious fruit at the season of ripening; while the life of a peach tree often extended to fifty years, and by cutting back to the ground and allowing it to sprout from the root, to even a much longer period.

But when the nurserymen commenced to prolong the existence of improved varieties of fruit by budding, not many years elapsed before the loss of original stamina and hardiness became apparent. Before long (in 1818) that destructive disease known as the "yellows" crept in. This was first noticed or described in print by a nurseryman in 1823; it was very soon ascertained to be contagious, and that the disease had come to stay. In the northern sections of the country peach growing, always precarious, now seems utterly ruined.

The question of actual degeneration seems fairly settled in the peach tree, and the fruit follows the tree and varieties have become lost. Now the question naturally arises. Can the peach be restored? Evidently not until the budded trees are thoroughly extirpated, root and branch. We must resort to the custom of our ancestors, of growing trees from seeds, and these seeds should be procured from sources where disease is unknown in any form. Then we may hope with reasonable certainty for another period of healthy peach trees and luscious fruit, provided all diseased trees are dug out and burned up.

Many sorts of peaches reproduce their like from the pit. Those fixed strains should be encouraged, and painstaking cultivators might impregnate the blossoms of such with pollen of good sorts. By saving the stones of fruit thus produced they will materially increase their chances of success in producing new and desirable varieties.

The cherry and plum do not manifest a tendency to degenerate; they seem to suffer through injury from insect enemies rather than from any inherent morbid condition. The varieties grown by the earlier cultivators are still known and esteemed, manifesting, even under the influence of repeated engrafting and of artificial modes of cultivation, a decided tendency to long life. Cultural practices which seem to have impaired the longevity of the pear and peach, apparently have little if any effect upon the cherry and plum, thus leaving the question of degeneration in considerable doubt.

Among the fruits termed "small fruits" the strawberry furnishes the clearest evidence as to its duration of life. Of this fruit, as nearly as I can recall, the kinds that have been cultivated thrive about thirty years, although there have been a few instances of longer duration, and some whose term has been shorter.

Of twenty sorts grown by nurserymen and advertised fifty years ago, not one is known in cultivation, if we except the Alpine, which seems to be perpetual, as does also the wild or native strawberry. Within the past forty years hundreds of varieties have been produced from seed, brought into notice, and are now gone to give place to new seedlings; and but few now extensively grown have been known to cultivation twenty years. Of fifty-one varieties grown in the nurseries of the late William R. Prince in 1839, not one remains. The strawberry reproduced from runners gradually becomes enfeebled and unproductive, and passes away, giving place to new and vigorous kinds raised from seed, which seems to be Nature's mode of reproduction.

The raspberry, blackberry and currant are long-lived, and sorts that were grown as far back as the memory of man runneth are as good now as ever, favourable conditions being equal. New seedlings are brought out from time to time, which, as novelties, have a tendency to supplant the older sorts, but the Antwerp, Franconia, Fastolff, Kneevett's and Northumberland raspberries, and a dozen others, are just as good as ever. Neither do the blackberries or currants, when well grown, give much, if any, evidence of degeneration. When they fail it may fairly be attributed to the influence of poor soil and cultivation.

Vegetables, especially those annually grown from seed, do not degenerate; seeds may become mixed and new sorts may be produced, but the annuals cannot be classed among plants that degenerate. Some seasons are found unfavourable to the development and growth of certain kinds, and new sorts are being continually introduced and tried.

The potato, indigenous to the mountainous sections of Mexico and South America only, is, consequently, when cultivated here, far removed from its native home; and it affords us the best illustration of the importance of renewal by seed. As usually propagated from the tuber, it grows and thrives well for about twenty-five years, after which it manifests a very decided tendency to degenerate; and new seedlings are resorted to, which, in their turn, will last a given time and produce good crops. Within my own experience, I have grown the Black Rusty Coat, Long Red, Chenango, Rohan, Peach Blow, Carter, Jackson White, Dover, Davis' Seedling, Kidney, State of Maine, Early Rose and Hebron, and several other sorts, but only two of these are now cultivated.

And, while serious apprehensions are quite generally entertained concerning the deterioration of plant life and length of vigorous life of the larger and smaller fruits, and while the life and vigour of trees and plants depends largely upon the soil and climate, the health of the seed and scion, and the plant food in adequate supply for the nourishment of its yearly growth and longevity—where all these conditions and requisites are furnished, and with the absence of extremes of heat and cold, the life and vigour will be prolonged to its fullest period.

To attempt the inquiry into the growth, longevity and decay of the fruits and vegetables we cultivate—to seek to learn the natural principles involved in the growth of each species, and the laws and principles of decay belonging to each, is particularly difficult where each seems to be governed by different and intricate forces, pertaining to its peculiar organism. Nature, with man's assistance, has pro-

duced fruits and vegetables in wonderful variety and profusion and of the highest excellence, and is still pressing onward; every season brings some new success in the line of fruit or vegetable raising, and notwithstanding there is so much mystery clouding the whole subject—so much that we should know, but do not—so much guess work, instead of positive information, and so much that seems impossible for the mind to understand peculiar to each plant—nevertheless, it appears worth the while to discuss these questions, with the hope of new and increasing light pertaining to the philosophy and science of horticultural and pomological pursuits. There can be no end to horticultural investigations; and few, if any, conclusions in this hidden science can be considered final; and the subject we have been discussing still affords a wide field for inquiry.

Nature when her varied forces can be brought into action, has a tendency towards improvement in increased varieties or sorts. Nature, when assisted by man, understanding her law of selection, can produce by cross-fertilization new sorts of hitherto unknown excellence, tending to improvement in size, colour, texture and flavour, and when the better conditions are sought, favourable to the highest and best development of each species.

Wild fruits are constantly being reproduced from seed. Nature's forces for the transmission of pollen from flower to flower by bees, butterflies and insects innumerable, are constantly engaged; thereby the seed product of each flower contains renewed and fresh natural force to reproduce a strong and healthy plant adequate to withstand all climatic and other conditions which nature intended.

It is quite probable that the fruits of the earlier period, from which the present fruits are the lineal descendants, each sort reproduced from seed, closely resembled the parent fruit.

Since the period when fruits have been introduced into one section of the country from the four quarters of the globe greater changes and greater varieties have become manifest.

Even now among our indigenous sorts the wild strawberry, the blackberry, the raspberry, any marked deviation from their original type is the exception and not the general law.

We are now comparatively in the early stages of investigation relating to life and organism of fruit plants. We have found by experiment that the seeds from one improved apple or pear will never reproduce its like, or even two alike, from the same core.

We have never seen from seedlings two Baldwins or two Greenings, two Bartletts or two D'Anjous. This seems to be the law of the apple and pear; but the law is not as inflexible with the peach and cherry, that often reproduce their type with even but very slight if any variation.

The conclusions which I have been led to regard as provisionally established may be summarized as follows:—

1st. Each fruit-bearing tree and plant seems inherently endowed with a certain given period of life. This, however, is subject to be influenced by favourable and unfavourable conditions.

2nd. Each species and variety of fruit-bearing tree and plant seems governed by conditions pertaining exclusively to its own growth, maturity and decay.

3rd. Some fruits appear to degenerate, while others furnish but little evidence of deterioration; and the latter statement applies equally to vegetables, as a class, during this century.

4th. While there undoubtedly is a limit to the life of every plant and fruit, neither science nor philosophy has yet determined the data by which we can deduce with any degree of accuracy the duration of life of many of the larger fruits or vegetables.

The subject, as regards each fruit, seems to be governed by separate laws and conditions; and where such infinite variety exists, it renders equally limitless the extent of possible inquiry, and opens a wide field for experiments and experience; and also may be prolific in topics for discussion by the members of this society.

It has afforded me very great pleasure to meet the pomologists of the Dominion of Canada. I have had an opportunity which I never had hitherto of meeting the Canadians face to face. I now have the opportunity of seeing their products on these tables, which not many years ago the whole wealth of the Dominion could not have produced. These have been produced by your intelligent horticulturists and the persistent efforts of your good cultivators. No country need be ashamed of the exhibition of fruit that now lies before you. There is no fruit that God has ever given to man that is equal to the apple, and there is no fruit that has a wider range of cultivation. It seems to thrive well all over this whole continent, if you except the extreme north and extreme south. I have also been very much gratified by the discussions I have heard in this place, not only the discussions of your dairymen, who seem to have the interests of this Dominion at heart, but the discussions of your horticulturists, which seem to embrace every product worthy of encouragement, and I shall return to my old society fully impressed with the dignity and good sense of your people, their devotion to their Government, their devotion to horticulture, and their devotion to everything which seems higher and better. (Applause.)

The PRESIDENT.—Mr. Hadwen's paper opens up a very large field for inquiry. It is certainly a most important and suggestive paper, and I only wish we had ample time to do it justice in the discussion. Notwithstanding the lateness of the hour, I think we must give members an opportunity for making such inquiries regarding it as they may feel disposed to make before calling for the next paper.

Mr. DEMPSEY.—I have felt very much interested while listening to the paper from Mr. Hadwen, particularly when he was speaking of so few varieties coming to stay in proportion to the number that we have had on trial. I have fruited, in my time, about 200 varieties of the pear, and the numbers that are worthy of continuing in cultivation are now about a dozen. We have grown something over 200 varieties—that is, American varieties—so far, and there are a great many that we have not tried. I got so discouraged that I have become a little cautious in investigating further in this way. Of the American varieties we have at the present time in cultivation, I think the Goodale pear stands at the head of the list with us. However, there are a few varieties, like Osband's Summer, that is a good summer pear, but of no particular value for the market. Of the many European varieties that we have in cultivation, I fancy there is nothing better than the Bartlett and Beurre Hardy. Those are the two pears that have come to stay, and of the two in our section of the country, I would prefer the Beurre Hardy. So you see that in experimenting with new varieties of fruits it is very discouraging sometimes. With the apple we have not averaged so many as pears, but we have still fruited a great many varieties, and out of that large number of varieties of apples I do not think that we would exceed thirty that we can really say are worthy of cultivation, and several of those are seedlings that I ought to say are confined very closely to our own county. There are varieties that are seedlings in this county, the production of seeds that were brought over by the settlers of New Jersey after the Rebellion in the United States. We find several superior fruits cultivated that were produced from these seeds, but they have never been disseminated, because many of them are yellow apples. One, called the Prunion, still remains, in my estimation, without a rival as a dessert apple. It is yellow, and consequently does not meet the demand in our markets. We want a red apple. Another is called the "Elvira." It is a beautiful dessert apple and a good cooking apple—a Septembor apple, that if it was red, would rise the Duchess of Oldenburg out of existence. These are apples that have been produced in our county over 100 years ago, and yet have never left the county to my knowledge. Now, we have in the American production of apples very few dessert varieties that compare with the English production. We have not, that I know of, an apple that will compare in flavour with Cox's Orange Pippin, that I spoke of before. There are very few that will excel the Ribston Pippin or the Wellington apple, or many other English varieties that I am of opinion have come to stay. It is not so with their pears, because we are left of the English productions of the pear only the Bartlett. I am sorry it was christened the Bartlett. It should have kept its original name of William's Bon Chretien.

Mr. HAMILTON.—I would like to ask the question, whether any one can say whether the artificial crosses or hybrids are as durable as natural ones. If we look back a little it would seem as if artificial crosses were not durable. Knight and some other English growers have raised a great many seedlings that were highly spoken of at the time, but that have quite disappeared, and I think, as far as my observation goes, that is the case, generally, with artificial hybrids. Natural crosses, however, are more durable. I cannot say anything with regard to apples or pears—a lifetime is too short for that sort of thing—but I know something of the potato hybrids of the last twenty-five or thirty years that have disappeared, and these were mostly American seedlings that were the result of artificial crosses. I think some of the old varieties of potatoes, before these new American sorts came in, lasted very much longer. I think it would be worth while endeavouring to ascertain whether there is anything in that, and to know if in the future we are to look for our good apples and pears to artificial crosses or natural ones. By natural ones, I mean those where the pollen is carried by the wind or insects—not the work of man's hand, by removing the stamen of one and dusting the stigma with the pollen of another. Just as we shall decide that question a great deal of the future of new varieties shall depend. If the natural ones are the more lasting, then it would seem that the better way to get new seedlings is to plant vigorous sorts alongside of fine flavoured ones and let them cross themselves.

Hon. Senator REESOR.—I hold in my hand a copy of the *Mail*, published in London, England, in which there is a letter from Mr. H. W. Ward, head gardener to the Right Honourable Lord Salisbury, in which he gives his experience as to the kind of apples that are suitable in that country. I will read over the list that he recommends to the people of England to plant. The list he gives is as follows: Beauty of Kent, Irish Peach, Summer Nonpareil, Worcester Pearmain, Cox's Orange Pippin, Ribston Pippin, Claygate Pearmain, Kewick Collin, Cox's Pomona, Lord Suffield, Beauty of Hants, and Blenheim Orange. He says: "The latter is the best all-round apple in cultivation. The above list is given, not in order of merit, but in the order in which they are needed for use from the end of July onward. The first named seven are strictly dessert apples, and the remaining five being generally used for culinary purposes." This may be worth a little something as a hint of the kind of apples that command the most attention there, and perhaps gentlemen here who have had experience may know how far they can be cultivated in this country.

Mr. SHEPHERD.—I think we must all say we have listened with a great deal of pleasure and satisfaction to Mr. Hadwen's able paper. I am particularly interested in his remarks about the cause of the degeneration of the larger varieties of trees. Now, take for example the *Fameuse*. On the island of Montreal, which is the home of the *Fameuse*, we have never been able to trace where it came from. It is supposed it is a seedling from imported French apples. I believe there is no apple identical with the *Fameuse* in France, but it is supposed it originated from the seed brought from France by the early settlers. Years ago it was quite a common thing to see an orchard of *Fameuse* of very old trees, seventy-five to one hundred years of age. To-day I believe these trees are very scarce, and the average of the *Fameuse* to-day I suppose is not more than twenty-five or thirty years. I do not suppose they bear more than twenty years, and very often less than that. There are no orchards of *Pomme Grise*. They are few and far between. They do not live long, and of course they are not profitable. The *Pomme Grise* has passed away. I suppose we can scarcely get on the whole island of Montreal twenty barrels of it. You never see this apple in the Montreal market. It was at one time, twenty-five years ago, one of the leading varieties of dessert apples shipped to England. If the Montreal merchant wished to send a present of apples to England he would always send some *Pomme Grise*, which were supposed to be something of the very best quality. So it is most interesting to hear the remarks made by Mr. Hadwen, and I think the point he has brought out that we should take none of the scions from diseased trees which hasten the degeneration. This point we spoke of before, and I maintain that we cannot be too careful in watching the scion. I take my scions from healthy trees.

I never take a scion from a Fameuse tree that appears to have the slightest degree of disease. I think it is a great mistake. We must be very cautious, if we want to retain these old favourite varieties. We must be careful in selecting our scions.

Mr. ALLAN.—I hope the paper read is to be passed in for publication. It is too valuable a paper to be lost sight of, and I trust Mr. Hadwen will be willing. I am sure every one here can join in the same voice, that we have enjoyed the reading of the paper, and the depth of the paper is such that we must have it before us to read it, and to read it from point to point, as it is of very deep interest to us all. It is one of the most valuable papers I have heard read at any of our conventions.

Rev. Mr. FULTON.—As to the longevity of the tree, I think the short-lived characteristic of the tree is due in the most part to the carelessness of the nursery-men. As Mr. Shepherd has just stated, we do not pay much attention to the root, and certainly it is the root which supplies the tree. Formerly they used to grow a fine healthy tree from the seed, and when it was sufficiently large it was put out. You cannot expect trees to live if the stock is unhealthy. I know one tree in the County of Huntingdon out of three that came from Mr. Holland's garden, in Montreal, in 1820, which is still a vigorous growing tree bearing fruit, and the trees that I got thirty years ago are perfectly healthy and good. I am perfectly satisfied that the difficulty is through the stock.

Mr. STARR.—May we not attribute all this short life of the present trees to the fact that they are root grafted and set out from nurseries, and that the trees we see about in our country where we find them over one hundred years of age were seeded as early as 1770 or 1780, along there. We find those trees living to-day and bearing crops. I can call to mind one especially, within three miles of my own place. It covers an area of at least 40 feet round, and the trunk is over $2\frac{1}{2}$ feet in diameter, and that tree is still bearing heavy crops of apples. That tree is grafted at some distance from the ground. You can see where all these old trees have been grafted, some of them were grafted early in the present century, and are healthy trees to-day. We find such apples as the Fameuse and the Pomme Grise planted at the same time. They were good apples for some years; to-day they are failures. They are not being planted as the young trees, and not being cared for as the old trees. In the first place, they are not as good all-round apples as those that have been selling well in the market; they do not carry well and they do not grow well. We have to look after these three attributes in all our apples, to make them a success. Those are three points that you must look after in the commercial apples—first, to grow well; second, to bear well; third, to carry well; and fourth, study the market.

Mr. SHEPHERD.—You can hardly say that the Fameuse does not bear well, and you cannot say it is not marketable.

Mr. STARR.—I am speaking from my own point of view. The Nova Scotian Fameuse twenty-five years ago was a first-rate apple. To-day, with the best cultivation, if we are getting fifteen barrels from a tree we can sell three as No. 1, five as No. 2, and the rest goes into cider. That is where the trouble comes in.

Mr. WILLARD.—The subject is full of interest to all of us. But I think that perhaps we fail to attribute the failure of many of our varieties of trees and the apparent degeneracy to the true cause. Now, there has been a change going on, through the last fifty years, throughout this whole country. The time was, fifty years ago, when we had forest trees scattered from one end to the other, almost over all the country, and those forest trees held back our snows and our rain. The modern system of drainage, while it is a splendid thing on many grounds, and has created a great value to the country, yet I see the ill effects that grow out of it. Our snows as they melt, on account of the absence of forests, are carried off rapidly, and from our ground being soaked with water in a short time it is too dry. We suffer from drought. I see it in my own orchard, and it has been a study with me what I would do to avoid it. My orchard is under-drained, and the water is carried off too quickly, and I do not believe it is well for the health of a tree it should be so. Then, again, there are other things. Reference has been made to the fact that our trees were propagated by root grafting. My opinion is that the trees are injured by the want

of forests. The wind sweeps across the country without anything to break it. This is a point worthy of consideration, whether or not good wind-breaks around our orchards are not of great value. I think they are.

Mr. BRODIE.—With reference to a good many of our old Faneuse orchards around Montreal, I think the degeneration of the trees is owing greatly to the impoverishment of the soil. Some of these trees have been cropped year after year, for twenty-five years, in my neighbourhood, and I have never seen manure of any kind applied to these trees. These trees are generally cultivated in the garden until they are about ten years old, and then they are seeded down and left that way. I know in our orchard, which was planted by my grandfather, I have taken great care to manure and cultivate the trees. My neighbour has a young orchard, fifteen years old, planted, and speaking to my foreman last summer, he said: "How is it you possess an orchard with such healthy green foliage and the foliage of my trees is so sickly?" I said, the reason was, that his foreman had not taken the trouble to put manure on his garden crop.

Mr. STARR.—I have wondered why our trees were so short-lived while we see so many trees around us. We generally see failures to-day, while the other trees outlive the allotted time. However, those who may come after us may yet live to see in our present orchards some of our trees that will live as long. Those old trees that we are speaking of, we must remember, are scattered; we see no full orchards; they are scattered trees here and there. That is the position we found them in.

Prof. SMITH.—I would like to make a few remarks with regard to this root grafting. I do not agree altogether as to that being the cause of the deterioration of our fruits. I know a number of years ago there was a practice among nurserymen to cut up seedlings between one and two years, and graft two, three and sometimes four trees from a single root, but the practice of root grafting upon whole roots gave just as healthy a tree as a tree grown from the bud that is budded and above the ground. It is a system I have always practised in growing trees, and I think gentlemen in this room will bear me out in the statement that some of the best orchards in the Niagara district were planted thirty years ago, and are now in a thriving condition, were grafted in that way.

Senator REESOR.—The experience I have had is that it is not only with the nurseryman but it is sometimes with the manure. I have always taken a good deal of interest in raising fruit myself, and have planted a great many varieties of grapes, pears and apples, and I have found this, and I took the hint from reading of the practice in England. In planting their grape vines there they dig the ground 2 or 3 feet deep and turn the top soil right to the bottom and then fill the balance of the earth in; if it is not rich enough they put in rotted manure. I have tried it only on a small scale, and in planting that way I have had as much growth from the grape vine in two years as I would have had in planting it in the ordinary way in perhaps four years, and I got as much fruit off the same vine for the second and third crop as I would have from four or five vines planted in the ordinary way.

The Convention adjourned until Friday.

MORNING SESSION.

FRIDAY, 21st Feb., 1890.

The Convention re-assembled at 10 a. m., Prof. Penhallow, President, in the chair.

The Committee on Organization presented the following report:—

PERMANENT ORGANIZATION.

That we recommend the permanent establishment of this convention under the title of the Dominion Horticultural Association.

The officers to be a president and a secretary-treasurer and a vice-president and corresponding secretary for each Province.

That Prof. Penhallow be the first president, and the presidents of the provincial associations be the vice-presidents; but in the event of any such president being also president of the Dominion association, the senior vice-president of that provincial association shall be vice-president of the Dominion association.

That in Provinces where no provincial association exists the Dominion association shall appoint a vice-president for that Province.

That the executive committee consist of the president and secretary (*ex-officio*), together with members to be appointed by the association.

Members of provincial associations shall be eligible to membership in the Dominion association upon payment of an annual fee of \$1, and any other person may qualify as a member upon payment of an annual fee of \$2.

The committee recommend that application be made to Parliament for an annual grant of \$3,000 for the purpose of holding conventions and publishing the transactions of the association.

That the provincial association shall be entitled to votes in convention distributed as follows: British Columbia, 2; Manitoba, 1; North-West Territories, 1; Ontario, 6; Quebec, 4; New Brunswick, 2; Nova Scotia, 3; Prince Edward Island, 1.

That meetings of the association shall be held annually.

All officers of the association shall be elected annually.

Vice-presidents were named as follows: New Brunswick, S. L. Peters, Queenstown; Manitoba, Mr. Frankland, Stonewall.

W. W. Dunlop, Montreal, was named as secretary-treasurer; George Johnson, Ottawa, as statistician.

B. Starratt, G. W. Henry and L. Woolverton were appointed members of the executive committee.

THE DUTY ON FRUIT

The debate on Mr. A. H. Petitt's motion, respecting the duty on fruit, was continued:

The PRESIDENT.—This is an important question, and one that presents many aspects; but I hope that political considerations will be left out in dealing with it. I am aware there may be a diversity of opinion as to the advisability of taking this step, and I hope that gentlemen will express their views concisely, so that we may arrive at a conclusion quickly.

Mr. PETTIT.—There seems to be a misunderstanding on this question. We do not want any duty on foreign products that we do not produce ourselves. We simply want a duty on those that we produce at home—the duty as it was a short time ago. I cannot really see any portion of this Dominion that is more affected by the present state of affairs than the Provinces of Ontario and Quebec, for the reason that we produce large quantities of summer fruit. The Americans, having a climate so much earlier than we, fill our markets about two weeks in advance of anything we can do. Consumers only require strawberries for about two weeks, when they then require another variety of fruit. The Southern States are prepared to supply Ontario with those fruits for about that time, and therefore our Canadian fruits have to come in after that demand has been pretty well met. With regard to the apple crop, we must look to England as the one market. Great Britain is the market for nearly all our apples. The south-western States are producing large quantities, but the samples that come in here are more or less fall apples. Our apples are keepers, and in that respect we look to the English market; but if our market is to be glutted with earlier varieties from the south, it has the effect of making the business of fruit-producing not so profitable as it should be. If other branches of agriculture are to be protected in Canada I do not see why fruit growing should not be. We are one branch of the whole. Taking the Province of Nova Scotia, there may be an exception there; but in this regard apples form the entire crop of Nova Scotia, as against all the kinds of fruit produced in Ontario and Quebec. They can produce the very finest varieties of summer and fall apples, and living right on the coast, with no railway transportation

of any account, they have a great advantage over us in reaching the British market. I do not think we should allow the interests of the larger portion of the Dominion to suffer for the sake of a single Province that already possesses peculiar advantages. As for New Brunswick, according to our friend here he need not look to any better market than he has got. We would be glad in Ontario to have half the crop of strawberries that they get there; and Prince Edward Island has carried off the prizes for winter apples in several cases here. I think that, taken as a whole, the Dominion requires this protection. There is another Province that might feel this slightly, but I believe if they consider it properly they should not object—that is, British Columbia, in the west. We should do all we could to encourage fruit production there. Ontario has done all it could to open up that North-West, and the result has been that as soon as Ontario and Quebec have sent their sons there to open up that country they are pouring down millions of bushels of wheat upon us in return. I say they should be willing to have us supply them with fruit, and I am sure we could do so at prices as low as they could be supplied from any other source.

Mr. C. R. H. STARR.—I was not present when this matter came up yesterday, but I observe that my name is in the list of gentlemen who form this delegation. While we would not wish to interfere in any way with the interests of our Ontario friends, we feel that in view of the fact that this matter having been discussed before the Nova Scotia association and that we were instructed with respect to this matter, we will not be at liberty to act in conjunction with that delegation. Therefore, we would request that our names be expunged from that list. I may say that while we do not wish to offer any serious opposition, we do not wish to act upon a delegation.

The PRESIDENT.—I have received an amendment to the main motion to this effect:

“Moved by R. J. Clinton, seconded by J. M. Fisk, that the question of duties be placed in the hands of a committee of equal number of representatives from each of the Provinces, who shall report on the same at 5.30 p. m.”

On being put to the meeting, this amendment was declared to be lost.

Mr. THORNBURN.—In the interest of the North-West Territories I want to speak on that question. We must be and will be for many years to come an importing country. We raise very little large fruit and must import it for many years to come. As protection in this case necessarily means increased prices by those who are protected, I do not see how it would help us to have this motion adopted. We must look largely to British Columbia for our future supply of fruit as soon as they are able to supply us, and we get some reduction in the rates from the express company. Naturally, Ontario and Quebec will compete with British Columbia in that trade and it will be profitable for both that there should be competition. I have heard from the representative of British Columbia in the meeting that they believe that they will be able to compete with the world in raising fruit. At present, when we send an order to British Columbia, as I and others have done, we have found that the merchants very often send us California fruit. With reference to that, the representative from British Columbia has said that where we could deal directly with the fruit growers instead of the merchants we could get better fruit, and get it more directly and fresher. I think, however, it shows a lack of enterprise on the part of the fruit growers of British Columbia, who are also dealers, that they permit those who would naturally be their customers to apply to those who deal in California fruits. We apply to those who transact our business, and if the fruit growers of British Columbia are perfectly sure they can supply us with as good and as cheap fruit as California they should let it be known. They will naturally get the trade. I have heard that the climate of British Columbia is somewhat enervating, and that until the importation of Ontario people went there they were wonderfully slow. I would ask the fruit growers of British Columbia to shake off their lethargy and put a little more stir into their business. Let them make known to those who are likely to be their customers what they can do for us, and there would be no need for protection at all. I am sure the people of Ontario and Quebec are enterprising enough to hold the market of Manitoba and the North-West without any protection. I think that the

display before us shows that those who are interested in the growing of fruit can compete with the United States or any other market in the world without protection. I cannot go to see the Minister of Customs on that delegation. If I did, I should speak in the way I have now done.

