ANNUAL REPORT

—OF THE—

POMOLOGICAL AND FRUIT GROWING SOCIETY

—OF THE—

PROVINCE OF QUEBEC

1894

MONTREAL
JOHN LOVELL & SON
23 St. Nicholas Street.

LIST OF OFFICERS.

FOR 1895.

HONORARY PRESIDENT

HON. H. G. JOLY DE LOTBINIÈRE.....Quebec.

HONORARY VICE-PRESIDENT

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

PRESIDENT

R. W. SHEPHERD, JR.....Como.

VICE-PRESIDENT

J. C. Chapais.....St. Denis.

SECRETARY

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

DIRECTORS

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

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THE POMOLOGICAL AND FRUIT-GROWING SOCIETY OF THE PROVINCE OF QUEBEC.

The Pomological and Fruit-growing Society of the Province of Quebec held its first meeting at Abbotsford, in the Methodist Church, on Thursday morning, 8th February, 1894. Present:—

J. M. Fisk, G. E. Roach, A. M. Fisk, M. R. Gill, Mark McKerley, N. Cotton Fisk, W. Marshall, E. A. Buzzell, C. O. Fisk, J. Blanchard, W. Craig, R. Whitney, S. Crossfield, W. J. Gibb, John Donahue, Abbotsford; S. Fisher, Knowlton; John Craig and James Fletcher of the Experimental Farm, Ottawa; J. McClellan, Noyan; R. W. Shepherd, jun., Como.; R. Brodie, S. Henri, R. Hamilton, Grenville; W. W. Dunlop and G. E. Cooke, Outremont; L. N. Bachelder, Rougemont; A. Guay, Oka; C. M. Fregeau, Rougemont; A. Brassard, Sutton; Cecil Newman, Lachine Rapids; A. Johnson, Cowansville; D. Pyke, Hudson; Robert Gillespie and others.

Mr. R. W. Shepherd, jun., moved, seconded by Mr. R. Brodie, that Mr. J. M. Fisk take the chair.

Motion agreed to.

Professor Craig, seconded by Mr. R. W. Shepherd, jun., moved that Mr. W. W. Dunlop act as Secretary *pro tem.*

Motion agreed to.

Mr. S. A. Fisher of Brome moved, seconded by Mr. Shepherd, that Mr. J. M. Fisk of Abbotsford be elected president. In making this motion, Mr. Fisher said it was due to Abbotsford, as the centre of the fruit interest, that the first president of the Society should be chosen from that place, and Mr. Fisk was well known as a recognized authority in fruit matters pertaining to the Province of Quebec.

Mr. Shepherd, in seconding the motion, agreed with Mr. Fisher that it was most fitting that the first president should be an Abbotsford man. The first one to move for the creation of a provincial society was the late Mr. Gibb, also a resident of Abbotsford.

Motion agreed to.

Mr. J. M. Fisk expressed his gratification at the honor done him. He considered the compliment was rather to the place than to the man, and felt quite certain that they could have made a much better choice. He felt sure Mr. Fisher would have filled the bill much better. However, he had no alternative but to accept the honour, and he promised the Society that he would do all he could to promote its objects and further its success.

Mr. Brodie moved, seconded by Mr. Pyke, that Mr. R. W. Shepherd, jun., be elected vice-president.

he had always taken in everything tending to develop the fruit-growing industry,

Mr. Brodie referred to the experience of Mr. Shepherd, and the great interest and felt sure that no worthier vice-president could be chosen. Mr. Pyke cordially seconded these remarks, and the motion was agreed to.

Mr. Shepherd expressed his high sense of the honour they had conferred on

him. He felt sure that the formation of such a society would be productive of much good, and promised to do all in his power to make it a success.

Professor Craig moved that Mr. Dunlop be continued in the office of secretary. He knew that Mr. Dunlop was anxious to get out of harness, but when they had a good man in the collar they should try and keep him there.

Mr. Dunlop said it would be impossible for him to accept, however willing he might be to do so. He however had no objection to act until they were able to choose another secretary, and he would always be happy to give the Society all the assistance he could whenever he had any spare time on hand. He must decline positively however to assume the office for another year, as his business engagements absolutely precluded his doing so.

It was then decided to postpone the nomination of the secretary until later in the day, and in the meantime Mr. Dunlop would perform the duties.

Mr. Shepherd moved that the chairman should appoint a committee to divide the province into nine districts, in accordance with the constitution, each, of which would be represented in the society by a Director.

The motion was agreed to, and the chairman appointed Messrs. Craig, Dunlop and Shepherd as the committee.

The chairman then read the constitution.

CONSTITUTION.

I. This Association shall be called the Pomological and Fruit Growing Society of the Province of Quebec.

II. Its objects shall be the advancement of fruit culture, by holding meetings for the discussion of all questions relating to fruit-culture, by collecting, arranging and disseminating useful information, and by such other means as may from time to time be deemed advisable.

III. The annual meeting shall be held at such time and place as may be designated by the Association.

IV. The officers of the Association shall be composed of a President, Vice-President, Secretary-Treasurer, and nine Directors, the said Directors being appointed to represent nine fruit districts, into which the Province shall be divided, and each director shall be a resident of the district for which he is appointed.

V. Any person may become a member by an annual payment of one dollar and a payment of ten dollars shall constitute a life-membership.

VI. The Directors of the Association shall prepare and present, at the annual meeting of the Association, a report of their proceedings during the year, in which shall be stated the names of all the members of the Association, the places of meetings during the year, and such information as the Association shall have been able to obtain on fruit culture during the year. There shall also be presented at the annual meeting a detailed statement of the receipts and disbursements of the Association during the year—the whole to be published in the annual report of the Association.

VII. The Association shall have the power to make, alter and amend By-laws for prescribing the mode of admission of new members, the election of officers, and otherwise regulating the administration of its affairs and its property.

VIII. The Constitution may be amended by a vote of the majority of the

members present at any regular meeting, notice of the proposed amendments having been given at any previous meeting.

Mr. Fisher, seconded by Mr. Shepherd, then moved the adoption of the Constitution as a whole, and the motion was agreed to, after which Professor Craig presented the report of the committee appointed to divide the Province into districts. The divisions are as follows:—

District No. 1.—Huntingdon, Laprairie, Chateauguay, Beauharnois, Missisquoi, Iberville and St. Johns.

District No. 2.—Rouville, Chambly, Bagot, Shefford, Brome, Verchères and St. Hyacinthe.

District No. 3.—Stanstead, Compton, Sherbrooke, Richmond, Wolfe and Beauce.

District No. 4.—Drummond, Megantic, Arthabaska, Richelieu, Yamaska, Lotbinière, Levis, Dorchester and Nicolet.

District No. 5.—Beliechasse, Montmagny, Kamouraska, L' Islet, Temiscouata Rimouski, Bonaventure and Gaspé.

District No. 6.—Pontiac, Ottawa, Montcalm, Joliette, Berthier, Maskinongé and St. Maurice.

District No. 7.—Quebec, Champlain, Portneuf, Montmorency, Charlevoix, Saguenay and Chicoutimi.

District No. 8.—Soulanges, Vaudreuil, Argenteuil, Two Mountains and Terrebonne.

District No. 9.—City of Montreal, Jacques Cartier, Hochelaga, Laval and l'Assomption.

The following directors were then elected:—

No. 1 District, G. B. Edwards, Covey Hill;
No. 2 District, S. A. Fisher, Brome;
No. 3 District, W. A. Hale, Sherbrooke;
No. 4 District, Hon. Joly de Lotbinière;
No. 5 District, Aug. Dupuis, L'Islet;
No. 6 District, Professor Pache, Bryson;
No. 7 District, J. C. Chapais, Kamouraska;
No. 8 District, D. Pyke, Hudson;
No. 9 District, R. Brodie, St. Henri.

A committee of the directors then was named, to decide where the next summer meeting should be held, and Mr. Shepherd, after the committee had deliberated, reported as follows:—"We took into consideration the divisions of the "Province, and decided that the first winter meeting should be held in District "No. 1, comprising Huntingdon, Chateauguay, Missisquoi, St. Johns, Napier-"ville, Iberville and Laprairie. The most central point of these is St. Johns. "The summer meeting we have decided to hold at Knowlton, in No. 2 District. "In doing this we are accepting the invitation of Mr. Fisher, the date of these "meetings will be decided by the Directors."

Professor Craig moved that the report of the Committee be accepted, and suggested that the winter meeting take place during the first half of January. All of which was agreed to. The meeting then adjourned until the afternoon.

AFTERNOON SESSION.

The first subject on the programme was an address by Professor Craig.

PROGRESS IN HORTICULTURE.

Professor Craig said:—It is with mingled feelings of pleasure and diffidence that I find myself facing an audience composed of so many familiar faces,—pleasure, because the friends of one's youthful days are, after all, those whose memories linger longest in our recollection—no matter how many ties and associations are formed in later life. But with the pleasure comes the thought born of application to present circumstances of the old proverb, which speaks of the relation of the prophet and his credit to his own country.

This feeling is overcome, however, in a measure by the assurance of the interest which I know you will take in this subject which we meet to-day to discuss for our mutual benefit.

These matters, to my mind, are of far-reaching importance, and should overshadow any side-issue of a personal character. In discussing the subject of progress in Horticulture, I will endeavour to do so entirely from the utilitarian standpoint—that is, from the standpoint of the usefulness and value of the more recent advances in Horticulture to us as progressive fruit-growers in the year 1894. Agriculture has grown to mean more than the cultivation of lands, and Horticulture, too, has grown to mean more than the planting and care of trees.

In its primitive state in this country, the practice of agriculture meant disturbing the bosom of the earth, planting seeds, reaping and eating the crop; muscular strength was its mainstay, and the constant exercise of rigourous self-denial its almost only economy.

Nowadays, agriculture has made such progress that it includes every culture from the cultivation of land to the cultivation of people who live on land.

That much progress has been made in all lines of agriculture is an indisputable fact, and, let us ask, what factors have contributed to this advancement?

In a broad way, it is largely due to the greater educational advantages working through various channels possessed by the farmers of to-day over those of past generations.

At the present era in horticulture, "science combined with practice" should be our motto.

Neither the one nor the other will stand by itself, but the two should be combined, and then we truly shall have horticultural advancement; at the Experimental Farm we endeavour to unite the two. So fully have the benefits of the Experimental Farm system been realised by the farmers of the Dominion, that the officers of this institution now feel that they are, in a measure, at the head of an agricultural school system, which stretches from the Atlantic to the Pacific, and which numbers among its pupils many thousands of the best farmers in the country. Coming more particularly to the subject which I wish to speak of, I may cite some of the principal factors which have had most influence in advancing the cause of horticulture. Among these may be instanced our Provincial associations. We all know the great beneficial influence which the provincial society of our sister province of the West has had in stimulating the horticultural advancement of that Province and the country in general, and I have no doubt that your society, which has its inception to-day, will in like manner influence as largely the horticultural future of this province. Our farmers' clubs have also a very useful effect. One of the most striking examples of horticultural progress may be cited in the discovery of the possibility of success-

fully using arsenical poisons for the prevention of insects and fungous pests. Some twenty years ago it was discovered that the ravages of the potato beetle could be more effectively and cheaply arrested by this means than by the old shingle and pan methods. The use of white arsenic was soon followed by that of Paris green and London purple, which are by-products of the same substance, and we all know how effective are both of these compounds in deterring insect attacks.

Following this came our knowledge of the life history of many of these minute fungus pests which prey upon our fruit and upon our agricultural products. I might say a word as to the character of this minute and numerous class of fungus pests. The word "fungus" is one of quite recent origin, just as our knowledge of this class of plants is recent. We have probably all heard a great deal about spores, in connection with fungous diseases, and I wish to point out one or two facts which will render clearer some phases of the life history of these plants.

In the first place, we must recollect that they are—that is, the individual plant is—very small, and what we see with the naked eye is an aggregation of many of these plants. In the second place, they have no power of assimilating material from the earth and the air in the same manner that our ordinary farm crops have; and lacking the power to do that, they have to get this food in an already assimilated or digested form. This they do by feeding on other plants of a higher order which possess this faculty of assimilating the raw materials from the earth and the air. We, therefore, never find these plants growing on soil, but always on other plants, and for this reason they are termed parasites.

The "black spot" of the apple, the "pear scab" and mildew of the grape are common examples of parasitic fungi. I spoke of the smallness of these plants: they are so very small in their first appearance, developing, as they do, from a single minute spore, that they cannot at first be detected by the naked eye. By the aid of the microscope, however, their life history has been worked out. It was found that they were carried by these organs called spores, which serve the purpose of seeds from one season to another. The whole principle involved in the preventive treatment of these is based on the discovery of the fact that sulphate of copper would prevent these spores or seeds from germinating. Our practice of spraying is entirely based on this principle. We found it necessary, in the case of "the apple spot," to spray the tree early in the spring. We do not know exactly when the spores are carried to the tree, and germinated, but we know that when the tree is covered with a very light film of the copper solution, the spores will not germinate.

The principle upon which our operations are based is a preventive one. Therefore let us remember to spray early and thoroughly. At all our horticultural and agricultural conventions, spraying is one of the most absorbing subjects of discussion, and about which most questions are asked, showing that farmers are awaking to its necessity. I shall deal more specifically with regard to the apple spot disease, which in this vicinity is doing a great deal of damage, as well as in many parts of Ontario is reducing crops, once profitable, to such a point, that orchard owners are seriously considering whether it will not pay them better to root out their trees and use the ground for other purposes. This spot has its origin in a spore which lives over winter on the twigs, dead leaves and buds, and germinates at an early period in the spring. Its growth may be prevented in a large measure by covering the trees with a film of copper solution. In answer

to the question : What is the best mixture ? I may say that Bordeaux mixture has given the greatest immunity.

It is said to have been discovered accidentally some years ago by some French grape growers in France, who were annoyed by boys stealing their grapes. They thought they would make an unattractive-looking mixture and sprinkle it over their vines in order to prevent the inroads of the boys. It had the desired effect, and was found also to prevent black rot and downy mildew. It is now used at one-half the strength which was first recommended, and is found to be very effective. Here is the formula for the dilute Bordeaux mixture : 4 lbs. bluestone, 4 lbs. fresh lime in an ordinary kerosene barrel of water. There are some difficulties and a good many annoyances connected with the application of this mixture. Nobody need take up the work and think it is going to be a pleasant, easy thing to do, because it is not.

In making the mixture, the first thing to do is to get your barrel half filled with water, then put your 4 lbs. of copper sulphate in a small sack or bag, and suspend it in the water. The copper solution dissolves, and being heavier than water it drops to the bottom, so that if the copper sulphate is placed at the bottom, it does not dissolve nearly as rapidly as when suspended. When that is dissolved, slack the 4 lbs. of fresh lime with the necessary amount of water, and pour into the first mixture, being careful to reject the coarse sediment which remains at the bottom. Then fill the barrel with water. The cause of our greatest mistakes, when we first began spraying, was that we did not know the enemy was up and doing us harm so early in the season, and we did not begin our attack soon enough. It is necessary to make two applications before the blossom opens,—the first one about three weeks before the blossoms open, and the second two weeks later ; the third application should be given just after the fruit has appeared. In the case of Fameuse, it will be necessary to make five sprayings at intervals of two to three weeks apart, according to the weather, beginning at the time as already indicated. Some varieties are more liable to attacks of disease than others, and the profit you will derive from spraying will depend in a large measure upon the care given in making the application, carrying out every detail, and also upon the variety of the apple.

Very careful experiments have demonstrated that the King apple has its value increased a dollar and ten cents per barrel by four sprayings during the season. The cost of making the four sprayings will vary according to the size of the tree, from nine cents up to twenty cents. Twenty cents per tree is not a very heavy outlay, when you come to consider that you might get three or four barrels to the tree and each barrel increased in value one dollar. One advantage of the Bordeaux mixture is that after the blossoms have fallen, you can add Paris green to it at the ordinary rate of 1 lb. to 200 gals. of water, and apply it for the destruction of the codling worm. Last year this pest was most destructive, and those who neglected to spray with Paris green lost nearly all their apples. Another disease which we are not called upon to fight so strongly in this vicinity —because we do not grow the fruit to a great extent —is the "pear scab."

But on the Island of Montreal and vicinity, where Flemish beauty pears are grown, this disease has caused much damage. It may be treated in the same way. I will give you some figures which I obtained last week, when attending a meeting of the Western New York Horticultural Society at Rochester.

The experiment which I will quote was conducted by Prof. S. A. Beach of

the New York Experiment Station at Geneva, and was designed to test the efficacy of Bordeaux mixture in preventing pear scab.

Seckels and White Doyennés were selected. The grading and marketing of the fruit was done according to the usual custom, and a record kept of the sales, with results as follows :—

	Sprayed.	Unsprayed.
Seckel-Firsts	$2.25 to $2.75 per bu. keg	$1.25 to $1.75 per bu. keg.
" Seconds	$1.75 to $2.00 " " "	$1.00 to $1 30 " " "
White Doyenné-Firsts	$4.50 per bbl. ($1.80 per bu.)	none
" " Seconds	$3.25 per bbl. ($1.30 per bu.)	$2.00 per bbl. (0.80 per bu.)

The average cost per tree for five treatments which were made amounted to 47 cents ; but the gain resulting from spraying for each one hundred trees varied from $423 to $562,—a most remarkable showing indeed.

I do not say that the results will always be so satisfactory, because then people would be led to expect more than they would attain in ordinary practice, but they will certainly amply repay the trouble and expense involved.

In the case of mildew of the grape, I use the same mixture. In the Experimental Farm vineyard last year and the year before, treated vines yielded from twelve to fifteen lbs. each, and untreated three to five lbs., and these were varieties selected because they were most liable to the attacks of this pest. The vines were treated for two years, and the figures I have given are the average yield for that time. The cost of spraying a vineyard in the season will vary from $6.00 to $10.00 an acre for four sprayings. The practice of spraying grapes has become universal in New York State. Grape growers around Lake Chautauqua reported last year that their grapes for the past season had only netted them eleven cents for a 9 lb. basket,—a little over a cent a pound, and yet they found they could grow them at this rate with profit, because, yielding at the rate of two and a half tons to the acre, they would give a return per acre of about fifty dollars, which is probably more than the average farm crop.

Some of the practical questions which arise in this connection are about the appliances for spraying. In the first place, we need a good force-pump. This should be supplied with two discharge nozzles. A satisfactory pump can be purchased at from ten to twelve dollars,—possibly less. The discharge pipes should be of rubber hose, six to eight feet long; and for spraying high trees, it is very convenient to have attached to this eight or ten feet of gas pipe.

This allows of the spray being carried to all parts of the tree. Attached to the end gas pipe, you will require a medium which will distribute the liquid in the finest possible state of division, It should not be pumped on to the trees in a stream as you would wash a wagon, but should be broken up, and fall in the form of a fine spray, so as to be as widely diffused as possible. The Vermorel Improved Nozzle is the best instrument for this purpose, it being provided with a central plunger for cleaning it when it becames clogged.

Mr. Brodie.—Is it better than the McGowan ?

Professor Craig.—I like that very well for tall trees, but prefer the Vermorel Improved for ordinary operations. There are two or three modifications of the Vermorel. The best is made with a right angle joint, and you can unscrew it at that point. The McGowan Nozzle costs rather more than the Vermorel. A tank or barrel for holding the liquid is then needed. I saw a very useful tank last week in N.Y. State, which would be just the thing for spraying a large orchard, but would not suit orchards where the trees are planted very close and

the ground is rough and uneven. It was a strong wooden tank set on a wagon, and made just like a wagon box, but closed, and with a pump fixed in the front end. On this tank two men could stand, the one holding the nozzles and spraying, and the other operating the pump handle and driving the horse. This tank held three hundred gallons of liquid, which was first mixed in a concentrated form in a barrel, and then filled into the tank. The motion of the wagon going over the rough ground kept the liquor agitated sufficiently.

In ordinary practice a coal oil barrel will serve as a tank. Another evidence of progress in horticulture is the fact that we are now studying the question of better fertilisation of our orchards,—that is, the fertilisation of the ground upon which the trees grow. It was too commonly supposed that if you planted a tree in the ground and gave it fair cultivation for two or three years, it would take care of itself afterwards, and there was no need to worry about it or give it further thought. But when we put a tree in the ground, we must feed it, or we cannot get much from it; unlike animals, it cannot move hither and thither for its food. The principal element of plant food contained in all soils are nitrogen, potash and phosphoric acid. An acre of apple trees will take annually from the soil probably 50 lbs. of nitrogen, 22 of potash and 8 of phosphoric acid. Roughly speaking, one-half of that quantity is consumed in the development of leaves and formation of wood, and the other half in the development of fruit. We must bear in mind that these elements must be replaced. Right in connection with this is quite an important point.