Mr. HENRY.—This gentleman has spoken on behalf of the North-West Territories and has found some fault with the way the fruit-growing is carried on in British Columbia. These people do not go to the North-West to grow fruit; but they are pleased to have a duty on grain or flour. I believe we have the same right to protection. We go to British Columbia to grow fruit. We want our industry to be protected until we get established; then we can compete with any country in the world. Perhaps we cannot compete in all winter fruit, but in early varieties—in plums and such fruit—I am satisfied we can surpass anything I have ever seen anywhere else. With regard to the lethargy that is spoken of, the great trouble is that the people who went there first were not fruit-growers. People got into fruit-growing by finding the fruit growing there. The people who are going in there now are of a livelier class, and will make it lively enough when they get properly started. The Californians have had the market because they have a great glut of fruit. They do not care what prices they get, so long as they get something for the stock that is on their hands. At the present time I am satisfied that we can supply a great portion of the North-West with our fruits, and these other varieties of winter fruits can be imported from Ontario. On this ground I favour the motion, which is aimed to give us a chance to show what we can do.

Mr. BUCKE.—A mistaken impression has gone abroad from what Mr. Carling said the other day about fruit being imported from the States. In looking over the statistics I find that the principal importations were of small fruits. They come in earlier than they ripen here. You can get strawberries in Ottawa now that are brought in from the States. Mr. Blue, in a speech made before the Ontario Association, said that as soon as the American fruits meet the Canadian fruit the American fruit suffers, because ours are so much better than those brought in. Why do you want to put a duty on those that come in earlier than ours? If the climate of Ontario is so much better than the climate to the south of us, I think we can compete with them. I do not think we want any duty to keep American fruit out of here. I see the imports of small fruits were \$95,800, and I think under those circumstances we do not want any duty. If you put any duty on fruits coming into this country we will only be injuring ourselves. We would simply shut out earlier fruits.

Mr. FRANKLAND.—It seems to me that this delegation is on the wrong question. I think when the report of the Transportation Committee comes in the true remedy for British Columbia will be there recommended. It is not so much the importation from the United States that we suffer from as it is the exorbitant rates being paid on fruits being brought into Manitoba.

Mr. STARRATT.—Perhaps it would be well for me to define the position of the delegates from Nova Scotia. The reason why we do not care to support this motion is that we raise large quantities of Gravenstein apples. That is one of our four principal apples. Our principal markets for the Gravensteins is the United States—in Boston or New York. If we impose a duty on fruit the Americans will probably retaliate, and we would be cutting off our market for the Gravenstein apples. In the second place, we are growing small fruit to quite an extent. That is an increasing industry, and promises to be of considerable importance. We also find a market for small fruits in the United States, in Portland and Boston, and under improved transportation facilities, we hope to make that a good market for small fruit. Personally, I am a strong believer in the principle of protection—that is, protection of the industries of Canada. I can sympathise fully with our friends from Ontario, and were it not for the instructions that we received from our provincial association I for one would be strongly inclined to support you. That is the position in which Mr. Starr and myself are placed.

Mr. BRODIE.—We, in the Province of Quebec, grow principally fall fruit and early summer apples. Usually we would get pretty fancy prices for our first apples brought to market, but now our market seems to be made a slaughter market for fruit from the States. It is so also in the line of vegetables, and I see that vegetables are named in this resolution. Take tomatoes when they were selling at \$2 per bushel, in one week five cargoes came from the United States and ruined the market completely. Some of our market gardeners have failed and been obliged to sell out, principally those on rented farms.

Mr. KEW.—This question has been raised a good many times with regard to the tariff; but I have heard of no one to-day advocating a free trade policy. Those who have given their views on the general question of protection and free trade have expressed themselves in favour of protection. No doubt, some of those gentlemen who have spoken believe in the policy of free trade, but I do not believe that there is one gentleman in the room today that would support a general policy of free trade between England and Canada and the United States. Give protection all round or give us none. It is a matter of small importance to a great many in the country; but it is of great importance to the fruit-growers of Canada. Another thing, speaking of the settlers in the North-West, they buy very little fruit until they buy their substantial fruit—their larger fruit. We can supply that demand. They grow small fruit, enough probably to supply themselves.

Mr. THORBURN.—No, no.

Mr. KEW.—I heard those gentlemen on the other side of the room saying they could grow strawberries and raspberries. Why don't they do it; can they get them from the Southern States cheaper than they can grow them? I say we demand our own markets. We do not ask a market from the United States. We have a market in England, and we ask to be given our home market. Where they can grow their small fruits in Manitoba give us the privilege of supplying them with the coarser fruits. If there are any persons in the North-West who want early fruits let them pay for their luxuries. What have the Americans been doing for years, but practising a policy of protection. We cannot afford to be hewers of wood and drawers of water. We must defend ourselves.

Mr. PETERS.—It seems to me to be a matter for mutual consideration and concession. I think we ought to consider our general interests. I propose to do it in this way: I claim that the Maritime Provinces, particularly New Brunswick, would be affected detrimentally by the passing of this resolution. The Provinces of Ontario and Quebec would likely be benefited by it. The Provinces of Manitoba and the North-West would probably be injured by it.

Several MEMBERS.—No, no.

Mr. PETERS.—The question is, is it for the interest of Canada, that Nova Scotia, New Brunswick, the North-West and Manitoba should be injured, and Quebec and Ontario be benefited. I believe in Canada for the Canadians every time. Now, the resolution does not embody the opinions as expressed by its mover, from the fact that the resolution is broad. It says fruit and vegetables, without defining those particular fruits and vegetables.

Mr. PETTIT.—They were defined before.

Mr. PETERS.—I got it from the gentleman this morning who addressed us, and said he did not intend it to apply to bananas, oranges, lemons, &c. I cannot forget, however, that the market for New Brunswick small fruit is very largely in the United States. I also gather from the delegates from the North-West and Manitoba, that their supply market is chiefly in the United States. The question then is, shall we re-impose this duty for Ontario and Quebec—magnificent in their proportions—to the injury of other Provinces? I will tell you the effect which the United States' fruit has upon us. Our people are bound to have strawberries a little earlier than we can produce them, no matter what the cost is. They go on the tables of the rich as a luxury; but the moment our fruit comes into the market there is no demand for the American fruit. I think that argument will apply equally to Ontario and Quebec. I venture the assertion to the gentlemen who are moving in this

matter that the very moment they are able to place their fruits on the market the United States people might as well keep theirs at home. Now, you gentlemen from Ontario and Quebec, I ask you to consider our position. We do not want to come up here and oppose any measure which we think is going to aid you, but we ask you not to forget the position we occupy. We claim, after a full consideration of the question proposed, that it is better to let the matter remain where it is for the present, feeling that no injustice will be done, but that mutual concessions will not only result in the general good, but will enable us the better to push our fruits upon the markets of the world, and enable us to do our best to grow a sample of fruit which the world cannot excel. I ask you to kindly consider our position, and if you can see your way clear, consistent with your own interest, we hope you will withdraw your resolution rather than have us vote against it.

Mr. BEALL, of Lindsay, Ont.—I have not troubled you very much since I have been here. I have no doubt that nurserymen will be benefited as well as others by the protection proposed, but this movement is in the interests of thousands of persons. It is in the interest of fruit-growers all over the country who are being ruined during the last year or two because of the removal of the duty. We hope to have it re-imposed, and thereby save a very large number of persons from bankruptcy. A gentleman from the North-West stated that a great deal of the fruit which they got just now came from California. I pity their stomachs. They must be American in taste or they would not buy any California fruit except grapes. They certainly would not buy pears or apples from California. The bulk of what they buy is small fruits; but they can grow small fruits in the North-West as well as we can. They can grow them abundantly. One word more respecting the protection for the farmer. I say that the last year that the duties were collected on fruit there was something like \$20,000 paid by the people of Ontario. Who paid that duty? Persons in towns and cities, simply for the sake of having luxuries. Who has paid that same amount of duty during the past year? It is a long and roundabout way of arriving at an answer. There is the producer and the consumer and the Government. That same amount was collected by the Government. It has got to be obtained from some other source, and it is taken from the general public—the farmers chiefly—instead of from those persons only who were consumers of luxuries. With regard to the subject of free trade, I just thought it was like a story I heard of the Japanese Minister at Washington. He was asked why he had not kept faith with them respecting a standing army. A few days before he had stated that his Government were quite willing to abandon their army. He said: "We are quite willing to keep faith, but as long as our neighbours keep up their standing armies we have to do the same." The same thing is applicable to us. It must not be a one-sided trade in this matter. If it is to be free trade it must go all round. We cannot carry on free trade and allow our neighbours to impose heavy duties on our products.

Mr. R. J. CLINTON moved, seconded by Mr. R. W. STARR, "That this question of re-imposing the duty be left over until our next annual meeting, when we will be better able to see the results of free trade in fruits and vegetables."

Mr. CLINTON.—This gentleman from British Columbia spoke of his fruit being able to compete in the world's market. Why, then, does he want a protection on that fruit? He speaks of the high rates that the Canadian Pacific Railway has charged him to bring his fruit into Manitoba. Is it policy for the Canadian Pacific Railway to continue charging that high rate? If the Canadian Pacific Railway does not bring the fruit in cheap enough, the Canadian Pacific Railway will be shut out of that trade entirely by the Northern Pacific and fruit coming in by way of Washington Territory. So far as Manitoba and the North-West Territories are concerned, their representatives here have made their views clear enough. We in Ontario can raise fruit cheaply, and we will send it up there by boats. I send fruit into Detroit, and compete there in what I call the world's market. They let my fruit go in there for a mere entrance fee. If we re-impose this duty they will retaliate, and I will have to be shut out and my fruit will have to come down and compete with the fruit-growers of Grimsby and Quebec. I like to see competition.

We are all anxious to make money, but I can give you figures to show you that there is a reasonable profit in competing in the markets of the world. California fruit comes into Detroit, but we knock them out in flavour. Another question is, when we are asking that the duty be re-imposed on fruit are we voicing the wishes of the people—a majority of the people—of Ontario? We are voicing the desire of the fruit-growers, but we are a small number compared with the people at large. We have the best climate on earth, and I think we ought to be able to raise our fruit as cheaply as we raise anything else. I only ask to have this thing rest for one year, and then we will be better able to tell how it should be decided. This thing has only been tried for one year, and I think it would be wise to leave it for a year longer, and if then the present system is found to be working to our disadvantage, I am quite willing to support these gentlemen from eastern Ontario. I want to work for the general interests of us all. Let us look at this thing in a broad light.

On being put to the meeting, the amendment proposed by Mr. Clinton was carried by a majority of one.

The PRESIDENT.—We may consider this question postponed for a year. I think this is a very wise decision as there are questions of very grave importance involved, and I hope we will do nothing we may be sorry for. I think it will be one of the worst things we can do, just at the opening of this convention and at the organization of our society. It is a wise thing to leave the matter open for next year and then give it the time which it demands for consideration. We will now proceed with the work of this morning. We have among us the Honourable Mr. Joly, from Quebec, who will read a paper on "An Easy Mode of Procuring Forest Trees for Planting."

Hon. H. G. JOLY then read his paper as follows:—

EASY METHOD FOR PROCURING GOOD FOREST TREES FOR PLANTING.

This paper deals with such elementary matters, with which practical men are so familiar that it may appear out of place in a meeting of this kind. However, I know from my own experience in tree culture how difficult it is to obtain the kind of information which would be most welcome to beginners, and I will address myself principally to those who are inclined to join in the useful work you have undertaken, and who may be glad to receive a little help in their first attempts.

There is no greater waste of time and money than planting trees that do not grow. Apart from neglect of proper care in planting, the want of success may be attributed either to unfitness of the soil for the kind of tree planted or to planting at the wrong time, or to the defective state of the tree planted. I will only deal with this last point to-day.

Good trees for planting may be obtained from the nurserymen at remarkably low rates. But the farmer may live at a great distance from the nursery, means of communication may be difficult, liable to interruption, trees may be delayed on the way from the nursery, suffer damages, reach the farmer at an unpropitious time for planting, and however small their cost and that of the freight, it may deter those who have never before planted trees from making the experiment, or cause them to put it off year after year, and finally give it up.

Any farmer may have on his own farm, at his door, a good nursery of forest trees, which will cost him nothing, will not fail and will be available at a moment's notice, by sowing in a corner of his garden the seeds of the forest trees he proposes to grow.

Growing forest trees from seed is generally considered as a slow process; people think that it will save time to go to the neighbouring woods and dig up good-sized trees. Those who have tried it will remember how difficult it is to find in the forest good, well-shaped young trees; how long it takes to dig them up, how much care and patience it requires, as their roots are mixed up with those of neighbouring trees or run under stones or fallen timber, and how often those trees, taken up with so much labour, are not worth the trouble of planting. But after so much time and work spent on them it would be a pity not to give them a chance; so they are planted. A g" at many will fail, as the roots are ruined, they will all suffer by the sudden change

from the shelter of the woods to the sudden exposure to sun and wind. The inexperienced tree planter invariably chooses his trees too tall, under the impression that he gains time, and does not stake them properly to resist the action of the wind.

I do not fear to assert that trees grown from seed in the nursery, and properly treated, will give more satisfactory results in every way (economy, rate of growth and final success) than trees dug up in the forest and transplanted in the open. The nursery tree being taken up in perfect order, its growth will scarcely be checked by transplanting; it will be, of necessity, transplanted smaller, suffering less from the wind; it will not miss the shelter of the forest, and the farmer who has his own nursery can transplant at once, without allowing time for the roots to dry and choosing his own time, a cloudy or damp day.

Of course, in alluding to the frequent failure of transplanted trees taken up in the forest, I do not pretend that experienced tree-planters cannot take them up safely by bestowing sufficient time and care, but I mean that the great bulk of the trees taken up by farmers and others which have come under my notice have failed, and I could quote instances of complete failure, when not one single tree outlived the transplanting.

Any observant farmer will soon find out the time when the seed of the trees he wishes to grow is ripe—elm, soft maple, from middle June to middle of July; in the Northern States and Canada, hard maple, birch, ash, oak, butternut, walnut, &c., in the autumn. Better sow the seeds at once, they are safer in the ground than anywhere else.

A soft maple or an elm sown in July will make a good growth of several inches the same summer. Sow the seed in straight rows, marked with a garden line, and with a good picket at each end to facilitate weeding. Depth and distance according to the size of the seed: about 1 inch deep for maple and ash, and 4 inches apart; and 2 or 3 inches deep for oak, butternut and walnut, and say 8 inches distant.

The third spring the trees will be fit for transplanting. In the meantime they will only require weeding, severing the taproot of the oak, butternut, walnut, the second spring, (with a sharp spade driven in the ground at an angle of about forty-five degrees, under the little tree), and hoeing between the rows, which can be done at odd times by the farmer or his children. The fact is, I would like to see that work entrusted to the children. They will take an interest in those little trees and learn to cherish them. We must teach the rising generation to replace the forest trees destroyed by their parents.

Once transplanted into favourable ground, keep off the cattle, and the tree will take care of itself.

But, if you will trust to nature, it will save you the trouble of sowing your trees. Wherever the ground is favourable you will find the young seedlings growing in the neighbourhood of the parent tree: in July the elm, the soft maple, on the roadside, near the ditches, on the bare spots wherever there is moisture, on damp moss, etc. The elm seed is so minute that I would recommend taking up those young seedlings in preference to sowing the seed. I have seen dozens of them growing on a piece of moss no larger than my hand, and transplanted them successfully.

The ground in the maple groves is covered with a regular carpet of maple seedlings, which can easily be pulled up by hand when the ground is soaked with the autumn rains, without injuring a single rootlet. Taken up in the autumn, I would recommend heeling them for the winter, and only transplanting in the nursery in the spring.

As for the seed of pine, spruce and other coniferous trees, it is very hard to collect. In the early spring, when the ground is still moist and soft, the pine and spruce and balsam seedlings can be pulled up by the hand (with a trowel if they resist), without breaking the roots, and transplanted at once in the nursery, merely taking the precaution to shelter them from the sun for a few weeks until they are well started. Every gardener must have noticed that whenever a maple or ash

grown in the neighbourhood of a garden, where the ground has been spaded in the autumn, preparatory to spring sowing, hundreds of little maple and ash seedlings are found growing before any other plant comes up. In a very short time a sufficient number can be transplanted to stock a little nursery.

The PRESIDENT.—This is a very interesting paper, and deserving of consideration, but we have four more papers to read, and hardly time to discuss it.

Mr. THOMAS FRANKLAND, of Stonewall, Manitoba.—Mr. President and Gentlemen,—I feel extremely grateful for the kind consideration that has been shown to Manitoba and the North-West Territories. We stand in a peculiar position. You, for a few years, have been growing fruit sufficient for yourself, while we are only beginning. I think it is a very fitting prelude to the paper that I am about to read, the one that has been read by the Hon. Mr. Joly, as it just fits in with the idea that Mr. Gibb had in regard to the Province of Manitoba. He sent me some nice little trees, and he thought our first beginning ought to be in shade trees. We wanted more shade, he thought, in the Province of Manitoba. It reminded me when I saw these seedlings that I would like to add a word to Mr. Joly's paper in that respect—that is, the facility with which these one year old seedlings can be planted. We had a number of these that I got from Mr. Papin, of Iowa, very cheaply, and in order to facilitate the planting I may very safely now give away my secrets. I had a boy assisting me, and the boy went before me with a crowbar, rather a curious instrument with which to plant one year old trees, and of course the ground had been ploughed as deeply as possible, and he planted his crowbar in the ground and I followed him with the seedlings, taking them out of a pail of water one by one and planting them in the hole he had made with the crowbar, and we planted over 2,000 seedlings, 4 feet apart, in a very short time. I give this secret to anyone, and they all are perfectly welcome to use it. My paper is on "Experiments in Fruit Culture in Manitoba."

EXPERIMENTS IN FRUIT CULTURE IN MANITOBA: BY T. FRANKLAND, STONEWALL CO., LISGAR.

The fixing of the boundaries of the fruit-growing belt has long engaged the attention of north-western horticulturists. Theories have been as numerous as experimenters, and many of these have dropped from the ranks, and with them their theories. Experiments have hitherto been conducted on old lines and with southern-grown and unsuitable varieties—without due consideration as to the changed conditions of temperature, moisture, sunlight, &c. This cannot, perhaps, be better illustrated than by detailing a few facts as to past experiments. Early in the history of the Province, the officers and servants of the Hudson Bay Company and others planted trees and shrubs imported from their former homes to make their adopted homes as homelike as possible. The currant and gooseberry, native to the soil, flourished well in their gardens and bore abundantly. The native black currant, especially in size, excelled the Naples, and was little, if any, behind that variety in fruitfulness and quality. The native plum, grown in thickets with moderate shade, succeeded well. No wild apple or crab was, however, known, and experiments were made by raising seedlings from southern-grown fruit, and importing trees from European and southern nurseries. These seedlings and importations were "of few days and full of trouble." In 1872 W. B. Hall, of Headingly, procured from Minnesota three-year-old dwarf trees of Duchess, Wealthy, Tetofsky, and half a dozen other varieties of apples and crabs, which were carefully planted on a northern slope, protected on three sides, in rich sandy loam soil. Two years from planting most of those came to bearing and fruited for several years; but Mr. Hall says, "They commenced dying at the top," and now only a few Siberians survive. His Lordship the Bishop of Rupert's Land for some years has taken interest in fruit culture. His first importations were destroyed on three successive occasions by locusts—one Yellow Siberian and one Transcendent crab being all now left. Both of these blossomed heavily last spring; but, on account of late spring frosts, the fruit was considerably short of previous years' records. From a more recent purchase he

has one tree that bore a few specimens last year of a very nice apple—name unknown. U. S. Consul Taylor, and Messrs. Bannatyne, Higgins, Fonseca and others have done considerable pioneer work; but while their labours have been crowned with little success, their valuable experiments have thrown much light upon the probable cause of failure. It is possible, in Mr. Hall's case, surrounded and sheltered as his orchard is on three sides by heavy timber, that a lack of what Prof. Budd calls air drainage may have contributed no little to his failure. In the case of the larger apples, the fact that the Duchess is reported at its northern limit in North Iowa or South Minnesota—that Tetofsky is said to be tenderer than the Duchess, and that the Wealthy so far has shown itself better adapted to a climate several degrees south of the place of its origination—these facts seem to point to the conclusion that harder varieties must be procured before successful culture can be assured. A few of the United States importations of Russian fruits from a climate very similar to our own were procured from Minnesota, but many of these had been grafted upon crab and unsuitable roots, and it is on record that not a dozen of the first root grafts of this period are to-day alive in Minnesota, while in Manitoba no trace of them is found, except in sprouting roots denuded of their sprouts each succeeding winter. The grasshopper plague wrought sad destruction and blasted many sanguine hopes, perhaps only a little before the time. Southern slopes, without judicious shelter, inducing sun scald and bark bursting, have given force to the theory that March and April blazing sunshine must by some means be prevented from doing its deadly work. The desire for large trees, often delivered with the best part of them left in the nursery rows, many killed before starting and more during transit, stuck unceremoniously into little better than gopher holes, soddened with water, smothered with weeds, and wished well, "the iron clad apples sure to succeed." All these and, perhaps, many more reasons, could be given for lack of success, and have caused such discouragement that the highest ambition of most people here seems to be to make the successful culture of grain, small fruits and vegetables a sufficient source of income to provide for the importation of the larger fruits from the Pacific coast, which bids fair to be the most successful fruit region of the American continent.

Present Experiments.

Stonewall is situated upon a ridge of land dividing the water-sheds of lakes Winnipeg and Manitoba, and the municipality of Rockwood, in which it is situated, forms, on a small scale of course, the Michigan of Manitoba—its peninsular location, with its sheltering timber bluffs scattered over the prairie, exercising a most ameliorating influence on the climate. In 1886 the writer made careful enquiries in regard to fruit culture of Profs. Budd, Saunders and Messrs. Gibb, Sias, Peffer and others. The very candid opinions given by these gentleman as to the capabilities of this hyperborean region, gave a few scattered rays of hope. The Russians, harder than the Duchess, and crabs, truly Siberian, were recommended and selected. Seeds of the northern-grown fruit were procured, and in the spring of 1887 about half an acre of good garden sandy loam soil was planted. One year old apples, 12 feet apart, with rows of raspberries, blackberries, currants, gooseberries, strawberries and vegetables, in intervening spaces, secured cultivation all over the garden, and the trees and shrubs did remarkably well for a first season, and ripened up their wood before the winter. In the spring of 1888, while none came out in leaf at the terminals, the damage was confined to from $\frac{1}{2}$ inch to 4 inches of previous season's growth, but none were killed. A good, healthy growth was made during the season, and again the dry fall weather hardened up the wood for winter storms. The spring of 1889 opened favourably, and almost every tree burst its terminal buds, and bid fair for a successful growth. On the nights of 28th and 29th May a rather severe frost wilted the opened buds, blasted plum, currant and gooseberry blossoms, and many trees were seriously injured, but only two or three entirely succumbed out of eighty apple trees. In the fall previous I noticed splitting of the bark at the crown, and while I left the mound of earth round the trees late in the spring, the

treos so affected were the ones to die. The others, in some instances, lost nearly all last season's wood; but the majority showed less damage, and all fought bravely during past season, for existence, and if from 12 inches to 2 feet of growth is any indication, their vitality may not be much impaired. The more than usual snow-fall this winter affords ample protection, and the melting snows in spring will no doubt supply in abundance the necessary moisture to the roots. The reputed short-lived Russians, naturally of dwarf habit, may necessitate continual planting, and perhaps we may aspire no higher than apple bushes; yet the promise is, that from these we shall have fruit, and the seeds hybridized by these northerners, with a judicious sprinkling of Siberians, may give us the longer lived, tough iron-clad, that will make fruit growing here a success. The varieties that so far have seemed most at home here are Russians-Lieby, 240; Red-Cheeked, Rubetz Natliv, 109; Vor Hibernal, 378; Red Repka, 200; Autumn-Streaked, 964; Russian Green, 382; Red Yellow and Koursk Anis-Lords, 315; and Autonovka.

Seedlings and Hybrids: Whitney, Soiree, Early Strawberry, Martha, Cherry, Red, October, Florence and a number of Gideons, unnamed seedlings.

Plums—De Soto, Wolf, Speer, Arab, that I have had for three years. The first three blossomed last year, but late frost destroyed fruit.

Blackberries—Snyder, Ancient Briton and Taylor. These all need covering, but have borne some fruit.

Raspberries—Turner and a Blackcap (without protection) have borne for two years very well.

Gooseberries—Houghton and Downing, just coming to bearing.

Currants—Cherry, Red Dutch, Victoria, White Grape, Long Bunch Holland, Naples, Lee's Prolific and Wild Black.

Strawberries—Crescent, Downers' Prolific, and some others not yet fruited. **Mulched with straw.**

The Beaconsfield nurseries, through our Agricultural Department, some years ago distributed a number of grape vines, some of which, in Winnipeg, I am told, are bearing; but not many efforts have been made in this direction. I have a few vines from the Minnesota Agricultural College that I got last year, I am sure an apology is due for the length of this paper, but on the question of fruit-raising Manitoba is seldom heard from, and I beg you will excuse me for trespassing a little more upon your patience by giving an abstract of the weather for 1889, as prepared by G. P. Bliss, official observer in Winnipeg, and hope that in reading the accounts of 40° in Manitoba it will be remembered that the effects of extreme cold are far more keenly felt, both by man and plants, in a maritime climate than in a continental one— 20° below in Quebec being about equivalent to our 40° . I also wish to call attention to the fact that the average mean temperature for the three winter months in 1889 was 9° above zero, being the same figure as given by Mr. Gibb as denoting the climate of Kazan, in Russia.

METEOROLOGICAL ABSTRACT FOR YEAR 1889.
 From Observations, with Government Standard Instruments, at the Winnipeg Weather Bureau—Latitude, $49^{\circ} 54' 24''$;
 Longitude, $97^{\circ} 07' 30''$; Height above Sea Level, $745' 10''$.

Months.	THERMOMETER.			BAROMETER.		HUMIDITY.		WIND.		SKY.		RAIN.		SNOW.		Remarks.
	Max.	Min.	Mean.	Highest.	Lowest.	From	Miles per Hour.	From	Miles per Hour.	Over- east.	Clear.	Fall.	Hours.	Pail.	Water.	
January	36	-40	6	30.588	29.499	N and W	7	9 days	22 days	.....	.....	.....	.....	9.58	2.48	Generally good weather.
February	40	-44	8	30.601	29.646	E " W	8	12	16	"	.....	.....	.....	11.80	1.76	Cheat and dry.
March	42	-18	25	30.433	29.861	S " N	12	9	15	"	22	"	.....	1.35	.10	Wind, damp, but moderate.
April	78	6	46	30.538	29.185	S " E	82	4	13	15	"	15	"	1.52	.21	Wind, damp, but warm.
May	73	14	32	30.523	29.002	S " W	81	2	12	10	"	21	"	1.60	.14	Good growing weather.
June	94	30	67	30.173	29.523	N " W	93	8	8	6	"	25	"	.35	.6	Dry for this month.
July	93	36	69	30.125	29.522	E " S	72	6	12	15	"	16	"	.72	.17	Too much damp.
August	97	35	74	30.283	29.494	S " E	96	3	7	7	"	24	"	.77	.10	Good harvest weather.
September	93	30	47	30.457	29.361	S " W	82	6	13	18	"	12	"	.48	.32	Generally misty.
October	75	0	32	30.731	29.796	S " E	14	15	14	15	"	16	"	.87	.21	Damp and cold.
November	52	-8	21	30.518	29.610	N " W	8	14	14	"	16	"	.....	3.25	1.95	.....
December	38	-28	13	30.506	29.471	N " W	16	12	12	"	19	"	.....	12.75	5.48	Show very heavy.
Totals . . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	121	39.73	12.63
Means . . . . .	.....	38.3	30.530	29.530	29.47	.....	11.8	.....	.....	.....	.....	.....	.....	.....	.....	.....

These figures refer to information ranging about 15 to 18 miles around this city, but from other observations and knowledge I find that to the N.W. the location is such that the temperature will be milder and atmosphere more damp, as the pressure of the lakes would tend to this result.

GEORGE P. BLISS, C.E.,
Official Observer.

WINNIPEG WEATHER BUREAU,
31st January, 1890.

Comparison Temperature.

	Dec., 1888.	Dec., 1889.
Maximum	18—	14—
Minimum	—2	—8
Mean.....	14—	—3
	Jan., 1889.	Jan., 1890.
Maximum.....	15—	0
Minimum	—12	—26
Mean	—6	—12

Note.—before a figure denotes *below zero*; — after a figure denotes *above zero*.

The coldest weather in this country is caused by local waves which only extend a few hundred feet at times and come from the north-west. The general surface of the country is not simultaneously affected by these waves. For instance, on the 17th we had one from the north-west which dropped my instruments lower than those within one mile of me; and while I registered —46, Stony Mountain only registered —28. This drop, —46, could have been registered in ten minutes, and the same instrument show 10° less cold in a few minutes. The average minimum reading of this country is not more than —28 to —30, and of that dry cold which would not cause quick freezing. The damp atmosphere at —15 is worse than our dry climate at —30. This I have proved, as an old observer in the service, in many ways. I wish you would write me definitely what you want. Ask it, and you shall have it. It is no trouble. I think you should see the books and pick out what you know would be useful to you. You can see them any time you come in. No. 21 Town street, they will show you all this information. Don't forget you are at perfect liberty to have any information of use to you.

Yours faithfully,

GEO. P. BLISS

Official Observer.

FRUIT GROWING IN BRITISH COLUMBIA.

The **PRESIDENT**.—We shall now listen to a paper on "Fruit Growing in British Columbia" by Mr. G. W. Henry, of Port Hammond, B. C.

Mr. HENRY then read the following paper:—

Could I write a paper on this subject five years from now I might give a very different report from to-day, for the people are only begining to realize what the capabilities of the country really are.

When I arrived in the Province in the spring of 1885, for the purpose of entering into fruit growing, upon making tours throughout the rural districts I was much surprised at the unhealthy, rough appearance of the trees, which, as a rule, represented the fruit-bearing orchards of the Province. I afterwards learned that this broken down appearance was caused principally by the abundant, early and continual yields of fruit given under a system of neglect.

One orchard in particular which I went to see, that is situated near where I am located, and is called one of the largest and best orchards in the Province, not only surprised me, but I might say almost discouraged me about going into fruit growing in British Columbia, for the appearance it presented at that season of the year, before the leaves were out, the branches broken down and twisted in all shapes, that, had it been in Ontario, I would have considered they were not worth the ground they occupied. Some of the trees were planted in the centre of large hollow cedar stumps, the branches of the tree first spreading over the top of the stump, its trunk being hidden entirely, others crowded in between stumps in all shapes, and upon the ground there had been an annual crop of hay cut for twenty years, of from three to four tons per acre.

When I learned all this, and found that the owner had annually sold immense crops of apples, plums and other fruits from the orchard I concluded that if such crops of fruit as this could be raised under such conditions, something extraordinary could be expected under favourable circumstances.

I visited that same orchard again in the autumn, and I could scarcely believe those trees covered with such dark green foliage, showing a strange new growth of wood, and loaded with beautiful fruit, were the same I saw presenting such a half dead appearance in the early spring—but so it was, and I handled some of the finest fruit from that orchard I ever have in any country. The owner sold that year of apples alone \$2,000 worth, besides upwards of ten tons of plums.

The pruning of these trees was done automatically, as it were—that is, each tree annually bore such heavy crops that enough branches were broken with the load of fruit each year to keep the top well opened to the sun and air.

I noticed plum trees there this year, with the main central shoot broken off entirely from its load, and all the side branches hanging down, so as to give it the shape of a well-trained Kilmarnock willow. At the time this orchard was planted it was a very difficult task to get the young trees for planting. Consequently, like many of the other old orchards in existence, most of the trees were had by grafting on the native crab, scions of different varieties being procured wherever possible.

The results which have been obtained under all these difficulties are consequently very gratifying, in showing what may be accomplished under a proper system. This orchard I mention is planted on what is known as bottom land of the Fraser River Valley, which is seemingly inexhaustible. Much of the high land will produce equally as good fruit, but will require more feed and cultivation.

I have spoken more particularly of the apple and plum, as they have been more extensively grown than any other fruits, although the cherry has proved itself equally successful. The trees of the Heart and Bigarreau varieties, especially, have grown to a size I never saw equalled anywhere, and the quality and appearance of the fruit certainly could not be surpassed.

Pears do not seem to have been planted much in the early days, no doubt because of the difficulty to procure the stock; nor do they seem to adapt themselves to all locations and classes of soil as well as the others. Yet in many parts of the Province the pear, I believe, can be grown more profitably than any other fruit, and finer samples could not be wished for—the flavour being excellent and the size of fruit immense. Specimens were shown at the Exhibition last October weighing over two pounds. Perhaps one of the most profitable fruits that can be grown in the country is the prune, which is now being planted somewhat extensively.

Of peaches and grapes we do not find many specimens in bearing. Of the former, what we do find are principally seedlings, and a few miles from the coast, considering the stock they have, the results are very satisfactory. In regard to grapes, I have seen vines of the Concord planted twenty years ago now with a trunk 6 inches in diameter, covering an immense area, and bearing half a ton of grapes in one season, a growth and yield I think hard to excel in any country; although the vines have never had any training or thinning out, the fruit ripened up well and gave some as fine samples as I ever saw. Now that I have given you some idea of the fruit growing of the past, I come to speak more particularly of my own experience, and what has taken place more directly under my own observation during the last three years, and will give you some of the results which have been secured under perhaps more than ordinary good care and culture.

Beginning with apples, I might mention an orchard of 200 trees that I imported to the country from Ontario in the fall of 1885. They were planted in the spring of '86, and in the season of 1889 yielded an average crop of one bushel to a tree. This is an exceptional result, and was secured by extra good care. But it shows what can be done. I have had young apple trees make an annual growth of 6 feet in the branches, plums and cherries 8 feet—and this not at the expense of the trunk. Standard pear trees have not, with me, made as satisfactory a growth; but my dwarf pears, of which I have about 500, planted about two years ago, show a good growth and last

year bore some fine specimens of fruit. Peaches and apricots have made a growth which is almost beyond belief; in two years they have grown from a little tree 3 feet high and $\frac{1}{2}$ inch in calibre to a tree with a large spreading top, having branches of this year's growth 7 feet in length and a trunk 8 inches in circumference, and last season (the second year after planting) some of them bore fruit.

With grapes I have had varieties make 15 feet growth the season of transplanting, and others that brought some fine bunches of fruit to perfection the same season.

But perhaps my greatest successes have been with the smaller fruits. In strawberries I can give as the result of $\frac{1}{2}$ of an acre of Sharpless strawberries a yield of \$200 worth of berries in one season, or 1,800 quarts, some specimens measuring 8 inches in circumference. In raspberries, last summer I had a yield from four rows of 75 feet in length each, the first year after planting, 350 quarts, or at rate of over 200 bushels to the acre, which I fully expect will be considerably exceeded this year. I have measured raspberry canes 13 feet long, which had been nipped back twice during the growing season. In currants, Fay's Prolific and Lee's Prolific, the third year from cuttings have yielded one quart to the bush. Gooseberries equally strong-growing and prolific. Last year I had Industry gooseberries measuring $1\frac{1}{2}$ inch in length and 1 inch in diameter.

Blackberries also grow and produce luxuriantly. I have tried Figs twice; the first year they winter killed entirely, but last year I had some trees come through safely without protection. My soil is of the very best composition, so that the account I have given you would hardly be a fair estimate of what could be always expected; yet by good cultivation there is no reason why in many parts of the Province equally good results cannot be secured.

Although I believe that in no part of the continent is there to-day as bright a future for the fruit-grower as in British Columbia, yet I would not have you think that there are no enemies to contend with, or no difficulties to overcome, for it might only be the cause of leading many into disappointment and failure, and do more harm to the fruit-growing interests of the Province than good. True, we have no cercario, no black knot, nor has the apple or pear many insect enemies. But in the first place the cost of getting the land cleared and fit for fruit-growing, is enormous; then all kinds of labour is so expensive, also the cost of getting fruit to market and everything in connection with the work. Then our markets as yet are limited; and we have got into no thorough system of handling fruit, whereby there may be disappointment experienced before that success is secured which is sure to come to the diligent fruit-grower in time. For markets both in the east and west are bound to be opened up for our fruit. Information will be diffused by our Fruit Growers' Association, and much can be learned by us from the similar associations in these Provinces, and conventions of this kind, and although we are late in getting a start in fruit-growing we will have the benefit of the experiences that have been gained in older fruit-growing countries, which will save us many mistakes. Instead of having to wait and hunt up remedies, after insects and disease do come, (as they are sure to do when fruit is more extensively grown), we will have our weapons ready to meet these enemies beforehand, procured at the expense of others. Yet we have our grievances, which have got here too soon for us, but which we hope to procure remedies for here, to a certain extent. The matter that was agitated most at our last meeting of fruit growers was the lack of a system of handling and marketing plums and some other soft fruits, a difficulty which I am sure we will soon overcome.

Another matter of great importance to us is one over which we have no control, but which can be controlled from Ottawa, and which we hope will be remedied at this Session of Parliament—that is, the present tariff; for the way it now is, all green fruit that we can grow in this Province is admitted free of duty from other countries, while on dried and canned fruits, which we do not as yet produce to any extent, also on some of the foreign fruits which we cannot grow, the duty is still kept on. Now, this does not give us a fair chance, not but what we can

compete with California, Oregon, or any other country in the growing of certain kinds of fruits, when we get fairly established; but the difficulty is that their fruit matures much earlier than ours, they have been longer established in the industry, they have the full benefits of their own markets, and then as soon as the glut comes they send their surplus stock into our markets, which just meets our first fruit on which the most money is to be made.

This seems a special legislation against us. The Dominion Government have gone to considerable expense in calling together this convention, and it is a good act, one which we hope will be productive of much benefit to the fruit growers throughout the Dominion. Now that they have called us together and learned our grievance we expect they will do what they can to assist us to the best advantage.

There are other drawbacks of a smaller nature, such as the accumulation of moss on trees during the wet season, and some of the insect pests which bother the apple tree; but these are easily disposed of. We also occasionally hear complaints of the bark splitting on plum and cherry trees. Again, there are seasons when the weather keeps very warm and mild so late that the young fruit trees of all varieties, keeping up a rapid tender growth, are caught suddenly by the first frosts and killed back; in some cases the trees are killed entirely. But the most destructive enemy we have is that which causes dead spots on our young apple trees. These spots make their first appearance in early spring, and sometimes cause the death of the young trees, by spreading all the way around it. The injury has evidently been done the previous summer, but does not show itself until the bark turns black the following spring. Sometimes these young trees have dozens of these spots on them, and if the tree is not killed outright a great deal of injury is caused. This trouble has only been found in certain places, and does not seem to be general. If the injury is not caused by the ravages of some insect, then the disease must be contagious, for it is only when young trees are planted adjacent to other trees affected in the same way that we find them injured. Whatever the cause may be it is a matter of the utmost importance to our orchardists that the cause should be learned, and the cure, if any.

We now have in our midst an experimental farm carried on by the Government under the supervision of Prof. Saunders, and through it we hope to receive much benefit, for I believe one of the most important features is to be the testing of fruit trees.

In this paper I have tried to give you an idea of what has been done in fruit-growing in British Columbia in the past and what we hope to accomplish in the future, if the Government will assist us in rectifying the present tariff; for we have an association, made up of experienced fruit-growers, who will be continually experimenting and disseminating information throughout the Province, whereby, with knowledge we can push forward in our work, so that soon we may see our fertile valleys and rich uplands covered with trees loaded with their precious fruits—not only orchards of the apple, pear, plum and cherry, but the golden fruit of the peach and apricot will be ripening in our gardens, and luscious grapes hanging in tempting clusters in our vineyards, blessing us with the fruits of our own labours. We hope many from these eastern Provinces will find their way across the vast plains and wondrous mountains that divide us to that western slope towards the great Pacific into a milder climate, where the warm Chinook winds have already softened winter's cold breath, and started vegetation into life, and there unite with us in making British Columbia what she is destined to be, one of the most profitable fruit-growing countries in the world.

Mr. STARRATT, Nova Scotia.—I have listened with a good deal of interest to Mr. Henry's paper. I consider it exceptionally interesting, and judging from the manner in which the convention listened to it, it has been appreciated. I have no doubt that Mr. Henry will make a success of fruit-growing in British Columbia.

The PRESIDENT.—Our next paper will be by Mr. John Craig, but recently appointed Horticulturist to the Central Experimental Farm at Ottawa. The subject is "Promising Cherries for Northern Latitudes."

Mr. CRAIG.—As our time is limited, I will not weary you with any preliminary remarks, but proceed directly to my subject.

PROMISING CHERRIES FOR NORTHERN LATITUDES.

BY JOHN CRAIG, HORTICULTURIST TO CENTRAL EXPERIMENTAL FARM.

According to DeCandolle, our most reliable authority on the origin of species, all varieties of the cultivated cherry belong to two species which are found wild. 1. *Prunus avium*: Tall, with no suckers from the roots, leaves downy beneath, fruit, sweet. This is supposed to have been the parent of the Heart and Bigarreau varieties. This species, from which the black and white cherries are developed, grows wild in Asia; in the forests of Ghilan (north of Persia), in the Russian Provinces to the south of the Caucasus and in Armenia; in Europe, in the south of Russia proper, and generally from the south of Sweden to the mountainous parts of Greece, Italy and Spain. 2. *Prunus cerasus*: Sour cherry, shorter, with suckers from the roots, leaves glabrous, and the fruit more or less sour or bitter. From this we have the Dukes and Morellas. These are supposed by DeCandolle to have been known to Greek civilization very early, and to have been in cultivation in Italy and Europe long before the White Hearts were introduced from Asia Minor.

The natural distribution of the wild representatives of both classes, the Hearts and Morellas, seems much the same, though the cultivated representatives of the latter have a much wider distribution in northern and eastern Europe at the present time. This class seems to have had a greater climatic adaptability than their tenderer relatives, the Hearts, and to have gradually worked northward and eastward till they have become common roadside trees in Poland and Central Russia. Before reaching this northern latitude they have become, however, specialized forms, differing materially from our west European types, as represented by the Kentish and Morello varieties—so different, indeed, in leaf, bud and texture of bark, as almost to point to a different origin. The west European Morellas, which in ordinary or average seasons have been fairly successful south of the 43rd parallel, in the somewhat dry western and middle States, and further north in the moister, though colder, portions of Canada, have in late years, from one cause or another, as in the west, injury from winter and black knot, and bark bursting in the east, been dying so rapidly and giving such poor returns as to compel the thoughtful planter to look for varieties more suited, if possible, to the vicissitudes of climate north of lines indicated.

Within a few years several varieties, as instances Ostheim and Wragg, have been brought into notice as having special qualifications in the way of hardiness and adaptability to climate. As far as we can learn, these varieties have been "incidental seedlings from east Europe importations, and to have inherited their hardiness from typical varieties of those regions." The result of investigation is that several importations followed, being special and personal selections made by Prof. J. L. Badd, of the Iowa Agricultural College, in 1883-4. These introductions comprise about forty varieties. From four years of personal observation, and from reports received from widely-separated sources, I am led to believe that we shall find among them many adapted to the more trying districts of Quebec and Ontario, and the milder portions of the North-West. But should our success be only partial with the originals, we can still use them as stepping-stones to something better, by means of crossing and selection, and this line of advance will have a prominent place in the horticultural work of the farm.

I will name a few of the principal groups comparing favourably in quality with Early Richmond, and surpassing it in hardiness, as far as tested. Beginning with those of the same season, among the most prominent are Orel 23, June Amarelle, King's Amarelle, and Strauss Weichsel. With the exception of King's Amarelle, which is excellent for canning, they are all better in quality than Early Richmond. So far they have endured a dry atmosphere, and 30° below zero, with little snow on the ground, at the same time being used as bud and scion stock.

Among those ripe with Late Richmond, or Late Kentish, as sometimes called, may be mentioned Brusseller Braun, Lutovka, Frauendorfer Weichsel, Griotte du Nord, Orel 24, Orel 27, and Bessarabian. This collection will cover a period of about two weeks, beginning with Lutovka and closing with Bessarabian. Prof. Budd, in speaking of this last, says that "it will endure more abuse of tree than most of our forest trees. Our original specimen has been cut for buds and scions for five years, taking off nearly all the new growth, yet the tree is sound to-day." Fruit large, firm-fleshed, and when ripe very mildly sub-acid; it promises to make a long lived tree of considerable size, and to prove a regular bearer of choice fruit.

The members of the next group to which I wish to call your attention are more or less dwarfs in habit, and mature their fruit with the English Morello. These are Shadow Amarelle, Spate Amarelle, and Large Long Late; with Spate Amarelle as earliest. The fruit of these should be allowed to hang on the tree till of a dark purplish colour when fully ripe. The trees are smaller than English Morello, with pendulous habit. As fruited in 1889, they were superior to Wragg for dessert use.

Another class, belonging to the Vladimir family, coming from Orel and northward to Kazan, Russia, is represented by Orel and Shubianka. These are specially promising for the dry sections of the North-West Territories. They are shrubby in habit, having the appearance of large currant bushes rather than trees. The leaves are very small; the twigs so slender as to be difficult to graft. They come into bearing early—when 3 or 4 feet high. Fruit, size of Montmorency, nearly black when ripe and mildly sub-acid. With this cherry on a hardy stock, such as the small-growing western forms of Bird Cherry (*Prunus Pennsylvanica*)—or Sand Cherry (*Prunus pumilla*),—the first of which it has been budded upon with success,—we should be able, very materially, to extend the limit of profitable cherry growing northward. These cherries probably belong to the same race as the "Koslor bush Morello" recently imported by the Fruit Growers' Association, through Mr. Neimetz, of Odessa. The forty trees of this variety now at the farm, and imported with the association's consignment, will be increased as rapidly as possible, for distribution to the colder parts of the Dominion. We will probably find some variation among the originals, as they are seedlings from the parent tree; but Mr. Neimetz assures us that the cherries grown from pits do not vary, and its early-bearing habits will aid very much in the matter of selection.

As root-grafting the cherry is not generally practised, a few remarks in that connection may not be out of place. I am strongly of the opinion that grafting the cherry is better for the planter, than propagation by budding. The root grafts are set down to the last bud on the scion as in apple grafts, thus giving the more or less tender mazzard stock additional protection and encourages rooting from the scion. When set still deeper in the orchard they are practically out of danger of root-killing. I have with me a few specimens illustrating the method. The scions are cut after the twigs are thoroughly matured, and before hard freezing, which is apt to weaken their vitality. They are firmly packed in forest leaves. In sand or moss it is difficult to preserve them in a strictly normal condition, owing to improper degree of moisture, often absorbing too much water. The scion is set in the root at the crown by the mode known as side grafting; the wedge should be about equally thick on both sides—if any difference is made, the outside should be slightly thickest. Again, if too much difference is made in this direction the whole pressure coming upon the *cambium* layer, the conditions are very unfavourable to growth of cell structure, by which the root and scion become united. Waxed thread and grafting wax are used to bind and cover the union. A mixture of equal parts of sand and earth seems to make the best material in which to pack the grafts for winter storage. The same danger must be guarded against here as in scion packing—that of too much moisture. This will cause the buds to swell before planting—a condition which is never followed by a good stand in nursery, except where the roots are equally advanced, and this we seldom find to be the case under ordinary cellar conditions. The simplest kind of cellar, with means for ventilation, serves the purpose. It should be kept near the freezing point by opening in the evening and keeping it

closed through the day when practicable. In this way a low temperature may usually be preserved, and the grafts kept perfectly dormant till planting time.

In closing, I wish to say a word in favour of mixed planting, especially in regard to cherry and plum orchards. By mixed planting I mean the intermingling of varieties. With small fruits the principle is established; with plums it is recognized; and late observations in various countries, notably in California and Europe, incline to the belief that alternating varieties in the cherry and plum orchard favours regular and continued fruitage. It is advanced by Prof. Budd and others that a variety which may be relatively a poor bearer when planted alone and depending on its own pollen may be found regularly fruitful when intermingled with other sorts; and further, that if the weather during the blossoming season is hot and windy a variety may mature and waste its pollen before the pistils are in a condition to be fertilized. In such cases, if surrounded by different sorts, the work might still be performed through the agency of insects and the breeze.

I will only add that I wish the title of my paper to be borne in mind in connection with statements made, and the varieties touched upon regarded as promising in advance of more extended tests, though many may develop defects not yet noted. But from varieties herein mentioned, or others not named of the same race, we will I believe, be able to select sorts which, if not of the highest quality, will at least make cherry growing more profitable and satisfactory in northern latitudes.

The PRESIDENT.—As the time has now arrived that we should adjourn this meeting, I must ask you to forego discussion on Mr. Craig's paper for the present.

The Convention adjourned until 2 p. m.

FRIDAY AFTERNOON.

The Convention re-assembled at 2 o'clock, Prof. PENHALLOW presiding.

The PRESIDENT.—The first paper we may consider is one of great value, having been contributed by B. E. FERNOW, Chief of the Forestry Division, Washington. Mr. Fernow is not here, because of a similar engagement with the American Horticultural Society; but Prof. Saunders has the paper in hand, and will present it to the meeting:

FOREST INFLUENCES: BY B. E. FERNOW, CHIEF OF FORESTRY DIVISION, DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.

We have heard a great deal during the last ten or twenty years of the influence which the forest exercises on the climate, the rainfall, the flow of springs and rivers; and those who have entertained an^d advocated the view that such influence exists have pointed to the far eastern countries, which once fertile, and verdant, are now desolate and arid wastes; they have related the devastations by the torrents in southern France due to forest destruction, and in Italy, Switzerland, Tyrol; they have explained the lack of rain in Spain and on our own central plains by the absence of tree-growth, and have advocated tree-planting in order to increase rainfall. Wherever a flood occurs^r forest destruction has been blamed as the cause; even the drought which has been experienced during the last summer in the western country has been brought into relation with the unusually large forest destruction by fire with which the western mountains were swept.

While there is undoubtedly much truth in the observations which have led to the general popular belief that forest and climatic conditions have certain relations to each other, the generalizations have, it is to be feared, often been carried too far. Consequently, those who did not share in this belief have denied forest influences altogether, have even considered the theories which such great men as Humboldt, Buffon, Boussingault had in regard to them as fallacious, and demanded better proof than the very-day observations, which, they said, leave out a consideration of other causes which may have had similar effect to that which was ascribed to forest destruction. Among these objectors are many scientific men, and the only way in

which they can be convinced is by a scientific demonstration based upon careful measurements, experiments and observations. The last few years have, therefore, been diligently used by some investigators, who do not intend to prove any theories but to simply find out the truth. Out of the large amount of material which has been accumulated I have tried to summarize what we really do know of the influence that the forest may exercise upon the climate.

I say "may" exercise, because whether it does or does not depends upon certain conditions, just as it depends upon certain conditions whether a cloud full of moisture will precipitate the same or is dissolved without precipitation. This must be fully understood.

The influence which a forest can possibly exercise is, in the first place, mainly due to its nature as a cover. Now, whether we place our cover before or behind the wind the effect will be different. The position, therefore, towards other climatic factors is of importance. We may have a cover made of mosquito netting or one made of wool; the effect of either, of course, will be different. Similarly so with a forest; the density, its age or height, and the extent of forest is of consequence. The composition, too, must be of some moment, for a coniferous wood acts as a cover all the year round, while a deciduous-leaved one loses much of its protective features during the winter.

We see, therefore, that it would not be wise to speak of the forest in general terms as doing this or that, but we can only speak of a forest under certain conditions, and therefore in certain localities as influential, while in other localities, under different conditions, the influence may not be felt or may be just the opposite of the one experienced in the first case. The influence may be beneficial and it may be objectionable. Thus, a large forest against the north-west may temper the cold blizzard, while towards the north-east it may cut off desirable rain-winds. In one locality it may be desirable to have a shelter against a burning south-wester, while in another the effects of the warm wind are needed to raise the otherwise low temperature.

It may also be conceded at once that cosmic influences, such as mountains and large water surfaces exercise, are mightier than forest influences, and that the latter are probably only of local importance in modifying climatic conditions, and the extent of their influence is confined to their nearest surroundings. Yet these very surroundings are the ones in which each of us lives, and since we cannot change the cosmic climate we should be satisfied to modify it locally, if that can be done.

In the first place, we know, from actual measurement and comparison, that the climatic conditions in the interior of and above a contiguous forest area are different from those of a large open field in the neighbourhood. This difference is due to the protection of the soil from direct sunshine and to the increase of the area which radiates heat, to the evaporation of the water from the leaves and the mechanical obstacles presented to the circulation of the atmosphere—the winds. In consequence, we find that the forest shows a reduced range of temperature—that is to say, neither the extremes of heat nor of cold are as great in a forest as without the forest. It is cooler in summer and warmer in winter; it is a mitigator of extremes in temperature; it has a more uniform temperature.

2. This mitigating difference is found still greater in the temperatures of the soil, the range in the forest soil being ten to fifteen degrees less than in the field soil.

3. The forest increases the humidity of the air in its interior, especially during the dry months, and altogether the moisture conditions of the forest air are more uniform.

4. The soil in the forest loses six to ten times less water by evaporation, and therefore remains more evenly moist than the field.

5. That the forest interior is less exposed to the action of winds will be readily conceded; hence, shifting sands, such as found along sea shores, would be kept quiet and of course evaporation greatly reduced.

6. The air above a forest is generally cooler and relatively moister than it would be without the forest cover.

7. The crowns of the trees diminish the force of the rain falling upon the soil, so that the latter is not as much compacted.

From this knowledge of the climatic conditions of the forest interior we may judge of the change of conditions on the same area after the removal of the forest.

The deforested area naturally would show—

1. Greater extremes of temperature of air as well as of soil.
2. Average moisture of the air lowered.

3. On a shallow soil with impenetrable subsoil formation of morasses is possible, while on deep soils more rapid desiccation of the soil is to be anticipated.