Analysis of the apple will show, if you take the seeds and everything into consideration, that the seeds contain much more fertilising constituents than the pulp surrounding them. In the seeds the valuable nitrogenous matter is taken from the soil, and we know that a small apple contains as many seeds as a large one, which points out to us the necessity or desirability of thinning the fruit—taking off the tree the superfluous fruit, because, as I have said, it costs just as much to mature a little apple as a big apple. The greater amount of pulp of the big apple is formed from constituents—water and sugar and starch—which come from the air, and therefore do not cost us anything, while the seeds of the little apple do cost us something in the direct drain upon the soil.

This shows the good sense of limiting the quantity of fruit which the tree should bear, because it is not always an easy matter to return to the soil the nitrogen, potash and phosphoric acid which are thus drawn from it.

In old orchards, I would advocate the keeping of sheep in the pasture, but do not think we should leave them to depend entirely on the pasturage for their support. They should be fed sufficient meal to prevent their browsing the lower branches of the trees. Returning again for a moment to the matter of thinning fruit, I may say we have in Ottawa a grape grower who has a very limited area of ground, and not a great many varieties of grapes, but every year he secures the principal prizes at our exhibition, and sometimes carries off the best premiums in Toronto from the great Western growers. He does this by exhibiting bigger bunches and finer-looking fruit.

This greater size of bunch and berry he secures simply by thinning. He first leaves on the vines only as many bunches as he thinks will be brought to perfection. He then goes over the fruit, and picks out all the berries that are being crowded in the bunch, and by this means he is able to secure much larger berries and very well formed bunches.

Another line in which we have made considerable advance in the past few years is in that fascinating pursuit of producing new varieties of fruit by crossing and hybridising. We have been doing a good deal along this line at Ottawa during the past three years, and we have now a large number of seedlings of known parentage of greater or less promise. In future, it will be the policy of the horticultural division of the Experimental Farm to restrict its work of distribution mainly to varieties originated there, confining it to the members of the different horticultural societies of the Dominion from whom we can hope to obtain accurate reports. We have found that the demand for this kind of popular missionary work quickly grows to a much greater extent than our means will allow us to undertake, so that in the future, new and desirable fruits will be distributed through horticultural organizations of this kind, the members of which will be privileged in this matter of testing the new varieties of fruit which we are originating.

I hope, in the coming spring, to give tangible evidence of our work, by sending to the members of this Society a new variety of raspberry, which I trust will prove to be better than anything of its class that we have had thus far. In connection with the matter of crossing, another very important point bearing upon successful fruit culture has been quite recently discovered. In some experiments in cross fertilising, conducted by an agent of the U.S. Department of Agriculture in Georgia, two years ago, the fact was developed that many varieties of pears were dependent for the fertilisation of their blossoms upon the pollen of other varieties; further investigation showed the same state of affairs with certain varieties of apples. This self-sterility explained why large orchards of a single variety were frequently unproductive.

Further, he investigated a large orchard of a single variety of pear tree, the Bartlett, known to be very fruitful when mingled with other sorts; but though the trees blossomed, no fruit appeared. At one end of this large orchard were two or three trees of the Keiffer variety, and immediately surrounding them were the *Bartletts*; these trees were very fruitful. This led to the conclusion that the productiveness was due to cross fertilisation. It was found that the blossom of the Bartlett pear could not be fertilised with its own pollen. This discovery formulated this principle that it is necessary to intermingle different varieties of fruit for purposes of cross fertilization, in order to secure fruitfulness which was found to exist here also. In following up this work we have found that many varieties of grapes and apples, if planted in large blocks by themselves, will be comparatively unproductive, owing to this reason. Mr. Brodie has cited the example of a large number of orchards which had reached the bearing age, but failed to produce fruit, and I think the cause I have given has more to do with it than anything else. At the meeting of one of our fruit-growing associations at Hamilton, a Michigan gentleman had a habit of bringing before every session the fact that he had an orchard which would absolutely refuse to bear any fruit whatever, although the trees were healthy, well cared for, and blossomed well. A number of questions were generally asked and satisfac orily answered by the gentleman, when those present would shrug their shoulders, and he would feel very proud at having raised a question which nobody could solve; but it came out later that the orchard consisted wholly of the Northern Spy variety, which may not be able to fertilise with its own pollen, probably answering the question.

Another factor which will affect our horticultural progress in the future is the fact that the success achieved by Canada in her horticultural exhibits at the

World's Fair was largely due to the manner in which the fruit was stored. The newer systems of cold storage are going to effect a very important revolution in the varieties of fruit which we shall grow with profit in the Province of Quebec. We have been searching for many years for a desirable winter apple that will combine all the good qualities and keep until the following season and ship well. All this is very desirable, but not so important as the fact that we can, by means of cold storage, keep our autumn and early winter fruits in such condition that they will be saleable in the spring when prices are high.

A friend of mine has built a large cold storage warehouse in Montreal, and I was astonished to find, a short time ago, on going through the 22 rooms, that many were filled with perishable fruit from California, such as early pears, grapes and apples, in perfect condition, and likely to remain so until sold to the dealers.

Returning to the World's Fair, I may say that Wealthies were brought out in good condition when the World's Fair opened in May; and visitng the cold storage warehouse on Water St., Chicago, in June, you could find Duchess apples which were being brought from the warehouse and put out in the stalls for sale. This question of cold storage is a new one, susceptible of great development. The time is coming when each fruit-growing centre will have its cold storage warehouse. A system of co-operative cold storage warehouses is no doubt an assured thing for the future, and the subject should be investigated by the progressive fruit-growers of to-day. It behooves us as practical fruit-growers to study these factors in all their bearings, as few of us are able to engage in the business either for health or amusement. We have had here at Abbotsford the rare privilege of watching the example of one whose good work is well worthy of emulation—one who worked not for glory, not for personal gain, but for the public good; and I think it is extremely fitting that this the first session of the Pomological Society of Quebec, which will in all probability be looked on in the future as the authority in matters relating to fruit culture, should be held at the scene of the labours of one who has left us such an admirable example. To me, there is inspiration in the thought. I wish this Society a long, prosperous and useful career. Let us each resolve to hold fast to that which is good, and unceasingly labour for the advancement of the science whose interests we all have at heart (Applause); and in doing so we shall be making progress in Horticulture.

Mr. Shepherd. —Professor Craig has mentioned that Wealthies were brought out of cold storage at the World's Fair in April; but I have had letters from Mr. Blatchford, saying that up to the time of the fire which destroyed the cold storage building, samples of fruit were taken from the Quebec exhibit and put on the tables in perfect condition. The Fair opened in May. He also stated that they had enough Quebec fruit of the season of 1892—which we all know was a very fine crop, and of which very fine samples were sent to Chicago—to last until about the middle of August, had it not been for the fire, and the fruit commanded great admiration. I am sorry to say that the fruit which went up from the crop of 1893 was not as good, but we sent the best we could get. It was not, however, up to the mark. The same can be said of the fruit from Ontario. I know that our samples of Fameuse were the worst I ever saw. When I was standing between the tables one day in October, a gentleman came along in a bath chair behind me accompanied by his wife in another bath chair. This gentleman was from California.

Turning to his wife, he said: "Mary, look at the famous Fameuse from Quebec." I did not feel very proud of the fruit myself, and explained that they were not good specimens at all.

Mr. Fisher.—When taken out of cold storage, would they last long enough for commercial purposes?

Professor Craig.—Yes; probably two or three weeks.

Mr Fisher.—And for shipping to England?

Professor Craig.—No; this matter of cold storage for fruit would only refer to that used for home consumption. It would last long enough to suit the needs of the retail grocer, probably some two weeks or longer.

The President.—While I was in Chicago in June, I was very much interested in the exhibit of apples from Australia. They came to the tables in very fine condition. They had been picked in February, and occupied some 66 days in transport. They did not last long when taken from the boxes and laid upon the tables, but in a very few days began to go. I was surprised to see fruit from such a distance in such good condition. The apples, to which Mr. Shepherd has referred, and which were in cold storage, I saw in several boxes. They came out in splendid condition. I am satisfied that the cold storage system will be adopted throughout the country in a co-operative way. We could put in the fruit, and keep it until prices were satisfactory.

Professor Craig.—I forgot to mention, in connection with the packing of Quebec fruit, a point which was very clearly demonstrated when the fruit was taken out. The apples kept very well when wrapped separately in tissue paper. There was difficulty in getting those who controlled the cold storage warehouse to receive the fruit at first on account of the paper in the boxes, and I understand, in order to meet their requirements, the paper was taken off, and in many cases considerable loss ensued, whereas the Ontario fruit which was very largely wrapped in paper, and accepted in that condition, turned out very well.

Mr. Shepherd.—I understand all our fruit was wrapped in paper.

Professor Craig.—Yes, here; but it was unpacked before going into the cold storage, and the paper wrappings taken off.

Mr. Brodie.—My experience of the crop of 1892 was that I refused $3.50 and $4.00 in the fall, and kept the fruit in cold storage until the spring when I had to sell at $2.50. I found there was no profit in cold storage.

Professor Craig.—Mr. Brodie would not be willing to risk that again this year.

SPRAYING.

Mr. James Fletcher, Dominion Entomologist, addressed the audience on the subject of Spraying for the prevention of Injurious Insects.

He said:—I am highly gratified at being given the opportunity of addressing an audience in Abbotsford, the home of the founder of horticultural science in this country and the home of a rising generation of horticulturists. All the gentlemen around me are well known as horticulturists, and the place is of great interest to every one who studies that science. The name of Charles Gibb alone would be sufficient to gain for Abbotsford distinction; but besides the late Mr. Gibb, the names of many gentlemen around me are well known as authorities in horticulture. I need only mention the name of Mr. John Craig, who occupies

a leading position as a horticulturist in Canada, whose name is even now after a few years well known all over the American continent, and is destined to become even better known than the great one I have already referred to. To-day the importance of the study of the different fungous and insect pests is recognised at every meeting where pomological matters are discussed. There was a time when I had to apologise to my audience for speaking of insects and fungous diseases. I would be frequently asked : " What are you doing here ? You are not a fruit grower." And when I would reply that I had come to speak about insects, I was not taken in earnest, but it was rather considered in the light of a joke. That time, however, has gone by.

The loss by the attacks of insects averages 10 per cent., and the loss from fungous pests another 10 per cent., so that nearly one-fourth of the whole revenue derivable from our fruits is destroyed every year by these enemies. Through the study of the life histories of these pests and the practical work put into the discovery of remedies of late years, a large proportion of this quarter of the income of the country can be saved. Professor Craig has told you about some of the remarkable developments of these remedies, and how we can now control many of the most serious pests which attack fruits and other crops. Perhaps a larger proportion than 75 per cent. can be saved by means of information which is at the command of horticulturists all over the country, and which they require only to put into effect. In the treatment of the black spot of the apple, a good deal of work has been done in this district, although it has not been in all cases, I am informed, quite so successful as in some other districts. The lack of success is not a reason for stopping these experiments, but rather should be an incentive to try again and find out the cause of the failure. I believe failure in most cases is due to want of care or want of information as to the method of carrying out the experiments. There are men here to-day who have tried this remedy for the black spot, and achieved enormous success. I would especially mention my friend, Mr. Sydney Fisher of Knowlton, who will probably favor us during the meeting with some account of his work ; but I do not care to quote instances of very great success, in case that might lead to disappointment among those whose efforts may not reap the same reward.

Last week I was attending a meeting, where one of the gentlemen present said he had bought a spray pump for spraying potatoes, and tried to use it, but could not get the good results from it which he was led to expect, and he went back to the water-can. Well, he should have tried to find out the reason why the pump did not work. Everybody who has ever bought an implement, the use of which is new to him, knows he does not get it at once to do what the agent says it will do ; but if it is a good instrument, and he will take the trouble to examine it, he will find there is either something out of gear or he is not using it properly. When we take into consideration the remarkable progress which has been made during the past year or two in the effective treatment of crops, to protect them against their insect and fungous enemies, and the fact that most of the remedies require to be applied as a spray, I consider that a spray pump is part of the necessary equipment of every fruit farm. If you apply the Bordeaux mixture for the black spot of the apple, knowing something of the life history of the disease, and recognising the fact that the fungus is on your trees now, and that if you put on a first application of 1 lb copper sulphate in 25 gallons of water before life begins in the spring, you are going to reduce very much indeed the num-

ber of spores or seeds which are on your trees, without any danger of injuring the foliage or crop. This is to be followed later by two or three applications of Bordeaux mixture, 6 lbs. copper sulphate, 4 lbs. lime in 45 gallons of water. Now, as this mixture of copper sulphate contains lime, this fact enables us to add Paris green in much greater strength than we could do without it.

It is not yet decided whether Paris green thus applied will have the same effect as if applied separately, but there is saving in the expense in not having to put on two separate applications. In all these spraying experiments the great expense is the labour. The primary cost of the spray pump is nothing. The crop of one tree will more than pay for that, and the pump lasts several years. There are three different classes of pumps, first, there is the hand pump, which you can buy for about $4.00. This is an extremely useful little implement, and can be used to spray from one dozen to forty or fifty trees. Then there is the knapsack pump. If you have an enemy you want to punish, get him to carry a knapsack pump for you. It is an extremely useful instrument, but I would advise you, for the sake of your hired man, only to let him work at it half a day at a time, because it is heavy and the labour very trying. The working of the hand at an unusual angle, in most patterns, the left hand, and the working of unusual muscles makes it very tiresome ; besides all this, carrying a cold solid block which the knapsack sprayer is when filled with a cold solution, on your back in hot weather, is very trying. In the case of any man, however, who has one hundred trees or two or three acres of potatoes, the knapsack pump will answer his purpose far better than a small pump which will involve the transportation of a great deal of liquid. Where you have large orchards, you will require pumps moved from place to place by horse power. We have used a good pump made by Van Duzer of Grimsby, Ont., which is mounted on a barrel, and is drawn over the plantation on a stone boat. One man pumps and directs the spray while another leads the horse. In the Western States, where they have made a business of spraying large orchards, there are larger pumps which are worked by horse power, the pump being geared to the axle, but I have never seen any which worked very well. The Knapsack pump costs $12 to $14, the larger pumps for horse power cost from $12 to $35. The pump we use is made in Western Ontario and costs $10 or $12, and a second tube can be attached to it for stirring the mixture which is being sprayed, the liquid being forced through the nozzle as a spray through one tube and back into the barrel through the other, so that the mixture is stirred up from the bottom with every stroke. Just as important as a good pump is a good nozzle. Mr. Craig has told you of the Vermorel nozzle, which is merely a modification of one first invented by the United States Entomologist, Dr. Riley. Its chief characteristic consists of forcing the liquid at an angle into a chamber from which it has to get out through a very small central orifice ; as a consequence, the liquid is broken up into a very fine spray. You must never deluge your trees, but simply spray them ; for this you must get one of the nozzles that will break up the liquid absolutely into a spray. Some of the fluids are costly and also injurious to vegetation, therefore they must be applied to the trees in the smallest quantity possible, — in fact, as nearly as possible in the same manner as dew is deposited. You thus economise the liquid and reduce at the same time the danger of burning the leaves with a caustic application.

In spraying for injurious insects, some knowledge of the structure of insects is necessary to obtain the best results.

Insects are divided into two large classes according to the way they take their food. Those which bite their food as we do with jaws can be easily poisoned by placing some poisonous substance on the surface of the food, but there are others which take up their food through a hollow tube in liquid form; of this class are the Mosquito and Horn fly. They do not destroy the tissues, but insert their tubes, and suck out the moisture from beneath the surface. We have poisons which kill either by being taken into the body and digested with the food or by simple contact. Of the first class the most important are the arsenites. Arsenical poisons may be diluted with other substances, to such an extent as to be hardly noticeable and yet be effective. The cheapest of them is white arsenic, but the danger from burning the leaves is such that it cannot be recommended, and there is the further danger of its colour,—a white substance may be so easily mistaken for something else. Paris green is, I consider, an ideal poison, because it cannot be mistaken for anything else. Nothing else has that wonderful clear, green colour, and then, too, there is the general impression that anything green is poisonous. That idea derives its origin from the fact that arsenic, in combination with some other materials, and notably with copper, gives that beautiful green known as Paris green. One of the questions frequently asked is the extent to which Paris green is adulterated. I have never paid much attention to this objection, because I do not think it is ever adulterated to an extent worth considering. But it is as well to settle the question once for all, and next session a law will probably be put in our statutes to make the adulteration criminal. Paris green has an exact chemical formula, and it is probable the law will provide that when anything is added to the formula in the way of adulteration, the compound shall cease to be "Paris green," and shall not be sold without a penalty. When that law is passed, fruit growers will then know what they are buying, and obtain possibly results better than they have done in the past.

There are two grades of Paris green in the market—one *pure* and the other called "*genuine*." Genuine in the ordinary sense means good and pure, and not to cheat. Pure the dealers cannot get over, but "genuine" they seem to think has a sort of double meaning. But I am under the impression that even if you take the worst grade, and apply it as advised, you are likely to get the results you want. Paris green, as it is to-day—good or bad,—applied to your trees, will give you results which will pay all the time for the application. It is, however, a very corrosive poison, and unless diluted in some way it cannot be applied safely to foliage for the destruction of insects. We dilute it either with liquids or reduce it with dry powders. Some people prefer the dry form, and mix it with a large proportion of dry powders. In this country, ashes or land plaster are found to be convenient. In a limestone country, the road dust would be handiest. Where you use land plaster, you have a special advantage, because it induces a vigorous quick growth to the crop to which it is applied. A remedy for the turnip fly, which I find about the best, is an application of land plaster, —50 lbs. to 1 of Paris green. This can be dusted over the young seedlings as they appear above the ground, and the land plaster has the effect of inducing a rapid growth in the young plants and pushing them past the stage when they are liable to injury from the fly, while at the same time the Paris green will destroy any of the beetles which nibble the leaves.

Another active poison is White Hellebore, which can be used with very

good effect on currants or raspberries for the larvæ of saw flies. You will find sometimes on black currant bushes a long yellowish white looking caterpillar with black spots all over its body. This is hard to poison, and requires a weak mixture of Paris green. On account of the difficulty of killing this caterpillar, it is sometimes thought without reason that the poison is not good. But Hellebore can be and is adulterated very much indeed, and, moreover, by exposure to the air, it loses its virtue very largely, and unsatisfactory results are sometimes obtained from using this substance when it is old. Another very valuable poison is INSECT POWDER. This can be used on many plants which we use as food, but people who know that Hellebore is poisonous do not like to use this. Hellebore, being poisonous, cannot be recommended as an application to such fruits as are to be eaten at once, but at the same time it is not so very virulent, and being a vegetable poison, when applied as a liquid application or exposed to the effects of dew, the moisture dilutes it and the effect is soon lost. You know that if you put tea leaves into hot water and infuse them, the strength is taken from them. It is the same with these vegetable poisons. When once they are wet, the virtue is taken out very rapidly, and we know that the dew every morning and frequent rains reduce much the danger from Hellebore. For the currant saw flies or caterpillars, which appear for the first time about the middle of May, it is advisable to use Paris green, as at that time the currants are hardly formed, and Paris green can be applied safely in a weak mixture of 1 lb. to 200 gallons of water. Later, when the fruit is large and well formed, Hellebore must be used. There are certain insects for which we have to use insect powder, which is not poisonous, at least for the higher animals. Upon lower animals, such as insects, we find it owes its virtue to a volatile resin or some other vegetable production in the plant which is of a volatile nature. The effect of this principle is to close up the breathing pores of the insects upon which it falls. Insects differ very much in their structure from other animals. You can cut off the head of an insect, and although it is inconvenient for it, that does not affect its vitality as it would a man's. Instead of breathing through their mouths, insects breathe through several holes down their sides.

Any substance which closes these mouths suffocates them. The poison in the insect powder has the effect of contracting the muscles which control the breathing pores, and paralyzing them so that they cannot open again. The same result is obtained by another application,—that is, any oily substance. A drop of oil on a fly's or wasp's back will kill by suffocation in a short time, because these minute holes I have mentioned will be closed up. A cheap and very easily handled oil is kerosene, but this has an injurious effect both upon animal tissues and the tissues of plants. Therefore it becomes necessary to dilute it. If we mix soap with the oil, it forms an emulsion, and this can be reduced to any weakness we require by adding water to it. It has proved a valuable remedy for many insects, particularly for plant lice and the leaf hoppers. A well-known representative of the last is the grape vine thrip, which works great havoc in vineyards and on the Virginia creeper. These I have mentioned are the most important insecticides.