4. Possibly, if the deforested area was extensive, a decrease of atmospheric precipitation might occur, and at least its distribution throughout the year would be changed.

5. On light and sandy soil, especially near the coast, where winds are strongest, the shifting of sands and formation of dunes is facilitated.

6. In the mountains deforestation causes torrents, carrying away débris into the valleys; land slides and snow slides are induced, because the mechanical retarding influence of the soil-cover and of the trunks upon the superficial flow of water ceases.

What the removal of the forest will do in changing the climate of an adjoining country of open ground is much more difficult to state. In fact, positively, we do not know much about it. The influence of an existing forest may be direct or indirect—direct by communicating the characteristics of its own climate to the neighbourhood; indirect by interposing its protective cover against and breaking the force of the winds, which would otherwise have free sweep over the fields.

Evaporation is the great dissipator of moisture, and the dry north-western and southern winds are its powerful aids.

A conception of the amount of evaporation may be had from the measurements of the United States Signal Service. In the western country the evaporation ranges from 25 to over 101 inches during the year. To choose a place near the Canadian frontier, take Fort Assiniboine, in Montana. The evaporation during the year was 39·5 inches, while during the same year the precipitation was only 17 inches (somewhat above the average); therefore, a deficit of 22·5 inches to satisfy the demands of evaporation alone. How much of this must be placed to the account of the evaporative power of winds we cannot tell, but this amount must be large, since according to experiments of the Signal Office with the temperature of the air 84 degrees and the relative humidity at 50 per cent., the evaporation with a wind at only five miles an hour was 2·2 times that in a calm, and with increased velocity the rate of evaporation was six times as large as that observed in a sheltered, calm position. But the wind at Fort Assiniboine during every month in the year reaches a maximum of over 36 miles, and as much as 58 miles, while its average is certainly not less than 12 miles an hour, to which corresponds a rate of evaporation of over four times that in the calm atmosphere.

When it comes to such warm, dry winds as the Föhn in Switzerland, and the Chinook on our Rocky Mountain slopes, a snow cover of $2\frac{1}{2}$ feet and more in depth will vanish absolutely in twelve hours' time before its insatiable thirst.

The mere mechanical action of the forest alone in breaking the force and velocity of winds, which the windbreak, of course, exhibits in a less degree, is most obviously a potent influence in preserving humidity.

Even without taking special account of this influence, direct measurements have established that the evaporation from soil kept saturated with water during the seven months, from April to October, was in the open 40·8, in the pine woods 15·9, and under the shelter of deciduous trees 6·2—that is to say, the water was evaporated in the field $6\frac{1}{2}$ times as fast as under the forest cover. Here, again, the influence in retarding evaporation is most potent, and explains the beneficial influence of a forest cover on the flow of springs.

Popular writers have been pleased to compare the forest floor with a sponge which takes up large quantities of water and then gradually gives it up to the soil

to feed the springs, and thus account for the observation, that mostly—but by no means always—forest areas produce more constant flow of springs. But, first of all, the forest floor is not like a sponge; and secondly, a sponge would not act as these writers conceive it. The experiment is easily made. To be sure, the sponge will take up large amounts of water until it is fully saturated, but not a drop will it give up below, unless it is pressed or more water is added. As soon as the water supply stops it begins to evaporate at the top, and supplies itself by means of its capillary forces with moisture from below. It would, therefore, be apt to drain off any moisture offered to it from below, instead of giving up its own moisture. Fortunately the forest floor has only to a slight degree this water capacity of a sponge, a moss-cover coming probably the nearest to it, and, therefore, being the most objectionable.

In so far as it does have the capillary forces of a sponge, it withholds the water from the soil and from the springs, and yet this very withholding capacity, this very loss of moisture to the soil, does produce a beneficial influence on the flow of springs by checking again the most avaricious robber of moisture—evaporation.

A forest litter, according to depth and kind, will allow from 60 to 75 per cent. of the rain falling upon it to filter through to the soil, while the moss gives up hardly more than 40 to 50 per cent. But the naked soil loses, by evaporation, its water so quickly, that only 20 to 40 per cent. will find its way into the drainage.

This protection of the water supply is equal to that of a mulching or to the cultivation in the field, namely, simply as a check against loss of water by evaporation. Besides, there is in this cover a protection of the granular structure of the soil. Such granular structure makes the subterranean drainage easier than on a naked soil, which is beaten together and compacted by the raindrops, and at last makes the water run off superficially. The same effect, of breaking the force of the raindrops, is due to the interception of the rainfall by the foliage, which, to be sure, withholds from 10 to 15 per cent. from the soil altogether, and thus this amount is lost to the soil.

Another loss of water for the springs and runoff is represented in the amount that is utilized by the trees in growing, if, indeed, this may be called a loss; for it produces useful material, and the amount of water which is returned to the atmosphere in the transpiration from the leaves aids in producing those very conditions above and in the forest which may make it a climatic factor for its surroundings, namely, an area of cooler and at the same time moister air strata, with a tendency to condensation.

It is interesting here to state that the amount of water needed by the plant is somewhat in the proportion offered to it: that is to say, in dry seasons and in dry regions the same species of tree will transpire proportionately less water than if the supply is ample. Conifers require from six to ten times less water than deciduous trees.

I have made a calculation upon the basis of some rough figures which give the amount of transpiration by various trees, and find that a coniferous forest in the west, taking the rainfall at 2½ inches, or 4,500,000 pounds of water to the acre, would hardly transpire more than 330,000 pounds, or 8 per cent. of the total precipitation during the period of vegetation. So that the loss to the soil waters from this source would not appear as great as some are inclined to believe.

Lastly, beyond any dispute and easily understood is the influence of the forest on the runoff, and especially on the superficial runoff—from mountain slopes. Here again, the simple mechanical obstruction which the inequalities of the forest floor and the trunks offer is the principal factor of influence. But also by distributing the water differently into subterranean and superficial runoff from what it would have been on a naked slope, an influence upon the system of springs and brooks is exerted. Yet when it comes to extremes of rainfall, even the best kept forest and forest floor—and we know but few such in the United States—would not be able to prevent the floods. In such cases the topography is decisive, and on the steep slopes of a West Virginia river-bed, for instance, no forest cover is capable of retarding the runoff of a heavy rain and the freshet that is bound to come. When it comes to discuss the influence upon the water conditions of a large stream with many affluents,

so many additional considerations must enter into the discussion that it would lead us too far to attempt it here.

The influence upon the runoff of the water may be summarized as follows:—

A.—In regard to Springs.

1. The forest floor prevents the filtration of a certain part of the precipitation; yet the largest portions of the snow water and of abundant rainfall filter into smaller or larger depths, according to the condition of the soil. Although this amount is greater on soil not covered, and although the process of vegetation of the forest trees consumes a certain amount of this water, yet the protection afforded against evaporation more than balances this loss.

2. The forest, therefore, reserves in the end larger quantities of water for formation of springs. Probably these amounts are also increased by the greater amount of condensation of atmospheric moisture over its area.

B.—In regard to Superficial Runoff.

3. Moderate rains may be retarded by forest crowns and forest floor from running off superficially, and are mainly carried off by springs alone. The conditions of permeability of the soil and of slope determine this, however, often more than the forest; so that in densely wooded localities, with an impermeable soil and steep slopes, the water is after all shed more rapidly into the creeks and rivers than in unforested or even entirely naked regions with a permeable soil and gradual slope.

4. When extreme and continuous rainfalls occur the forest cannot practically and effectively reduce the amount that will come to run off superficially, but its influence may be beneficial in retarding the confluence of the little rills and rivulets of the runoff.

5. In mountainous districts the forest is of utmost importance in protecting the soil against abrasion and preventing the formation of torrents, which carry rocks and débris into the rivers, and thereby increase the danger of floods, even in the rivers, and make navigation precarious.

With this brief review of our knowledge as to what forest influences we may reasonably expect, there is, I hope, enough beneficial and desirable influence remaining to deserve our close attention, even if we are not willing to generalize as broadly as some of our friends have done in their enthusiastic plea for the forest.

May there be found in Canada sufficient broad statesmanship, sufficient intelligence in regard to the administration of its economic resources, to insure, first, a proper policy of protecting her mountain forests against unnecessary, wasteful and harmful destruction, and, secondly, a systematic planting of timber belts through the treeless plains for the amelioration of their climatic, and especially their water conditions.

Prof. SAUNDERS—In confirmation of this statement advanced by Prof. Fernow as to the great importance of even light forest protection in preventing evaporation, I would cite a case that came under my observation on our Experimental Farm in Manitoba during this last year. On the bluffs that rise from the Assiniboia River there is a certain amount of scrub to the height of 6 or 8 feet. Although this scrub was so low, when we cleared a place for fruits in it we allowed a margin of this undergrowth to remain as a protection against the drying winds which sweep over the prairie. The fruit and ornamental trees which were planted there have grown without the least injury to the foliage from wind, and have grown much more luxuriantly than those not so protected. A large proportion of trees that are planted on the western plains are injured by being blown about and become battered and bruised by the winds, but in the instance referred to, a very marked difference can be observed between the plantation protected by this low growth of scrub and plantations outside of it. This experience bears out the statement advanced by Prof. Fernow, that one of the most important points in con-

nection with forest cover is the influence it exerts in preventing the injury which arises from constant wind drying the moisture out of the ground and evaporating what is necessary for the successful growth of the trees.

Perhaps I may be allowed a moment or two, if there is no discussion on this paper, to make an explanation. When I was addressing the Convention yesterday, and giving a rapid review of horticultural progress in different parts of the Dominion, I omitted an important point with respect to Manitoba. I began to describe the condition of things on the Red River belt, which is about 50 miles wide at its widest part, and I left out in my statement the more important considerations involved in the country outside of that belt. One thing I omitted to do which, in justice, I want to do now—that is, to refer to the collection of fruit trees made by Mr. Frankland at Stonewall, which I lately had the pleasure of inspecting. This gentleman is representing Manitoba on this occasion. Mr. Frankland's plantation is on a gravelly soil, and I found everywhere in Manitoba that plantations on gravelly soil succeeded better than those on the rich heavy prairie loam, which seems to stimulate protracted and late growth, and does not give the trees time to ripen up their wood before winter. I saw at Mr. Frankland's place enough to encourage me a very great deal with respect to the future of fruit-growing in Manitoba. He has a number of varieties of apples, plums and cherries, which are young yet, but which were enduring the winters and promising to eventually become good trees.

Mr. STARR.—I would like to say a word with regard to shelter belts. My own experience in orchard-growing is that they are of great value; and if they are so in Nova Scotia, where we have a range of mountains, would they not be very much more so in the open plain, where no such natural protection exists. In an orchard of my own, some eighteen or nineteen years old, I have on the north side a belt of trees running 40 or 50 feet high. It is quite a narrow belt. A young orchard has been placed on the north side of that belt, and yet I have found that the protection on the north side is almost equal to that on the south side. It acts as a wind-break, and the heavy winds pass over the tops of the trees. This is particularly noticeable when the fruit is about half grown and would be injured by the wind.

The PRESIDENT.—Perhaps it might be well to defer the discussion of this paper until we have another, which is practically on the same subject, from Mr. Phipps, who is the Commissioner of Forestry in Ontario. Then we can discuss the two together.

WIND BREAKS: BY R. W. PHIPPS, COMMISSIONER OF FORESTS, TORONTO.

Mr. PHIPPS.—I am most happy to be able to address you on this occasion, knowing that I have before me some of the most prominent men in the fruit-growing line to be found in the country, and perhaps I may be permitted at the outset to say a word or two respecting the paper which has just been read. I wish to say a word first on the spongy floor of the forest. When you get into an old country forest it is ten to one that you will find that floor of grass. I did not find one that was otherwise. Now, if the rain descends on that it is not at all so much like a sponge as a forest in its natural condition. As we find the floor here, it is deeply covered with a mass of deciduous leaves. That is the condition our forests will be in if cattle be kept out. In its natural condition the forest will be filled with a beautiful young undergrowth, which will also assist very largely to hold the water. I will give you an instance. I knew a forest—in fact I owned—it on the summit of a hill in this country, which stood for thirty years to my knowledge. The rains descended and the floods came, but the forest floor never changed. The forest was as good when the axe was laid to it, as I had known it thirty years previously; but after this forest was gone and there was a wheat field where it stood, then when the rain fell you could see that a great change had come about. The soil was washed away until I knew it to be banked up 2 feet deep against the fences. That is to show the character of the forest floor. As soon as the forest was cleared the soil was washed away, and washed away so dreadfully that those fields are not worth much now. I have been through hundreds of forests, but I have never yet seen the water run when the rain

fell as it does in the fields. It seems to sink in, and it is undoubtedly held there in this country. Wherever the forest has its proper condition it has a heavy bed of leaves, as well as clustering circumflexes of young trees. Wherever that is the case through the forests, the floor will hold a great deal of water, which will not run away or pour out in rivers and creeks for days and weeks, as it would in the case of a field of land. That I know to be a fact from a life experience. I am sure, however, that we are indebted to Mr. Fernow for bringing it to our knowledge that the German Government have just collected the results of a series of experiments on the operation of forests with a view to finding how much the forest retards the washing of the land and how much the forest assists in producing rain. They have taken a very large portion of forests and have had it carefully examined by military engineers over a period of years. The result is, that they think that it has always had as much rain as the cleared districts, not far off, in the same country. Mr. Fernow sent this statement to the New York *Garden and Forest*, a very valuable publication, and it appeared there last month. I shall get it for my next report, and we shall all have an opportunity of seeing it. Now, I would like to say one or two words on this differing of the amount of rainfall. The question as to whether forests increase or do not increase the rainfall is not so much regarded by those who remember this country as it was long ago. It is not the quantity of rain. Sometimes we find we get a great deal too much rain—rain that washes away things. What we want is the old-fashioned genial showers which we used to have coming along in May and the early part of June, when we needed them, and we used to find, that so long as we kept a considerable quantity of bush we got plenty of rain, while now in some districts we do not get enough. It is more a question of the distribution of moisture than the amount of it. Now, as my subject to-day is not so much concerning forests as wind breaks, I would like to say a few words on that matter. I have, in the course of my examination of this subject, got into communication with a great many people throughout the country, who have sent me word as to what they have found is actually the case in their respective districts from the result of wind breaks or of any old forest lines that may still exist. I should like, if it will not weary you too much, to give you an idea of these communications.

The following statements give the effect of wind-breaks where they have been established throughout Ontario. They are from the township clerks of the various localities, gentlemen who are well informed of the progress of the adjacent country:—

Dawn.—When fall wheat is protected by the woods around, the frost does not seem to hurt it nearly so much as when out in an open field. Both fruit and crops thrive better where thus protected.

Esquesing.—I have myself observed the beneficial effects of planting trees closely for shelter as a protection to fruit and grain crops.

Burford.—Wind-breaks are very beneficial, but when grown take about all the substance from the soil from two rods on each side. Nevertheless, they are grand for sheltering fall wheat and clover.

Blandford.—Have observed great benefit from such shelter. Have seen fine crops of fall wheat and clover sheltered by belts of timber from the west and north winds, while in more exposed situations such crops were comparative failures; also consider such shelter of great benefit to orchards; the trees seem to thrive better when so sheltered, and the more tender varieties can often be successfully grown.

Merssea. Where fields and orchards are sheltered, especially from the east winds, the effect is very marked. Where—as here—the snow fall is light and generally of slight duration, fields protected by the forests produce much the best crops of wheat, and the orchard derives a like benefit.

East Flamboro'.—The effects of trees planted for wind-break, or shelters for fields, especially west winds in spring, so far as I have observed, have proved beneficial to crops in general.

North Easthope.—The experiment of wind-breaks here has been good, especially in the matter of orchards.

Minto.—Fruit, grass and crops thrive the better for wind-breaks.

Dorchester.—Have observed for a number of years that fruit and fall wheat do better where they are sheltered by trees.

Moore.—The benefits resulting from belts or wind-breaks may be seen any season, almost, in the improved condition of winter wheat, compared with fields in exposed situations where the cold, biting winds have unrestrained sweep. Fruit trees also thrive and bear better, grass starts sooner in the spring, and stock have shelter in cold weather and shade from a scorching summer sun.

Dummer.—A natural growth of cedar, pine, elm, etc., has grown up along some of the fences close enough for a wind-break. Fall wheat and fruit trees are decidedly benefited by such shelter. I cannot say with regard to spring crops.

Egremont.—Had a field of wheat this summer in which a few maples were saved when cleared; these have grown bushy and very beautiful. I noticed that the wheat was heavier and plumper around these trees than anywhere else in the fields.

Glanford.—Where wind-breaks have been grown the orchards and crops sheltered by them have been greatly benefited.

Grosfield.—Last year wherever wheat was sheltered from the west winds it was good; where not sheltered it was all destroyed.

Crowland.—There is no manner of doubt that wind-breaks are of decided advantage, inasmuch as it prevents the fields from being denuded of the snow, which serves as a covering for all that may be committed to mother earth, the good effects of which I have demonstration of every year.

Oxford.—Wheat, and all fall plantings, peach and other trees, are very much benefited thereby. Such wind-breaks are becoming more in use yearly.

Tilbury East.—Planting here is only in its infancy, but it is observed that the fields farthest from the bush fare badly in the winter and spring under fall wheat. Indeed, it is very questionable if fall wheat could be raised profitably in this section, now the whole country is denuded of forest, or threatened to be.

Rochester.—No wind-breaks planted, but bush on the north and west of growing crop has a markedly good effect.

Euphrasia.—Wind-breaks eventually become both ornamental and useful; grass and crops do not so much require wind-breaks as fruit does. In many fruit-growing sections the apples especially are blown off by wind before fully matured, for want of proper wind-breaks. This I look upon as a great evil, as Ontario can raise fruits well, and there will be a great demand in the North-West as well as in England.

Harvey.—Where the crops are sheltered by the forests it preserves them, by keeping the snow on later in the spring. Out in the clearance the wind drives all the snow off, leaving them bare, only around the fences, and common sense will show the necessity of wind-breaks and shelter even, for the cattle, as well as orchards and grain crops.

Stamford.—Wind-breaks are always beneficial, particularly to the apple crop. Close to trees that are growing in the line fences, however, grass and crops do not thrive.

Canonto.—The effect of some wind-breaks planted here can be seen by the merest tyro, so much so that people are beginning either to plant or leave saplings as they clear their land.

Colchester.—Where the natural forest has protected farms on the west and north I have always noticed that the crops have always looked and been better than others in the same locality not so protected.

North Gwillimbury.—A precisely similar statement.

South Gwillimbury.—Have observed, and heard also from those owning wind-breaks, that they are a wonderful help to growing crops as well as orchards.

Canboro'.—Have one field sheltered on three sides by bush. On that field I am sure of a crop of fall wheat, while on land not sheltered by trees the crop is sure to be heaved by frost as the snow blows off, and nothing is left to protect it.

Osprey.—Have an established wind-break round my orchard, and the effect is that the trees are sheltered from the severe winds in winter and spring, and that the apples are not so liable to be shaken from the trees in fall; but the break is of poplar, which must soon be cut down, as they have completely filled the orchard with a network of roots and young shoots. (As repeatedly stated elsewhere, the poplar is a very valuable tree for many reasons; but great care must be taken to put it only where its propensity to throw out suckers will do no harm.)

N. Cayuga.—Know one or two wind-breaks that have grown up naturally, and have observed that the fields were sheltered thereby to a distance of twenty rods and upwards, and both grain and grass, where so sheltered, have thriven better. Have not had an opportunity of observing the effect upon fruit.

Willoughby.—Few have planted wind-breaks, but where they have I have no doubt that the result is better, especially on fall wheat, clover, and fruit of all kinds.

Laurel.—Know one grove along the north side of a lot, and near this grove the vegetation is much more rapid in the spring and much more early. Also, the crops attain there a much greater growth. The most useful trees for this purpose are the balsam, spruce, pine, cedar and hemlock. I have one of balsam, spruce and tamarac around the north and west sides of my orchard, which have been planted about twenty years; and these break the wind so that the storms in the autumn do not shake the fruit from my trees as from those of my neighbours.

Bruce.—No wind-breaks planted out that I am aware of, but wherever the crops are sheltered by what remains of the original forest the prevailing opinion is that they thrive better. This refers more particularly to winter wheat.

Down.—Many farmers have planted trees, especially along the western side of their farms, and the change has been very noticeable in the sheltering and protection of fall wheat.

Amabel.—It is well known to every farmer here that land sheltered in the winter season is more favourable and surer for fall wheat than unsheltered.

Eramosa.—There are several who have established wind-breaks, though the trees are not planted very closely, and in every instance under my observation the effect is beneficial, to grain crops especially, in sheltering from parching winds and encouraging more heavy dews. (This is a point not to be lost sight of. If you pass by a row of pines in a heavy mist, you will find it almost raining under the pines, almost dry elsewhere).

Caradoc.—A few have planted pine, and a good number have planted willow for this purpose. The past winter, to a greater extent than formerly, proved the utility of forests in shielding crops, as the wheat in sheltered situations invariably proved superior.

Adolphustown.—Where protected by wind-breaks, fruit, grass, and crops in general most assuredly thrive better.

Colchester.—There are no persons in this locality who have planted trees for wind-breaks, but many have left strips or belts of timber along the west boundaries of their farms; and wherever this has been done it has proved a great benefit, especially for fall wheat. In the instances where timber has been so preserved the owners would not have it destroyed on any account, which is a good evidence that it is of advantage.

Oneida.—There is a large growth of poplar trees growing on the line between myself and my neighbours on the west side, and I can now raise good wheat on an exposed knoll where I could raise very little before.

Mr. MILLIKEN considers that what is needed is lines of trees across the country. He has on his lawn some fine specimens of Norway and native spruce. He has found the shelter of the woods is very valuable for fall wheat, and, in fact, beneficial to crops generally. Is planting a line of Norway spruce and cedar along the whole north of his farm, having it in great part finished now. Planted at 5 feet from the fence, but considers that he planted it too close, as the branches soon need more

room. Has about twice too many trees in it, which will give him every second tree to take up and replant. Believes that if a number of farmers would plant rows the benefit would be very great. Has a row of pine about 30 feet high. The benefit from these would extend nearly across a square ten-acre field. Finds the second week in June a very good time to plant evergreens. A young spruce brought by him from New Brunswick (native there) seems of a better foliage than either the Norway or Canadian. Considers that shelter from the south-west side is also often serviceable, especially in preserving apples from the strong fall winds which are apt to blow them down.

Mr. JAMES has two fields protected on the north and east by a second growth of young pines, about 35 or 40 feet high. These two field have had excellent crops of fall wheat twice in succession, while the wheat over all the rest of the farm has not been nearly so good, and this notwithstanding that these two fields have never been drained, while the rest is well under-drained. Mr. James considers that, though draining is undoubtedly good, yet shelter from trees is better for fall wheat. Even right over the under-drains the wheat often failed, but succeeded, with the exception of very small patches, where the bush gave shelter. Mr. James has also a long stretch of young pine wind-break in front of his farm. He finds no injury whatever from the pines near the crops. Would prefer spruce, as it spreads its branches near the ground, and thus gives more shelter than pine, which have their branches some height up.

OLD MILLER HOMESTEAD.—Here is one of the finest wind-breaks in Ontario, a double row of pines planted thirty-five years ago, 40 feet high, and three rows of spruce, all 10 feet apart (the pines to the outside), planted twenty-three years, and now taller than the pine. This surrounds an orchard of about two acres. The clover in the orchard is a heavy crop and grows as thick close up to the trees as elsewhere. The fields to the north and west show no injury whatever from shade, the grass growing as well close up. Mr. Miller, a son of the late proprietor, says: It is of the greatest possible service to the farm. Mr. Miller has planted wind-breaks at his own farm a mile off, and would not be without them for thousands of dollars. Would pay that difference if buying a farm. When he went on his place could not grow anything with ease for the wind, which blew his young rose trees to pieces. Has it now well sheltered. Gave the statement that all fall wheat near not sheltered largely failed. Where sheltered on any side it was a good crop. Fields near here, not sheltered, of ten acres, lost four out of the ten. Would not object to anyone planting a wind-break south of his land; considers the benefit of checking the force of the wind much greater than the trifling loss by shade. Would be glad to see farmers induced to plant long lines of trees; if done generally, it would be the best thing possible for the country.

Mr. MILLER (a namesake) has planted a fine row of pines round his grounds and found them of the greatest possible benefit. These were planted the first new moon in June, which was considered the best time. Cedar he finds succeed well and grows large making fine wind-breaks. He is planting a field, three acres, with maples as a grove. He will fill some of the field, being low, with soft maple and cedar. Agriculture will be almost impossible here unless more trees are planted to check the wind. Believes from his experience that if much of the land were in trees the rest would grow more than now, when it is mostly cleared. Has planted a great deal on his place.

There is another method of getting these young seedlings than growing them in Ontario, as all know—that is, of importing them from foreign growers. As my hearers may wish to know the facilities for doing this at the price charged, I will furnish them with a copy of a letter from Mr. Miller, owner of the chief evergreen wind-break mentioned in these pages as existing in Markham, as to the firms from which he procured the seedlings, and the cost:—

“MARKHAM, 3rd August, 1887.

“DEAR SIR,—In reference to the spruce, I imported the trees from Little & Ballantyne, Carlisle, England. They were twice transplanted, and from twelve to

fifteen inches in height. I think they cost there about fourteen shillings per thousand, without packing. The boxes and packing cost more than the plants. The freight from Carlisle to Liverpool generally was more than the freight from Liverpool to Toronto. I imported several times, and they cost me from \$10 to \$17 per thousand, delivered in Toronto. I had an offer from the firm of Austen & McAsten, of Glasgow, to deliver them in Toronto at twenty-eight shillings per thousand, but I never got any from them. They were willing, I may say, to send a large quantity, if ordered, at a lower rate. Trees, I may remark, should not be less than one foot in height, and should have been twice transplanted. I think that is all the information I can give, having unfortunately destroyed all my old invoices and bills which relate to this.

"Yours truly,

"JOHN MILLER."

With reference to prices, trees can also be imported cheaply, perhaps not so low as this, from Douglas & Co., Waukegan, Ill., an excellent place to obtain evergreen trees. But as it is not well, if we can avoid it, to send money out of the country, I should advise all tree-needlers, before importing, to consult with some Ontario nurseryman as to the price they can be furnished at here, and having been informed on the matter, take their own course as to purchasing at home or abroad. There are many reliable Ontario nurserymen, though indeed, in opposition to either importing or buying here, there are reasons why a farmer, if he can, had better grow his own.

There are many others giving evidence over the whole of Canada to the same effect, and I have personally verified most of the instances which I have given. I have travelled thousands of miles in seeing these different places. One farmer would show me his wind-break and another his orchard. One thing I have noticed is that nearly every young orchard that has been planted of late years has been planted round with spruce or pine, or something or another to serve as a wind-break.

I would like to say something concerning the Norway spruce. It is an excellent tree for these wind-breaks. Of course you have all seen it. We must not go clipping it so low or it will turn brown and soon be killed. If we want to have Norway spruce we must leave them to grow to a good size, and they will then make a good wind break. We must not, however, expect it will last as long as some other trees. Robert Douglas, of Waukegan, the greatest planter in the States, told me that he came over to this country and examined nearly all the Norway spruces that he had planted forty years before. A great number had been planted, but not one of them was alive. Still, I do not know of anything else so good, except our own Canadian white pine, which we find in a good many localities to do exceedingly well as a wind-break. There is a very good instance of this to be seen in Markham. Our friend, Prof. Saunders, has one up near London as well, and a very beautiful one it is. The case I refer to is on the old Miller homestead, to which I have already referred, and the particulars of which I have already given.

A MEMBER.—Is not our native spruce of Ontario as good as any?

Mr. PHIPPS.—The Canadian spruce makes a very handsome wind-break, but I cannot tell whether it will last as long, or whether, on the whole, it will answer as well as the Norway spruce. I should like to say that I prefer the white variety myself to the black. I was travelling through the prairie country in the United States, and I found the universal custom was to plant something around the fences to serve as a wind-break. But there they are planting osage orange, which, of course, is not applicable to us here. Instead of making a hedge of it, they allow it to grow up about 20 feet high, and although it is an ugly looking thing it answers very well for the purpose for which it was intended. For our purposes in Canada I should very much prefer that the farmers should be encouraged to plant rows of timber on the north and west side of their farms—because winds do not always come from the north. This timber would ultimately come in of use. Let

them take a strip 100 or 50 yards wide. It had better be on good land, which should be thoroughly ploughed. Keep the weeds well under, and in a short time there will be an excellent growth. It will not be long before valuable timber will be so scarce that these strips will yield a handsome return. I do not know of anything better than white ash. It is a very useful tree; and our friend, Mr. Grover, of Norwood, whom I see here, has succeeded very well in his part of the country. I have seen it tried in countries where it would not do, but here it does well. In a few years the trees will be found to be 6 inches thick, and by planting close and keeping them trimmed you will have trees without knots. If you plant trees in the opening you will have branches low down, and every branch means a knot. This is the style of wind-break I should like to see generally introduced. My opinion always has been that it is best to take the trees of the forest. If you go into the forest you will find plenty of white ash and black ash; but if you pull them up you find the roots so long and straggling that you have poor success. If, however, these trees be twice transplanted you will grow a bunch of roots, and then you can work with them satisfactorily. If an influential body like yours would only press it, I have been of the opinion that the Government might be induced to come to the front and give away a large number of these trees to persons who need them and would take care of them. That is done at Washington. Everyone does not get large numbers of trees, but there is a general distribution. It is not necessary that the Government should go into the nursery business; but orders might be given to nurserymen to send so many to this farmer and so many to that. That could be done in this country, and many would, no doubt, apply for them. We should then see Ontario covered with little groves of trees, and we would not be under the impression, as we now are, that all the valuable timber is going out of the country. We should see it rising on all sides, and we should feel that there would be plenty of timber for all economic purposes. I would like to say a word or two on evergreen wind-breaks, which are very good things in their way. I have seen lists which were published of the most valuable evergreens in use in the United States, but I would not myself care to plant those evergreens, which are generally used there or are generally found to be profitable there. I would much rather look around and see what trees have grown here, and plant those; because I have known so many people go to a great deal of trouble and expense in planting trees and finding afterwards that they would not answer. What I have found to succeed here is our white pine, native spruce and Norway spruce. When I was travelling last year through England and Scotland I found that everybody was planting and protecting his land by trees. In the centuries past there had been a wave of tree-cutting, but now there is coming a wave of tree-planting. The same feeling is coming to prevail in Ontario, and we should do what we can to make our country something like what it formerly was. I wish I could describe to you what kind of country it was when covered with a forest years ago—how much richer it was, how pleasant the seasons, and how much easier we could grow crops. You are a body having great influence, and I trust you will do what you can to have farmers growing more trees.

Mr. FRANKLAND.—Have you seen arbor vitae growing as a hedge?

Mr. PHIPPS.—There is an excellent sample near Toronto. It is nearly 20 feet high and nearly 12 feet wide at the base. It makes a beautiful dark green hedge. Wherever cedar will grow there is nothing better. I would not, knowing what I do of cedar—although people say it will grow on high localities—risk it there; but if I had anything to be grown near its natural habitat I would prefer cedar to anything else for a wind-break.

Prof. SAUNDERS.—Mr. Phipps will find that very fine hedges have been grown on dry land. I have grown cedar hedges luxuriantly on a dry, sandy soil, and I think it would not be wise, although that is not its natural habitat, that the statement that it would only grow under those conditions should go to the public unchallenged. There is not a very great deal of difference in the growth of arbor vitae on dry or damp soils, if the seasons are reasonably moist. I also wish to say

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that I have seen very fine hedges of Norway spruce. With respect to Mr. Miller's wind-break, did those trees that you saw present any evidence of decay after twenty-three years of growth?

Mr. PHIPPS.—Not the slightest.

Prof. SAUNDERS.—I have seen many trees of Norway spruce in Canada over forty years old. It seems to me it is a very valuable tree, and while Mr. Douglas may be right in the cases he looked at, I think we can show him a good many trees more than forty years old that are thrifty and growing well to-day. Many such trees can be seen in the Hamilton district.

Mr. PHIPPS.—Hamilton is a very remarkable place for growing spruce. That is the place where a friend of mine grew thousands from seeds and managed to succeed just as well with them as those he purchased in the nursery. I have seen that tried on farms near Toronto without success.

Mr. BUCKE.—There is a man living on the shores of Lake Huron, about 12 miles above Sarnia; and his Norway spruces are over fifty years old.

Mr. FISK.—We have found that a borer affects the top of it, and in some cases keeps it back. Is that the case generally?

Mr. PHIPPS.—Some complaints have reached me of Norway spruces beginning to decay at the top, but I have not seen any. When we consider that life is not very long, most of us who can get a tree that will serve for forty years in a wind-break will think it will do. Mr. Miller planted his spruces, and back of them he planted pines, which will last an immense time. With regard to cedar, I have seen people plant a number of young trees, and then trim them to make them look like little trees; but we should not trim or prune an evergreen, if we can possibly help it. The advantage of cedar is its peculiar power to grow on another soil; it brings its soil with it. If you plant it in loam it spreads out and completely covers the ground, and by keeping the sun out the soil gets to have a peculiar character suitable for the growth of that tree. That is, it produces its own soil if you give it a fair chance.

Mr. FRANKLAND.—Would berberry grow in the North-West?

Mr. PHIPPS.—I know some honey locusts out near Owen Sound, and during this last year I asked Mr. Hartman how they were growing, and he said very well. There is a sort of spike on them that keeps the cattle from pushing through. Twenty years ago we had a great many locusts, but then there came a borer which killed them nearly all off.

Prof. SAUNDERS.—What varieties of the berberry are best adapted for hedge plants in Manitoba and North-West?

Mr. CRAIG.—*Berberis amurensis*, an Asiatic variety from the Amoor valley, succeeds well in Minnesota and Dakota as a hedge plant. It is not as free a grower as the *vulgaris*, but has thick, firm leaves, remarkably free from the cluster-cup fungus, bears trimming well and with age forms an impenetrable barrier. The fruit is borne in very long racemes, bright scarlet, very attractive. *Berberis thunbergii* is also one of the best, but its hardiness has not been tested to any extent north of the 44th parallel.

Mr. FRANKLAND.—Will *Berberis vulgaris* be hardy with us?

Mr. CRAIG.—It will probably be all right as to hardiness, but the foliage is often very defective, owing to its being a favourite host of the cluster-cup form of the wheat rust.

Mr. FRANKLAND.—Is it true that red cedar propagates the apple-leaf rust?

Mr. CRAIG.—It has been shown that there are several species of the so-called "cedar apple," some of which communicate the disease to apple trees and others which do not. At the Iowa Agricultural College, with which I was lately connected, experiments with the species affecting the cedar there went to show that it was not communicable to the apple, but was readily propagated on the wild crab.

Mr. FRANKLAND.—Would you recommend honey locust for hedging in the North-West?

Mr. CRAIG.—While I have seen very fine specimens of the honey locust in Minnesota, perfectly hardy and growing thriftily, I should not expect it to succeed in

Manitoba and the North-West when subjected to hedge pruning. In regard to windbreaks, Mr. Chairman, I think it largely a matter of locality—first, whether we shall have a wind-break, and second on what side of the orchard the wind-break shall be placed. In the North-Western States experience is teaching orchardists to plant their fruit trees on northern slopes, with shelter belts on the south and west sides. The northern exposure prevents the trees starting into leaf under the influence of unusually warm weather in early spring to be nipped by late frosts. The south and west protection mitigates the effects of the drying winds so prevalent during May and June in Manitoba and the North-West. Prof. Farnow's paper excellently illustrates this principle. Wind-breaks in any locality should not be crowded against the orchard; they are designed to protect, but are better at a reasonable distance.

This morning we had the subject of growing forest trees discussed from the home supply standpoint. I would like to add a few thoughts especially in the interest of the commercial grower. The ground should be deeply ploughed and well pulverized to favour deep rooting. The seeds should be planted in rows 2 feet apart covered with 2 or 3 inches of soil. To get rid of the first troublesome crop of weeds go over the rows with steel rakes removing the upper crust. The young seedling will then appear before the second growth of weeds. Good cultivation is all that is needed afterwards. Soft maple and elm seed should be planted as soon as ripe, about 1st June, and will make a growth of from 6 to 18 inches the same season. Box elder, ash and other varieties ripening their seed in autumn should be planted in the fall. If kept in a dry condition over winter they do not germinate readily. This is especially true of ash. Millions of forest trees are annually raised in this way by western growers and sold at rates ranging from \$1 to \$5 per thousand.

Mr. PETERS.—Our experience in New Brunswick is, that if we want to grow a really good fruit, particularly when we are not certain as to whether the tree will be sufficiently hardy for our climate, we select a northern and eastern slope—the more northern the better. We hold the tree back as far as possible until the weather gets sufficiently warm, so that when the bloom comes out it will not be affected by the frost. Thus far we have never required any particular shelter in either of the quarters of the orchard. Speaking of the maple and other trees for planting, I am sure that if there is any section of this Dominion that wants a nice lot of maple trees we could furnish them. We have no difficulty in propagating trees if we transplant in the spring. We invariably fail if we transplant in the fall.

Mr. WILLIAM THOMPSON, London.—Mr. Phipps has referred to the benefit of wind-breaks in fruit-growing, and I would like to mention a curious matter to the Convention. I have been greatly interested during the past summer in noticing the effects of a row of maple shade trees, on the west side of a turnip field, on the growing crop. The trees were about 30 feet in height, and while the turnips in all other parts of the field were growing fairly well, a strip of from 25 to 30 feet from the maples was entirely without crop. At one point, where half a dozen maples had been killed from some cause, the roots were growing fairly well up to the fence. In another field a large ash tree, growing at the north end of the turnip patch, had produced similar results over an area of 20 to 30 feet around it, the ground here being entirely bare, although in the rest of the field the crop was growing well.

Mr. R. W. STARR.—The children who pick for us know where to find the best raspberries, namely, on the north side of the bush. That is a hint to those who have been trying experiments with wind-breaks.

Prof. SAUNDERS.—Mr. Peters' experience is so different from some of the other gentlemen that it shows the importance of the remark that was made, I think by Mr. Phipps, on Mr. Farnow's paper, that we have to consider this question from the point of locality and climate. In New Brunswick and Prince Edward Island they have abundance of water. The English thorn grows there remarkably well. They have nice hedges there, hedges that we could not produce in Quebec or Ontario, much less could they be grown in Manitoba and the Territories, where they would not survive a winter. I suppose we have fourteen or fifteen different climates in this Dominion, from the Atlantic to the Pacific, and before we can give advice as to any particular locality we should know what the climate is.

Mr. PHIPPS.—In Massachusetts they are raising pine forests from pine seed, while, if we attempted it, it is doubtful if we could get a forest at all. The conditions there must be different, and they must be different with me compared with some of the gentlemen who have spoken. I have grown many thousands of bushels of turnips, and grown them so big that eight would fill a flour barrel, and we grow them close to the bushes. Certainly, under other conditions shade might do harm. We must not be too greedy in this matter in cutting the corners of the field. I do not come here with the idea of instructing a learned body like yourselves, but I know you are an influential body, and I want your co-operation in pushing the principles of forestry among the people.

Prof. SAUNDERS.—Before we go on to the next paper I would like to remark that provision has been made to carry out, to a limited extent, the suggestion made by Mr. Phipps, in regard to the distribution of trees in the North-West; and this year, as an experiment, 100,000 young trees will be sent to the western plains to begin with. Circulars were sent out this morning to the newspapers of the North-West, asking farmers who wish to have these trees to send in their names. This is probably one of the best and most important departments of work which could be undertaken here. It is done largely in Europe, where trees are not so much needed as in this country. When once the distribution is begun I think the people will look for it, and demand it in future in an increasing degree.

Mr. PHIPPS.—I am very glad to hear what Mr. Saunders has just said. To make such a movement successful I do not know that it could be put in any better hands than those of Prof. Saunders himself.

COMMITTEE ON LEGISLATION REPORT.

Mr. WOOLVERTON.—I desire to present, at this stage, the report of the Committee on Legislation. The Committee on Legislation beg to make the following recommendations:—

(1). That all packages of fruit imported into Canada from the United States be properly branded "American" at the Customs, and thus prevent such being exported from this Dominion as Canadian fruit, in order that our fruit may in time establish a reputation for itself; and further, that such fruit re-packed and branded as Canadian fruit be confiscated.

(a). That a copy of this recommendation be sent to the President and Secretary of the Dairymen's Association, to see how far the principle would apply to dairy products.

(2). That more accurate and complete statistics be gathered in relation to the products of the garden and orchard, showing the quantity of every kind of fruit, large and small, grown in each Province, and the quantity of the same exported or imported into the Dominion.

(Signed)

CANON FULTON,

Chairman.

The PRESIDENT.—You have heard the report of the Committee on Legislation. What is your pleasure in regard to it?

His Honor Judge MOSGROVE, Ottawa.—I would merely suggest to the committee to add a penal clause for the offence of re-packing and re-branding American fruits as Canadian. I would not simply confiscate them.

Mr. WOOLVERTON.—This report is as far as the committee goes. Of course it is open to any other gentleman to suggest additions.

Judge MOSGROVE.—Do you think that simple confiscation would have the effect of preventing the wrong. I hardly think so.

Mr. FRANKLAND.—I move the adoption of the report.

Mr. CASTON.—I second the motion.

Judge MOSGROVE.—There is no doubt about it, although I have very little experience in these matters, that in order to prevent this practice, you will have to

provide some severer punishment than simply confiscation. I would, therefore, respectfully suggest to this meeting that a punishment should be attached to the offence of re-branding American apples as Canadian. Of course, re-branding fruit is not an offence of itself; it has to be created an offence by legislation. If the offence is created and put upon the party who does the wrong, you do not punish the man by simply confiscating the article, and you are affecting, not the man who is the wrong-doer, but the man who owns the fruit. As a consequence, a man who does the wrong goes unpunished. I would therefore move, seconded by Mr. Denton, that the report just read be amended by adding to the first clause the following: "That it be further recommended that a penal clause be added to the proposed legislation in addition to the confiscation therein mentioned for the offence named." This matter is not going to be dealt with simply by us; it is for the House of Commons to deal with, and therefore they may put in a fine or imprisonment according to the heinousness of the offence. I think this is a very serious matter in this country. They may punish the offence by imprisonment for one, three, four or six months, or by a fine, as they may think proper, but if you simply deal with it by confiscation of the goods you by no means touch the offender, as he goes scathless. A great many questions would arise in respect to the confiscation of goods. Who, may I ask, is to have the power to say that they should be confiscated.

Mr. FRANKLAND.—Would not the common law apply to the case?

Judge MOSGROVE.—The common law of England would certainly not touch it. There is nothing wrong in it as it is. You have to create the offence.

The amendment was put to the meeting and declared carried. The report, as amended, was then adopted.

The PRESIDENT.—We shall now have a paper on "Trees and Plants for the Cold North," by Mr. J. C. Chapais, of St. Denis, Kamouraska.

Mr. CHAPAIIS then read the following paper:—

TREES AND PLANTS FOR THE COLD NORTH.

Mr. CHAIRMAN AND GENTLEMEN,—Very probably I am, amongst all the persons here assembled, one of those practising arboriculture in one of the most northern regions of the Province of Quebec.

St. Denis, in Kamouraska County, where I live, is situated ninety miles below Quebec, in $47^{\circ} 30'$ of latitude.

I have thought that it would be of some interest for fruit-growers present to know what trees and plants our severe climate allows us to cultivate with success.

Nobody will be surprised to find out how comparatively small is the number of those trees and plants when I will tell you that our winters gratify us, sometimes, with a temperature as low as 30° F., and are always very severe.

Our summers are short, and we have protracted autumns, without snow, very cold, with alternation of freezing and thawing, causing more damage to vegetation than the most severe cold of winter, which we experience only when the soil is covered by many feet of snow.

Now that I have given you an idea of the conditions under which we make our horticultural and fruit-growing work, I will point out the different varieties of trees and plants which we cultivate with good results:

Apples.

Summer.—Duchess of Oldenburg, Peach, Red Astrachan, Summer Calville, Tetofsky.

Fall.—Alexander, St. Lawrence.

Early Winter.—Fameuse, Hermine, Wealthy.

Late Winter.—Winter Calville.

Crab or Siberian.—Hyslop, Montreal Beauty, Transcendent, Whitney.

We are testing other comparatively new varieties, especially of Russian apples. Time only will tell what they are worth to us.

Pears.

Clapp's Favourite.—Summer Doyenne.

Pear culture will never amount to anything more than an amateur culture in our region. The two varieties here mentioned grow and give fruit since many years in a few localities around our place. I am testing them now in my own orchard.

Plums.

Blue.—Damson or Orleans, Imperial, Lombard.

Yellow.—Imperial Gage, Orleans, Reine Claude.

A curious fact to mention is that all the plum-trees just named live much longer in our latitude than they do in the Montreal or more southern regions.

Cherries.

French cherry.

No other cherry can compare with this variety in our region, either for productiveness or good quality of fruit. It is considered to be the same as Early Richmond.

Gooseberries.

Green.—Downing.

Red.—Houghton.

Currants.

Black.—Black Naples.

Red.—Cherry.

White.—White Grape.

Raspberries.

Red.—Antwerp.

White or yellow.—Orange.

The last variety named is, as far as we can judge, of French origin, for it is cultivated in our gardens from time immemorial. It is the best and most hardy known to us.

Grapes.

Black.—Champion, Hartford.

Grape culture is impossible below St. Roch des Aulnaies, L'Islet County, next to our Kamouraska County, seventy miles below Quebec. Even from Quebec to that place it cannot be anything but an amateur culture. The vine withstands well our winters, if mulched with earth, but it does not ripen its fruit every year.

Strawberries.

Red.—Sharpless, Wilson's Albany.

White.—White Alpine.

The White Alpine strawberry is *remontante*, a French word, meaning that it gives two crops in one summer. It is very hardy, withstands well our winters without mulch of any kind, and is of a rich and extraordinary aromatic flavor.

Cranberries.

For wet land.—Bell.

For dry land.—Cherry.

To complete these notes, I will now give the names of a few ornamental trees and shrubs not belonging to our region, but well acclimatized.

Ornamental Trees.

Butternut (*Inglans cinerea*), Cut-leaved Weeping Birch (*Betula pendula laciniata*), Horse Chestnut (*Aesculus hippocastanum*), Kilmarnock Weeping Willow (*Salix*

caprea pendula), Lombardy Poplar (*Populus pyramidalis*), Locust-tree (*Robinia pseudo acacia*), Ash-leaved Maple (*Negunda fraxinifolium*), Norway Spruce (*Abies excelsa*), White Poplar (*Populus alba*).

Ornamental Shrubs.

American Ivy or Virginia Creeper (*Ampelopsis quinquefolia*), Berberry Bush (*Berberis vulgaris*), Bladder Senna (*Colutea arborescens*), Dogwood (*Cornus sanguinea*), Double-flowering Plum (*Prunus triloba*), Honeysuckle or Woodbine (*Lonicera caprifolium*), False Syringa (*Philadelphus coronaria*), Indian Currant (*Symporicarpus vulgaris*), Persian Lilac (*Syringa Persica*), Rose-coloured Weigelia (*Dierilla Rasea*), Snowball (*Viburnum opulus sterilis*), Snowberry (*Symporicarpus racemosus*), Upright Honeysuckle (*Lonicera tartaricum*), White Lilac (*Syringa vulgaris alba*).

In the vegetable garden we can grow almost all the ordinary plants under cultivation in the Montreal and more northern regions of the Province without starting them in the hot bed. But then we can get cabbages ready to eat only in September, and cabbagers only at the end of August. If we like to have them earlier we have to sow them in a hot bed, and so we have to do with cauliflower, celery and leeks.

The six following kinds of vegetables it is impossible to grow at all, because they give only very poor products for want of heat and on account of the shortness of the summer: Artichokes, Egg Plants, Melons, Peppers, Tomatoes, Watermelons.

In the flower garden thirty-one families of plants supply us with fifty-four varieties of hardy perennial flowers, bearing without any protection, the inclemency of our winters.

Foreigners living in Europe in the same latitude as we do must think that we are not much favoured by nature, from an horticultural point of view. In fact, if we follow the isothermal line running through the regions under the same climatic conditions as we are, we have to go as far north as Stockholm, in Sweden, to 60° of latitude, a difference of 12° 30' in our latitude.

Mr. CASTON.—It is surprising to find how many varieties it is possible to grow in 47° north latitude. They are certainly not tied down to a few varieties after all.

Mr. FISK.—I was surprised to hear Mr. Chapais say that the Lombard plum grows there.

Mr. CHAPAIIS.—It grows quite well there.

Mr. FRANKLAND.—About what size is the white strawberry?

Mr. CHAPAIIS.—It is rather small, but we hold to it because it bears heavily, and it is such a hardy variety.

Mr. CASTON.—Does it grow two crops in the season?

Mr. CHAPAIIS.—Yes; it bears in the beginning of July, and we have berries all the time on the bush until the beginning of September.

Mr. R. W. STARR.—What is the average snow fall in your section of the country?

Mr. CHAPAIIS.—In the open country 5 feet; in the woods 7 or 8 feet.

Mr. R. W. STARR.—I think that is a solution of the question. If we had that protection in Nova Scotia we should be able to grow fruits that we cannot do now.

Mr. CASTON.—Do the apple trees yield well there?

Mr. CHAPAIIS.—Not so well, of course, as around Montreal, but then the fruit is very good. Of course, I am not speaking from a commercial point of view. Our aim is simply to supply local wants. I do not think we shall be able to make a commercial affair of it, except, perhaps, for strawberries.

Mr. CASTON.—Have you any other grape that will ripen as early as the Champion?

Mr. CHAPAIIS.—The only work we have done with the grapes is in growing the Champion and the Hartford.

Mr. FISK.—In Kamouraska County they are more than a month later than we are in Montreal.

SMALL FRUITS AND THEIR COMMERCIAL VALUE IN ONTARIO.

The PRESIDENT.—The next paper will be on "Small Fruits and their Commercial Value in Ontario," by Mr. A. M. Smith, of St. Catharines, President of the Ontario Fruit Growers' Association. In his absence it will be read by Mr. Woolverton.

Mr. Smith's paper was as follows:—

Mr. CHAIRMAN AND GENTLEMEN,—I have been asked by your committee to give a paper on the commercial value of small fruits; but from want of any reliable statistics or data, I can give nothing more than a rough estimate or calculation of the money value of this class of fruits grown in the Dominion, and I have concluded to give you instead a few thoughts and suggestions in regard to their economic value and the importance of paying more attention to this branch of horticulture. In regard to the healthfulness and necessity of those fruits I think there can be no question. The former is endorsed by the best medical authority and the latter by the best housekeepers and cooks in the country, and coming in a season when there is scarcely any other fresh fruits makes them doubly valuable; and it is a wonder to me that the tables of Canadians, particularly those of our farmers, who have every facility for growing them, are not better supplied. Of course, when the country was new and farmers were busy clearing their land they had an excuse for not devoting their time to their cultivation, particularly as there were in most places sufficient wild berries to supply their wants—besides the newer and better sorts had not then been introduced. But now that the country is cleared up and the wild ones have disappeared, and there are plenty of choice kinds that can be cultivated with less trouble than it would take to go to the bush to hunt up wild ones, how is it that nine-tenths of the farmers of Canada do not grow enough small fruits for their own consumption, to say nothing of growing them for market? I will venture the assertion that not one farmer in fifty, take this Dominion through, has a bed of strawberries on his farm, except they may be wild ones; and I will venture another assertion, that there is not one farmer in 500 but what would eat a good sized dish of strawberries and cream twice a day for a month if they were set before them and their wives, and families. Wouldn't their mouths water for a dish once a week if they could get them? And a very little trouble and expense would supply them with these and other small fruits throughout the season. But you ask these men, why don't you plant berries, currants, &c., and they will tell you they can't afford to buy the plants—or they have not time to tend them; while at the same time they are spending more for plug tobacco and poor whiskey every year than it would take to buy plants enough to plant an acre, and they spend more time loafing around the bar-rooms and corner groceries than it would take to cultivate them. But I am happy to say there is beginning to be an improvement in this direction. Occasionally a farmer visits some of his friends in town and stays to tea, and gets a taste of strawberries (townspeople, who have no land—you-know can afford such luxuries), or visits a more progressive neighbour's garden and sees them growing, and the next year he plants a few, and thus it is spreading a little, and I am in hopes that in a few years farmers will begin to eat fruit, as well as those who have no land to grow it on.

One thing that makes the growing of small fruits of importance is that they will succeed in many sections of our country where larger fruits cannot be grown, on account of the severity of the climate; and with the present methods of canning, evaporating and preserving fruit, there is scarcely a settler in any part of this wide Dominion who could not grow enough of some kind of fruit to have a supply the year round. There has been a great increase in the varieties of small fruits in this country within the last few years. It is within the memory of most of us when all the cultivated varieties of strawberries and raspberries could have been counted on our fingers, and the currants on our thumbs. But now they are numbered by hundreds, and every year brings out a score of new ones, clamouring for public favour. 'Tis true but few of them are superior or equal to many of the old varieties, and many soon drop out of the list and are lost sight of; but some come to stay, and are real acquisitions and improvements on the old, and in this way great advancements

are being made. Some of our skilled hybridists such as the late Charles Arnold, P. C. Dempsey, Prof. Saunders, and others, have demonstrated what can be done in hybridizing and producing new and valuable fruits, and I believe that within ten years we shall see greater results in this direction than we have in the past, and I believe we have a great help in the testing and introducing of new fruits in your Experimental Farm. Heretofore this business has all been in the hands of interested parties who had the plants to dispose of, and in many cases they have cared more for filling their own pockets than for the success and value of the fruit, or the interest of the purchaser, and the consequence has been that much time and money has been expended in growing what has proved to be worthless. But now we can be assured that the tests made under the supervision of Prof. Saunders and the values placed upon them for this and similar climates can be relied upon, and I only regret that we have not a branch or a similar station in Western Ontario, where we could have tender varieties of fruit, such as peaches, pears, plums, grapes, as well as small fruits that cannot be grown here on account of the severity of the climate, tested and disseminated, and I sincerely hope and trust that our rulers will soon see the importance and necessity of this work, and grant us this boon.