Remedies are active or preventive. The preventive remedies are chiefly good farming methods by which insects are reduced in number and prevented from attacking crops. The best preventive is good clean farming. Another preventive is a judicious rotation of crops; thus the insects that attack wheat this

year will not have wheat on the same land next year. Every plant known has its special insect enemies. The apple has over 200—in fact, nearly 300—different kinds of insects which feed upon it in its different parts—the roots, stem, leaves, and fruit. All plants allied to each other are liable to be injured by the same insect. If we have any kind of crop in a field one year, it is liable to leave its insects on the land to feed on the next crop if it is of the same nature; this is why we should have a rotation of crops, so that the insects which feed upon a given crop will not be furnished with the food best suited to them the following year. This is the one great principle which underlies the reappearance of injurious insects, and it applies of course also to injurious fungi. The continuance of the food supply makes an abundant recurrence of the animal or parasite which feeds upon it. Let me give you an instance: The Colorado beetle, which is now so abundant, was first discovered less than one hundred years ago, and was one of the rarest insects in North America. It was found in the Colorado mountains about 1820. Only three specimens were discovered by the naturalist who first took it; he went to look for insects. After thirty or forty years' civilization, man crossed the continent, and planted the potato wherever he went. That vegetable belongs to the Nightshade family, which is a small family. We have only two kinds of the Nightshade wild in this part of Canada, and only one of these is indigenous. As I have said—when first discovered, the Colorado potato beetle was very rare, this was because the supply of food was small, but when supplied with our potatoes it increased very rapidly. When we grow in large quantities any given crop, we must expect that the insects which feed on that will increase, unless we take special means to prevent it. This is why the economic study of the life history of insects is so necessary. In the last eight or ten years the most important discoveries have been made. It took years of constant experiment before Paris green, kerosene, emulsion and other insecticides were found to be destroyers of injurious insects.

I have said Paris green is an ideal poison. It is so cheap and is of so bright a green that it cannot be mistaken, and it can be effectively employed for many different purposes. Now, with regard to spraying crops, let us ask: is the spraying of trees useful? For ten years that subject has been brought prominently before fruit growers all over the country, but it is not yet adopted to one-hundredth degree of what it ought to be. I expected that some one would have asked Mr. Craig if there is any danger in applying Paris green or other arsenical poisons to trees. There is no danger at all. The most careful chemical analysis of apples from trees which had been sprayed in the way recommended by entomologists failed to show any arsenic in or on them at the time of picking.

The ridiculous statements which were published in English and American papers, saying that there was danger, were utterly false. England has twice disgraced herself in her agricultural matters lately, by the cattle embargo which was put on because the depression was so great, and then the government dared not remove it, although it was plain to the whole world that the action was based on a false statement. That was the second disgrace, and the first was when they pretended our Canadian apples were poison, and, as the newspapers said, "saturated with arsenic." Anyone who knows anything of the physiology of plants knows that no poison such as arsenic, which is caustic in its nature, could get into the tissue of a plant without destroying it. The same principle holds good with regard to potatoes. It is said that the poison could be "absorbed by the root." Well,

potatoes are not roots, but branches, as can be plainly seen by examining them. The eyes are buds from which branches spring. In the Jerusalem artichoke there is the same formation, but much more apparent. In some potatoes there is no difficulty in seeing that the potato is not a root, but is a modified branch; the tuber is a special reservoir for the laying up of starch to feed the young buds or shoots the next year. They can absorb nothing from the soil. Anything taken in is taken in by the leaves from the air and laid up in the branches. Arsenic would destroy the tissues, but could not get inside of them. But supposing this plant could absorb, there is no possibility of its doing so. We know that if the arsenic is thrown on the ground, it is at once acted on by the humous acids in the soil, and is very soon oxidized and destroyed.

As the leaves absorb nothing solid, the poison cannot get into the leaves. Therefore, I say, it is not well for horticulturists to wait and not apply these useful remedies lest there should be danger. They should take the word of scientific men who assure them there is no danger. Their first duty is to save their crops, and they will save a large proportion every year if they will only take the ordinary measures recommended.

The saving from spraying apple trees and plum trees is between 70 per cent. and 80 per cent. on an average. The codling worm in the apple and the plum curculio are the special enemies of the apple and plum trees. For the last ten years entomologists have given special attention to this subject, and are now able to speak positively as to the great value of spraying with the arsenical poisons.

From some confusion in the application of fungicides to destroy fungi, and insecticides to destroy insects, uncertainty arose, and we found it was all due to a misapprehension. Too much had been demanded from the mixture of fungicide and insecticide, but the testimony of leading men in Canada and the United States, where these remedies had been used, is that it decidedly does pay farmers and fruit-growers to spray their trees with Paris green and other mixtures.

Paris green should be applied to apple trees for the codling moth directly after the flowers have fallen. One lb. of Paris green, one lb. of fresh lime and 200 gallons of water. If it rains immediately after application, it should be repeated in a week, otherwise it should be repeated in a fortnight. Only three applications are required, and the increase in the quantity and quality of the fruit will amply repay the grower. Many kinds of plums are more susceptible to injury from arsenical poisons than others, and it therefore becomes imperative that this addition of lime should be made to all applications on plum trees. Some of the European plums are very sensitive.

I would increase the amount of water to the mixture for plums 250 gallons to 1 lb. of Paris green and 1 lb. of lime. I have never seen any injury to plum trees by an application of this strength but once, and that I found was due to the fact that the lime had been slaked and had no longer any strength, and consequently had little effect on the Paris green in neutralising it.

I know a great deal of spraying has been done throughout this district, and one would naturally expect that the farmers and fruit-growers would have adopted these remedies more widely. Some have tried, and did not meet with the amount of success they expected. I think this was due largely to some want of information or consideration of the nature of the insects for which the application was made.

One of the most injurious insects here is the leaf roller, a small caterpillar. I think in that case the injury was largely done before the application was made.

One of the worst fruit insects brought under my notice in the last three years is the bud worm,—a small insect that eats out the buds directly they burst in spring. This injury is sometimes serious; its history is as follows:

The eggs were laid last year, and small brown caterpillars hatched, which fed for some time on the leaves, and then spun a silken cell on the twigs of the trees, and remained there torpid until the spring. They come out just as the buds are bursting. For the first two or three days they feed on the young leaves, and then eat their way into the buds, destroying many flower-buds and also boring down into the shoots.

It becomes necessary to find when they first appear. That we now know is directly the buds begin to burst. With a small amount of labour and poison you can cover your trees and destroy the caterpillar. This is one of the few instances requiring the spraying of apple trees before the leaves appear. That being the case, and it being necessary at this time of the year to apply the Bordeaux mixture for the fungous disease, the "black spot," we can thus treat at the same time that disease and the bud moth by adding the Paris green to the Bordeaux mixture. It is not wise to spray trees while in flower.

We have never yet been able to prove that bees are actually poisoned from the trees having been sprayed while they are in flower; but there is no advantage in spraying them while they are in flower, because you run the risk of destroying the stigma of your apple flowers as well as the bees. The stigma is very sensitive; it is covered with a glutinous coating, so as to hold the pollen when blown on to it; but, as I say, there is no advantage at all in spraying the trees while in flower, as a week later answers all purposes and there is then no possible danger.

How it is these sprays can be so effective, the amount of Paris green used being so infinitesimal that it can only be found by a most delicate chemical test, I am not prepared to tell you, but I know and I submit it is all that it concerns you to know; the experiments show that it is so. I find there is great tendency among people, when they do not understand a thing, to let it alone altogether. But all the time you as fruit-growers are not spraying your orchard, you are losing your money. It is more practical to do it at any rate, and then if you must know how, find out why it is afterwards. If you succeed, I shall be glad to hear from you.

The egg of the codling worm is laid by a small moth inside the calyx or cup of the apple flower. In spraying the trees, an infinitesimal quantity once dropped into that cup is sufficient to destroy the young caterpillar directly it hatches. It takes a week for the caterpillar to hatch. Apple blossoms last from 5 to 8 days. If, therefore, we spray directly after the petals of the flowers fall, we have sprayed when experience shows us there is chance for the poison to be effective and destroy the insect before it eats its way into the apple. In the past year, those who sprayed their crops reaped a great advantage of not only having more fruit but fruit of much better quality. It was the same with those who sprayed their potatoes for the rot: not only were the potatoes saved from the disease, but they were of a much finer quality and much evener in size.

Mr. Shepherd.— What mixture do you recommend for the cabbage worm?

Professor Fletcher.—The two worst enemies of the cabbage are the green caterpillar which attacks the heads, and the white root maggot which attacks the

roots. For the first there is not the slightest difficulty: mix insect powder with four times its quantity of the cheapest common flour; close that in a tin canister for 24 hours. You have then a mixture sufficiently strong to destroy every insect it touches. This can be dusted over the plant from a small muslin bag, and every caterpillar it touches will be destroyed. Five years ago, round Kingston, they grew no cabbages on account of the attacks of this insect. I induced a large dealer to grow cabbages and apply this remedy, and he cleared over $300 that year.

The cabbage maggot, which attacks the roots of young cabbages planted out early in July, is treated, but not quite so satisfactorily as I should like, by mixing hellebore and water and making a tea of it: ¼ lb. of hellebore in 2½ gallons of water. Mix with a little hot water, and then fill up with cold water, having removed a little of the earth from around the root; pour half a teacupful around each plant, and then pull the earth back again. This should be done before the 1st of July. Look at your cabbages towards the last week in June, when the maggots are usually getting large enough to make their depredations easily recognizable; when seen, treat them at once. If you cannot see the maggots, you can always tell if they are present by the moisture around their roots. There is a double benefit from the mixture. Not only is the insect killed, but the plant gets benefit from the moisture and forms new roots above the old ones which were injured.

Question.—Now, what proportion of the plants you have treated will you save?

Mr. Fletcher.—Mr. Fisher's gardener treated some in his garden even at the end of July, and he wrote me saying they were the best in his plot. If applied in June, nearly every plant treated can be saved.

Mr. William Gibbs.—What do you recommend for borers?

Professor Fletcher.—The remedy for borers is entirely of a preventive nature. Treat your trees every June with a soap or alkaline wash. Prepare a solution of common washing soda, with enough common soap added to make it as thick as whitewash. This is put on the trees, and remains throughout the season. This will prevent the female beetles from laying their eggs on the trees at all.

Mr. Shepherd.—There is no wash which will take the borer out when once it gets into the tree. In the month of June my man examines the root of every tree, and if he finds borers he runs a copper wire into the hole which he entered, and kills him. In our section of the country we have thorn, and chokecherry, and wild plum hedges all over. These harbour the borers. That is one reason why we are so much troubled; but if we examine the tree regularly, we have very little trouble.

Professor Craig.—I would emphasise what Mr. Fletcher says about that wash. Prevention is better than cure. There is not a single borer on the experimental farm, and the trees are washed with a solution which costs ¼ of a cent per tree. Besides preventing the borer, it keeps the bark remarkably clean, green and healthy. Dissolve one pound of washing soda in two gallons of water, and thicken that to the consistency of ordinary paint, with soft soap, and apply it with a whitewash brush.

The President.—Professors Craig and Fletcher have shown the necessity of spraying in the case of fungous diseases. What would be the effect if a man sprayed his orchard and his neighbours did not spray? Are these spores carried by the air?

Professor Fletcher.—Undoubtedly. All these fungous pests are propagated

by spores so minute that they can be carried a great distance; but where the trees are sprayed, the spores alighting on them will not germinate. By systematic treatment every year, not only the insects but the fungous diseases would be reduced. The converse can be readily seen by the spread of black knot all through Canada. Botanists know perfectly well it is caused by a fungous; but, as I have endeavoured to show fruit growers, it is not worth while wasting time in discussing that matter. Never mind what causes it; we will give you something to stop it. They, however, will wait to make up their minds what causes it before setting to work to cut it out. The black knot is so prevalent in some parts of Canada that in a few years a cherry tree without a black knot will be a specimen fit for a museum. In the Ottawa district it is entirely unknown, but that will not continue unless we can persuade the farmers in surrounding districts to cut out the black knots and burn them.

Mr. Fisher.—Is that wash a preventive of bark lice?

Mr. Fletcher.—Kerosene emulsion is the proper remedy for bark lice, and is applied in the early part of June with a force-pump.

Mr. President.—You mentioned two tubes to your pump. I suppose that is with the object of spraying two rows at once?

Professor Craig.—Yes; it is not absolutely necessary, but it facilitates and expedites the spraying. It requires another man, but the operation is one every one wants to get over as soon as possible. I spoke of a tank. In connection with that the men who operated the nozzles and held the spraying machine were on a platform about four feet above this tank, so that with this long hose and the gas pipe attached they could reach into and over almost every apple tree in the orchard. It paid them to do so.

Mr. P esident.—The pear blight attacks not only the pear trees here but the apples also. I was surprised to see the few apple trees on the ranges below here that escaped. This is the first season we have had any experience with it here.

Professor Craig.—I went to some trouble this autumn in looking up the matter of pear blight. I knew it was damaging the trees here and in Western Ontario, and wanted to get all the data possible. I therefore sent out a circular asking for as much practical and personal experience as every grower who had anything to do with the disease could give. I also studied the disease theoretically, and after getting all the information I could was not as well satisfied with the results of my investigations as I would like. We know very little yet with regard to the practical means of preventing the spreading of pear blight. It belongs to the general class of fungous diseases, but to that particular branch which is of bacterial origin and closely allied to some of the diseases that affect the animal kingdom as well as plants. That class is always most difficult to treat. We know that the germs enter the plant through the tender tissues of the young growing leaf, because we always see that the branch dies from the top downward. We further know that the disease can be transmitted from one tree to another. It is very easily done. If we cut out the blighted blanches of a tree carelessly and use the same knife on a healthy tree alongside, we will most likely transmit the pear blight to that tree, if it were an apple or a pear. We find that the disease is most prevalent on damp rich soil where the trees are making very luxuriant growth. For active remedies the only thing to be done is to cut off and burn all the blighted portions as fast as they appear. I had a great deal of diffi-

culty on that account in the past season with the Russian apples. That has been the worst enemy of the Russian apple. I suppose 90 per cent. of over 300 varieties were affected during the past season, and I think a good many would have been killed outright if I had not had the blighted parts removed and burnt just as soon as they appeared. The appearance, after the early indications, was very rapid. You may see the leaf just turning brown as if it was scorched, and the next day perhaps two feet of that branch will be withered as if struck by lightning or seared by fire. It is necessary to cut 12 or 15 inches below where the bark on the outside shows the disease by turning black before you can be sure that you have taken out all the diseased portion. I tried the Bordeaux mixture; but you see the disease attacks the tree during the growing season, and as soon as new leaves are formed,—and they form very rapidly—you would have to keep them thoroughly covered to protect them. I sprayed two or three rows most thoroughly, but found the leaves getting ahead of me all the time.

Professor Craig.—Our experience in the past is that it comes by periods. It first appeared in Canada about 1820, and was very severe for 2 years. 20 years later it appeared again in Western Ontario, and damaged the orchards to a great extent, but it only stayed about the same length of time. So it seems to have a terminal periodicity about it.

Mr. Dunlop.—I remember a blight somewhat similar appeared in the Island of Montreal a good many years ago, but confined itself solely to one variety, known as the Montreal Beauty, a crab-apple. I have seen whole rows partially or wholly destroyed, whereas other varieties were not touched at all.

The Society then adjourned until the evening.

EVENING SESSION.

The President read the following paper:—

NOMENCLATURE OF RUSSIAN FRUITS.

By J. M. Fisk.

Ladies and Gentlemen:—In bringing up this question of the nomenclature of the Russian fruits, I do not for a moment wish to suggest a revision, or even to criticise the work so well and ably done by the late Charles Gibb.

Mr. Gibb took up this work at the request, or rather by a resolution of the American Pomological Society, passed in 1885, giving him the special work of revising and arranging the nomenclature of American importations of Russian fruits.

At that time, these were in a state of great confusion, and entailed a considerable amount of personal sacrifice and expense on the part of Mr. Gibb; but when his work was completed, it was so well done, that his report was adopted by the U. S. Department of Agriculture, as well as by the American Pomological Society, and published in their report for 1887.

As time advances, these fruits have become more widely disseminated, and are developing in many instances one of their Russian characteristics,—that of early productiveness, and in so doing are verifying a statement made by Mr. Gibb after his return from Russia, which was that "Nomenclature in Russia is hopelessly confused; different names are given to the same apple in different

localities, the same name to different apples growing in adjacent districts. So many names, however formidable they may sound in Russian, mean merely round white, white sweet, white transparent, etc., names without individuality. Fortunately a few names have been fixed by commercial demand, and are known by the same names throughout Russia."

The point which I wish to bring out is, that this confusion, or rather duplication, of varieties has been imported with the Russian fruits, and not until the trees begin to bear can we discriminate or classify properly.

Mr. Gibb's work in the revision of the Russian fruits partook more of the nature of rendering an English translation of many of the almost unpronounceable Russian names, rather than that of classifying or distinguishing one variety from another ; hence this work is still to be done.

One or two illustrations will suffice to show that this is a necessity, if we wish to prevent continuous confusion.

In the family of the yellow apples, we have the Yellow Transparent, Charlottenthaler and Grand Sultan, all alike, or so near alike both in tree and fruit season of ripening and quality of fruit, that the grower may mix the three varieties in one package, and send to market, when neither the seller, the buyer, nor the grower himself can tell one variety from the other.

Why then have three varieties where practically but one is represented ?

And this is also true in other families, such as the Alexander, in which we have Alexander, Grand Duke Constantine, and Aport. For the Arabka we have Winter Arabka and Herrenapfel, or Lords, the same.

Also Summer Arabka and Pointed Pipka are alike ; while in the family of the Titus apple, we have Titovka and Zolotareff alike, etc.

The Russian apple is more at home in the Province of Quebec than in many other parts of the Dominion ; and as it is likely to become popular on account of its hardiness for the colder parts of the Province, we cannot act too soon in taking steps to avoid this confusion of varieties on our markets and exhibition tables ; and I would suggest that, as we have now a Provincial Society, a standing committee on Nomenclature of not less than three be named to take notes and compare samples of fruits, as opportunity may offer, and report from year to year, with a view of a proper classification of the different varieties.

This work will of necessity extend over a period of several years, as there are many varieties which have not yet fruited.

Professor Craig.—I can simply corroborate our President's statement from my experience with those varieties. I do not know so much about the Grand Sultan ; but as regards the Winter Arabka and Herren, they are, I believe, identical. The trees I do not know so much about, but I believe them to be the same as I have them in the orchard on the Gibb Farm. As many synonyms should be taken from our list as possible.

Mr. Brodie.—My experience with regard to Yellow Transparent and Charlottenthaler is similar.

Mr. Hamilton.—I have prepared a paper on the subject of Russian apples, and had just taken up the idea which Mr. President has brought before you, as the result of my examination of the subject (I have 80 varieties).

RUSSIAN APPLES.

By R. Hamilton, Grenville, Que.

What is the practical result to the Province of Quebec of the introduction of the large collection of Russian fruits, apples, pears, plums and cherries, that the late Mr. Charles Gibb was instrumental in having introduced into this country some years ago? Has there been any direct advantage from the varieties then brought in, and in what does it consist?

My own conviction is that a great and permanent advantage has been gained all over the country, both from the hardy fruits which have already found their way into all sections of the country, and the immense awakening and impulse given to the subject of hardy fruits. If the matter ended there I believe it would have still been worth while. But the introduction of the Russian apples alone has been an immediate benefit. We had no such early variety as the Yellow Transparent. It is earlier than anything we had, and of such good quality both for the home and commercial orchard, fruitful and of fine appearance and fair quality both for eating and cooking, and then there is before all else that special feature of superlative hardiness. If one of the splendid long keepers that were known to us for long years, but which we could only long for, could be reproduced with the Russian constitution, so that such a variety, say, as the Northern Spy could be grown on any and every farm in this province, then the Russian will have done us inestimable service, and men yet unborn will bless the introducer of Russian fruit. When, however, everything has been said that can be said in their favour, very few of the Russians will stand the test and prove of direct permanent value.

Yellow Transparent is the type of a large number of kinds that resemble it more or less nearly; very early, yellow, soft fleshed, fairly well flavoured and of fair size, especially when thinned out as soon as well formed.

Charlamoff is the type of another large class of varieties with the season and appearance of the Duchess, but without character. Probably not one adding a single good feature that we were not earlier in possession of in the Duchess of Oldenburg.

There is another class with fewer representatives, however, than either of those already mentioned, at the head of which may stand Prolific Sweeting; a fairly large light coloured apple that, while not without merit in itself, yet has no one good quality except hardiness of the tree, that would induce us to continue to give it a place in a collection.

Another class, of which Titovka might be taken as the representative, is worthy of a place next to, if not ahead of, the Yellow Transparent family. This section is distinguished by fruit of large size and brilliant colouring but only medium quality, with great hardiness, vigour and thriftiness of tree, and may become one of the parents in the new and improved race that is expected to spring from the Russian, though in point of season it is defective. It is an early fall apple.