In regard to the growing of small fruits for market, many of us know the time when our towns and cities were chiefly supplied from the States, and farmers thought that growing small fruits for market was small business. I well remember that when I planted my first acre of strawberries at Grimsby less than thirty years ago that my neighbours thought that I was crazy or a fool. But when they saw I realized more from that one acre than they did from ten acres of wheat they thought I was not so foolish after all, and to-day there are scores of them in just such foolish business, and now our markets are well supplied with all kinds of small fruits of our own growing, and during the past year we have exported over \$75,000 worth to our neighbours; and from what information I have been able to gather I am sure that the value of the amount consumed in the country would not be much less than \$1,000,000 annually. But this amount ought to be double what it is, and I am satisfied it will be in a short time. Settlers in Manitoba and the North-West are beginning to find that these are nearly the only fruits they can grow successfully, and they are planting largely, and the Ontario Government has been sending out missionaries among the farmers at their various institute meetings in different parts of the Province, and many of them have been converted, and are actually going to plant out berries enough for their own use, and perhaps some to sell, and there are indications of a general revival in this branch of horticulture; and it becomes those who are leaders in fruit growing to render all the assistance they can, to give information in regard to best varieties to plant, to encourage the growing and testing of new varieties and their dissemination, to give instructions in regard to cultivation, &c. I have said nothing about varieties or the profits of growing small fruits, taking it for granted that those assembled here know as much as I do about these things. My object is to stir up more interest in them and show their value and importance to the country at large, and teach the people not to "despise the day of small things," particularly of small fruits, and if I can do this, even in a small way, my object has been accomplished.

Mr. PETERS.—Will you give us some idea of the yield of strawberries per acre; What is a fair yield?

Mr. WOOLVERTON.—The average yield in southern Ontario would be, perhaps, 2,000 quarts per acre, although in special instances, with careful culture; we have as high as 4,000 and 5,000 quarts, and I have known even as high as 8,000 quarts obtained. But that is only under special circumstances, on soil specially adapted and after excellent care and cultivation. It is only in rare instances that they can succeed in getting such results.

Mr. PETERS.—Then, as to your mode of cultivation?

Mr. WOOLVERTON.—The mode of cultivation with us is generally in matted rows, which we keep rather narrow. We give them as much manure as we can possibly afford. That is about the rule. Of course, the ground should be well worked up a year previous to the strawberries being put in.

Mr. PETERS.—How long do you keep them in the same crop?

Mr. WOOLVERTON.—We give them about two crops; then the land is planted with something else.

Mr. STARR.—What is an average crop of raspberries?

Mr. WOOLVERTON.—I do not do much with raspberries, but I think I would get fully as many raspberries from an acre of land as strawberries.

Mr. STARR.—More than 2,000 quarts?

Mr. WOOLVERTON.—Yes; perhaps 3,000.

Mr. PETERS.—What will they average per quart?

Mr. WOOLVERTON.—They vary in different seasons. One season I averaged 10 cents for the whole crop, another season 8 cents, and I have averaged as low as 6 cents.

Mr. PETERS.—In making a new plantation, what distance do you put them apart?

Mr. WOOLVERTON.—We plant our strawberries 1 foot apart in the rows, and the rows about 3 feet apart. We take two crops of fruit off, as a rule, and then plough it.

Mr. PETERS.—You plant in the spring?

Mr. WOOLVERTON.—We plant as early in the spring as convenient.

Mr. PETERS.—Do you call that one crop?

Mr. WOOLVERTON.—No; there is no crop that year. The first season we allow them to run until we have a sufficient number of plants ready for the plantation for the next two years.

Mr. PETERS.—What is the nature of your land?

Mr. WOOLVERTON.—Sandy loam.

Mr. CASTON.—What is your best raspberry?

Mr. WOOLVERTON.—The best market raspberry in the Niagara peninsula is the Cuthbert.

Mr. CASTON.—I think the Turner is harder than the Cuthbert.

Mr. FRANKLAND.—The Cuthbert is rather tender.

Mr. WOOLVERTON.—The Turner is a very excellent raspberry for home use, but is not quite so firm as the Cuthbert.

Mr. PETERS.—How do you protect strawberries in the winter time?

Mr. WOOLVERTON.—We cover them with a strawy manure.

Mr. PETERS.—Did you ever attempt to put rail fences, running east and west, 3 rods apart?

Mr. WOOLVERTON.—No.

Mr. PETERS.—Do you have snow all winter?

Mr. WOOLVERTON.—No.

Mr. PETERS.—We adopt that plan in New Brunswick.

Mr. WOOLVERTON.—It collects the snow, I believe.

Mr. PETERS.—Yes.

Mr. WOOLVERTON.—It would not do with us. We have had no snow at all this winter.

Mr. CASTON.—Have you tried mulching the gooseberries and currants?

Mr. WOOLVERTON.—I have never tried it. They are not affected by the winter with us at all.

Mr. CASTON.—Mulching with top manure, or anything of that description, is supposed to help the crop.

Mr. WOOLVERTON.—I find coal ashes useful in that way.

Mr. CASTON.—They are good to mix with the soil, but as a top dressing for the strawberry nothing is equal to good barnyard manure well rotted.

Judge MOSGROVE.—How do you leave your rows?

Mr. WOOLVERTON.—My plan is now to harrow them down more than I did at one time. Formerly I left them as wide as possible, by having a wide row and a narrow walk. Now my plan is to keep the rows rather narrow—say, down to about 10 inches.

Mr. PETERS.—You do not allow the plants to get thick in the row?

Mr. WOOLVERTON--No. If you allow them to get wide, those in the centre obtain no benefit of cultivation. It is best to keep cutting the runners off after you have as many plants as you wish.

Judge MOSGROVE.—In regard to the cultivation of the strawberry, I have been adopting a different course at my place. Lately I have been planting the rows four feet apart and then rolling the rows over, not ploughing up. On one side of the row I have dug a trench and put manure in, letting the runners go over it, so that they take root there next year and then I cut out the old one. The great difficulty I find in carrying out that system is, that my men will not cut out the old, worn-out plants. This year I have adopted rather a different course. I have put pins down where they have cut them out, so that I can trace in the future by means of these pins, what has been done, and can compel the men to cut out the old ones. I was happy to hear Mr. Peters speak about the fences which they use in New Brunswick. Among my own crops I have 2,400 yards of fences running all through the eight acres.

Mr. WOOLVERTON.—I see that Mr. Smith has just entered the room. He left in my hand a resolution which grows out of the paper which has just been read, and perhaps it would be wise to introduce it at this point.

The PRESIDENT.—The following motion has been presented for consideration. Moved by A. M. Smith, seconded by L. Woolverton:—

"That whereas there has been and is a great loss to the Canadian farmers and fruit-growers in the introduction of new fruits by parties interested in the sale of trees and plants, which, upon being tested, have been found to be worthless, and thus a great amount of time and money have been wasted; be it therefore resolved, that while we believe the Government, through their Experimental Farms, are doing all they can in the way of testing fruits for their adaptation to this and similar climates, still we realize that the tests made here, owing to the severity of the climate, do not meet the wants of the great fruit-producing portions of our country. We therefore regard it as very essential to the welfare of this industry and the country at large that a branch experimental station should be established somewhere in southern Ontario, where not only tender varieties of fruits could be tested, but also grains and vegetables which cannot be produced in more rigorous climates."

Mr. A. M. SMITH.—I do not know that it is necessary to take up much time in explaining that motion. I think you can all understand for yourselves that Ottawa, where the Experimental Farm is located, is not the situation where they can grow many of our choice varieties of fruits. We deem it very necessary that those varieties which are constantly coming before the public should be tested in some way before they are sent out, before parties invest their money in them. A great many of us know to our sorrow that varieties which have been offered to us, and recommended very highly by men in high positions in the horticultural world, when we come to grow them in our locality they have turned out to be worthless; the large price we paid for them and the time we have expended is all lost. We all know the pains that is being taken at the Experimental Station, at the expense of the Government, to test the different varieties of fruit and, in fact, everything in the agricultural line, and we can all see that this climate here is not adapted and never can be adapted for testing a great many varieties, not only of fruit but of grain and vegetables. Hence the necessity for establishing a branch Experimental Farm. This thing is being done in the States of the neighbouring Union to a large extent. I would like to hear an expression of opinion on this point.

Judge MOSGROVE.—Would not the Guelph Experimental Farm station do the experimenting that you require?

Mr. SMITH.—I am sorry to say that the Guelph Farm is very little, if any, better situated for testing the varieties of fruit to which I refer than the farm here at Ottawa. A few varieties of apples may stand the climate of Guelph, but peaches are altogether out of the question. Many varieties of apples, pears, plums, grapes, cherries, and other small fruits will not succeed there at all.

Judge MOSGROVE.—Can you grow grapes in the Niagara district which we cannot grow here?

Mr. SMITH.—We can, and without protection. I have no doubt you can grow a great many varieties of grapes here by laying them down in the winter, but where we grow grapes by the fifty acre lots, as they do in the Niagara district, that would be an almost endless job.

Mr. BEALL.—We have a great many varieties growing in the Lindsay district, but of course they succeed a great deal better when they are covered up in winter.

Mr. ALLAN.—I think there is a great necessity for something being done on the lines suggested by the resolution. Fruit growers generally know what it is to experiment themselves. We know how costly it is; we know how long it takes to gain the knowledge required, and in gaining that knowledge we lose a good deal of time and money. By the establishment of an experimental station of this description somewhere in southern Ontario it would cover the requirements of a very large portion of the country. A test made there would not only be a test for southern Ontario, but for other portions of Ontario as well. It would be a test for western Ontario, and even for grape vines for this district, probably as good a test as could be made at the Ottawa farm. It would also apply for southern British Columbia, and, in fact, would be a good and reliable test for many sections of the country. For these sections that grow for commercial purposes there would be more value got out of a branch farm in southern Ontario than can be obtained from the Experimental Farm here, from the tests which have been made for producing the harder fruits for the colder regions. I am quite in accord with the spirit of the resolution.

Mr. SMITH.—In regard to the farm at Guelph, there is a gentleman here, Prof. Panton, who can tell us what success they had with the fruits there.

Prof. PANTON.—I really could not tell you the success of our trial there, but I published it in a former bulletin. We started out with some ninety-six varieties and a good many of them would not ripen with us. I think we cut them down to about twelve.

Mr. SMITH.—The question is, do you regard the location at Guelph as a suitable one for testing the tender varieties of fruits, such as are grown in southern Ontario.

Prof. PANTON.—I think hardly so, for the tender fruits. With regard to the small fruits, we have had fairly good success, but none with the grapes. Peaches and pears we never attempt to grow. In regard to apples, this year we are setting out in the orchard a large number, and probably we shall have some good results.

Mr. WOOLVERTON.—This is a desirable matter to push, and perhaps the resolution should be referred to the Legislative Committee. I do not think there would have to be any great expense incurred in establishing such a branch station as has been indicated. There is such a station in the State of Michigan. Mr. T. T. Lyons, President of the Michigan Horticultural Society, sent me a circular some time ago speaking of the success they had had, and I do not see why it is not a practical thing that we should have one.

The resolution was unanimously adopted.

The PRESIDENT.—I think if we transmit the resolution to the Minister of Agriculture, with the proper representations, it will suffice. The next paper will be by Mr. Thomas Beall, of Lindsay, on "The Suitability of the Climate of Ontario for the Propagation of Grapes for Wine."

Mr. BEALL.—I should state that the title of the paper as just announced, and which appears on the programme, is not as I gave it in. Owing to severe illness in my family I had not the time to get up all the particulars that I would like to have obtained on the subject, and, with the permission of the Convention, I will change the title of the paper to read:

THE GROWING OF GRAPES FOR WINE IN ONTARIO.

Grape culture in this Province is capable of expansion to almost an unlimited extent. We have thousands, perhaps hundreds of thousands, of acres of land where

the soil, the elevation and the climate is as well suited to the successful prosecution of this industry as in the greater portion of the wine districts of Europe.

It may therefore be reasonably asked: Why grape-growing is not more extensively pursued in this Province?

If this question were asked of the grape-growers in Ontario, individually, each person would probably give a different answer.

A gentleman in the County of Essex, one of several to whom application was made for information respecting the subject of this paper, gave five reasons why there was not a greater acreage of vineyard in that county: "(1) Want of enterprise; (2) Ignorance of the culture of the grape; (3) A feeling that the business will be overdone; (4) Want of confidence in the wine trade; (5) Discouragement from poor returns from the commission sharks of Toronto and Montreal." The 1st, 2nd and 5th reasons are well known. The 3rd and 4th call for a few words of comment.

The 3rd reason, "A feeling that the business will be overdone," is a probability which every intelligent grape-grower should carefully consider; for, if immediate provision for the manufacture of Canadian wine be not at once made on a larger scale than at present, and a much greater amount of commercial tact, capital and scientific knowledge brought into requisition, the production of grapes is already overdone—in proof of which I need only point to the fact that many tons of grapes were sold in Hamilton in 1888 at from 1 ct. to $1\frac{1}{2}$ cts. per pound. But as long as grapes, such as Concord or Worden, can be readily disposed of at from 2 to $2\frac{1}{2}$ cts. per pound (and wine-makers can well afford to purchase at that price) grape culture will be one of the most profitable industries in this country. For, at that price a net profit of \$50 or \$60 per acre can be realized; and, as good, sound wine can be made for much less than 50 cts. per gallon with grapes at that price, wine-making should be at least as profitable as grape-growing. Concord grapes can be profitably produced, on a large scale, at one-half the price quoted.

My friend's 4th reason, "Want of confidence in the wine trade," should be enquired into.

A good deal of the Canadian wine in the market is of fair quality. Occasionally a sample of good quality is met with, but its general character is so uncertain that it is impossible to duplicate the sample from another year's vintage from the same maker. No two makers pretend to make wine alike in character, and the same maker does not produce a similar wine two years in succession. Hence, the reason why Canadian wine has no fixed commercial value. The Pellew Island wine is sold from 60 cents to \$2 per gallon, when all might be worth the highest price—perhaps more. It is no wonder, therefore, that "no confidence can be placed in the wine trade."

At the last winter meeting of the Ontario Fruit Growers' Association, at Windsor, the members had an opportunity—through the kindness of some of the leading wine-makers of that locality—of sampling several varieties of their wines. Some samples were sweet and insipid enough to please the most intolerant of prohibitionists; others were of fairly good quality. A few were really very fine wines. Two samples especially, which were presented by Mr. Ernest Girardot, were very superior wines—so good, in fact, that if a maker succeeded in making a wine of that identical character continuously, it would, as soon as it became known, bring a higher price than the best light European wine now in the market; which goes far to prove what has often been stated by experts, that the most of our grapes contain an abundance of all the necessary elements for producing a first-class wine—the sugar, the acids, the tannin, and the etheric or fragrant oils.

The expense of producing the best wine is but little, if anything, greater than for the production of the poorest. The principal difference in the quality is in the amount of correct scientific skill brought to bear in its production.

The limit of profitable grape culture for dessert purposes has now been reached, unless new markets can be opened for the surplus. Manitoba and the North-West Territories is the hope of many; but their hopes will be in vain, until just and equit-

able freight rates can be obtained from our public carriers. At the present time the rates for certain goods, fruit especially, is exorbitant, even when obtained at privileged points; but at other places, where there are no competing lines, the rates charged for the same class of goods is positively prohibitory. I will mention one case. The express rate last summer on a certain kind of fruit from Toronto to Portage la Prairie, and also from Grimsby to Portage la Prairie, was \$3.25 per 100 lbs.; while from Lindsay, even after the agent had kindly obtained a specially reduced rate, it was \$6.75 per 100 lbs.

The hope of the grape-grower is therefore in the establishment of wine-making at central points on a large scale, so that the whole crop may be sold at once in bulk for cash. If this were done grape culture would advance in extent unequalled by any other branch of horticulture, and the thousands upon thousands of acres of land unexcelled for grape culture in the world, which are to-day nearly worthless, would in a few years become more valuable than the best wheat lands in the Province are at present.

One of the largest grape-growers for dessert purposes in Ontario was told a year or two ago that a company was about to be established in his locality for the making of wine on a large scale; and in order to secure a sufficiency of fruit the company would require a number of persons in that locality to contract with the company to plant, to cultivate and to sell to the company all the fruit for twenty years, the company binding itself to purchase the whole crop in bulk for the twenty years at a price not less than 1 cent, per pound, and was then asked what he would do in the matter. His answer was: "If I can be assured of the solvency of the company, and of its ability to fulfil its part of the contract, I will plant 100 acres of grapes next spring on the conditions mentioned." I quote this as a proof of what grapes can be grown for, and also to show what this expert as well as hundreds of other persons, would gladly do.

Here, then, is an opportunity for the profitable investment of capital such as does not often occur. The raw material can be obtained in abundance and at a price as low as can be desired. The cost of manufacturing is small in proportion to the capital invested, and the market for the manufactured article unlimited, and also with a certainty that the profits will be all that any person could reasonably ask, with a certainty of their continuance for generations to come.

Mr. PETTIT.—I quite agree with the remarks made by Mr. Beall in his paper in regard to the large area of country in Ontario suitable for grape-growing. It covers a far greater extent of country than many of us imagine. In replies which I have received when asking for information in order to prepare a paper on grape growing in southern Ontario, I was really surprised to find the large tracts of country where the climate and soil are suitable for this industry, and I believe that the wine-growing industry of Ontario has a great future before it. I believe that when prejudice can be driven from the minds of our people that the thousands of dollars which is now paid annually to foreign countries for their wines will be kept within the Dominion. There have been so many new and early varieties, and hardy varieties, that the territory for grape-growing is almost unlimited.

Mr. KEW.—I do not pretend to be a grape grower, but I cannot help agreeing with remarks made as regards the profits which may be derived from grape-growing. Mr. Beall made a statement that a cent a pound profit would suffice. I heard a statement made at the convention at Grimsby a few years ago, and it was laughed at by a great many. I thought at that time that we could not grow grapes for less than 5 cents a pound. Since grapes have come down in price to an average of 4 cents for Concordes, taking the crop all through—sometimes they come down to 3 and 2 cents—surely there must be profit in the vineyards when so many are being planted. In California, a country we hear so much about, and where the conditions are so favourable to fruit growing, they are still planting grapes and growing them. They plant and grow them under a different system than we do here, but they cannot grow more to the acre than we do. They feel well satisfied and are making a good fair profit when they can get from half to three quarter cents a pound.

Rarely does their price exceed three-quarters of a cent per pound, and when we consider the expense there, the high price of land, and the difficulty of getting the land into cultivation, as it is a very hard soil to work and requiring irrigation, for them to be satisfied with that price should induce us to be content with a cent a pound. The irrigation canals in California are built by the State authorities, and the growers are charged so much for irrigating their land, according to its size. All these expenses considered, also the high wages for employees, which must be a tax upon them, why should not we, the grape-growers of Canada, be satisfied with a cent a pound when we have all these advantages. I quite agree with the remarks of Mr. Benli.

Judge MOSGROVE (Ottawa).—I suppose I am the most extensive grape-grower in this part of the country, but when I hear gentlemen like Mr. Smith, coming from a section of the country where they have vineyards in fifty acre lots and larger, I hardly feel justified in saying anything on the subject. My experience has been but of a few years. I knew nothing about grape-growing until I happened to purchase a small tract of land a few miles from Ottawa, and I went there to reside, but not with the intention of planting a vineyard or anything of that kind. However, I took a fancy to grapes, and have now under cultivation ten acres. I had had no experience or knowledge whatever of grape culture, except from my reading, and, at first I laboured under many great difficulties. For the first few years I employed gardeners, paying them high wages, and got but little satisfaction in return. The first year I planted 168 vines, of which I have but eight or ten living. The next year I planted from 500 to 600, and of that quantity I have about 100 or 150 of the original planting left. The following year I planted 720 vines, and of those I have 300 living. This, certainly, was not promising, but I was determined to succeed if I could. I was told that grapes could not grow here, but I resolved to continue, and did continue, until I feel now that I can plant 100 vines and calculate on seeing more than 90 of them grow and bear fruit. I have got about 100 varieties on my premises. So far as my field goes, I have not more than a dozen varieties there, but in my garden and around my walks I have a large number of varieties. In regard to wine-making, I brought up from South Missouri a white wine grape—the “Elvira”—and it has succeeded beyond my expectations. It is an immense bearer, and has increased much in size. As to the quality, I cannot recommend it as a table grape, but it makes a nice white wine. I made about 600 gallons of wine last year altogether. Of the red grapes, I likewise got the “Marion.” Last year I took extra care in picking the grapes, and had the green and injured ones thrown out. In this section of the country last year, 1889, was the worst for grapes we have had since I have had anything to do with fruit. It was the only year in which the fruit did not fully ripen with me, but the two wine grapes which I have mentioned always ripen. The reason is, that they are the grandchildren of our common wild grape. The “Elvira” is from seed of the “Taylor,” which is one remove from the wild grape. I cannot give the pedigree of the “Marion.” Bush describes it as one of “Wendworts’ famous school of grapes.” That is all he says of it in his work. In regard to the effect of properly examining the grapes before they are mashed down, for several years the amount of acid ranged as high as 15 or 16 degrees, but last year, by eliminating all inferior grapes—the green and injured ones—I reduced the acid by 3 degrees, which anyone who makes wine, and knows anything about wine-making, knows that that is a great difference. It brought up the sugar to 75 degrees by Oschell’s saccharometer, and I had to put in very little sugar. Mr. McGill, the assistant Dominion Analyst analysed the wine, and finds it contains 11 degrees of alcohol. I have some very nice wine, but I have never sold any yet. I am satisfied, however, that we can make a fine wine here. As to selling it, I cannot speak, but I am going to try it this season, as I have on hand all that I made during the past six or seven years. I have made a nice sparkling wine, which does very well for passing an evening with friends, making the hours short and happy, driving dull care away. For the first attempt I have ever made in this direction I do not think it is at all discreditable. I am strongly impressed with

this, that to make a good article in wine you have to go to the Riparian family, and I believe that that is the conclusion of all wine-makers. I cannot think that grapes can be raised as cheaply as some gentlemen say to be profitable. At any rate, it cannot be done in this section of the country. As one remarkable thing in connection with grape culture here, which I would like to refer to : in all my reading, I have not read that east of the Rocky Mountains any European grape has succeeded, but I want to state that there are two grapes of the European family grown here to perfection—one is the "Chasselas de Fontainebleau," and the "Meunier." Whether any others would grow here or not I do not know.

Mr. SMITH.—Do you know anything about the grape called the "Northern Light?"

Judge MOSCROVE.—Yes; an old gentleman, Mr. Cameron, who is governor of L'Orignal gaol, found a seedling growing alongside his kitchen door, and he pulled it up and threw it away. It commenced to grow there, and the late Judge Daniels told Mr. Cameron to plant it and take care of it. He planted it again and it grew well. It produces a very fine grape, and I believe will be a very great acquisition to the grapes of this country. It ripens before the Concord a week or ten days. I have heard that a certain gentleman had control of that grape vine, but last year I was down there holding court when Mr. Cameron showed it to me, and he was very desirous of selling the vine, so that it is in the market for anybody who wants to purchase it.

Mr. R. W. STARR.—I know two vines growing in my neighbourhood in Nova Scotia, which are certainly over fifty years old. One is the Black Custard and the other the old Sweet Water. We also grow the Royal Muscatel with a good deal of success. This latter variety does very well with us. The clusters are certainly as fine as any of the American grapes, and decidedly better than the Canadian, so far as I know them.

Mr. BEALL.—Can you speak of any European grapes grown in Niagara, Mr. Smith?

Mr. SMITH.—I know of none, except at Niagara-on-the-Lake. A gentleman there, of the name of Haffer, who is mayor of the town, has been successful in growing the "Black Hamburg." I have never seen them growing, but have heard of them.

The PRESIDENT.—It will be necessary for us to hold an evening session for the transaction of business, and I do not see how we can possibly hear the remaining papers on the programme.

Mr. PETTIT.—I will move that the balance of the papers be read by title, and the papers be handed into the secretary for publication in the Official Report.

Judge MOSCROVE seconded the motion.

The resolution was adopted.

The Convention then adjourned, to meet in the evening.

FRIDAY EVENING.

The Convention met at 8 p.m., the President stating that the proceedings would be necessarily short, owing to a desire of many of the delegates to return to their homes.

Mr. ALLAN.—The Committee on Transportation is prepared to report. It is not a very formal report, and it is made up of resolutions. I will just merely read the resolutions which form the report. They are as follows:—

1. The bills of lading in general use by the railroad and steamship companies carrying fruit to England contain so many exceptions and conditions, inserted entirely in the interest of these carrying companies, that they are practically worthless in protecting the interests of the shippers of fruit. We therefore recommend that a special committee be appointed to consider the matter, and invite correspondence from the various carrying companies, with a view to procuring the use of bills of lading more equitable in their conditions.

2. We recommend and heartily endorse the suggestions of Mr. Sargeant, Traffic Manager of the Grand Trunk Railway, to run regular fruit trains, similar to the

cheese trains, to the seaboard, as being most desirable in the interests of the fruit-growers and shippers; also, that only ventilated cars, with improved springs and buffers, be used on these trains.

3. That a regular committee on transportation be appointed to confer with the proper authorities of the express companies and the Canadian Pacific Railway to make arrangements for shipping fruit to Manitoba and the Territories, both from British Columbia and the Eastern Provinces, at lower rates than now prevail. That, in the opinion of this Convention the rates are so high as to practically prohibit a proper development of the fruit trade in those Provinces.

4. That if the proper facilities and accommodation in transit be provided for fruits, the possibility of extending the trade in our products with Europe is practically unlimited.

That the over-production of some varieties of fruit, notably out-door grapes, calls for more extended markets; and our Canadian markets being glutted, there is nothing to induce the increase of grape culture.

At present the grape-consuming population of Britain is limited to those who can afford hot-house grapes at a high price; and inasmuch as out-door grapes are not grown in Britain, an opening is offered there for an enormous trade. The same would apply to our melons, which are much higher in flavour than the hot-house melons of Britain, and hence would command higher prices in their markets. Our tomatoes also are larger, better in flavour and brighter coloured than those grown in Britain, and therefore, we are convinced, would take a lead in their markets. In case of a short crop in Europe of plums, pears and peaches, the accommodation asked would present an opportunity whereby we would be enabled to take advantage of the British markets.

5. That in the interest of growers and shippers of fruit from Canada to Europe it is imperative, for the greater development of the trade, in order that delicate apples and other fruits may be successfully placed upon the European markets, that steamship companies provide clean and well ventilated compartments, equipped with atmospheric blasts, for the preservation of fruit in transit; and we would further recommend that greater care be exercised in the handling of fruit packages in transhipment and delivery.

The PRESIDENT.—I think, perhaps, the best way to deal with these reports is to consider the resolutions in detail, and then we can adopt them or not.

First resolution was carried.

Second resolution was carried.

Third resolution was carried.

Fourth resolution was carried.