Amtman or Golden White may be regarded as the representative of another family of Russians. In this section are five or six varieties that bear fruit of good size, beautiful colouring and fair quality. It is of St. Lawrence season, and therefore no gain to us in that respect. It is hardy without the highest degree of hardiness. In this division may be placed Amtman, Golden White, Long White, Autumn Streak, and Getman's Bean.

Another class that has apparently several representatives is Longfield. This includes Good Peasant and Englishman's Pippin. A chief character of the tree is soft wood, that results in pendulous branches and a decided tendency to weep; only fairly hardy though quite thrifty. It is a wonderful bearer of rather small apples with considerable colour and very soft fragrant or aromatic flesh. This will never be of value as a marketing fruit as it lacks both size and colour.

A family that has several representatives of a fairly good fruit is Borsdorfer, all of them hardy without the highest degree of hardiness.. Thrifty trees though not robust, brushy, requiring plenty of pruning. The fruit is small and unpretentious, but is of good quality and a rather long keeper. It is an abundant bearer of apples hardly equalling our old Pomme Grise in size and of a nondescript colour, dull yellow with dark dots and, rarely, a faint tinge of blush. Of no use as a market fruit when anything more showy can be procured.

The Aports are a numerous family of large apples that resemble more or less nearly the Alexander, and of which it may be regarded as the type. Besides three or four that bear the name of Aport there are the Anisovka and the Krupneena, all distinguished by large-sized fruit with rather coarse, hard flesh, most excessively acid but spicy or aromatic flavour, and some, though by no means all, of high colour. They are as far as I know only moderate bearers though very hardy. It is not an early-bearing family.

The Arabka seems to be a family name also, including a few varieties. I think Herrenapfel is not identical with Arabka, though strongly resembling it. This is a very hardy tree, but not equal in this respect to some other varieties. It bears a very handsome fruit of a deep red colour and hardly fair quality, and spots badly, besides cracking. It is not an early nor a heavy bearer, at least with me.

Russian Gravenstein seems to stand alone, with few relations. It is a tree of medium, stocky, rather slow growth, robust, well branched, though not brushy, and makes a rather handsome round topped tree. Ironclad.—Fruit of full medium size, somewhat ribbed, yellowish green with deep red stripes, a solid rather hard apple that would carry well and has the appearance of being a keeper. My trees have given only a few specimens yet that I have not had the opportunity of testing, but that I have a high opinion of, from their appearance. I look upon this as one of the most promising sorts among the Russians.

Antonovka also stands alone. It is one of the best trees, and in point of hardiness is unsurpassed. In the nursery it is not promising, but after being established in the orchard it grows well and rapidly. It is rather an upright tree, stocky, well branched, not brushy, vigourous; not an early, but a good bearer when it gets started. Fruit of large, sometimes very large size, conical, somewhat ribbed, green, with hardly a tinge of reddish buff. Flesh coarse, breaking, juicy, acidulous, not acid; a fine cooking apple, and perhaps in some stages of ripeness an eating apple. An early winter fruit that, if picked quite early and carefully stored away, might keep; of this I am doubtful. I look upon it as in many respects a valuable variety.

Repka Malenka is I think also one of a class with several members. It has, however, so little to recommend it, being small and of no appearance, that I think we may safely pass it by.

Blackwood I place in the same category, though decidedly better than the last mentioned.

Switzer is another that has few relations but is a superb variety in every respect. Fine in tree and fruit. Tree of upright rapid growth, branches long and rather slender, and too numerous, making the tree brushy and consequently requiring a great deal of pruning. It is vigourous; the limbs are clean, bright light red, and look as if washed and varnished. It is very hardy, though not equal to the Antonovka, and it is not as early nor as heavy a bearer as the Yellow Transparent or Duchess, but it is a good, almost an annual bearer of the loveliest fruit imaginable that always catches the eye instantly. "What a lovely apple!" is the exclamation of almost everyone when seeing it for the first time. It is of an indescribable glowing orange red tint that makes it irresistible as a market apple. It is of best quality, flesh white with red tint, breaking crisp, subacid with a delightful fragrance and aroma—an excellent dessert fruit that cooks well. Its drawback is that it drops badly from the tree, and begins to drop early in the season; so that if the ground beneath the trees were not heavily clothed with grass or clover it would be necessary to mulch it heavily with straw or other material to save the fruit from great injury. It is not equal to Fameuse in quality, however.

Of Hibernal I can say but little, but that little is mostly in its favour. The tree is one of the hardiest, of good stocky growth, not bushy. It is not an early bearer, and the fruit, what few specimens I have had, have not been large, but first fruits have frequently not been large among the Russians. They have been well coloured, however, and are of Spy shape.

Red Wine and Erdbeerapfel are small red apples with a good deal of acidity that at present do not appear of any special interest, though they may turn out better later. Red Wine is a very hardy tree, and very productive of a medium-sized, clean, well-shaped bright red fruit, firm, and will I think carry well.

Red Queen has not fruited with me, but the specimens of fruit I have seen give me a high opinion of it. The tree is a rather slow grower, but robust, stocky and hardy, though surpassed in this respect by some others.

Red Sierinkia has not fruited with me yet.

German Calville—My specimens resembled very much the Longfield and Good Peasant, and therefore I think were not true.

Beel 248 is a fine tree that has not yet fruited with me.

Popoff is a characterless fruit.

Golubinoe beloe, White Pigeon, is a smaller peach apple of good quality and high productiveness.

Of Tiesenhausen, Juicy Burr and Teschanka I have had single specimens, but am unable to pronounce upon them.

Romna is a variety that have a high opinion of. It is a fine stocky tree of unrivalled hardiness and beautiful fruit. My specimens have been few and small, but true. Some that I saw at Messrs. Craig & Son's place at Abbotsford were very fine, of good size and colour and perfect form, and the tree is apparently exceedingly productive.

Up to this time nothing has appeared that gives any definite promise of being a keeper, that is, that will keep till May or longer, so that the only good property that we are absolutely in possession of from the Russians is absolute hardiness, and this joined to early bearing and productiveness, I think we may surely hope for some more valuable features from their introduction here in the future.

Mr. Shepherd.—I cannot agree as far as Getman's Bean is concerned, for it

does not at all look like Golden White, etc.; the Charlottenthaler is like Yellow Transparent, but not quite so conical.

Professor Craig moved, seconded by Mr. Brodie, that a committee of three be appointed by the President whose duty it shall be to describe and report at each winter meeting on all new fruits which have come before themselves or any member of the Society during the year, with a special reference to Russian apples.

Motion agreed to, and Professor Craig and Messrs. Hamilton and Newman were appointed to the committee.

Professor Craig moved, seconded by Mr. Brodie, that a committee of three be appointed for the ensuing year, whose duty it shall be to investigate the latest experience in the treatment of insect and fungus pests, and report the result of these investigations at the winter meeting.

Motion agreed to.

Committee :—Messrs. Fisher, Brodie and Dunlop.

Mr. S. Crossfield, Abbotsford, read the following paper :—

SMALL FRUITS FOR HOME USE.

Mr. Chairman and Gentlemen :—I was asked by the President of our F. G. A. of Abbotsford to give my ways of fruit-growing,—that is, small fruit for home use.

There is no great knack in growing small fruit. The principal knack is in making a start; half of the undertaking is accomplished when you have begun.

THE STRAWBERRY.

The strawberry is the earliest and most delicious of the small fruits, and can be cultivated so easily that every garden should possess a good bed.

Any soil that will grow a good crop of vegetable will answer for strawberries; it should be well drained; and should be in such a shape for winter that water will not stand on the bed and freeze and smother the plants.

Plant as early in the spring as the land can be prepared, as it gives the plants the whole season for growth, and enables them to produce a full crop the following year.

This is done the same as you would set out a vegetable plant. Any blossoms which appear the same year of planting should be removed. I have had the best success in planting in matted rows. The rows should be three feet apart and the plants fifteen inches apart in the rows. Keep the runners so as to form a matted row twenty inches wide; this leaves a path for working and gathering the fruit. Some kinds that throw out a good many runners will have to be thinned out to about four inches apart, to produce fruit of a large size.

As the plants do not throw out runners until July, this gives a good chance for cultivation. When the runners have formed roots, the weeding will have to be done by hand in the matted rows.

Mulching is done when the ground is frozen in autumn. I use straw, an inch thick, and I also place on a few boughs or anything that catches the snow, and in the spring remove them. Leave the straw; it will keep the weeds from starting and keep the berries off the ground. Every spring set out a new bed as before.

When the fruit in the first bed is gathered, spade or plough up, and prepare the ground to plant the next spring. It is less work to set out a new bed every spring than to bother with the old one. For a family of eight or ten, one hundred strawberry plants will set two rows sixty-five feet long. The plants can be bought for one dollar per hundred, and ought to give seventy-five quart boxes to the hundred plants. In choosing the kinds, pick on some well tested variety of early and one of late, such as Crescent for early and Captain Jack for late; this will give you fresh berries for one month and a good supply for canning.

RASPBERRIES.

This fruit is so easily grown, is so well adapted to all kinds of soil, is so delicious when grown by cultivation, and we have such hardy varieties, that it is really remarkable that more people who have a garden do not grow them. Some farmers think if they have wild ones in the fence corners that is all that is required. If they would try the easiness with which cultivated varieties can be grown, and once experience the pleasure of their superior size and quality, and compare them with the wild ones, they would want to root out the fence corner-plots and never look at them again. When the unsightliness of the wild briar is taken into consideration, and the waste of time often in going a distance to gather them, I think the case is strongly in favour of the cultivated variety. The raspberry will not yield as much on the same extent of land as strawberries, but it costs much less to grow the raspberry. With care, a plantation will last six years.

For garden plots, plant four feet by two.

Plant the same time as strawberries in spring.

Cut the canes down to within two inches of the ground, and when set out, keep down weeds and all suckers except in the hill; five or six is enough to leave in a hill. When the plants have grown two feet high, drive in a stake which will stand two feet high when driven, bore a hole in the top end of the stake, pass a string through the hole, and tie around the plant. Cut off tops of plants when two and a half feet high; by this way of doing you will find it easy to keep them clean and easy picking. The next spring leave five or six new suckers in the hill with the old ones, and hoe out all others as well as all weeds. When the berries are picked the next season the old canes should be cut out and the new ones tied to a stake, as before mentioned. In the fall, put around the plants some good manure. Repeat as above mentioned year after year as long as your plants prove to be profitable.

Fifty plants will cost one dollar, and will set out two rows fifty feet long, and should give you fifty quarts of berries. By planting Turners for early, and Cuthbert for late, you will have fresh berries for one month and a good supply for canning.

THE CURRANT.

The currant can be used in so many ways for making jellies and jams, and it is wholesome and makes such refreshing drinks, so profitable in warm weather, that every family should have a few bushes in the garden to furnish a supply for the year.

Set the plants three feet apart from each other in the rows, and four feet between rows. Manure freely, keep the ground mellow and free from weeds and grass, and beautiful crops of berries will repay the cost and labour.

Leave only three of the new and strongest stems each year to grow. Cut out the old wood after fruiting, which will be the third year from planting. The kinds that have done best with me are :—Red, Fay's Prolific, White, White Grape, Black, Lee's Prolific.

THE GOOSEBERRY.

The gooseberry requires the same cultivation and general treatment as the currants. Gooseberries—Houghton.

The following is an approximation of the cost of plants required.

	Plants.	
Raspberries, red and white	50	$1 00
Strawberries	100	1 00
Red currants	12	50
White currants	6	25
Black currants	6	25
		$3 00

Mr. Gibb.—I thought fall planting of strawberries gave better results than spring planting.

Mr. Crossfield.—It is difficult to get the plants rooted for the winter. They are liable to be lifted out of the ground by the frost.

Mr. Dunlop.—As soon as you can secure plants in the summer, say about August, is the time to plant. This cannot be done for commercial purposes, as the trouble is too great, but for a supply for private use plant about the middle of August and keep the runners off. Planting in the fall immediately preceding the winter is very risky in the case of strawberries, unless they are well protected. Their roots are not sufficiently established, and there is no growth, so that the advantage is very little. In the States they raise potted plants for that purpose; but if you take up your plants carefully with the earth attached, you have the same advantage as with potted plants, without the trouble. I have done it frequently, and have had a good crop the following season.

Mr. Fisher.—I have had exactly the same results as Mr. Dunlop. I make it a practice to set my runners into pots, putting the pots right into the bed. Take a small three inch or two and a-half inch pot. For commercial purposes this plan is impossible, because it entails too much labour, but for private gardens get strong plants well set by hand, and planting them then they are seldom lost in

the following winter. I never tried matted rows; I thought keeping plants separate was better than matted rows, because I was able to mulch the plants very carefully and keep the fruit clean. I mulched always with cut grass under the plants, which I like better than straw because it has no weed seeds in it.

Mr. President.—What varieties are most profitable?

Mr. Fisher.—I have tried quite a number of varieties, but have not been very successful with many. The one I place most dependence on is the Charles Downing, which I found most satisfactory. I tried several other kinds, but found on the whole that this variety was my main dependence. Of course if you wish to have a longer season, you should have an early variety and a late variety. I have had Downing on my table for 3 weeks.

Mr. Brodie.—Some of the French farmers north of Montreal grow 12 to 14 acres of strawberries, and they all grow them on the matted row system. They plough them up every second year.

Mr. Dunlop.—With regard to varieties, that is a difficult question to answer. The other day I received a bulletin from an experimental station, showing the results of a test of 80 new varieties in one season. There are very few varieties of strawberries that give good results over a large territory. They are all more or less local. There are a few varieties like the Wilson, which adapt themselves to all situations. A more recent variety, which has proved very successful, is the Bubach No. 5; but in planting this it is necessary to have a staminate variety also, and the Parker Earle has been recommended as a good fertiliser for this variety.

Mr. Hamilton.—One that has done very well with me is the Miner's Prolific. It gave the best results on soil that resembled very much the soil of the base of the mountain here—coarse granite detritus with little vegetable matter in it. One variety will do very well in clay and another in light soil. Some, highly recommended to me, turned out almost worthless on my soil, but I did not doubt the good faith of the party who sent them, as no doubt they did very well with him.

Mr. Craig.—As Mr. Dunlop has stated, a great many of these new fruits succeed only over a small area of country, and are not suitable for general planting, yet there are a few among them that do succeed, like the Crescent and Captain Jack. These two varieties are known from one end of the continent to the other. Among the newer fruits there are a few that succeed generally. Among these I might mention the Bubach, which seems to generally adapt itself. Although better in some places than in others, almost everywhere it has risen into favour. Sharpless is an older variety, and does not succeed so well except in heavy clay soil. The quality of the fruit is so good that it is pretty generally planted for home use. There are some others that I might mention here. There is the Parker Earle, which has yielded the largest per 100 feet of row of any variety I ever planted. Our soil where they are planted is light, sandy loam. It is a staminate variety, and is very useful for fertilising the Bubach. Two others, the Beder-Wood, also sent out under the name of Baxter, and Warfield No. 2, are promising varieties for market.

Mr. Dunlop.—Do you know anything of the Williams?

Professor Craig.—We have been growing that for the past two years. The principal point in its favour is that the variety is extremely healthy. A good many varieties in our light soil are apt to rust. The Williams seems to withstand attacks, and is very healthy and a fertilising variety. It also bears very

well, but did not come up, in the past two years, in point of productiveness, to those I have mentioned, although very close to them. Another good point is that the berry is very firm and ships well.

RASPBERRIES.

Mr. Shepherd.—Mr. Crossfield only mentioned two varieties of raspberry. What are the best varieties of white raspberries?

Professor Craig.—We can look at all these questions from two standpoints. If we want them for our own use, we want a berry of the finest quality. If we want to sell, we look at the variety that will give us the most dollars in return. In white raspberries I think I will have to rather beg the question. There is not so much choice. If I were growing for my own use, I should grow Brinckle's Orange, also the Golden Antwerp, but these require too much care to grow profitably. But the berry for market use is the Golden Queen, and it is also good for home use. Mr. Dunlop has established a reputation for supplying the finest raspberries to the Montreal market, and he may be able to give some points on the subject.

Mr. Dunlop.—With regard to white raspberries, I grow only the Golden Queen, as I do not know any other variety that is so profitable. It is not the best in point of quality but it has a firm berry. Brinckle's Orange is rather soft for the market, but for home use cannot be excelled. With regard to red raspberries, I like to prolong the season by growing more than one variety. Marlborough for early and Cuthbert for late are the two most profitable varieties. Marlborough sells at a higher figure in consequence of its earliness. Those two varieties I find the most profitable for market purposes, although I have grown a great number for testing purposes and my own use. The best plan is to lay the canes down and allow the snow to furnish the necessary protection. Raspberries can be made a very profitable crop, the demand is so great.

Mr. President.—Are the black caps not more suitable for market on account of their firmness?

Mr. Dunlop.—Yes; but as our market is near, we have no difficulty in getting the berries there in good shape, being right in the neighbourhood of the city. The Shaffer is gaining a reputation. When it is ripe it becomes a dull dark red colour, and does not hold up long in the box, and crushes more or less. But once people get to know it they buy it. They like the black raspberry flavour which it has.

Mr. President.—What varieties do you prefer for your own use?

Mr. Dunlop.—Brinkle's Orange, for the light. In the red I am growing a variety I got under the name of the Beaconsfield. But I find it to be the same as a variety I imported from England under the name of Prince of Wales, and am inclined to think the latter is the correct name. It is a very large, soft berry, very productive and of long season. You cannot detach it from the stalk without crushing the berry, and have to market them with the stalk attached. It is a very desirable berry for home use.

Professor Craig.—What sized boxes do you put yours in?

Mr. Dunlop.—The ordinary raspberry box, which holds about a pint and a half.

Mr. Brodie.—The Shaffer is a fine raspberry, but there is some difficulty in propagating it.

Prof. Craig.—This is one of the berries propagated from the tips. It is a hybrid, a red raspberry with a black cap form of growth. If Mr. Brodie will bend the tips down late in the season, just at the time they begin to swell, which is not usually before the first week of September, he will have no difficulty.

Mr. Brodie.—Do you notice that raspberries make far more rank growth of wood in sandy loam than in clay soil? There is plenty of wood, but not so much fruit, but in clay ground there is not much growth to wood and lots of fruit.

Mr. Dunlop.—There is such a thing as clay soil being so compact as to hinder the growth of wood to some extent. Otherwise I would expect the conditions mentioned by Mr. Brodie to be reversed.

CURRANTS.

Mr. President.—Currants come next. Is there any demand for Fay's Prolific?

Mr. Brodie.—Mr. Hughes told me he had to discard Fay's Prolific.

Mr. Dunlop.—It is not the fault of the fruit so much as of the bush. It is a straggling grower, so that you have to provide artificial support to keep the fruit off the earth.

Mr. President.—Is there any demand for black currants?

Mr. Dunlop.—Occasionally it exceeds the supply.

Formerly the difference in price between black and red was not sufficient to encourage the cultivation of the black. The black currants take a lot of room, are difficult to pick, and do not command a much higher price, so that they are not raised very extensively.

Q. Are the larger varieties of the red the most profitable to grow?

I find there is a certain demand for large varieties like the Fay or Cherry. You can get an additional five or ten cents a gallon for them, but it is very questionable whether they are productive enough to make them as profitable as some smaller varieties which produce more. I have a variety I procured under the name of Raby Castle, and which is sold by leading firms of the United States as the Victoria, but they do not correspond to the English Victoria. They are certainly, however, one of the best currants we can grow for profit.

Mr. Wilson.—Do you prefer it to Raby Castle?

Mr. Dunlop.—I find no difference. I procured the same variety under these two different names from several different sources; I also imported Raby Castle and Victoria from the Old Country, and find them distinct from this variety, but apparently identical.

Mr. Hamilton.—I have heard it said that Victoria and Versailles are identical.

Mr. Dunlop.—No, Versailles approaches Cherry very closely.

Mr. Brodie.—Do you not find the White Grape the best?

Mr. Dunlop.—Yes; it is undoubtedly the best, take it on the whole. It is very productive. It is not, however, saleable except in limited quantities. I grow the Cherry currant, and find it is always sought for; it does not produce very much fruit, being so large, but they are easier to pick, and command a higher price than the smaller varieties.

Mr. Gibb.—Is the Cherry currant not rather tender for our severe winters?

Mr. Dunlop.—That is one of the reasons for the want of productiveness of the Cherry. If you examine it closely after a severe winter, you will find the buds injured and the branches bare. I think it is a native of Italy, and that is probably the reason why it is not very hardy in this climate.

Professor Craig.—There is a very common impression that currants are all about the same. I just want to interject a remark in the form of a mild protest against this. There are currants and currants in regard to quality.

Of those which have come under my notice, the finest of all for home use is one which is not very well known, and is called Moore's Ruby. It does not bear as heavily as Victoria or Raby Castle, but the quality more than makes up for the lack of productiveness, Anybody planting for his home use and wanting a nice sweet berry should try Moore's Ruby. It is a light red in colour.

GOOSEBERRIES.

Mr. President.—A gooseberry being introduced from the United States which is very promising in appearance is the Red Jacket. Has Mr. Craig tried it?

Professor Craig.—I have, but I have not fruited it sufficiently to speak very authoritatively with regard to it. I think, however, the Red Jacket is a thoroughbred Canadian. As far as I have been able to trace its history, it originated in London, and was sent to a nurseryman at Lakeport, and from there came into the hands of its present disseminator, and is coming back to us as a thoroughbred American. It belongs to the Mountain Seedling class, and is a cross between that and European varieties. I know the quality is very good, but cannot speak of its productiveness.

Mr. Brodie.—I find the Whitesmith and Industry the best English berries, and the Downing and Houghton Seedling the best American varieties. I have tried Pearl, but I am disappointed with it. Last year was the first year of bearing, and we will have to try it another year.

Mr. Dunlop.—Until a few years ago I confined my attention simply to the American varieties. At first we grew the Houghton. Gradually that got to be considered too small, and we abandoned it for Smith's Improved and Downing. The latter is well adapted for our climate,—a hardy, stout-growing bush, does not make many small shoots like the Smith's Improved, and therefore requires but little pruning. It is more generally grown than any other variety, and gives satisfaction for commercial purposes. I have tried twenty or twenty-five varieties of English, and find that some of them are inclined to mildew, and some are liable to be injured by our winters. Mildew is very uncertain. You never know when it is going to attack you. I believe in experimenting with fungicides for the prevention of mildew, and have so much confidence in overcoming it, that I have made quite a plantation of English varieties. If I can find some hardy varieties and can save them from the mildew, the fruit is much better than that of American varieties. I tried the formula recommended by the Experimental Farm a year ago, and think it succeeded in arresting the mildew. I gave the results of my experience to Professor Craig at the time. That is the only thing which prevents my going into the English varieties entirely, because these are so superior to ours in size and flavour that after trying them you do not feel like touching the Americans at all. Each one must test this matter for himself in a small way at first. With regard to distance for planting, I think 3 by 4 feet altogether too close. The trees have not room to develop; and in planting them at that distance for commercial purposes, we cannot get at them to give them the necessary manure and labour required.

I plant my bushes not in direct squares, but in two or three rows, so that the fertilisers can be applied from the cart driven on one side of rows. If you plant the rows even 7 or 8 feet apart, you will have to use a wheelbarrow to convey the fertilisers, and that is pretty costly if you have to apply it to a large piece of ground. The distance to plant depends upon the variety. For strong growers, like the Downing gooseberry or Victoria currant, I find rows 7 feet apart and plants 5 to 6 feet in row a good distance.

Some of the English varieties do not make very large bushes and do not require so much space. We do not prune here as they do in England where they train the bushes up. That is not desirable here on account of their liability to be broken down by the snow.

Mr. Asa Johnson.—What English varieties do you prefer?

Mr. Dunlop.—I have tried the Rifleman, which has succeeded so far without trace of mildew. Another is the Keepsake, a very large white variety. The White Smith does very fairly. It is not exceptionally large, but is productive. I was unfortunate with my Industry. Had a very severe winter after they were planted, and the bushes were more or less injured, and are inclined to mildew ever since.

Mr. Crossfield.—What way do you prune them?

Mr. Dunlop.—I take out the superfluous wood and shorten any excessive growth. The fruit is produced on wood of two years' growth, or more, and the object of pruning is to retain a proper proportion of bearing wood. The habit of the variety has to be considered, some varieties requiring much more pruning than others. Train the bushes low; it suits our climate best. Do not train them in tree form, as practised in England.

Mr. Brodie.—Do they not grow those English varieties at Long Point on heavy clay soil, and are they not more successful than with you at Outremont?

Mr. Dunlop.—They do, and the soil has something to do with it; but I judge the proximity of the river has more to do with it. The gooseberry does better in a moist climate. The English varieties have that climate, and naturally we succeed best when the conditions are as nearly as possible the same. I think the cold nights succeeding very warm days, which we sometimes have when the fruit is developing, has a tendency to produce mildew; but as the bushes are often attacked later in the summer this may not be the case.

Professor Fletcher.—Did you ever put in a top dressing of clay to prevent mildew?

Mr. Dunlop.—The soil where I grow my fruits is inclined to be heavy, and contains a good percentage of clay.

Professor Fletcher.—It is claimed in England that gooseberries will not mildew on clay.

Mr. Dunlop.—They may not in that country, but that is not the case here.

Professor Craig.—Do you know if English gooseberries could be grown successfully on sandy loam?

Mr. Dunlop.—I think that clay is their natural soil.

Mr. Shepherd.—Do you think that gooseberries of English varieties are more successful on clay near a large body of water?

Mr. Dunlop.—Yes; a large body of water produces a moister atmosphere.

Mr. President.—What is the diffierence in the Montreal market, as regards value, between English and American varieties?

Mr. Dunlop.—For a limited quantity you can get a much higher price for the larger varieties of English. I do not know what the result would be if you supplanted the old American varieties with English; I do not know whether the prices would keep up or not. Where you have the English in a limited quantity and the American in a larger quantity, you get about 25 to 50 p.c. more for the English.

Mr. Brodie.—I have seen the Whitesmith bring 50 cents a gallon, while the Downing only brought 40 to 45 cents.

Mr. Dunlop.—The Downing is very productive, and at 40 cents is profitable.

Mr. Shepherd.—The Smith's Improved is larger and good in quality.

Mr. Dunlop.—Not larger than the Downing. The difficulty is it is inclined to be tender, and in a severe winter is likely to be injured; it is also a very difficult bush to prune, forming annually a large number of very slender shoots, which require to be removed; and also mildews in some localities. There is a great difference in the hardiness of the trees in English varieties. Some of the varieties are likely to be injured by our winter season.

Mr. Shepherd.—I was at Mr. Dunlop's some time ago, and was astonished to see the number of the English varieties he was testing and what splendid specimens of fruit he had. At our next annual meeting he will be able to give us a paper on the English varieties of gooseberries.

EVENING SESSION.

HOUSE PLANTS.

Professor Fletcher spoke on the subject of house plants.

He said:—There is no occupation that makes people better-tempered and more generous to everybody about them than growing house plants. In the vegetable world, there is nothing so agreeable to the eye as flowers, and nothing which gives greater pleasure. They can only be grown by people who love them. Nothing shows more culture than a love for growing house plants, thus bringing nature from the outside into our homes, so that we have its most beautiful products in our midst all the year round. If you have plants, you can take off cuttings to give to your friends, and in plants of the right sort the more you cut off the flowers the more the plant tries to do its duty by throwing out other flowers. There are three things aimed at in the cultivation of house plants: First, to give colour; second, to give perfume; and third, simply for the foliage. The plants that will not only flower during the summer but also during the winter are the ones we want, and we must so manage them that they will give the best returns. I know of no plant so useful in a house as the old-fashioned scarlet geranium. You must not nip these aspirations in the bud at the last minute when you want him to work, but you must prepare him in July or August. Nip off the tops and make his growth strong. Take him up about September, put him in a pot, and put him back again into the bed. You want to have something bright in the colour of your scarlet geranium. By taking them up and putting them into pots and back into the beds, their appearance in the beds is the same. Having my flowers in the pots, when the autumn frosts come round, I take them out of the ground and put them in the porch or the cellar, and never give them

a chance to freeze. All the time, the plant in the pot is getting roots formed and has a growth which will give you flowers about Christmas day or January. The only flowers you can get then are those prepared during the summer, and a few early kinds of bulbs. I will not say anything about propagating house plants, because everyone who is fond of them can propagate them. I will mention one very easy way of making cuttings of soft wood plants recommended first by Henderson of New York.

Take an ordinary soup plate, fill it with sharp sand, some of that Laurentian detritus—simply sharp sand without much mould in it. Put your cuttings around the edge, and in a few days they will make little roots. Then put them in a small pot with a little earth, and they will begin to grow. There is a great deal in choosing your cuttings; when you admire a flower, if your friend wants to give you the biggest shoot in the centre, stop his hand and take a little piece off the side. It is those little side pieces that take root so much better. If you can, tear them down so as to leave a little spur, that sort of slip which strikes root much better than the thick fleshy shoot full of juice. But if your friend insists on giving you the centre stem, let it fade a little before planting and it will strike better. The surest way with some of the shy geraniums is to break the stem through, and leave it attached by a piece of bark to the opposite side where you pruned it. Let it hang on the plant for 24 hours; then cut it off, and put it in the ground without further ceremony, and it is almost sure to grow. Among the geraniums of different colours, I know of none better in the scarlets than the General Grant. It is an intense scarlet. The best geranium grown at all is known under the name of Colonel Holden, a very large scarlet flower, with the two upper petals cherry-coloured, almost purple. The general effect is an intense rich cherry scarlet. The flowers are very large. I have one in my house of which the flowers have been in bloom five weeks, and no doubt they will continue in bloom three weeks longer. Do not allow the room to be too much heated, and the flowers will last a very long time. The best pink is known by the name of the Christine, a very beautiful rich pink with a white eye. Of the whites, very few hold their flowers well. One of the best of the whites is La Vestale. The best double white is La Favorite. It is a very pure white. The trouble with some of the whites is that they are green at first, and by the time the green is absorbed the flower is beginning to fade. Mazeppa is a single pale rose, rather a difficult colour to describe. This has the great advantage of giving the largest blossoms I know. For a greenhouse plant I know of nothing to compare with it for the size of its flowers. Gloire des Lionais has a very large flower, but it holds its flowers very little, and they drop too easily for a house plant.

The Begonias are very easily propagated.

The Primulas Chinensis are undoubtedly the best, because they flower best during the winter, and when finished flowering the roots may be broken into two or three young plants, and put in pots, and kept on from year to year until you are tired of them. A good variety is the Primula Obconica. I had one of these two years ago. It was in full bloom when potted, and has been in full bloom ever since. It has the drawback that with some people it is poison. One grand old friend I am going to mention is the Calla Lily. There is nothing easier than to grow the Calla Lily. It is really a bulb. You must not keep it working all the time! If you pet your bulbs, after you have brought them all through the winter, and tried to make them flower and they will not until you get thoroughly disgusted,

knock them about, give them rather a hard time. Their leaves will dry down, and they will put their energy into saving themselves for the next year, and then you have a good healthy bulb. Pot them into a nice pot of good strong soil, water and feed them well. When he throws up his second and third leaves, you will see that one shoot has a little sharp point, and in about a month you will have a magnificent flower. You want to give it a rest in the summer. Pot it early in autumn, give lots of food and water, and directly the flowering is over let it dry off again. Treat it with a little neglect. The plant will produce flowers in order to save itself from extinction. If you give a plant hard lines or hard circumstances under which to live, it will make its first effort to produce flowers. In growing geraniums be not too kind; do not give too much earth. Give a small quantity of rather poor earth, and then instead of producing leaves it will produce flowers, because that is an effort on the part of the plant to produce seed and save itself from destruction. The Oleander and Calla are, very much, native of the same place. They grow on the edges of rivers in the Holy Land and on the shores of Lake Gennesareth.

To go to this beautiful place and see these glorious Oleanders growing on the edge of the lake, covered with masses of flowers, and filling the air with their rich perfume, was a treat indeed. The Oleander is rather a difficult plant to flower. We must consider the great diversity of circumstances and the conditions it requires out of doors and in the house in winter. Who has not had the disappointment of seeing the flowers drop off in 2 or 3 days after bringing in the pots? The conditions were changed too much for the constitution of the plants. You take in the plants towards the autumn when they are well formed, and they die without producing flowers. If, however, we prepared them beforehand and earlier in the season, cut off the flowers and let them make them anew; instead of one bunch of flowers we would have 3 bunches, which being produced in the dry atmosphere of the house would open then.

Heliotrope and Mignonnette are both easily grown if well prepared beforehand. Mignonnette, one of the nicest plants for the house, will scent the whole room. About midsummer, take up the young plants and put them into small pots; and if the pots get too small, put them into larger ones. It is always well to grow a few bulbs of Roman hyacinths which will flower about Christmas day. The proper treatment for bulbs is simply this: The bulb is simply a body containing leaves and flowers already formed and ready to expand. They will not expand unless we give them some support, and the only support is to put them in and allow them to form their roots before they form their leaves and flowers. Plant your bulb in earth, or put it in a vase with water, and allow the root to form first, and there is no trouble in growing the flowers. How are you to produce your roots first? Simply keep them in the dark. If you want to get them to root first, you must do what it would do in the soil. Keep the plant moist and in a dark place. Instead of producing shoots they will produce roots, and having produced a strong growth of roots they will throw up their flowers and bear them just when you want them to. The least likely plant to grow as an ornament to a room is a sunflower. By chance, once, in one of my pots in the house the stem of a sunflower came forth, and I saved it and sacrificed the other plants; and instead of a big flower, a delicate little thing came out, and I learned more botany from that sunflower than I did in a month in the garden.

Mr. Brodie.—Did you ever try cyclamen as a winter plant?

Mr. Fletcher.—Yes, but they do not grow very well in the house. They require too careful treatment.

Meeting adjourned until the morning.

9th Feb., 1894.

The Society met at 10 a.m.

Mr. G. E. Roach, Abbotsford, read the following paper:—

MARKETING APPLES AND VARIETIES FOR MARKET.

Mr. Chairman and Gentlemen:—

I have been requested to give a paper relating to marketing apples, also best varieties for market. Now, sir, my experience in marketing is very limited; with the exception of our local markets, I have not exported apples to any great extent, so I will leave the question of exportation to some commission men, if there are any present. In the first place, we want the apples for the market, which, I am sorry to say, for the past few seasons we have not had, and I am sure that the apple market has lost ground on account of this, and other fruit such as tropical fruit are filling the want, or, in other words, crowding out our apple market. Now, when you can buy good grapes from 2 cts. per lb., plums, pears and peaches from 25 cts. to 75 cts. per basket, bananas from 75 cts. to $1.25 per bunch, what chance is there for apples against such prices? Several years ago you might have shipped thousands of barrels of apples to Montreal, and found a ready sale. But now you might ship fifty barrels, and they might lie in the warehouse a month or more without sale, unless sold by auction, which is a very good system lately taken up by commission men in Montreal. But, still, one has to be very cautious, especially where freight costs as much as it does from Abbotsford to Montreal. Now, I would like to know what is best to be done with such apples as we have had for the past few seasons. I think we would be just as well off if we let them stay in the orchard and rot, as to try and harvest them. After taking out the expenses, they net us nothing, with the exception of a few varieties that do not spot. Another drawback to the orchards is the cider question. The licence imposed on retailers is a great drawback; although the licence is small, very few care to pay for it.

If this licence could be done away with, there might be a chance of utilising our inferior apples.

Now, I will give a few points on market varieties.

I will place first on my list the Duchess,—being one of our most perfect apples, it is certainly one of the best market varieties.

The Fameuse is the leader of all varieties, when we can get them free from spot.

St. Lawrence is one of our finest dessert apples, and finds a ready market when free from spot.

Yellow Transparent, one of our earliest dessert apples, though of fine quality, I would not recommend for market unless shipped in baskets at near points; it is apt to run too small as the tree grows older.

Red Astrachan is a good market variety, although the tree is not hardy in most localities.

Wealthy is a fair apple, heavy bearer; its weak point is dropping before it is ready to pick, and it has spotted almost as bad as the Fameuse lately.

The Alexander, being a showy apple, will sell well in some markets; it is a great bearer, and can be sold cheap and still be profitable.

The Longfield is one of the overbearing varieties; and being of a light colour and small in size, will never be much of a market apple.

The Red Pearmain, if it was propagated, is a very productive variety; has a good appearance and sells well.

Blue Pearmain,—not a profitable variety, being a light bearer and very apt to blight.

Golden Russet,—our best winter variety, fairly good bearer; the tree, though a slow grower, is very hardy with me.

Ben Davis is also a good winter variety, fairly good bearer, can be placed as a good market variety owing to its fine appearance and late keeping qualities.

Scott's Winter,—it is very productive, good colour and good keeper; if grown extensively, would find a ready market.

Canada Baldwin,—a good midwinter variety, fine appearance. Tree not hardy, quality medium, sells well in market.

Winter Calville,—it is one of our best winter varieties, has a fine flavour, waxy in appearance, has a good demand in our local market.

Mr. Shepherd.—The subject Mr. Roach has opened is a very important one. It is a question upon which very few fruit growers can agree as to which are the best varieties to cultivate. My experience has been, in the order of profit for the home market, as follows: Duchess, Wealthy, St. Lawrence and Fameuse. Then comes the Mackintosh Red and the Winter St. Lawrence. These are the varieties I am fruiting. There are two or three other varieties of late winter apples which I am going to plant extensively in a few years. The Duchess has proved during the last 20 years a most profitable apple with me.

I market my Duchess in baskets. What are not fit to go into baskets are put into barrels and sent to commission merchants in Montreal, to sell at any price they will bring. My markets for the Duchess are Montreal and Ottawa, as I am well situated for shipping to both points. The next variety, the Wealthy, has been a most profitable variety. It is a very heavy bearer. That is their weak point. It is too heavy a bearer, and runs more or less small unless thinned, but it is a clean fruit. I always ship in boxes such as the one I show here. The box holds 196 apples, four dozen and one to each layer. I have never had complaint of the boxes being broken open. I could read you many letters showing the good condition in which the apples arrive in England, but will read just one. It is from an English merchant in London, a large linen draper, who heard about my McIntosh Red, and wrote me to send some: "I beg to acknowledge with thanks the "receipt of your cases of apples, which have turned out splendidly. We have "nothing in this country to compare in colour with your fruit. I sent the best "dozen to the local fruit show in the early part of the winter, for exhibit only, "and have had several letters from visitors asking for particulars."

I have never had complaints since I adopted the closed box. The first system of packing in boxes adopted by Mr. Cochrane was patented, I believe. That

system was ventilation and isolation. He contended that the box had to be opened at the sides. I bought a lot of his cases, after the company he got up failed, for 5 cents a box, but soon found that the fruit did not always get over in good condition. The Winter St. Lawrence frequently arrived in poor condition. I since adopted the closed box, and have never had any complaint about the apples arriving in any but first-class condition.

For cultivation for exportation in barrels I would recommend:—Scott's Winter, Golden Russet (Fisk), Canada Red, Canada Baldwin, where it can be grown profitably. These are all hard apples and keepers.

For exportation in cases:—Fameuse, Wealthy, McIntosh Red.

These are delicate table apples, and all red.

The Wealthy is very much appreciated in England. It is more so, I think, than the Fameuse, as it gets over in better condition. The coloured apples are always popular in England. Apples with the colour our Quebec climate puts upon them, and of such quality as the three last named, command the highest prices when they reach the other side in cases.

We must take more pains with our packages. We should copy the Californians. It is owing to the great care and attention which they have devoted to the package and packing that has enabled the fruit growers of that State to reach such far away markets. The Tasmanians ship all their apples to England in boxes, and I believe the apples are, like oranges, wrapped in paper. The trade in Tasmanian apples has assumed large dimensions; fortunately for us, their fruit arrives in England in midsummer, just when we are out of the business.

The Wealthy is an apple whose season is almost identical with the Fameuse. It takes the place of the Fameuse. My experience as a shipper in boxes is, particularly since the Fameuse has taken to spotting, that it is more profitable. The second quality I sell in Montreal for the price they will bring. I do not take much stock in second quality. My idea is to get the highest price for the best quality. For Wealthy, Fameuse, McIntosh Red, Winter St. Lawrence, there is no difficulty in getting good prices. The cases cost about 45 cents. I could ship anybody cases in shooks at 45 cents. That includes racks and everything, but the boxes have to be nailed together.

Mr. President.—What is the quantity they are supposed to contain?

Mr. Shepherd.—About two cases and a half to the barrel.

Mr. Pyke.—Two cases and two layers to a barrel, and then the barrel was not shaken.

Mr. President.—What has been your experience with regard to prices in cases as contrasted with barrels?

Mr. Shepherd.—I have had very good prices in cases. I have not tried sending them to England to be sold at what they will bring. That is a risky business. Montreal apple exporters do it to a large extent, but they have their agents on the other side, and they sometimes make heavy losses. I receive orders in the fall for hundreds of cases for England. They are chiefly presents from Montreal people to their friends on the other side. But they want the very best. They do not ask what they are to pay, so long as they get the very best and so long as the apples arrive in a condition which will be a credit to the country. I have sold to the agents of English fruit dealers in Montreal. There are a great many English houses who have their agents in Montreal to buy. The sale is at so much a barrel delivered on board ship. I did that with

the cases in 1892, and got good prices. I think there is a good market to be worked up in England in that way, shipping the very best fruit. There is no use putting anything but perfect apples in the cases.