On the fifth resolution, with reference to ocean transport:

Mr. STARRATT.—Our great difficulty has been in the transportation of our fruit. My locality is Annapolis, which is a shipping port, and unless we get a steamer at Annapolis we are compelled to transport our apples over the railway to the port of Halifax, and we cannot have an oversight as to handling them, and the consequence is that they are put upon the English market in a bad condition. Now, if an arrangement can be made with steamboat owners, or with some central authority, by which we can get the steamers fitted up as fruit-carrying steamers, I think such an arrangement would be of almost incalculable benefit to the fruit-growers of the Lower Provinces as well as here. We know that putting seven, or eight, or ten, or fourteen thousand barrels of apples in the hold of a ship, that notwithstanding the ventilation, the consequence is they must be destroyed to a greater or lesser extent, and my own observation has led me to the conclusion that the shippers of fruit to Great Britain have been grievously imposed upon and injured, not only by the improper ventilation of the ship which carried the fruit, but also by the careless manner in which their employees handle the barrels in moving them round. Now, I have had some experience in shipping apples to England, and I have watched them, and others have watched them, and the complaint was that when the fruit was put upon the market in London or Liverpool it

was almost useless. It is the universal result of my inquiry that bad attention to the fruit has caused this, because the barrels were injured and shaken about and ill used by the employees of these vessels. Now I hold it to be of the very first consequence to the shippers of fruit, not only from Ontario, but from Quebec, New Brunswick and Nova Scotia, that it be put upon the English market without being injured. Now, there can be no possible difficulty in placing our fruit upon the English market in good condition, if the ship is arranged with proper ventilation, so that the fruit will not be heated in transit. Now, I know a proposition has been made to protect our fruit, by which it may be kept cool and thoroughly protected from the heating process; but there is one difficulty, and there is where the mischief arises, and it is from that fact that our losses occur. Our barrels are handled too roughly, and I entirely agree with any proposition whereby a judicious means of moving the fruit in transit can be procured, so as to get it in good condition on the market.

The resolution was carried.

A committee was then appointed to wait upon the transportation companies.

Mr. L. WOOLVERTON, Secretary of the Ontario Fruit Growers' Association, read his paper on

APPLE GROWING IN SOUTHERN ONTARIO.

The apples of southern Ontario are gradually gaining a world-wide reputation. In its favoured climate and fertile soil the apple is found in greater perfection of growth than in any other country in the world. So well known have Ontario apples become in foreign markets that the barrels so branded command a higher price in the British market than those of other countries. This superiority consists in the highest combination of points with regard to size, colour and quality. In some places apples grow to an abnormal size at a sacrifice of quality; in others they are firmer, and consequently longer keepers; but we claim that here these qualities are combined in a high degree of excellence. The numerous medals awarded to the Ontario Fruit Growers' Association for excellency of display and for best society collections of fruits, by the American Pomological Society, the Centennial Commission, of Philadelphia, and at the late Intercolonial Exhibition in England, bear witness to the excellence of the fruits of southern Ontario, and all have served to draw the attention of intending settlers to our fertile country.

It is well known that the further north an apple can be successfully grown the better for its colour and its keeping qualities; and for this reason a few varieties succeed better still further north. For instance, the Faneuse, that prince of dessert apples, succeeds far better in the neighbourhood of Montreal, both in size and colour, than in the Niagara district, and the Wealthy apple can be grown much larger and finer in the vicinity of Ottawa than on the southern shore of Lake Ontario. But for a long list of our very finest winter apples, the latitude of Montreal or Ottawa is too high, and would prove destructive to their very life.

Briefly, we will here mention a few of the varieties which are most highly valued for export, as grown in southern Ontario and which are here in their most northern limit of successful culture. First, there is the King, a beautiful large red apple of the most excellent quality. The writer has an orchard of this variety, now twenty-five years planted, and has found it to bring, invariably, the highest price of any apple sent forward to either the Canadian or British markets, sometimes selling in Covent Garden as high as \$6 per barrel. This last season this apple has been quoted at from \$5 to \$6 per barrel in the British markets, and even in Canada I have sold it at the rate of \$4 per barrel, f.o.b. When well grown it attains a fine size, and on one occasion, by actual count, I have filled a barrel with one hundred and eighty-four apples. But like other precious articles, the King apple is hard to get in any quantity. The tree is a scant bearer at best.

The Gravenstein, a fall apple, beautifully striped and splashed with red, of fair size and of excellent quality also, is another prime apple for export, brings almost

as high a price as the King in the British market. This apple is a good bearer, and it is a mystery why so few trees of this kind are planted.

The Roxbury and the American Golden Russet are two varieties very highly valued by the commercial orchardist. The former, when well grown, is of a good size and, when mature, of fairly good quality. Its great feature, however, is its keeping qualities, owing to which it may be kept in our own fruit house or cellars until March or April, and then shipped on to either home or foreign markets at the time when other varieties are scarce and apples are high-priced. The American Golden Russet is about equally valuable as a market apple, but is inclined of late to be somewhat affected by the apple scab, known to scientists as *fusicladium dendriticum*; and, indeed, unless this can be overcome by means of copper sulphates or hypersulphite of soda, will destroy many of our very best apples.

The Cranberry Pippin is an apple that has late highly commended itself to me as a commercial apple. It is large, oblong, beautifully striped and splashed with red, of a waxy lustre, and very crisp flesh. I find it sells at a very high price as a fancy apple. The tree is a very rapid grower, and unless well pruned and treated with potash fertilizers much of the fruit will be misshapen. I would include it in our list.

The Northern Spy has a high reputation as a commercial apple. In quality it is excelled by very few, and when clear and well grown is also a beautiful apple, but of late I have found it particularly liable to spot.

The Baldwin has had a wonderful run of popularity on account of its fine appearance, large size under good cultivation, and enormous productiveness. But of late it has not borne out its reputation in this regard, and some large orchards of this variety in southern Ontario or in western New York have been for several years almost barren. Then, the quality of the Baldwin is only second rate, and, altogether it does not seem wise to recommend it as highly as formerly.

The Greening is one of our standard winter export apples, and is hard to displace by any of the newer varieties for planting in southern Ontario. As generally grown it is not beautiful in appearance, being entirely green, and not very even in form. But in the rich sandy loam of the Niagara district it grows perfectly even in form, and takes on a beautiful red blush, so that it is number one in beauty as well as quality. It is yearly becoming more and more appreciated in foreign markets, and since it is one of the most productive of all apples, it well deserves a place among our best varieties. To show what the Greening will do under favourable conditions, I may here make mention of an old Greening apple tree in my father's orchard which, at 75 years of age, covered a space of ground 40 feet in diameter, and yielded twenty barrels of apples. It would be easy to calculate a fortune from an orchard of such trees; thus, 40 trees per acre at 20 barrels per tree, at \$1 net per barrel, \$800 per acre; 100 acres, \$80,000 per annum! Many thus foolishly exaggerate the profits of fruit culture, and I must confess to having been myself somewhat duped by reading glowing descriptions of the enormous profits of fruit-culture as given in papers and journals which are now run in the interests of the nurserymen, and not of the fruit-grower, when I sold out every head of cattle and converted a grain farm into a fruit farm.

On the whole, however, I am now, after sixteen years of patient waiting, quite contented with the result. An apple orchard I am satisfied is in Southern Ontario, the most valuable part of the farm, provided it is planted with a judicious selection of varieties, such as are indicated above. According to my experience, a fair yield per acre from such varieties as Spy, Greening and Roxbury Russet is an average of about two barrels per tree, from trees in their prime, or over twenty-five years planted. The price fluctuates considerably, according to the state of the foreign markets. For instance, in 1880 the average price per barrel in Ontario, according to the Dominion statistics, was \$2.37; in 1881 it was only \$1.50, in 1884 \$3.23, in 1887, \$1.92, and in 1888 \$2.06. Of course, this price includes the package. Perhaps it would be fair to average the net value of a barrel of good winter apples at \$1.00, and this would give, according to the above yield, an annual return from

an orchard in prime bearing about \$80 per acre. This, of course, presupposes every tree to be in thrifty condition, well pruned, well cultivated, and well dressed each year with suitable fertilizers.

For those who are situated near to our large cities, it will be profitable to grow fancy summer apples, such as the Red Astracan and Duchess of Oldenburg, which, on account of their extreme beauty, rather than their quality, command a high price in our home markets.

With regard to the extent of the apple orchards of Ontario, it is stated in the report of the Ontario Bureau of Industries that there are about 200,000 acres of orchards in the Province, and of these about 60,000 are situated in the counties bordering on Lake Ontario, about 40,000 in counties bordering on Lakes Erie and St. Clair, 20,000 in counties bordering on Lake Huron, and about 50,000 more are situated in the inland counties lying intermediate between the above mentioned. Thus it is seen that a large portion of the commercial orchards of Ontario are situated in the southern part of the Province.

The export of apples from Ontario is gradually increasing, according to the statistics in the same report. In 1880 only about 32,000 barrels were exported, and the quantity has annually increased until in the year 1888 over 226,000 barrels were exported, yielding the Province a revenue of at least as many dollars.

From these imperfect statements it will at least be evident that apple culture in southern Ontario is one of the most important industries in which the farmer can engage who is favourably situated as to climate, soil and markets, and that by such conventions as these, at which these important points are brought forward, much good will result to the Dominion, by increasing the interest in fruit culture, and thereby ultimately increasing the wealth of the country.

The PRESIDENT.—At the close of the proceedings of this meeting I feel that we cannot adjourn without my making one or two remarks with reference to the work we have accomplished and the origin of this work. As I pointed out in my opening address, the conception of this meeting originated two years ago. Those with whom the idea started, felt that there was some important work to be done by such an assemblage of fruit-growers, representing the interests in the widely-separated parts of this Dominion, and it was this feeling which urged them forward to renew the application to the Government for a grant, which at first was not granted. The application failed, however, for various reasons, and it was only by pursuing the matter that the object was finally attained. We may consider, I think, from the success which has attended this meeting, that those efforts were not in vain. In fact I think, we may hold that this meeting has been of an eminently successful character. The papers have been valuable, and the discussions have been carried on with a degree of intelligence and interest which it is very rare to find in meetings of this kind; and as one gentleman remarked to-day after he had been listening to our discussion here, he said: "I fear you are going to set up a rival House of Commons. This is a fruit parliament." This is, I think, what we may consider the highest tribunal for the decision of matters relating to the fruit industry; and I may say, furthermore, that the success which has attended this meeting, not only regarding the papers presented and the discussions thereon, but taking the meeting all around, that it is a surprise to all, and exceeds the anticipations we had of it. Of course, I looked upon this as a matter of experiment. It was a matter of experiment. When we applied to the Hon. Mr. Carling last spring for the money which has enabled us to come together here, and when he finally announced that the money had been granted, and we were making arrangements for this meeting, he said: "I suppose you will be wanting a meeting every year." I said, "That is entirely for the future. We may, but we cannot tell." I said at present we had not developed any precise plan with respect to that, but I felt perfectly confident that the interests involved in this meeting were of such an important character that if any reasonable measure of success attended our proceedings something better would result in the way of permanent organization. Now, that result has actually been attained, and we have established here indeed a permanent organization—at least, we have taken the steps necessary to that end, and it only remains to get the

substantial support of the Government in order to carry them out. Now, I look upon this movement as the most important movement that has ever been taken in Canada in the interests of fruit culture, and I now consider that the establishment of this new society is of even greater importance. It opens a very broad field of usefulness, and I say in the future the members of this society will have a noble work before them, and I feel that it is an honour to anybody to be connected with the promotion of that work. I have felt, as I have presided over this meeting during the three days we have been in deliberation, that it was certainly an honour to preside over the discussions of so eminently intelligent a body of men as we have here now. With reference to the new society, I may say that much against my own wishes the committee of organization saw fit to urge upon me the acceptance of the Presidency of this Association for the coming year. Personal considerations would have induced me to absolutely decline that, but I have always held that where a man can be of any small use in promoting the general welfare it is his duty to do so, even if it be by sacrificing his own personal convenience, and it was in that spirit that I finally consented to accept the office, which was thus most kindly presented me. I may say that I consider this office given to me is one of very great honour, and it will be my duty or my endeavour during the coming year to do the best I can, in my own small way, to promote the very large interests which are entrusted to me as President of this new society. (Loud applause).

Mr. STARRATT.—Coming here 1,100 miles from a lower Province, a stranger amongst strangers, I came to this Convention, and I am glad to say that I have enjoyed myself very much listening to the papers that have been read and the discussions which followed by the gentlemen here assembled. I go away with very good feeling towards the gentlemen I have met here, and towards the association engaged in this grand work. This is a great and growing industry. It is particularly so in the Annapolis valley. The day is not far distant when the Annapolis valley to Digby will be one vast orchard. People are awakening to the situation and are looking forward to the possibilities. I thank you all gentlemen for the thoroughly courteous manner and warm consideration which you have extended to myself and my colleague, and I hope to meet you all at another convention.

Mr. PETERS.—I cannot allow this session to close without expressing to you, gentlemen, the very great satisfaction which I have felt in meeting with you. Coming from a distant Province—a Province which used to be considered very distant until the short line was constructed—a perfect stranger to all men who have been connected with this association, I may say that I have felt very much at home here, for a day or so. I thank those with whom I have associated for the cordial reception they have given me and the courteous treatment they have accorded me, and I shall carry home nothing but the most kindly feelings.

The usual vote of thanks was tendered to the Press, and the Convention adjourned.

APPENDIX.

PRIZES AWARDED AT DOMINION CONVENTION OF FRUIT-GROWERS HELD AT OTTAWA ON 19TH, 20TH AND 21ST FEBRUARY, 1890.

JUDGES.—O. B. Hadwen, Worcester, Mass.; S. D. Willard, Geneva, N. Y.

SECTION 1—SEEDLINGS.

Winter Dessert Apples—5 Specimens.

1st. Smith & Kiernan, St. Catharines, Ont.....	\$10
2nd. Thomas Beall, Lindsay, Ont.....	5
3rd. J. Croil, Aultsville, Ont.....	3

Winter Cooking Apples—5 Specimens.

1st. A. Brousseau, Abbotsford, Que.....	\$10
2nd. S. Greenfield, Ottawa, Ont.....	5
3rd. C. O. Fisk, Abbotsford.....	3

Winter Pears.

1st. P. C. Dempsey, Trenton	10
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SECTION 2—STANDARD VARIETIES OF APPLES.*American Golden Russet.*

1st. W. Borthwick, Ottawa, Ont.....	3
2nd. M. Pettit, Winona.....	2
Highly commended—C. O. Fisk, Abbotsford, Que.	

Arabka.

1st. Charles Gibb, Abbotsford, Que.	3
2nd. P. Dupuis do do	2

Baldwin.

1st. J. Graham, Wallbridge, Ont.....	3
2nd. P. C. Dempsey, Trenton, Ont.....	2
Highly commended—W. Borthwick, Ottawa, Ont.	

Ben Davis.

1st. J. Graham, Wallbridge, Ont.....	3
2nd. P. C. Dempsey, Trenton, Ont.....	2
Highly commended—W. Borthwick, Ottawa, Ont.	

Blenheim Orange.

1st. G. Murray, Deer Park, Ont.....	3
2nd. J. Croil, Aultsville, Ont.....	2

Blue Pearmain.

1st. J. M. Fisk, Abbotsford, Que.....	3
2nd. P. Dupuis, do do	2

Canada Baldwin.

1st. A. Brousseau, Abbotsford, Que.....	3
2nd. J. M. Fisk, do	2

Cabashea.

1st. J. Graham, Wallbridge, Ont.....	3
2nd. W. Borthwick, Ottawa, Ont.....	2

Cranberry Pippin.

1st. W. Borthwick, Ottawa, Ont.....	3
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Fallawater.

1st. W. Borthwick, Ottawa, Ont.....	3
2nd. R. W. Starr, Cornwallis, N.S.....	2

Fameuse.

1st. J. Graham, Wallbridge, Ont.....	3
2nd. G. B. Edwards, Covey Hill, Que.....	2

Greening (Rhode Island).

1st. S. L. Peters, Queenstown, N.B.....	\$ 3
2nd. J. Graham, Wallbridge, Ont.....	2

Grimes Golden.

2nd. G. B. Edwards, Covey Hill, Que.....	2
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King.

1st. W. Borthwick, Ottawa, Ont.....	3
2nd. M. Pettit, Winona, Ont.....	2
Highly commended—Smith & Kerman, St. Catharines, Ont.	

Mann.

1st. P. C. Dempsey, Trenton, Ont.....	3
2nd. J. Graham, Wallbridge, Ont.....	2

Newton Pippin.

1st. D. Vanduzen, Grimsby, Ont.....	3
2nd. L. Woolverton, do	2

Nonpareil.

1st. C. R. H. Starr, Wolfville, N.S.....	3
2nd. R. W. Starr, Cornwallis, N.S.....	2

Ontario.

1st. W. Borthwick, Ottawa, Ont.....	3
2nd. J. Graham, Wallbridge, Ont	2

Peck's Pleasnt.

1st. J. Graham, Wallbridge, Ont.....	3
2nd. P. C. Dempsey, Trenton, Ont.....	2

Pewaukee.

1st. P. Dupuis, Abbotsford, Que.....	3
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Pomme de Fer.

1st. E. Charron, Rougemont, Que.....	3
2nd. N. C. Fisk, Abbotsford, Que.....	2
Highly commended—G. B. Edwards, Covey Hill, Que.	

Pomme Grise.

1st. N. C. Fisk, Abbotsford, Que.. ..	3
2nd. J. M. Fisk do do	2

Roxbury Russet.

1st. W. Borthwick, Ottawa, Ont	3
2nd. J. Graham, Wallbridge, Ont	2
Highly commended—P. C. Dempsey, Trenton, Ont.	

Scott's Winter.

1st. Charles Gibb, Abbotsford, Que.....	3
2nd. R. W. Shepherd, jr., Como, Que.....	2

Seek-no-Further.

1st. D. Vanduzen, Grimsby, Ont.	3
2nd. G. Murray, Deer Park, Ont.....	2

Spitzenburg.

1st. G. Murray, Deer Park, Ont	\$ 3
2nd. G. B. Edwards, Covey Hill, Que.....	2

Spy,

1st. G. B. Edwards, Covey Hill, Que.....	3
2nd. W. Borthwick, Ottawa, Ont.....	2

Highly commended—A. G. Hull, St. Catharines, Ont.

Starke.

1st. R. W. Starr, Cornwallis, N.S.....	3
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Swaar.

1st. G. B. Edwards, Covey Hill, Que.....	3
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Swazie.

1st. R. W. Starr, Cornwallis, N.S.....	3
2nd. G. B. Edwards, Covey Hill, Que.....	2

Tolman Sweet.

1st. J. Croil, Aultsville, Ont.....	3
2nd. P. C. Dempsey, Trenton, Ont.....	2

Wagener.

2nd. W. Borthwick, Ottawa, Ont.....	2
Highly commended—R. W. Starr, Starr's Point, N.S.	

Wealthy.

1st. G. B. Edwards, Covey Hill, Que.....	3
2nd. J. M. Fisk, Abbotsford, Que.	2

Yellow Belleflower.

1st. J. Croil, Aultsville, Ont.....	3
2nd. G. Murray, Deer Park, Ont.....	2

Highly commended—W. Borthwick, Ottawa, Ont.

Any other variety of Dessert.

1st. J. Croil, Aultsville, Ont.....	3
2nd. G. B. Edwards, Covey Hill, Que.....	2

Any other variety of Cooking.

1st. G. E. Roach, Abbotsford, Que.....	3
2nd. W. Marshall, Abbotsford, Que.....	2

SECTION III—PEARS—5 SPECIMENS OF EACH.

Belle Angevine.

1st. Mrs. Evans, Chilliwack, B.C.....	3
2nd. R. Wintermute, New Westminster, B.C	2

Beurre Grises.

1st. P. C. Dempsey, Trenton, Ont.....	3
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Duchesse de Bordeaux.

1st. P. C. Dempsey, Trenton, Ont.....	3
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Josephine de Malines.

1st. P. C. Dempsey, Trenton, Ont.....	3
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SECTION IV—DOMESTIC BOTTLED FRUITS—1 QUART OF EACH.

Apples.

1st. Mrs. A. M. Smith, St. Catharines, Ont.....	\$ 3
2nd. Miss E. Smith, St. Catharines, Ont.....	2

Pears.

1st. Miss E. Smith, St. Catharines, Ont.....	3
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Peaches.

1st. Mrs. A. M. Smith, St. Catharines, Ont.....	3
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Cherries.

1st. Mrs. A. M. Smith, St. Catharines, Ont.....	3
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Raspberries.

1st. Miss E. Smith, St. Catharines, Ont.....	3
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Strawberries.

1st. Mrs. A. M. Smith, St. Catharines, Ont.....	3
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SECTION V—WINTER-KEEPING GRAPES.

Grapes—Six Bunches Red.

1st. A. G. Hull, St. Catharines, Ont.....	4
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2nd. M. Pettit, Winona, Ont.....	2
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3rd. W. Borthwick, Ottawa, Ont.....	1
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Grapes—Six Bunches Black.

1st. W. Borthwick, Ottawa, Ont.....	4
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2nd. M. Pettit, Winona, Ont.....	2
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COLLECTION OF CANNED FRUITS EXHIBITED BY CANNING COMPANY.

1st. Delhi Canning Company, Delhi, Ont.....	15
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2nd. W. Boulter, Picton, Ont.....	10
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Highly commended, Simcoe Canning Co., Simcoe, Ont.

NOTE—Plates of Winter Nellis, Beurre d'Angou and Easter Beurre Pears were exhibited by Mr. E. A. Hale, Cambridgeport, Mass., and a large collection of canned vegetables by Mr. Wellington Boulter, of Picton, Ont., all of which exhibits were highly commended by the judges.

Although the date of the Convention was not announced in time to take steps for the preservation of the earlier varieties of winter fruits, and the season had not been a favourable one, a very creditable display was made, some 600 plates being on exhibition.

The following papers, &c., were read by title, and in accordance with a resolution to that effect are published in connection with the proceedings of the Convention:—

EXPERIMENTS IN GRAPE CULTURE IN THE PROVINCE OF QUEBEC: BY WM. MEAD
PATTISON, CLARENCEVILLE, QUE.

Though not so highly favoured as to climate as our sister Province of Ontario, an interest has been awakened in our Province in grape culture through the efforts of its Fruit Grower's Association, and in localities exempt from unseasonable frosts most of the varieties of any promise have been tested as to their adaptability. Yet in a commercial point of view grape-raising in Quebec is subject to contingencies that may never make it profitable, but for home supply the vine is steadily making its way into our gardens in the southern portion of our Province. Having for some

years past devoted my leisure time to experimenting in this and other fruits, I have been asked to give results obtained in the trial of over one hundred and twenty-five varieties of grapes in open air on my grounds.

I should, however, state that for market purposes my production is about limited to the necessities of the case, as when our fruit is ripe enough to eat the market in our cities is usually glutted with southern grapes, and we can only rely for remunerative prices on the fresh and fine appearance of our fruit, so that I was not actuated, in entering into this undertaking from an idea of any "money in it."

In the list appended the classification shows first market varieties, classed in order of profit, but the others about in the order of their ripening.

To any intending to cultivate a few vines for home supply it should be stated that varieties classed as "Market" afford a safer selection, as the majority under the head "Home" could be very well dispensed with and dropped altogether from our already too long list.

To a convention of fruit growers it is hardly necessary to enter into the description of well-known varieties, but brief details will be given of the "novelties" in their order as to colour.

Black and Purple Grapes—Market in order of value.—Champion, Concord, Worden, Moore's Early, Dempsey's Seedling, Barry, Herbert, Aminia, Essex, Wilder, Hartford and Belvidere.

Black and Purple—Home-use, in order of ripening.—Adirondac, Creveling, Early Victor, Louise, Canada, Eumelan, Rockland, Favourite, Senasqua, Bacchus, Isabella and Othello.

Black Novelties that have fruited.—Garber's Seedling, Jewell, Standard, Rommel's Delaware Seedling, Peabody, Norwood, Frances Scott and August Giant.

Black Novelties on trial that have not fruited.—Caywood's No. 50, Nectar or Black Delaware (Caywood), Metterney (Caywood), Paragon (Burr), Eaton.

Black and Purple Discarded.—Florence, Telegraph, Cottage, Early Dawn, Rickett's, No. 543, Miles, Hooker, Brant, Mansfield, Waverley, Linden; Black Eagle, Union Village and Highland.

Notes on above Novelties.

Garber—Origin Pennsylvania, U. S. A., native, medium bunch and berry, compact, red peduncle, highly coloured juice, a vigorous, hardy and profuse bearer, preferable for wine, jellies and canning.

Jewell—Origin Kansas, U. S. A. (John Burr's best so far, fully tested), medium bunch and berry, compact, early, prolific and excellent in flavour.

Standard (Burr)—Same description as his Jewell, but not as vigorous or early.

Rommel's Delaware Seedling (Jacob Rommel, Missouri)—Large, compact bunch, medium berry, early, and fine in flavour, so far vigorous and hardy, and a grape of much promise.

Peabody, Rickett's, Newbergh, N.Y., Clinton Seedling—The best of his black varieties, bunch presenting a fine, compact appearance, berry, medium, flesh tender, juicy and rich, roots suffered in the winter of 1885-86.

Norwood—Origin Massachusetts, U. S. A., resembles Concord in foliage and hardness, bunch and berry large, ripens with Worden, but does not drop its berry when ripe.

Frances Scott (Rickett's)—Small bunch and berry, medium early, highest quality, but subject to mildew.

Dempsey's Seedling—This remarkable grape was kindly sent me for trial with his Burnet and others, by Mr. Peter C. Dempsey, Trenton, Ont., some years since, as No. 25, but as I have seen this number quoted as a white grape, I have since omitted to number it. The grape very closely resembles Barry (Rogers' No. 43), but has proved earlier, more prolific and better in flavour. Mr. Dempsey's Burnet has never failed to ripen here, with attention to thinning out, only showing mildew last season, with many others hitherto exempt, and is much esteemed for its delicacy of flavour.

White Grapes—Market.—Niagara, Lady, Empire State, Duchess, Belinda, Martha.

Home Use.—El Dorado, Jessica, Purity, Allen's Hybrid, Antoinette, Charlotta, Mason's Seedling, Grein's Golden, Peter Wiley, Sweetwater, Chasselas ("from Belgium or France, 1840,") Prentiss, Pocklington and Lady Washington.

White Novelties fruited.—Golden Gem (Rickett's), Golden Drop (Pringle), Undine (Rickett's).

White Novelties not yet fruiting.—Frances B. Hayes, Eclipse (Burr).

Whites Discarded.—Rommel's July, Early Auvergne, Fontignan and Early Malvasia (foreign), Rebecca, Perkins, Croton, Rommel's Superior, Faith, Centennial, Autochon, Blanche, Rickett's No. 346, Lady Charlotta, Transparent, Eva, Irving, Noah and Triumph.

Notes on White Novelties.

Golden Gem.—Very small bunch and berry, prolific, delicate foliage, quality its only favourable feature.

Golder Drop.—Origin Vermont, quite early, small to medium bunch and berry, good quality, slow grower.

Undine.—Large, showy, compact bunch, medium berry; our season usually too late to develop its flavour.

Red Grapes—Market.—Massasoit, Delaware, Brighton, Lindley and Vergennes. **Home Varieties.**—Northern Muscadine, Wyoming Red, Gaertner, Walter, Mary, Salem, Owosso, Agawam, Roger's Nos. 8 and 30, and Jefferson.