The cases after they are filled in the orchard are carted down to the apple shed, and nailed up two or three days afterwards. A little time is taken up in packing; but if you want to have first-class prices you must take some trouble.

Mr. Brodie.—In the case of an orchard furnishing 1000 barrels, how long would it take to pack them in boxes?

Mr. Shepherd.—You cannot pack them as quickly as you can in barrels, but you will get much more for your apples.

Mr. Brodie.—What is left will be about two-thirds, which will have to go with the culls.

Mr. Shepherd.—You get more second quality. But in 1892, after taking out my best Fameuse and packing them in the cases, I sold the No. 1 apples remaining at $3 a barrel, and the No. 2 for anything they would bring. After you have taken the apples which are the correct size for the cases out of the crop, and then sorted into the barrels what is left, you have all the apples the same size; and when they are opened out, they look very fine, and bring almost as good a price as if you had some big ones among them. It is useless to pack into cases for the home market, as the package costs too much.

Mr. Brodie.—You never tried competition on the auction market in England?

Mr. Shepherd.—No. I find the St. Lawrence pay me very well. I market them in baskets also. There is a good market for them in Ottawa, and good prices. The McIntosh Red, in my opinion, is one of the most beautiful and profitable apples, and so far has not developed any great spotting. It does spot a little more than the Wealthy, but it is one of the most profitable apples you can grow. I think it is the most beautiful apple we have in Canada; it is of fine size and quality. The original tree is growing at Dundela, Dundas County, and is eighty years old. The owner, Mr. McIntosh, is still living, and sends a barrel of apples from that original tree to Mr. Gibb of Como every year.

In 1891, 40 barrels of McIntosh sold in Montreal at $4 per barrel, when Fameuse were bringing only $3. Then there is the Winter St. Lawrence, of which I think a great deal. I do not think it is a variety you can grow very extensively, because it is a delicate apple, and will not keep after Christmas. I have shipped them in cases to Ireland, Scotland and Germany, but they do not keep or carry as well as the McIntosh, Fameuse or Wealthy.

Mr. Brodie.—Do you find the tree is as healthy and vigourous as the St. Lawrence?

Mr. Shepherd.—It is a very healthy tree.

Mr. Brodie.—Mine are subject to bark lice, and it is only on these two trees I have them.

Mr. Shepherd.—My St. Lawrence are the healthiest trees that I have growing on gravel soil. It has a great many recommendations. It is an apple that does not blow off in a high wind, whereas, after a high gale, I find half my Wealthy crop on the ground, but the Winter St. Lawrence stands through the gale.

Mr. Newman.—Do you find it bears well?

Mr. Shepherd.—Yes, every second year. Its shape is against it. It does not stand tight packing in barrels, but in cases it does well and ships well. For

a late winter apple I would recommend the *Canada Red.* The history of the Canada Red is this:—

The "Canada Red."—It is only within the last three years or so that we have found out that Canada Red is, undoubtedly, a very hardy tree. For upwards of thirty-three years, to my certain knowledge, this variety has been cultivated at Hudson on the Ottawa, forty miles west of Montreal and within two miles of my own orchard at Como. Canada Red is not a new variety,—in fact, it is an old variety, which is at the present day largely cultivated in Ontario, New York State and Michigan. Yet, strange to say, no one ever supposed Canada Red capable of withstanding the rigourous winter climate of the Province of Quebec. The trees are over thirty-three years old, and out of an orchard of 1,200 trees of mixed varieties, planted so long ago, Canada Red is the most healthy, hardy and productive of all, surpassing Fameuse and St. Lawrence. "They are the survivals of the fittest;" therefore, I think Canada Red may safely be recommended for planting in more favourable sections of the Province with success.

The orchard at Mount Victoria, Hudson, which Mr. Pyke has now, was planted by the late George Matthews 33 or 35 years ago. Mr. Matthews took great care of his orchard. He got most of his trees from Rochester. After his death, however, the property was sold, and the gentleman who bought it never resided there, but rented the farm from year to year, and it changed tenants several times. Under those circumstances it is not likely the orchard was well taken care of,—in fact, it was not taken care of at all.

Out of the 1200 trees which Mr. Matthews planted 35 years ago, the Canada Red is the best, and I think that this is a fair test. The soil is light and sandy and very poor. Mr. Pyke said a couple of days ago, that the soil was so poor that he could not raise a crop of oats on it, yet these trees bear very well.

Canada Red is described in Downing as one of the leading old varieties. I took care to find out what it was, for I had my suspicions it was a well-known variety. I took a few samples to Mr. Clogg, Montreal, and asked him to name it. He said he thought it was the Canada Red, but was not sure. I sent samples to Mr. Woolverton, Grimsby, Ont., and he wrote back to say it was the "Canada Red," and very fine specimens. It seems that in Ontario it does not grow so large as at Hudson. The trees to-day are the best trees on this farm at Mount Victoria. It is a variety that we can safely recommend. It is described in Downing's book.

Mr. Hamilton.—With regard to one apple which Mr. Shepherd recommended very highly, the Winter St. Lawrence, I hope the Committee will relegate it its proper position as the Rambour Barré.

Mr. Shepherd.—Is it a French apple?

Mr. Hamilton.—Yes, it is in all the French and German works.

Mr. Shepherd.—That identical apple?

Mr. Hamilton.—Yes.

Mr. Shepherd.—Have you seen plates?

Mr. Hamilton.—Yes, and the description tallies exactly.

Mr. Marshall.—I cannot speak in favour of the Winter St. Lawrence. I have planted some 30, about 15 years ago, and the trees are now in a very unhealthy condition.

The land was well drained and a gravelly soil and in a good state of cultivation; one-half of the trees are now dead. They seem to be very subject to sun

scald. I think where the sun strikes them in the late part of the winter, along in the month of March, the sap runs, and then the cold comes afterwards. A great many of my trees were very badly damaged in that way. My experience is that they are a very poor keeper. They are large-sized, fine-looking, and market well in condition, but they do not last very long.

Mr. Newman.—They do not keep?

Mr. Shepherd.—No; but they will keep if put in a good place until January.

Mr. Newman.—They spot, and are rather a shy bearer.

Mr. Dunlop.—I think it is one of the varieties that will be found to require exceptional conditions to do its best, and the testimony will be very different. I have seen some Winter St. Lawrence trees planted among others. They must now be at least 35 years of age. In that orchard one-third consists of St. Lawrence trees, and these trees are probably the most healthy and thrifty remaining in the orchard to-day. I have seen them bearing two or three very large crops indeed, and the owner tells me they are the most profitable trees in the orchard. They are probably one of these varieties that do very well if the conditions suit. The same may be said of many other varieties. They fail with some people and succeed with others. The fruit is inclined not so much to spot as to crack, and it is subject to a slight discolouration.

Mr. Hamilton.—What was the nature of the soil where those very healthy trees are?

Mr. Dunlop.—It is on the side of Montreal Mountain. The soil is deep in places, with a lot of decayed limestone rock—just the soil that would be suitable for most apple trees.

Mr. Shepherd.—Did not Mr. Gill say he planted Winter St. Lawrence by mistake?

Mr. Gill.—They were sold to me for a different apple.

Mr. Shepherd.—The same in my case. 18 years ago I ordered from Mr. Fisk, 30 Alexanders, and after they had been planted out a year or so, Mr. Fisk wrote, saying he was sorry they were not Alexanders but Winter St. Lawrence. At the time, I was much disappointed, but now I am very much pleased to have them instead of the Alexanders. Those that are growing on the gravel I applied wood ashes to about every other year. I am well situated in that respect, because I get the ashes off the steamers, and I believe the ashes have a great deal to do with the perfection of the fruit. They have a better colour and are cleaner after the application of the wood ashes.

Mr. Gill.—I ordered 10 Alexanders, and the remainder in Duchess. I had one Alexander and 4 Duchesses, and the rest was this Winter St. Lawrence. The Duchess did well, the Alexander did extra well, but the Winter St. Lawrence has been a failure.

Mr. Brodie.—I do not want to discard the old Fameuse just yet. I believe in the Bordeaux mixture, and in putting our shoulder to the wheel and in doing our best. Spraying with Bordeaux mixture is very disagreeable. I have had 3 years' experience of it. After spraying the whole day, a heavy shower of rain would come on sometimes during the night and wash the whole mixture off. It was rather discouraging. That happened 3 times in one summer,—the summer 1892.

Mr. Shepherd.—Did you spray last year?

Mr. Brodie.—My crop was not large enough.

Mr. Shepherd.—That is the year you should have tried it.

Mr. Brodie.—I sprayed with Paris green, but the rain washed it off, and I never had such worthless trash. Three years ago I sprayed and gave it a thorough trial, and it was a success, but in 1892 the rain washed it off after three applications, and I thought I had enough. If you will allow me, I will give my experience in marketing. I find my most profitable fruit is the Duchess, and the next best is the St. Lawrence, then the Yellow Transparents. The latter I have not had in large enough quantities to judge, but what I have had I have got the highest market prices for. Three years ago I made a trial shipment of 30 barrels to the Old Country—10 of Wealthy, 10 Alexander and some Plumb's Cider. I shipped them to be auctioned off. I had no gentlemen friends there to handle them. The Wealthy netted $3.50 a barrel, the Alexanders $3.00, and the Plumb's Cider $2.50. This was the year we had the big crop. I am well pleased with the Plumb's cider. They are the best cooking apple we have. I have not tried Mr. Shepherd's cases, but intend giving them a trial.

Mr. Shepherd.—I wanted you to give them a trial 2 years ago.

Mr. Brodie.—I thought that if I took off all my best apples what would remain would be third-class.

WILL IT PAY TO CONTINUE TO GROW THE FAMEUSE?

Mr. Shepherd on this subject read the following paper :—

It would seem that no other known variety of apple just fits the place of Fameuse,—at least, whenever it has been well grown, as we have grown it in this province.

No other apple has the texture, quality and beauty of Fameuse in November and December. It was an unfortunate day for Quebec fruit growers when the spotting first attacked our favourite apple ; it is the apple which for the last fifty years or more has paid growers best. The Fameuse is not a hardy tree, and no doubt dies sooner than it used to, yet withal the fruit is so fine and the tree bears so profusely, that we are loth to give up planting it. In some respects the Wealthy (an apple whose season is almost identical with Fameuse) takes its place. Perhaps the Wealthy is quite as profitable or more so since spotting has become an annual affliction to the Fameuse, but for our home markets it has not yet become so popular. After all, seven-eighths of our crop of Fameuse is consumed in the province ; only a small portion is exported.

For exportation to England, Wealthy has proved quite as profitable as Fameuse, and is as much appreciated there because it retains its flavour better when it reaches the other side.

If spraying can overcome spotting as efficaciously as the application of Paris green preserves the potato plant from the ravages of the Colorado bug, and if nurserymen are particular to cut their scions only from healthy trees, and if they are honest in the training of the tree in the nursery, then it will pay to continue to grow Fameuse. No other variety is so difficult to form ; no other requires such severe cutting back the first and the second year. Fameuse ought not to be allowed to branch before the third or sometimes the

fourth year, and then there is some certainty of its branching from well ripened wood and becoming a good, healthy tree. The trees are not as healthy and as long lived as they used to be, because nurserymen do not always cut their scions from healthy trees.

Mr. Hall.—Is there anyone here who has any experience with the sweet Fameuse? I have three or four trees which have been doing wonderfully well. They do not seem to be affected with the spot. They grow larger, and look like the Fameuse in every way. When you cut them they look the same, but they have got a sweet flavour. I do think they are going to be an apple that will sell well locally.

Mr. President.—That is the sweet Fameuse of St. Hilaire, and probably a seedling of the other Fameuse. It is not the Fameuse sucrée.

Mr. Hamilton.—In collecting fruit for the Chicago exhibition, I found that variety in two or three places, and noticed it was comparatively free from spot. It is fully as fine in colour but not so handsome an apple, and it is wanting in that fine special quality of the Fameuse. It has a white soft flesh and is sweet, but is not so delicate as the Fameuse. I found in every case it was a very heavy bearer and comparatively a healthy tree.

Mr. Hill.—It seems to sell well in our local markets.

Mr. Brodie.—In Montreal I had 6 barrels one year and they clogged the market. The people left them and tried the other Fameuse.

Mr. Fisher.—I would fight pretty hard before giving up the Fameuse. I have never had any pleasure in the way of eating equal to putting a tooth, at the right season, into a good Fameuse. I would do anything I could to keep it. This year I followed the instructions of Messrs. Fletcher and Craig with regard to spraying, and sprayed the orchard very thoroughly. I had not a great many Fameuse trees, and they were only four years old. I had off my trees about 2½ barrels and not a single spot to be found on one of them. I used the Bordeaux mixture 4 lbs. of blue vitriol, 4 lbs. fresh lime, to a kerosene barrel of water. I sprayed the orchard five times during the season. I have a knapsack sprayer, and it is the last work a man wants to do.

It is hard and disagreeable but it saved my fruit. For the codling moth put in Paris green and spray immediately after the bloom falls—4 lbs. blue vitriol, 4 lbs. lime, 4 oz. Paris green. I used hot water to dissolve the blue vitriol. Pour hot water on to it in a pail and then pour it into a barrel. I found difficulty with the lime. There was a sediment but I strained that off.

Mr. Brodie.—I understood we had to dissolve 6 lbs. of blue vitriol in hot water, then 4 lbs. lime in 3 gallons cold water. Then let it stand for some hours and strain both into the barrel.

Mr. Fisher.—The way I did was to take an ordinary wooden pail. It will not do to use metal vessels with blue vitriol. Pour the hot water on to the blue vitriol and let it stand until it dissolves. I kept on adding hot water to the blue vitriol in the pail until it was dissolved, pouring it into the barrel as I did so. I then added my lime. I do not think more than half a pound of lime refuse was left in the strainer, and practically all the blue vitriol went into the mixture. I sprayed the trees again three times after I used the Paris green. On the 15th of May I sprayed my trees with the Bordeaux alone as the buds were barely beginning to swell.

Just after the fruit set, I sprayed with the Bordeaux mixture and the Paris green together. I did that again when the apples were about the size of the end of my finger. Then two weeks later I sprayed with the Bordeaux mixture alone, and about three weeks later with the Bordeaux mixture alone. I am inclined to think the latter spraying was not necessary. It was not only on the Fameuse that I found no spots, but I had not a single spot of any kind in the orchard at all. Every year previously the apples were spotted, the Fameuse very badly. Not only were my Fameuse absolutely free from spot, but they were considerably larger than ever before. I got about 2½ barrels from four trees, and the oldest tree was only set four years. I never had success with my orchard, and up to last year never had a decent crop in it. I lost tree after tree until I was almost in despair. The codling moth was also very bad in our neighbourhood, and the first thing my neighbours remarked, when coming into my orchard, was their absence.

Mr. Brodie.— I found the plum curculio just as bad as the codling moth. Around Montreal we have had all these pests long before you got them in the country. Montreal has been a slaughter market for apples from the States, and the Americans do not always send us their best quality. The apples came in full of codling moths, which got into the manure and were spread around the city. I have been spraying for codling moths for 10 years now.

Mr. Marshall.—When would be the right time to spray that insect which curls up in the leaves? You do not call that the codling moth?

Mr. President.—That is the leaf roller.

Professor Craig said it was necessary to spray for these before the tree came into leaf.

Mr. N. C. Fisk.—The question, shall we grow the Fameuse any longer, I think will remain quiet for a while. Those who have Fameuse are not going to root them out and throw them away just yet. We are going to spray the others and are going to try and get the plant back to where it was in 1860, when we had none of these pests. I would like to get back there and be able to take barrels full off the trees, and get $3 a barrel for the fruit.

Mr. President.—I have great faith in the spraying. Three years ago I did make a little experiment. Professor Craig sent me down from Ottawa an ammonia mixture as well as the Bordeaux mixture. I tried the Bordeaux mixture pure and simple, and I also tried it with the addition of ammonia. I took three trees in the same row and experimented with the two different preparations, and to judge from their appearance, just observing the three while the fruit was growing, I could not perceive much difference, but when I came to pick and grade, I found it was in favour of the ammonia mixture. Two years ago I repeated the same operation, and found the result in favour of the Bordeaux mixture. Last year I did not spray at all as I was absent in June. I am satisfied that if we are going to bring back the Fameuse, we must go into spraying. I have confidence that spraying will produce the best results. We ought to co-operate in this matter, and not have one man spraying and his neighbour leaving it alone, because the spores from this fungus are carried by the wind.

Mr. Brodie.—We must not neglect fertilizing our orchards as well as spraying. If we depend altogether on the spraying and do not apply something to the root, we will not improve our orchards. I find that to have bright coloured fruit we should use hardwood ashes. Where I cannot get the ashes I have been re-

commended to try muriate of potash. Can get that at $40.00 a ton, and am going to try it this year. As far as top dressing with manure is concerned, I have done that every year, but I have had more success with the ashes because the manure was a harbour for the codling moth and other insects.

Mr. Marshall.—When did you apply your ashes?

Mr. Brodie.—As soon as the snow is off the ground.

Mr. Marshall.—You would not recommend it in the fall?

Mr. Brodie.—No, it would be just a waste of fertilising.

Mr. Johnson.—I sprayed with dry hardwood ashes on a windy day. The ashes will fly quite a distance.

Mr. Dunlop.—I have tried ashes as a means of preventing gooseberry mildew and have found it has no effect whatever.

Mr. President.—Ashes, if used in that way, would act more in preventing caterpillars from eating the foliage than in destroying fungi.

Mr. Dunlop.—It would be eventually carried to the root of the tree, and benefit it in that way. Mr. Brodie was right in saying we must not forget to fertilise. A lowered state of vitality predisposes to attacks by disease, especially fungi. It is a question whether the vitality of the Fameuse is not lowered by its heavy bearing and other causes, and while we should continue our experiments in spraying as a temporary means of alleviating the evil, we may yet discover that a deficiency in our soils is the primary cause.

It is at least as reasonable to assume that the conditions of soil have become changed as those of atmosphere, and the importance of the subject demands the fullest investigation in this direction.

Mr. William Gill.—Does the Fameuse spot more in cold, wet seasons?

Mr. Brodie.—I know that the season which damages corn, and in which tomatoes will not ripen, is a very bad one for apples. The apples will be very poor and spotted. What is too cold for the one is too cold for the other.

Mr. President.—I think undoubtedly the cold and wet has a good deal to do with it. A wet season is much more favourable to the growth of fungi than a dry season.

Mr. Johnson.—Will some gentleman tell me the proper name of the apple which I have in my hand? I call it the Bethel, but it has been given many names, and the question has been disputed at several shows.

Mr. President.—That is the Bethel. It is also called the Shaker Pippin.

Mr. Johnson.—One party stated he could distinguish the difference between a Shaker Pippin and a Bethel.

Mr. President.—I am glad Mr. Johnson has brought the question up.

Mr. Fisher moved that it be referred to the committee of nomenclature, and suggested that the committee should meet some time in the winter and put into the report of this meeting all the names they had decided upon.

Mr. Shepherd seconded this motion, which was agreed to.

GRAPES.

The following paper on grapes was then read:

OUR OUT-DOOR GRAPES AND THEIR DEVELOPMENT FROM THE NATIVE SPECIES OF NORTH AMERICA.

By Wm. Mead Pattison, Clarenceville, Que.

It will be our purpose, as far as limits will permit, to take a retrospective course along the pathway of the development of the grape, from the period of the discovery of this continent to the present day. The first colonist of North America found wild grapes in profusion, and distinguished the species as the Fox and Frost grape. As early as 1564 wine was made of them.

An early writer on the subject tells us the Rev. F. Higginson of the Massachusetts Colony wrote home in 1629, "Excellent vines are here up and down the woods. Our Governor has already planted a vineyard with great hope of increase."

Grapes were found by the first settlers of Canada along the St. Lawrence as far north as the Isle of Orleans, and we conclude that they were in abundance from the fact of its being called by Jacques Cartier "Isle de Bacchus." Indeed from early accounts our ancestors showed equally as much enthusiasm over the grapes found indigenous to the country, as that evinced by us in this last half of our century over the descendants of the same given us by nature and art.

The late Prof. Asa Gray arranges the genus Vitis of North America into four divisions, viz.,—Vitis Labrusca, or Fox grape; Vitis Cordifolia, or Frost grape; Vitus Vulpina, Muscadine, or Southern Fox grape, and Vitis Astivalis, or Summer grape. The great array of varieties now in cultivation are the result of either spontaneous or of artificial hybridising.