Novelties fruited.—Beauty (Rommel), Poughkeepsie Red (Caywood), Ulster Prolific (Caywood).

Novelties not yet fruited.—Woodruff's Red, Ideal (Burr).

Discarded.—Dracut Amber, Challenge, Underhill Seedling, Diana, Hamburg and Amber.

Notes on Red Novelties.

Ulster (Marlboro, N.Y.)—A vigorous grower and abundant bearer, berry and bunch somewhat resembling Catawba, but often shouldered, good quality, and gives promise of being a popular standard.

Poughkeepsie Red.—Bunch and berry larger than Delaware, quality nearly as good, earlier, but a very moderate bearer.

Beauty.—A small wine grape, rarely maturing in this latitude.

In conclusion, in order to meet questions often asked as to my preference amongst the perplexing array of varieties, will say that for general usefulness as well as profit those classed above as "Market" would be my selection, while for home varieties, though some of which are otherwise unprofitable, the family favourites are in black, in order of ripening, Jewel, Adirondac, Peabody, Barry, Concord and Burnet. In white, Jessica, Lady, El Dorado, Duchess, Purity and Chasselas. In red, Massasoit, Delaware, Brighton, Walter, Lindley and Salem.

For winter use Herbert, Barry, Duchess, Empire State, Salem and Vergennes.

(*Letter From Miss Annie L. Jack, Chateauguay Basin.*)

"I do not think grapes have been better tested commercially in this Province than on our fruit farm, Hillside. While making it a point to test many new varieties we have but few that repay the care and labour, and among thirty tested sorts we can endorse Prof. Thurber's comment made years ago: "You can go to the Concord with a wheelbarrow, but to almost every other kind with a hand-basket." Since he made this remark some more prolific varieties have been originated, but our acre of Niagaras has never yet repaid us the interest on our money, only one good full crop being yet produced, though they often bear a partial crop when others fail. So we place Concord first commercially, Niagara next, and then the Duchess, a small white grape that has one good quality, that of keeping until the new year without loss of flavor or texture. The Champion or Beaconsfield, while very prolific, is of such

poor quality we have never thought it worthy of cultivation, making it a rule not to put on the market what we cannot eat ourselves. For this reason we wait till our Concords are ripe, instead of selling them when just coloured, though by that time they are much reduced in price; and so, to sum up we find grapes a very unsatisfactory commercial crop, subject to many varying contingencies. Last season there was only here and there a bunch of fruit on the vines, though they set well in the spring, and when there is a full crop everywhere, prices run down to 2 and 3 cents a pound, which, with the cost of baskets, freight, netting and labour, leaves but a small surplus for the grower. A grape is a grape to most buyers, and what we most need is a discriminating public to be able to tell superior varieties and well ripened fruit, and willing to pay a little more for it."

PEAR CULTURE IN SOUTHERN ONTARIO: BY N. J. CLINTON, WINDSOR, ONT.

Had it been in the month of September, instead of February, when this great gathering of the fruit growers of the Dominion was convening, it would have been easier for us to demonstrate to you the beauties and attractiveness of this occupation than it is to-day.

We could have shown you samples of this fruit that would be both pleasing to the taste as well as the eye, for instance, the Bartlett, Clapp's Favorite, Flemish Beauty, Seckel, &c. Are there any nicer fruit of any class to eat than these in their season (providing they are developed to their highest perfection). In these we do not come in contact with a fuzzy skin at the first bite, which has somewhat of a repelling nature, as in the peach, nor on investigating further our teeth do not run against a stone or pit (as in the plum or peach). And when the housewife purchases fruit to can or preserve, from half a bushel to a bushel (what they usually put up with us) she gets better value for her money in bulk than she does in either of the last named varieties, as there is less waste in preparing them for the jar. However, these other classes of fruit have redeeming qualities, such as flavor, &c., that bring them upon an equal with the pear and are equally sought after in the market.

There is a great difference in the same variety of pear grown in different localities and under different circumstances. This is equally true of other classes of fruit.

It is not necessary for me to state here that pear trees want cultivation as well as any other crop. It is not enough to plant, take care of them until they commence bearing, and then seed the orchard down into grass, and leave it to shift for itself; if so the result is the fruit becomes small and inferior in flavour.

The first pear trees that were grown in south-western Ontario were the old French trees (some now standing on the bank of the Detroit River). They were brought over from France by Father Potier, a Jesuit, and planted some time between the years 1760 and 1780. The fruit is considered fairly good for preserving and eating, and sells for 50 cents to \$1.00 a bushel, when other pears bring \$1.50 to \$2.00. With a crop of fifteen to twenty bushels they are quite profitable at that price, but since that time the hand and brain of the horticulturist have improved on them by hybridizing with other varieties, and importing, until many new and better varieties have been introduced. Mr. James Dougall started one of the first nurseries, and had at one time over three hundred varieties of pears in his nursery, and shipped stock nearly all over North America where pears are grown.

The actual season of the pear is from the middle of July, starting with Elliott's Early, Doyenne d'Ete, Magdelin, and winding up about January with such as Winter Nellis, Vicar of Winkfield, Lawrence, &c., but after November the market is limited to a few families, and the varieties worth eating that keep longer are few. Those mentioned above are the best I know of, with the addition of the Beurre Clairgeau, Duchess and the Anjou, which keep well into November. It is in the latter part of August and September, and October, when the larger pear growers have to get a move on, for instead of a couple of months to harvest them, as the apple, we have only a couple of weeks after they are picked, and sometimes hardly that. And I might say right here, gentlemen, that the markets of all our leading cities, when the

local supply is insufficient, can be furnished with this fruit, also peaches, plums and grapes, from southern Ontario more cheaply and as good as from any other country in the world.

In our district Detroit gets most of our surplus stock, and there we come in contact with fruit from different parts of United States, not excepting California, and in some varieties we can produce them as large as the latter, and in almost all varieties the flavour of our fruit is superior.

To show you whether there is any money in raising pears in southern Ontario, will give you a little of our experience, and you can draw your own conclusions.

We have an orchard of three acres, in which there are four hundred and fifty trees; these are set close to 17 feet apart each way. Ninety-seven per cent. of the trees are bearing, and are from ten to twenty years of age; some few are only four and five years, put in lately to fill up vacancies. For the last three years we have realized or sold the product for \$208, averaging one year with another. For the year 1887 we got almost two hundred bushels, for 1888 one hundred and forty bushels, and 1889 close to two hundred and seventy-five bushels.

Now, taking cost of the trees at 50c. each it

amounts to.....	\$225 00
Value of land per acre at \$150 for three acres	450 00
Labour for setting out trees, 10c. each.....	45 00

\$720 00

Interest on investment of \$720, at 8 per cent..... 43 60

Cost of picking fruit, 50c. per bushel..... 10 25

Marketing fruit..... 20 00

Pruning trees, 23½ days at \$1.50 per day..... 33 75

\$720 00

Total..... \$107 60

The average gross sales were \$208 00

The annual expenditure including interest on investment..... 107 60

Net profit for three acres per year..... \$100 40

Net profit for each acre per year..... 33 46

Some will ask, What about the returns for the first few years after planting? In reply I will say that the trees will not interfere materially in raising good crops, off the same ground, such as potatoes, turnips, mangolds, &c., for the first few years, and later on nearly any crop that is profitable, for the trees do not shade the ground as much as apple trees.

Those varieties of pears that succeed well with us are, for summer: Elliott's Early, Doyenne, d'Ete, Magdeline, Tyson; for autumn: Bartlett, Clapp's Favourite, Flemish Beauty, Seckel, Howell, Louise Bonne, Jersey, Beurre Rose, Beurre Superfine, late autumn: Duchess, Anjou, Sheldon, Clairgeau, winter: Graslin (fairly), Vicar of Winkfield, Winter Nellis and Lawrence. My pick of the first class would be the Doyenne d'Ete; it has a fine flavour, good appearance, and usually bears well; tree hardy; size small. The Elliott's Early is not much known; was introduced by Mr. Elliott, of Sandwich, ripens the first with us and it has a good flavour; trees are not very hardy. In the 2nd class, the Bartlett is much sought after and seems to be the standard pear, and with us brings the highest price in its season; also, is used more for canning than any other pear. The Flemish Beauty comes next for this industry. The Seckel is the finest pear we have for dessert purposes, and the trees seem hardy and free from blight. The Howell is a good bearer and sells well, being of good size, with a pale yellow colour. In the 3rd class, for standard trees I prefer the Anjou and Clairgeau. The latter grow large, and what they lack in quality, which is fair, is made up by their fine appearance. In the last class all

three are good, while Winter Nellis may have the advantage in flavour, but is usually not so large as the other varieties. We might also mention Jos. De Malines, Glout Morceau, and others.

It may not be out of place if I mention a list of hardy pears that might be suitable for this district, if pears can be grown here at all, such as Flemish Beauty, Fulton, Buffum, Onondaga, Seckel, Sheldon, Beurre d'Anjou, Winter Nellis, Lawrence, Tyson, Osbands Summer, Beurre d'Amalis.

In conclusion, gentlemen, let us endeavour to be honest with the dealers and strive to get an individual name for our fruit by placing it in barrels or baskets the same sample all through.

FRUIT EVAPORATION AND ITS RELATION TO THE FRUIT-GROWER: BY J. T. DONALD, MONTREAL.

When the process of evaporating fruit was first introduced it was thought by many that it would soon displace canning as a mode of fruit preservation. Such, however, has not been the case.

At the present time, in Canada at least, evaporating is practically employed in the treatment of apples only. Much the same limitation is found in the United States, if we except the Pacific coast, where the process is successfully applied to peaches, apricots, pears and other fruits.

Evaporation has been successfully applied to vegetables as well as fruits. Corn has been treated on a large scale, but at present little, if anything, is done in this line.

When properly applied, evaporation produces but little change in the fruit beyond the removal of a large portion of the water originally present, and of course a corresponding reduction in weight and bulk. It follows, therefore, that if the proper quantity of water be added to the evaporated fruit it is practically fresh fruit.

Why, then, is it that evaporation is not more extensively employed? The reason is not far to seek. On account of the amount of water removed in evaporating fruit considerable time and care are required to prepare the evaporated fruits and vegetables for the table; whereas, in the case of canned goods the cooking is done in the factory on a large scale, and the goods come into the consumers' hands quite ready for the table, or at best merely requiring to be warmed. This it is that prevents the wider application of our process of fruit preservation. The question of fruit evaporation is thus practically limited to apples, and in this connection the industry has assumed somewhat large proportions, and is yet capable of considerable development.

The apples sent to the evaporating factory are such as are not suited for shipping; that is such as are not possessed of keeping qualities, windfalls and the culls of winter fruit. At the factory the apples received are divided into two grades; first those of good flavour, size and shape, and so suited for peeling by machinery; and second, all inferior, badly-bruised, misshapen and small fruit. The first grade is peeled, cored and sliced by machinery, often in one operation. The sliced fruit is at once exposed for a few minutes to the gas produced by burning sulphur. This prevents discoloration, and in no way injures the fruit; at most only a mere trace is left after evaporation is completed. After being "sulphured," the slices are spread on trays of galvanized iron netting, or of cloth, and heated air passed over them, the result being, as already mentioned, that a large portion of the water is withdrawn, and at the same time certain chemical changes, akin to increased ripening, are produced in the fruit, resulting in an increased percentage of sugar, and diminished acidity.

The length of time the apples are exposed to the heated air depends upon the temperature employed. Considerable skill is required to obtain a satisfactory article; if the temperature of the evaporating chamber be not right at the beginning of the process there is danger that the slices will become damp, whereas a properly evaporated apple is dry and spongy. After withdrawal from the evaporator the apples

are usually allowed to lie in a heap for several days, to equalize the moisture that may be in different batches. They are then packed in boxes usually containing 50 lbs. each.

The cores and peelings of this first grade of apples are not wasted. They and the inferior apples that reach the evaporating factory may be classed together, as they usually undergo the same treatment, although worked up separately. According to the market, these two materials are used as a source of cider, or are evaporated, and shipped to jelly makers on this continent, or sent to Europe, where they are used in the fabrication of certain grades of wines. Sometimes the apples are quartered before being evaporated; sometimes they are treated whole.

Let us glance now at this process in its relation to the fruit-grower. In the first place, an evaporating factory presents a means of rendering marketable fruit which otherwise would be unsaleable, and in the second place it gives employment for several months of the year to a large number of hands, thus giving an increased home market for fruit-growers' products. These benefits have been recognized by fruit-growers in places where evaporating factories exist, and the inhabitants of such localities have been willing to offer inducements to companies to locate in their midst.

If it be granted that an evaporating factory is of advantage to fruit-growers, the question arises: What is to be done in the fruit-growing districts where no such factories exist? Can the individual fruit-grower evaporate his own apples? There are small machines made for this purpose and widely advertised. Experience has shown, however, that they do not give as good results as they should, and as are claimed for them, and there is difficulty in finding a market for the small lots, and of course working on a small scale the expense of manufacturing is greater than in a large factory. In the opinion of the writer, evaporation on the large scale should be the object of those who would derive benefits from the process, and he would suggest that the fruit-growers of a district combine, and agree to support a factory, as they do in the case of cheese-factories and creameries, and it is altogether likely that someone could be found who would be willing to erect the not very expensive plant required and conduct the manufacture. It must not be forgotten, however, that experience is a very desirable quality in the manager of an evaporating factory, and unless such is at hand the promoters of an evaporating business should begin operations on a very small scale, gradually expanding as experience is gained by their manager.

COMMERCIAL ORCHARDS IN THE PROVINCE OF QUEBEC: BY REV. R. HAMILTON, GRENVILLE, QUE.

By commercial orchard I mean an orchard planted solely with a view to the revenue to be drawn from it. In planting such an orchard, the chief, I may say the only object, is to make money, and to attain that end only such sorts as are calculated to yield a profit will be planted, whether they be good or only mediocre. It may be that a third or fourth class fruit, such, for instance, as the Ben Davis apple, may yield better returns with a smaller outlay of capital, talent and labour, than a high-class fruit like the Northern Spy, and in such a case it would be the right one to plant. It is questionable, however, if the public would not in time get over the depraved taste that permits the purchase of such poor fruit as the Ben Davis.

The apple is the orchard fruit, *par excellence*, of the Province of Quebec. A very few pears are produced, as well as a few plums and cherries, but the quantity is so inappreciable as not to call for mention; so that, when I speak of orchards, I mean apple orchards exclusively.

It is matter of regret to all of us who take a lively interest in the subject that the range of our larger fruits is so limited, and it is to be hoped that in the near future it may be greatly extended, as a good deal of well-directed effort is being put forth in that direction.

The principal orchard section of the Province of Quebec is the island of Montreal. Its soil produces the sorts of apples chiefly consumed in the city, in the greatest perfection. They are of large size, fine texture, glowing colour, and delicious flavour, and are produced in great abundance. And, proximity to the city, the great centre of consumption, must naturally lead to ever-increasing areas being given up to the production of this most important fruit.

Besides the counties of Jacques Cartier and Hochelaga, which, together, compose the Island of Montreal, outside of the city, the Counties of Huntingdon, Beauharnois, Chateauguay, Rouville, Missisquoi, Shefford and Brome, contain many large and valuable orchards. Rigaud, on Two Mountains also contains some fine isolated orchards.

Of orchards in the neighbourhood of Montreal, undoubtedly the finest are those of the Upper and Lower Lachine roads. There the soil and situation seem to suit them admirably, and fruit of the highest excellence is produced.

The number of varieties to be found in Quebec orchards is very large. Upwards of 150 have been collected. Still, the commercial apples are comparatively few in number. I believe that nearly the half of all the apples produced in the Province are Fameuse, and the remainder are, in great part, Strawberry (of Montreal,) Peach (of Montreal,) St. Lawrence, Red Astrachan, Alexander and Duchess of Oldenburg, and, in recently planted orchards, Wealthy. In some districts a few other sorts have been pretty widely planted. Amongst others are the so-called Winter St. Lawrence, Decarie, Roseau, Pomme Barré, Golden Russet, Ben Davis, Swazie, Pomme Grise, Cellini and the King of Pippins.

What are the principal commercial apples of the Province of Quebec?

Twelve years ago the consensus of opinion said, first, Fameuse. If a vote were taken to-day I believe that decision would be reversed; for, while that fine sort is of as high a quality as ever, and as productive, it has become so subject to spotting as to be, in many places, almost worthless, and can no longer be depended on for a crop. As it is only a biennial bearer, and every other crop, at least, spots, it can only be counted on for a crop about once in four years, except in specially favourable localities.

Duchess is, in the opinion of many, a much more profitable sort. It comes into bearing, profitable bearing, earlier than almost every other sort. It is almost always good, that is, saleable. Its season is, for an early apple, a long one; it bears few culls; it hangs well on the tree, and carries well, even for long distances. Taken one year with another, it is one of the most productive and, best feature of all, for our Province at least, it is unsurpassed in hardiness. It has yet other points in its favour: Being of compact growth, it may be planted more closely than most sorts. Again, it seems to have fewer insect enemies and to be less subject to injury through atmospheric changes than most of the sorts with which we are acquainted. Taken all in all, it has few equals.

Strawberry (of Montreal) approaches the Duchess in many respects. It is only second to it in hardiness. It is as thrifty and as healthy, but it does not bear so early or so heavily. But, on the other hand, the fruit is of better quality, and Montreal fruit men say, sells better. It is slow in coming into bearing, but bears well once it gets started, and the fruit is beautiful and of good quality both as a dessert and cooking apple.

Peach (of Montreal) is another hardy, vigorous and fruitful variety, that in those respects leaves little to be desired. It also has few insect enemies and is not liable to disease. Like the Duchess and Strawberry, it is an early sort. Unlike them, it will not carry well, and must be grown near to market; but put up in nice shape it sells well. It is of very fine quality, whether for eating or cooking, and is superior in point of productiveness to the Strawberry, though not equalling the Duchess.

Yellow Transparent, another very early apple, perhaps the earliest of all, being often ripe in the end of July and always by the 10th of August. It is an early bearer, a heavy bearer, and a continuous bearer, taking its off year about once in four years—at least such has been my experience with it. It is probably the most

profitable of the early apples, and being a compact grower may be planted closely. It is a beautiful, clean and thrifty tree, but is subject to disease of the bark, and on that account requires constant watchfulness. I feel inclined to assert that these are the best four early apples to plant in the greater part of the Province of Quebec, combining hardiness, healthiness, fruitfulness, early bearing, beauty and good marketing qualities in a greater degree than any others, besides being not difficult as to the character of the soil.

Red Astrachan, a variety that is grown with profit in some localities, cannot compete with those mentioned in any of the features indicated, unless in that of beauty. Its fine colour is in its favour. In a favourable situation, where the soil is rich, deep and cool, it may pay, though probably under such conditions any one of those mentioned would surpass it.

The Alexander demands almost similar conditions for its successful production.

The St. Lawrence, one of the best apples, is less planted now than formerly. In many localities it is uncertain and capricious. Occasionally it is found to be a light annual bearer, generally fair, but sometimes spotted and cracked. In fact, it is not a profitable commercial apple.

Cellini, an apple of the season of Alexander and St. Lawrence, is, I believe, coming to the front. It is a large, fine cooking fruit, almost rivalling the Alexander in size and better in quality. It is a moderate annual bearer, and the tree is amongst the hardiest, and of a thrifty disposition. It is not so well known and widely planted as it deserves to be.

Wealthy, an apple of the season of the Fameuse, is a variety of which too much cannot well be said. It is a more universally useful apple than any other with which I am acquainted, uniting in itself almost every desirable feature of a first-rate fruit. It is as hardy as the Duchess, and as early a bearer; it is as fruitful as the Fameuse, and rivals it in size, shape, colour and quality, and keeps fully as long. It reaches a good size quite early in the season and cooks well, and up to this date I believe has shown no tendency to spot. As a shipper it will prove about equal to the Fameuse. Its weak point is, a tendency to bark diseases. Nothing is perfect.

A more beautiful apple, if possible, and a larger, is the so-called Winter St. Lawrence, but it is not so productive, and is decidedly tender in the colder and bleaker sections.

There are very few sorts that can be called winter apples that are at all widely grown, and no one sort that can be singled out and declared to be generally suitable for cultivation in the Province of Quebec as such. Quite a few are found occasionally being successfully grown.

In the counties of Huntingdon, Chateauguay and Beauharnois, in several orchards the Northern Spy is found doing very well—most frequently in strong, deep, cool soil.

The same may be said of the Ben Davis, Golden Russet and Blue Pearmain. But there are more than enough of failures to prevent any one planting any of these varieties extensively. One very promising sort, especially in the cool, strong soils, is the Canada Baldwin. It is hardy, a good and heavy bearer of fair-sized apples of fine quality, that keep well and ship well. Its weak point is that on all but the deepest and coolest soils it sun-scalds, and the bark splits on the south side and, as a consequence, it dies early. Its many good qualities should induce orchardists who have suitable soil to plant it largely. It is the only purely Canadian long-keeping apple that can be grown in our Province.

Scott's Red Winter is highly spoken of by some who have grown it, but is very small and exceedingly sour until quite late in the spring, and at my place is far from being hardy.

The great need of our Province is a long keeping apple—one that shall combine the quality of the Northern Spy with the beauty of the Winter St. Lawrence, the fruitfulness of the Fameuse and the hardiness of the Duchess. One that might be planted in any situation, like the Duchess, for example, with some promise of success. Such a variety would be of incalculable benefit to the whole country. Let us hope

that those who are in a position to do something, looking to the accomplishment of so desirable an end may take it into their consideration, and take such measures as may insure its being accomplished.

HINTS ON THE NOMENCLATURE OF FRUITS BY R. W. STARR, CORNWALLIS, N. S.

MR. CHAIRMAN.—I would like to call the attention of this convention to the importance of the correct and proper nomenclature of our fruits, especially those commercial sorts, which now have a favourable reputation in the markets of the world.

Incorrect nomenclature is productive of many evils; it causes market reports, in many instances, to be valueless to the grower; and in others, injures the reputations of varieties; while in still other cases the reputation of the packer suffers, from ignorance, the imputation of intentional fraud, by representing his goods as other than they are.

Any variety of fruit that is known in the markets has a certain reputation for certain qualities, and is largely bought and sold on that reputation, which should not be imperilled by the carelessness, ignorance or dishonesty of the grower or packer, from the use of incorrect names.

The use of synonyms should be avoided as much as possible, and where observed, noted for correction. Local names given through ignorance of the real name should be corrected as soon as discovered, so as, if possible, to prevent their being established. Nurserymen are frequently to blame for sending out old sorts under new names, thus adding to the existing complications. They should be more careful and test everything new, or supposed to be new, before sending it out. As to the work done by irresponsible tree brokers and pedlars, we cannot control them, and those who deal with them must expect to be frequently sold or disappointed.

Unfortunately, many of our fruits have received local names, and wrong names, in years gone by. They are known by those names in the markets, and all attempts to change them has only resulted in confusion and failure. For instance, "Yellow Bellefeur" is known in the markets of the Maritime Provinces as "The Bishop's Pippin," or "Bishop Pippin," and all attempts to correct the name have met with decided opposition from dealers and market men; and "Flushing-Spitzenburg" is universally called in the market "Vandervere," with similar objections to any change. I find the same apple here as Pomme de Fer. Some of our well known varieties have been burdened with absurdly long and inappropriate names, and fruit-brokers, market men and dealers, alike seem impatient of their use. The result is that contractions and abbreviations of all sorts are in general use. "Esopus Spitzenburg" is called "Spite," "Westfield—Seek-no-Further," "Seek," "Rhode Island Greening," "Greening," and so on throughout the list. All we can do in such cases is to accept these changes and abbreviations, as recognized synonyms of the various sorts, and publish them as such in our reports and transactions.

I have said that the use of synonyms should be avoided, but as all rules must have exceptions I think we must except all those foreign fruits which are blessed with unpronounceable, jaw-breaking names, and if any of them show signs of coming popularity, in mercy to ordinary fruit-growers and market men, to prevent dislocation of jaws and distortion of facial muscles, we must select a short, appropriate synonym and publish it as the name by which the variety shall be known.

The American Pomological Society, at the suggestion of its late honoured president, the Hon. Marshall P. Wilder, has for some years past been doing good work in recommending the abbreviation of long names. I think we should by resolution adopt their recommendations as far as they go, and also endeavour to supplement their work by a close investigation of our own fruit lists, to see what improvement we can suggest on the same lines. Their rule has been to discard all superfluous words, affixes and prefixes, where it was possible to do so, and leave a distinctive name.

Let me here say a few words to pomologists, horticulturists and originators of new fruits or flowers. When you think you have got a good thing don't be tempted to give it a long fanciful name; life is too short to use it. Don't give it a very pretentious name; you may come to be ashamed of it. Don't give it the name of some old variety, adding affix or prefix; you are only confusing matters, and betraying a want of originality.

But when you sit down to select a name for your pet to be known by hereafter, you may choose the name of your town, or your home, your own name, or that of a friend (if not already taken), choose a word, or, still better, coin one, only let it be one short, terse, and euphonious word, and your success is half assured.

TRANSPORTATION OF FRUIT: BY HUGH MCCOLL, ST. JOSEPH DU LAC, P. Q.

Great praise is due to the various Horticultural and Fruit Growers' Associations of the Dominion for their knowledge, acquired by careful study and practical experience, and for their liberal distribution of such knowledge, which has induced so many fruit-growers to experiment, many of whom, if left to themselves, would otherwise have remained silent.

And now that fruit can be grown in this Dominion with success, as is proven beyond a doubt, the next and essential thing to know is, how this fruit is to be selected, packed and transported to foreign markets. On this subject I have copied an article from the Auckland, New Zealand *Weekly News*, which is: "The Orient Steamship Company are setting a good example to other shipping companies in their endeavour to promote trade from the colonies to London. They have given a free passage to an experienced man from the Covent Garden Market in London, to Hobart, in order that he may give practical instruction in Tasmania on the best methods of packing fruit for export. This expert, who sailed on 8th November, brings with him specimen fruit cases in order to show the orchardist the manner in which fruit should be packed. The Orient Company are making preparations for the carriage of a large quantity of fruit this coming season. New Zealand fruit-growers may take a hint from this, for the time is coming, and that soon, when fruit-growing for exportation over sea will, in all probability, be one of our staple industries."

Seeing that New Zealand is likely to take the lead in transporting fruit to the English market with success, it is high time for us to move and do likewise, who are so much nearer. And in order to accomplish it with greater success, would it be too much to ask this Association, which has already done so much, to negotiate with the various shipping companies who trade to and from our ports, to induce them to take example from the Orient Company? Seeing that this Association is making every effort for the success of this important industry, I have no doubt that by our next fruit season suitable shipping accommodation will be given to shippers. As proof that our fruit is appreciated on the English market, I have received three circulars from fruit dealers soliciting consignments, two from Covent Garden, London, and one from Liverpool.

NOTE.—A number of communications and papers were received too late to be brought before the Convention and in consequence are not published with the proceedings. Among these is a paper contributed by Mr. F. P. Sharpe, Woodstock, N. B., one of the pioneer fruit growers, and an invited delegate from that province.

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