Except in California and Mexico attempts on this continent to introduce the European species of grapes have ultimately proved failures, while one of our native species, from the resistant power of its roots to the Phylloxera, has given the European vineyardist valuable stock for grafting upon, that have saved their vineyards from total destruction.

To the Vitis Labrusca of Linneas we owe the greater number of our present varieties. Its native home is east of the Alleghany Mountains, from South Carolina extending north to Canada. It adapts itself to varied soils and conditions, attaining the greatest size in the granitic soil of New England. From the class known as the Northern Labrusca our most valuable hybrids have been obtained.

The persistence of this type is so marked that where its existence as forming one of the parents of an hybrid has been in doubt, the question has been determined by planting the seeds, and the reversion of some of the seedlings settled the point.

The first variety of this species that obtained wide celebrity was introduced by Wm. R. Prince, of Flushing, Long Island, about 1820. He obtained it from Mrs. Isabella Gibbs, who discovered it growing wild in North Carolina in 1816 and brought it North. Prince propagated it and called it the Isabella, and ten

years later he published a treatise on the grape. It is cultivated now to a very limited extent, and is found too late for high latitude.

The Isabella has played its part in rearing a numerous family of children, but they being of the Southern type of the Labrusca, but a few are in favor North.

One of them, the Adirondac, was introduced in 1852. Though of surpassing excellence, it did well for a few years in favorable localities, but from inherent defects was generally discarded even in its native home on Lake Champlain. The Catawba, a native of North Carolina, was brought to notice by Major John Adlum of Georgetown, D.C., who published the first American work on grapes in 1823, under the quaint title of " A Memoir on the Cultivation of the Grape," in which he claimed that in introducing the Catawba he conferred a greater benefit upon the American nation than he would have done by paying off the National debt. In a very short time the Catawba was extensively cultivated along the Ohio River, and Nicolas Longworth of Cincinnati manufactured large quantities of wine of it. From disease overtaking the vine the extensive vineyards of Southern Ohio were destroyed, but in the lake region of Central New York it found a more congenial home, and is now flourishing, supplying our markets in winter with a grape having few equals as a long keeper. The Diana, a seedling of Catawba, was introduced to the public notice in 1843 by Mrs. DianaCretore of Boston, Mass., and was quite popular for a while. Though not as productive as its parent it is considered by some to be better, and is still in favor South, but mainly for its keeping qualities.

In 1849 Ephraim W. Bull of Concord, Mass., announced the discovery of the widely famous Concord. After it had captured public favour, he was asked how he obtained it, and his reply was: " I was looking about for the best grape which met the necessary conditions of hardiness, vigourous growth, size of berry, early ripening, and with these conditions as good flavour as the wild grape affords. At the foot of a hill on a woodland path leading to the river, I found an accidental seedling in 1843. It was very full of fruit, handsome and sweet,and the whole crop had fallen to the ground before August was out. Here was my opportunity. I planted the grapes at once and got many vines, most of them harsh and wild, but one of them bore a single bunch which I found ripe on the 10th September, 1849, six years from sowing the seed. This was the Concord."

Mr. Bull continued his efforts and succeeded in establishing a strain of seedlings, giving new grapes to the country every year. Its progeny could be numbered by the hundred, but for our present purpose only those tested here will be given, namely, varieties the result of natural variation or other parent uncertain : Moore's Early, Worden, Lady, Martha, Eva, Pocklington, Norwood, Cottage, Eaton, Rockland Favorite, and the numerous Concord seedlings of the late T. B. Miner of New Jersey.

Varieties definitely known to be crossed with Delaware are, Duchess, Nectar, and most of the late John Burr's seedlings. With Iona are Jefferson and Highland. Allen's hybrids crosses are El Dorado and Lady Washington. Niagara is claimed to be crossed with Cassady, Woodruff's Red by Catawba, Brighton by Diana Hamburg.

The foreign crosses are also numerous, but successful only in the South.

In 1850 Hartford Prolific was introduced by Steele of Hartford, Conn., with favour, being the earliest variety then known, but the defect of dropping its

berry when ripe detracted from its value as a market grape. It is still in favour North. The most prominent Labruscas enumerated as being discovered in the first half of this century were natural seedlings, or as called by some, "Spontaneous Hybrids." Now we shall enter the era of artificial hybridisation. By this process the first successful products were given to the world in 1856 by Edward S. Rogers at Salem, Mass. The direction of his efforts was in impregnating the Mammoth Labrusca of New England with varieties of the species Vitis Vinifera of Europe.

As a result he retained and designated, by number, over fifty new varieties. In time several of these became the leading grapes of commerce, viz :—Massasoit, Lindley, Herbert, Barry, Aminia, and Salem, the special merits of which may perpetuate his name in connection therewith for many generations. The success attending Rogers' efforts gave a surprising impetus to attempts in this direction by others. Unfortunately for Rogers his zeal was not proportionate to his means, and his valuable hybrids, which in our time would have assured him a fortune, left him comparatively a poor man.

Dr. Stephen W. Underhill of Croton Point on the Hudson, an enthusiast in this field, at an early day brought out several varieties by Labrusca crossings. Those tested in Canada were Irving, Senasqua, and Black Eagle, and a Delaware cross called Croton. Further south these have stood the test of time.

The late Peter C. Dempsey of Trenton, Ont., followed the same path, and produced Burnett by Black Hamburg crossing.

J. H. Ricketts and the late A. J. Caywood, both on the Hudson, originated varieties of value by crossing with the Labrusca. Ricketts' crossings mostly on the Riparia species now number several hundred, though comparatively few have attained prominence. The popular varieties, Delaware, Creveling, Taylor, as well as some of Rommel's productions, are claimed by some authorities as partaking of Labrusca blood.

To conclude this type of grapes, Cottage, Telegraph, Belvidere, Woodruff's Red, Jessica, Wyoming Red, and Champion have in recent years given us varieties prominent for early ripening, especially the Champion, which is much valued North, and still holds the palm as an extra early and profitable grape. These latter are spontaneous products or variations of the original type by which nature in her origin of species has been so bountiful to mankind in the present century.

We will now have to consider briefly the Vitis Cordifolia of our native species, known as the Frost grape, or rather its subdivision named by Michau Vitis Riparia. This species is not only distributed well to the north along the banks and islands of our Canadian rivers, but its geographical boundaries extend south and west over a great part of this continent. Nature in this species has supplied us with wine as well as an edible grape, readily propagated by cuttings. Dr. Despetis in his study of the Riparia has noted over 300 subvarieties, of which the Clinton is the most prominent.

The Taylor as before noted, thought to be an accidental cross with Labrusca, has given the South valuable wine grapes in Elvira, Noah, Missomi Reisling, Grein's Golden, and Rommel's hybrids, viz, Amber, Pearl, Transparent, Faith, July, and others.

While Ricketts of Newburg, N.Y., with Clinton produced Bacchus, Empire State, Naomi, Peabody, Pizarre, Quassaick, Secretary, and Waverly, six of these

have been tested in Clarenceville and all but Bacchus discarded. Three of these flourished for a few years and then gradually dwindled out. Peabody and Waverly were exquisite in quality. Perhaps if their foliage had been sprayed by mixtures now in use other results might have been obtained. The Clinton crosses of Arnold of Paris, Ont., have fared the same here. If some of the finest children of the Riparia species are to be saved we must interpose with spraying mixtures.

In conclusion a brief tribute is due to prominent propagators, whom with those already named have contributed valuable varieties to our Northern Grape list. The Hon. Geo. W. Cambe of Ohio, in introduction of " Lady " has given us the most valuable extra early white variety, and will soon introduce an extra early black to be known as " Campbell's Early." Few men have taken more interest in popularizing grape culture.

Samuel Miller of Missouri, discoverer of Martha, still a popular white, can look back over a useful life's work in this and other branches of fruit culture. John B. Moore of Concord, Mass., will be remembered in connection with Moore's Early. Jacob Moore of Brighton, N.J., with Brighton and Moore's Diamond. Jacob Rommel of Missouri with Rommel's Early Black. These names, with those of Bull, Rogers, Caywood, Burr, Ricketts, Dempsey, Prince and Underhill, veterans who have mostly passed away, will survive in connection with their creations for many generations.

Mr. Brodie.—I have not many grapes, but the few I have I cannot get the fruit very well. I have Brightons, Rogers No. 4 and Rogers No. 9, and the Beaconsfield or Champion, or whatever name it goes by. I like the Brighton the best of the lot, but it does not seem to fertilise its blossoms very well. I never have a crop off it, but it is certainly the best of the lot. I like the Rogers No. 9 very well, but the past few years I cannot get a crop of grapes in the garden.

Mr. Fisk.—Did you ever get a good crop ?

Mr. Brodie.—Yes.

Mr. President.—I am growing the Brighton, and find it very good in quality, but, like Mr. Brodie, I cannot get a crop off it. It does not give me any fruit, but in conversation with Mr. Pattison, he told me he found he could remedy this by leaving it to produce more wood. He said, "Do not cut it back, and you will get more fruit."

Mr. Shepherd.—You mean, not to cut it so much ?

Mr. President.—Yes.

Mr. Shepherd.—But you cut it down as usual in the fall ?

Mr. President.—Yes.

Mr. Marshall.—I have a few grape vines of Brighton and Duchess. The Janesville is a very early grape and very prolific. There is also a grape called the " Wilder " which does extremely well. The Adirondac is very prolific but the flavour is too acid. The Lindley is a nice grape. They all seem to do well on my soil, which is a gravel warm soil.

Mr. President.—Does the Lindley mildew ?

Mr. Marshall.—No, the Sweet Water mildewed very much with me last year. It is a white grape.

Mr. Hamilton.—I found the Brighton to be a very good bearer and a fine grape, but it loses its quality, after being ripe, quicker than any grape I have ever handled. The one that has done best with me for a number of years is the

Worden. I have the Concord, which I like very much, but it very rarely ripens. The Worden seems to be almost identical with it in quality and is rather a heavier bearer, and ripens fully two weeks earlier. For a number of years we gathered our first Moores early, about the twenty-seventh of August. It is quite likely that its earliness is due to the warm nature of our soil. I have not found it to be so early in other places. Most people like the Janesville very much. There is a pleasant sharp flavour to it that seems grateful to many people. It is also a heavy bearer. Hartford Prolific is a heavy bearer, but it drops its berries and you have to gather them off the ground. The Ives Seedling is also early, but not so early as it seems. It colors up early but takes a long time to ripen. "Lady," a white grape, is very early and delicious, but it bears very few bunches and they are very small. It is a most delicious grape to eat. If I were planting a large number this season I should certainly plant the Worden. There are a number of others about as early. Two small black grapes that we have from Kansas, the Early Victor and something else, are very fine eating, but too small for market growing. The Telegraph is a fairly good bearer of early crops, and a very early one is Red Wyoming that I thought likely to be a favourite. Another grape I find that is not doing well in my neighbourhood, but is doing well with me is the Agawam. It is of such rampant growth that in deep rich soil its wood never seems to ripen. My soil is thin. I have planted Agawam on boulders, and on these it ripens well by the end of September.

Mr. President.—Let me give an experience of mine with regard to a wild grape. It was introduced by my brother from Belœil. I planted the vine out by a stone pile. It trailed itself over the pile and had no care given to it at all. To my surprise it has borne annually crops of very fair fruit and of good size for the wild grape. I never pruned it or touched it except to take a few branches for propagation. The grape is nearly as large as the Delaware, and for eating I prefer it to the Champion in quality, and the vine is so hardy that it requires no protection. It is one of the best croppers there is in the province. Last year I sold 140 pounds of fruit from that one vine. It was an exceptional grape. They paid me 4 cents a lb. for it, while you could buy grapes in the city, cultivated varieties, for 2½ cents.

Mr. Dunlop.—Does it produce large berries?

Mr. President.—No, and it has a very loose bunch. It is as large as the average wild grape, and very nearly as large as the Delaware.

Mr. Brodie.—Does it pay to grow grapes for commercial purposes around here?

Mr. President.—It does not for me except this wild grape.

Mr. Cotton Fisk.—I contend that the Province of Quebec could not grow grapes for market purposes, but might for home use, and occasionally get some ripe ones of some particular varieties; but that most of the season the grapes would be sour—sour in many ways, sour in quantity, sour in quality, and sour in pocket. Mr. Robert Jack of Chateauguay, however, contended that he could grow grapes successfully for market purposes. I have not seen him since to discuss the question with him, but am very doubtful if it can be done in Quebec, especially when you can buy good ripe grapes for about 2 cents per lb. I should like to see the man who could grow grapes for commercial purposes and make them a success. Thousands of baskets sold this year for about 11 cents for 9 lbs. We could not grow grapes for commercial purposes under 10 cents a lb.

Mr. Guay.—It is certainly possible to grow a good grape, but the expense is too great for commercial purposes. At Oka we have the Brighton and Duchess which have given us excellent fruit. The trouble, however, is great, and it will not pay to sell them at two or three cents per pound.

Mr. N. C. Fisk.—This wild grape, which is a very hardy grape, requires to be kept off the ground. It does not require more care, and is fully as hardy as the Wintergreen.

Mr. Hamilton.—The hardiness of some of our well-known grapes is not very well understood. At Mr. Newman's place there is an Adirondac which has gone into some cherry trees. It is never pruned and yet bears heavy crops.

Mr. Newman.—We have three vines of Adirondac which we never took any trouble with, and from which we get quite a crop. Of course the crop is not certain. It is not as large as the Upper Canada grape. It is a second quality early domestic grape.

Mr. Dunlop.—I came to the conclusion long ago that we could not grow grapes profitably in the Province of Quebec. They are nice to grow for your own use, but apart from that the labour is thrown away.

PLUMS.

The following paper was then read :

Notes on some Varieties of Plums grown on the Island of Montreal by W. W. Dunlop, Outremont.

Some twelve years ago I commenced planting a few plum trees of the varieties recommended for hardiness, and since then have been yearly adding to the number, so that I have at present in my orchard more than 80 varieties.

My object in planting so many varieties has been to test the relative hardiness and productiveness of each, with a view to determining whether the culture of plums could be made a profitable industry in this Northern climate.

There were two important points which I desired to learn by actual experiment, viz., the hardiness of the trees and the hardiness of the fruit buds, as a combination of these would be essential in a tree for profitable cultivation here.

Although my place is exposed on the West and North, and the thermometer registers some degrees lower than in the sheltered gardens of the City of Montreal, I have been agreeably surprised at the hardiness shown by many of the varieties; and if hardiness of tree alone were the only qualification, I would have no hesitation in planting largely of several varieties. Unfortunately, however, the hardiness of fruit bud is of equal importance, and to this more than the want of hardiness in tree many be attributed the want of success which has attended the growing of this fruit in cold climates.

Many varieties perfectly hardy in tree are tender in bud, and *vice versa*, and there does not appear to be any means to arrive at a selection except by actual experiment. Nearly all my varieties have now arrived at an age for fruiting, and I hope during the next few years to find among them some that are sufficiently hardy in fruit bud to recommend for planting largely for commercial purposes. In the meantime, I give the following list of varieties on trial, with some notes on their behaviour.

Mooer's Arctic.—I have received two varieties under this name; the fruit is nearly similar, but there is a difference in tree. The true Mooer's Arctic is a good grower, fairly hardy in tree and fruit buds very hardy. It has acquired its reputation for extreme hardiness from its fruiting in unfavorable seasons.

Richland.—Tree hardy, not yet fruited.

Bradshaw.—Tender, has borne a few plums.

Quackenboss.—Have trees 12 years old which have borne occasionally fair, crops, and are in perfect health; the hardiness of this tree has not been appreciated, it is among plums what the Duchess is among apples; the fruit buds, however, are not as hardy as desirable.

Lombard.—This variety has been more generally recommended for hardiness than any other, and has in consequence been freely planted; it has not sustained its reputation for hardiness with me, and after repeated tests I am forced to the conclusion that its cold resisting powers have been greatly exaggerated.

Smith's Orleans.—Trees planted ten years, fair bearers of fine fruit, not quite hardy.

Glass Seedling.—Tree a more spreading grower than Quackenboss, and foliage darker green, otherwise very like it; trees 7 years planted, models of health.

German Prune.—Trees 3 years planted fairly hardy so far.

Gueii.—Trees 3 years planted fairly hardy so far.

Hudson River Purple Egg.—Trees 3 years planted fairly hardy so far.

Prince Englebert.—Trees 6 years planted have commenced to bear nicely. This variety so far appears to be one of the most promising as possessing hardiness of tree and of fruit buds. I should not hesitate to set out a number of trees.

Yellow Egg.—Trees 6 years planted not very hardy; have borne fairly but not heavily.

Bingham.—Trees 4 years planted, not very hardy.

Imperial Gage.—Trees 4 years planted inclined to be tender.

Bleecker's Gage.—Trees 4 years planted inclined to be tender.

River's Early Prolific.—Trees of this variety imported from England 2 years ago have been slightly injured each winter.

Cluster Damson.—Imported from England 2 years ago. An examination of the wood shows this variety to have passed two winters without showing any trace of injury; it appears extremely hardy.

Victoria.—This magnificent plum appears fairly hardy, trees planted 3 years show no injury, and produced a few specimens of fruit last summer.

Pond's Seedling.—Tree hardy and produces fairly.

Shipper's Pride.—Trees 7 years planted, an enormous grower, and more or less injured each winter, not fruited.

Bavay's Gage.—Trees 7 years planted not very hardy but bears fairly.

Coe's Golden Drop.—Trees 2 years planted appear hardy, have seen it bearing fair crops.

Fellenberg.—Trees 3 years planted, does not appear to be as hardy as the German prune.

Duane's Purple.—Trees 3 years planted hardy so far, and a fine grower.

Yellow Gage, (Prince's).—Trees 5 years planted hardy, and have borne one fair crop.

Wangenheim.—Trees 3 years planted appear hardy.

General Hand.—Trees 3 years planted appear hardy.

McLaughlin.—Trees 3 years planted tender.

Washington.—Trees 3 years planted fairly hardy.

St. Lawrence.—Trees 3 years planted not very hardy.

Peter's Yellow Gage.—Trees 2 years planted appear to be tender.

Field.—Trees 2 years planted apparently much hardier than Bradshaw which it resembles.

Stanton.—Trees 2 years planted apparently hardy.

Prince of Wales.—Trees 2 years planted apparently hardy.

Czar.—Trees 2 years planted apparently hardy.

French Damson.—Trees 2 years planted apparently hardy.

Union Purple.—Trees 2 years planted apparently hardy.

No. 53 Seedling.—This is a seedling of the prune type, and has been grown on the Island of Montreal for a number of years, being distributed by suckers or sprouts. It is one of the most constant and reliable bearers, and may safely be planted for market. It does not appear to be propagated, and it is difficult to obtain the trees. Season, middle of September.

No. 54 Seedling.—Equally as desirable as preceding. Season, 2 weeks earlier.

No. 55 Seedling.—An excellent late blue plum tree, hardy and a fair bearer.

No. 56 Seedling.—Of the Reine Claude type tree, perfectly hardy and good bearer.

No. 57 Seedling.—A late blue plums about as large as Mooer's Arctic, tree, very hardy and good bearer.

No. 58 Seedling.—Slightly larger than above, blue, ripens with Bradshaw, of fine quality, tree hardy, but fruit buds not quite as hardy as the other seedlings described, a great bearer in favourable season.

No. 59 Seedling.—Fruit and season similar to Shropshire Damson. Tree very hardy but not a heavy bearer.

No. 60 Seedling.—Fruit similar to Bradshaw. Season 15th Sep. Tree fairly hardy, but fruit buds not entirely so.

White Orleans (Quebec).—Trees 10 years planted have borne fair crops, fairly hardy and a desirable variety.

Blue Orleans.—Tree does not appear to be as hardy with me as the White.

Quebec Damson.—Trees hardy and have borne well, planted 10 years.

Darwin Peach.—A new plum imported from England, stood the winter of 1892 without injury.

Belle de Levan.—Imported from England. Killed first winter.

Goliath.—Imported from England. Killed first winter.

Shropshire Damson.—Although reputed to be tender, this tree has stood two winters with me without injury.

Grand Duke, Monarch, Black Diamond, Arch Duke, Beauty of Naples, Peach, Saratoga.—These varieties planted in 1892 have so far not been injured.

Monroe.—Trees of this variety planted two seasons were killed each winter.

DeSoto.—This American variety has been very satisfactory. Tree very hardy and bears annually, every farmer should have a few trees of this variety.

Wyant.—Tree a poor slender grower, and fruit, although of good quality, too small for market.

Wolf.—Somewhat similar to DeSoto, desirable.

Weaver.—Very hardy and productive.

Maquoheta.—Tree a fine grower, and seems to stand the climate well, the few specimens of fruit I have obtained appear inferior to that of many of our native varieties.

None of my Russian plums have yet fruited, although planted 4 years ago. The trees of *Moldavka, Early Red, Long Blue, White Nicholas, Hungarian, Long Red, Merinka* are apparently hardy; *Yellow* (*Vol.* 1) and *Wyzerka* could not stand the winter.

Simonii.—Tree planted 5 years injures slightly each winter, but is gradually forming into a large tree; an interesting variety, but one tree is enough.

Abundance.—Of the Botan family, not much hardier than a Peach, and of no use here.

Botan. 6 (Hammond Willard)—At least as hardy as Simonii; not been planted long enough to judge definitely.

Mr. Fisher.—How far apart do you put your trees?

Mr. Dunlop.—I believe in plums it is better to have them close together. I have my apple trees thirty feet apart in row. I fill in between each two apple trees a plum tree. That plum will last twelve or fifteen years, by which time the apple tree will require the whole space. If planting plum trees alone I would put them about fifteen feet apart, or, if anything, closer than that—ten feet apart. I have mentioned a good many varieties, but at the same time I have a number of seedlings which have not originated with myself, but have been growing at various points of the island for a number of years past. I have taken great interest in looking up these seedlings. I have selected five or six of the best of these, and have no hesitation in saying that in those seedlings we shall find varieties far ahead in hardness of tree and fruit bud of anything we have. No one knows where these originated, but they have been growing, and some have been distributed pretty generally around the Island of Montreal.

Mr. Shepherd.—Have they been propagated?

Mr. Dunlop.—No, never propagated by grafting. The suckers have been distributed from one neighbourhood to another. I do not suppose that the fact of their growing on their own roots makes much difference in the hardiness of the tree. They suit the climate better than our propagated varieties.

Mr. Fisk.—Have any names been given these seedlings?

Mr. Dunlop.—No. I shall make it a point to bring these varieties before the committee and get them named if they are worth it. While most grafted varieties will give a crop occasionally, these seedlings almost invariably produce a crop.

Mr. Brodie.—This yellow plum which you have seen in my garden, does it resemble the Yellow Egg?

Mr. Dunlop.—No, the Yellow Egg plum is a very large egg shaped plum. Yours is more of the gage type.

Mr. Johnson.—Is the Peach plum a good variety?

Mr. Dunlop.—I have only a couple of trees, but it grows on the island and produces fairly. I do not know that it is vigorous enough to become a commercial plum. It has not become a commercial plum even in more favourable climates.

Mr. Johnson.—What about the Saunders?

Mr. Dunlop.—I had one tree so far planted but it was very much injured this winter.

Mr. Shepherd.—With reference to the de Soto, I have them planted out now for about eight years. It is not a plum of first quality, but very useful. It is better than our N ives. In the fall of 1892 I gathered six half bushel baskets from six trees planted five or six years, and they have been bearing heavily every year. They gave me a very heavy crop last year when there were scarcely any wild plums. The De Soto and that class of plum ripen pretty late when there is no other plum scarcely in the market, which is an advantage. I have sent them down in grape baskets to Montreal and have got forty cents a basket for them because they came in late.

Mr. Brodie.—I got forty cents a gallon for my De Soto.

Mr. Shepherd.—They can be grown so easily. They get no care whatever. I like the Forest Garden. It is a larger plum than the De Soto, but the quality is probably not any better, if as good. It has, however, a finer appearance. The Glass Seedling has proved fairly satisfactory with me, but never bears very much.

Mr. President.—I can substantiate what Mr. Shepherd says with regard to the De Soto from my experience. It is an annual bearer, and as it comes late it is more valuable for commercial purposes. What few I grow I have sold in St. Hyacinthe at forty cents a gallon or ten cents a quart. Another advantage is that it possesses a thick skin which makes it well adapted for marketing and shipping. Another great feature is that this skin is so thick, it is to a certain extent curculio proof. You hardly ever see it punctured by curculio.

Mr. Brodie.—My experience in plums is with all these native varieties Mr. Dunlop speaks about. I propagate from suckers. The trouble is they produce so many suckers.

Mr. President.—Have your Russian plums fruited yet?

Mr. Dunlop.—No, the trees are not very long planted, about four or five years ago. The greater number blossomed last year. What few fruits did come, the curculio took off.

Mr. M. C. Fisk.—Is the Victoria tree as hardy as the Pond Seedling?

Mr. Dunlop.—I think it is. I have received trees of this variety from the West, U.S. and England, and while I fancy I can detect a slight difference in habit of tree, I shall not be surprised if it and the Pond Seedlings should prove to be identical.

Mr. Fisk.—I have grown Pond Seedlings a number of years. They proved hardy, and fruit uniformly every year though not heavily. I also fruited the Early Russian Red this year for the first time. I think it is going to be a very nice plum.

Mr. Shepherd.—Is it a freestone?

Mr. Fisk.—I do not think so. It is rather a light red, a very pretty plum.

Mr. Dunlop.—I saw the Early Red in fruit on the Experimental Farm at Ottawa.—I was much pleased with the fruit. It is of fair size and beautiful shape, color reddish with a tinge of blue.

Mr. Shepherd.—Is it a freestone?

Mr. Dunlop.—It is a clingstone.

Mr. Guay asked about the Reine Claude.

Mr. Dunlop.—I mentioned it under the name of Bavay's Greengage. The trees are not very hardy. They stand the climate, but are always injured more or less. The Reine Claude is a plum that does fairly well, but not a variety you would recommend for profit in this climate.

Mr. Guay.—The tree grows very well at Oka, and produces excellent large fruit. I would like to know if you have tried the apricot ?

Mr. Dunlop.—No, I have seen the Russian apricot tried, and I think many people have invested in the tree and I think have been generally disappointed. The trees have not grown in a great many places, and are not likely to fruit to any extent ; and where they do fruit, the fruit is not valuable for commercial purposes.

Mr. Fregeau.—I planted four different varieties six years ago. Only two are living. I had just one apricot last spring, and only two blossoms. I suppose the frost killed them.

Mr. Hamilton.—I planted five Russian apricots. One survives now, six years old. The tree is seven feet high and stands the winters well but does not produce fruit.

Mr. Brodie.—I planted two Russian plums, one red and the other is the prettiest yellow plum I have ever seen. It is lemon yellow with a star pear-shaped, a freestone and the quality of the very best. But I had only three plums ; they, however, were perfect.

Mr. Fisher.—I had some very nice plums that bore very well last year. It was the first time I had any fruit from them to speak of. I cannot tell the name of them. I bought them from a local nurseryman, Mr. Hunt, and he gave them local names. I am not sufficiently familiar with the nomenclature to make even a guess what they are. My impression is they are known varieties. I have three trees, each of which gave me a little over three gallons of good sound fruit. They are young trees, and this was the first year's bearing. I sprayed them at the same time as my apples. Up to this year I had no fruit to speak of on the trees at all. They are now four years planted, and until this year never had more than half a dozen plums. I wonder whether the spray had anything to do with my getting the fruit. Does spraying save the trees from curculio ?

Mr. President.—Did you not notice any effect on the foliage from using the same preparation as on the apples ?

Mr. Shepherd.—Did you spray before they leafed and afterwards ?

Mr. Fisher.—Yes, I never noticed anything on the foliage.

Mr. Dunlop.—The addition of lime to the mixture would prevent the arsenic in the Paris green from affecting the foliage. The lime performs a very important office in neutralizing the arsenic in the Paris green. Spraying with Paris green is recommended for curculio, but that is an open question. The plum has not any calyx like the apple for the poison to settle in, and unless you get the spray all over the fruit, it might not have any effect. The trouble with the plum is, it is so oily that if you spray it, very little of the spray remains on the fruit. Perhaps the beetle may feed on the foliage, in which case spraying would be beneficial.

The Americans jar the trees with a mallet, which frightens the curculios and they immediately drop to the ground and are caught in sheets spread for that purpose.

Mr. Johnson.—When do they do it ?

Mr. Dunlop.—When the fruit is a little larger than a pea, and continue as long as you catch curculios.

Mr. Fisher.—When the curculio strikes the fruit, what is the result ?

Mr. Dunlop.—If the weather is favourable the egg hatches and the larva

burrows into the stone of the plum, prevents its development and the fruit falls to the ground.

Mr. Fisher.—I noticed last year the few I had were blighted. The plum, when it got to a certain stage, swelled and got yellow. There was none of that this year. Last year one-third or one-half of the plums were affected that way.

Mr. Dunlop.—That is caused by a fungus, and no doubt spraying ought to be beneficial. The plums swell out and become deformed and spongy. I have never seen any of the European varieties affected in this way.

Mr. Shepherd.—With reference to spraying for curculio, I was reading the other day in the *Country Gentleman* that a great plum grower read a paper before a New York Society, and he does not recommend spraying, they still resort to the jarring process. They catch curculios in something like inverted umbrellas.

Mr. Hamilton.—Wild plums are to a large extent affected with the disease Mr. Fisher speaks of. It began in the district in which I lived five or six years ago. A few trees were troubled, but last year the disease spread so there was hardly a sound wild plum left on the country side.

Mr. Fisher.—I think one of the varieties I have is a wild plum. It is known as the Williams plum. It came from his garden in that neighbourhood. I described it to Mr. Craig. and he thought it was probably a wild plum. It is a red plum and bears abundantly, and I noticed it was most subject to that sort of blight.

Mr. Shepherd.—In our section, which is a great wild plum country, we have wild plums growing in hedges up the farms, for half a mile, all through our section, particularly at Como and some at Hudson. I have noticed that, ever since I was a boy, the plums frequently swelled to a large size and never ripened, but fell off when green. The inside is all pith, no stone or kernel. It is a disease that comes on periodically and has not increased. I can recollect over thirty years, and it has not increased. Some years it is bad, and some it is not. We have some excellent seedling plums at Como. I have one in my garden ; the original tree is dead but had been bearing for over thirty years. I am saving the suckers and am going to set them up in different parts of the farm. They are larger than the De Soto and very good quality, quite as good as the De Soto for jam.

Mr. President.—Have you any trouble with the black knot in the Island of Montreal ?

Mr. Dunlop. I cannot say I have had much trouble with it. I always made it a point whenever I noticed any appearance of it to cut it out immediately and burn it. I notice that the choke cherry is very subject to it, and I generally cut those out in the vicinity. I do not feel at all uneasy about preventing it. Should it appear on the trunk of the tree, I cut it out and put a very little turpentine on and a coating of shellac over the wood. So far I have never lost a tree by it, and the cases where it has appeared were generally in trees from sprouts the parent trees of which had been affected.

I attribute my comparative immunity from this disease to the fact that my trees are on new land, as the cherry and plum trees in my neighbourhood are pretty generally affected, especially when grown for a great number of years on the same piece of ground, as is often the case with varieties which reproduce themselves by suckers. I am inclined to think that the primary cause of this disease will be found to be the same as the black spot of the apple—a deficiency in soil.

Mr. Brodie.—I cannot find a sound cherry tree around in the neighbourhood on account of the black knot. I have been chopping them down by degrees, but would like to keep some of them for our own use.

Mr. Newman.—The black knot set in so badly with us that we could not fight it anyway. We have never been able to cultivate our cherries. We have to put them in places where the soil is never disturbed, and they were in thick hedges, and when the black knot set in it went the whole length of the hedge so that the suckers and everything got infected.

Mr. Shepherd.—Have you lost the variety?

Mr. Newman.—The suckers all the time are coming up, but they are infected and we do not get any fruit.

Mr. Brodie.—I have six of these Newman cherries and find they are not subject to the black knot as much as others.

Mr. Shepherd.—Where did they come from?

Mr. Newman.—From Normandy. There are two varieties—the black cherry and the red cherry. The black knot set into the black cherry first and then spread to the red and then to the choke cherry.

Mr. Fisher.—What did you do, Mr. Brodie, to take care of them?

Mr. Brodie.—I have not got them growing in hedges like our ordinary cherries. They are quite close to some plum trees and got their share of the spraying with the Bordeaux mixture. I have been particular to cut out any piece I saw infected. I will not chop down those as long as I can get them to bear fruit.

Mr. Shepherd.—It is a splendid cherry. I do not see how the spraying could affect the black knot. The only remedy is to cut it out and burn it. My recollection of Mr. Newman's orchard dates back thirty-five or thirty-six years. The cherries were known all over the Island of Montreal as a Newman cherry, and Mr. Newman then was not inclined to give away scions.

Mr. Brodie.—Mr. Newman could not hinder branches growing through to his neighbor's fence being cut. That is the way I procured them.

Mr. Shepherd.—Mr. Newman found these cherries very profitable. Hundreds of baskets went to the Montreal markets every year.

Mr. Brodie.—Twenty years ago I used to sell two hundred to two hundred and fifty gallons every summer. Now I can hardly get enough for my own use.

Mr. Hamilton.—It would be a good thing if we could induce fruit growers' associations all over the country to make it a point to look up good native plums. I have been shown a native red plum of a very fine quality. If more efforts were made, plums might be found among our natives that would prove very useful. True, most of them are very astringent, but now and again we come upon one that has no astringency, and bears heavily. I came across one in my country, and have been trying to get suckers out of them, but from some cause in late years they do not seem so inclined to sucker. Fruit about two inches long, with very little red. Two or three years ago, when I found I could not get a sucker, I bought a bucketful of plums, and planted the whole bucketful, in the hopes of getting a new seedling like the parent trees.

Mr. President.—I think the suggestion of Mr. Hamilton is a very good one. Now that a committee is appointed on nomenclature, two residing at Montreal and one at Ottawa, any gentleman who has any fruits, plums or anything else, and wants an opinion as to its merits, needs simply mail them free to Ottawa to Mr. Craig or to the other gentleman. In mailing to Ottawa they go free of post-

age, being government matters. I hope you will all assist us in every possible way by sending in samples of fruit and asking questions of the experimental station. We have as much right as any part of the Dominion to ask questions of these gentlemen.

The meeting then adjourned until the afternoon.

Afternoon Session.

Mr. R. W. Shepherd, jun., read the following paper:–

A FEW NOTES FOR BEGINNERS, R. W. SHEPHERD, Jr.

If you buy apple trees, buy them in this province.

Buy trees that have proved to be hardy, and profitable bearers.

Do not make the mistake of purchasing trees that are not known to have been well tested here.

It cannot be too strongly impressed on the minds of beginners that the successful fruit growers of this province are the men to whom they should look for the proper varieties, suitable to the climate and surroundings.

Do not make the mistake of planting too many varieties.

It is a very common mistake, and a very pardonable one. Nearly every beginner hopes to succeed in the undertaking, and he hopes to succeed, too, better than his neighbour. Hope is a great attribute to success, and it is a commendable virtue; but when hope leads the beginner in orcharding to expect to realise what is impossible, it really becomes a misfortune, because disappointment and discouragement must follow.

The agent of some far away nursery comes along with his beautiful pictures of fruit, and the beginner, although he may know that the climate where the trees (which this agent is selling) were grown is much milder and more favourable than our own, yet, led away by the desire to grow better fruit than his neighbour, he *hopes* to succeed, and gives an order for a number of varieties of trees altogether unsuitable for this province. I know whereof I speak, because I have been just in the position described, and I have spent a deal of money to gain what little knowledge and experience I possess of profitable varieties. Furthermore, I contend, and do so with emphasis, that the varieties being equal, the trees grown in our province of Quebec nurseries are much more likely to succeed than those procured from the South or West. I think every experienced orchardist will bear me out in this.

About twenty years ago I first began to plant orchards. I bought a few hundred trees in Western Ontario, excellent trees and well grown—but I do not believe I have half a dozen of those trees to-day. Such trees may live and struggle on for a few years, but only under most favourable circumstances do they turn out satisfactory in the long run.

I admit the large nurserymen of the West and South have done a deal of good by instilling the enterprise and desire among us to plant out orchards, and also in many instances by disseminating new and hardy varieties; but, on the other hand, many persons have become discouraged by planting out trash and varieties quite unsuited to the climate, recommended by irresponsible agents. Happily, however, since the distribution of pomological reports of societies and

the bulletins from the Experimental Farm at Ottawa, there is really no excuse for anyone to set out orchards with untried or unprofitable varieties. I might give many instances where trees procured from far away nurseries have failed, but one will suffice. Two small orchards at the western end of the Island of Montreal, side by side, contain fifty trees, each planted the same year (about five years ago), and with trees of almost the same varieties, one man procured his trees from a Western nursery, the other from a Quebec nursery. Of the Western trees, scarcely one-half are alive; but of the Quebec trees, *not one has died yet.* It is always better to procure your trees from a nursery near by if possible; at any rate the evidence is unfavourable to trees being grown in nurseries where the climate is much milder than the orchard where the trees are to be planted.

A beginner who can confine his varieties to six or eight at most, and such as have proved to be profitable, will certainly reap the benefit in after years when he markets his fruit. I know from experience the difficulty of disposing of a large crop of twenty varieties. It means more expense in picking, sorting and packing as well as in the selling of the fruit.

After procuring your trees, plant them carefully and sensibly,—summer, fall and winter varieties, *respectively*, together.

It is such a mistake to have your summer and fall apples mixed up in the same orchard,—such needless waste of time going over the same ground twice with pickers and packages.

Having planted your trees carefully and sensibly, *take care of them.* Cultivate the ground the first four or five years. Mulch around the trees with coarse straw, corn husks or anything of that nature. Mulching is always necessary in this climate where we have often long spells of dry weather and hot sun in summer.

Examine your trees twice every year for the borer and other insects. Wash the trunks of the trees with soft soap and water every spring. I am a firm believer in the efficacy of washing the bark of the trees to prevent the borer's ravages, or in fact sun scald, as I have noticed that those trees where the wash has been applied have been less afflicted with sun scald.

Prune lightly. I do not believe in severe pruning in our climate. I know those trees which live longest are those which naturally require little pruning. At the same time, it is necessary to keep the branches from interlacing, and also not to allow too close a head; but after trees begin to bear, if they have been properly formed at first, the heavy crops of fruit will soon open out the heads.

Often more harm than good is done in cutting off branches of bearing trees. If you use a pruning knife often, I mean on small interlacing branches, you may almost discard the saw; but whenever you prune, bear in mind always to cover over the cut, whether made by knife or saw, with paint or shellac.

By following at first such general principles, as years pass on, the beginner will become an interested and close observer, and experience will teach him better than any other instructor the best methods of cultivating his orchard thoroughly and successfully.

Mr. Brodie.—I feel very diffident about criticising this able paper. I do not agree with Mr. Shepherd about raising trees here. I believe more in the variety. I have got trees as far west as Windsor, Ontario, and have more faith in the variety than the place where the trees are raised. I got some of my best trees from Windsor, among them the Golden Russet and Plum's Cider. These

Plum's Cider I substituted for Montreal Peach. I thought Montreal Peach a bonanza, but found afterwards they did not sell well, they bruise so easily. Mr. Dunlop has been over my orchard and has seen these trees which are a perfect picture of health.

Mr. Dunlop.—I think the place where the trees are grown is of importance only in certain varieties. Take the Duchess tree or the Wealthy or other trees of well known hardiness, it matters very little where we procure them if well grown. I would not care to take trees which are not very hardy, if grown at a southern point particularly if propagated from trees grown some time at that point. I fancy they would have a tendency to become more tender in the warmer climate.

Mr. Shepherd.—Mr. Brodie believes if varieties are hardy that it does not matter whether they are grown in a more southern nursery. One-half of the trees I got from Galt twenty years ago were Fameuse, and I have not one left. The rest were some Golden Russets and one or two other varieties. I had ordered in place of the Fameuse, two or three varieties known up West. Mr. Gibb recommended me to change the order to Fameuse, which I did.

Mr. Brodie.—I got fifty Fameuse from the late James Dougall. He procured the scions from around Montreal. At the same time I got trees around the Province of Quebec, some Winter St. Lawrence, and out of twelve trees only two are living now.

Mr. Fisher.—The question depends almost as much on the care and honesty of the nurseryman as the particular place where grown, provided it is not very extreme south. I would like to make a suggestion to the nurserymen here. They do not send out agents among the farmers as people from a distance do. If the trees are brought to a farmer's door, he will be persuaded to buy them. That is why so many foreign trees are sold throughout the country. It is really through the solicitation of agents, and not through a preference to foreign trees. I hope our merchants are more honest than the foreign ones, and will supply us really with what their agents say they do.

Mr. Brodie.—I procured these trees through direct correspondence with the nurseryman.

Mr. Dunlop.—If they were trees from scions procured from Montreal, the climate could not affect them very much for the time they had to live in it. If there would be any difference it would be by growing a tree a number of years in a warmer climate and propagating from that tree which might give you a more tender tree.

Mr. Hamilton.—I can bear out what Mr. Shepherd says. When I got the bit of ground I have now, I brought 1500 apple trees from the United States. That was about ten years ago, and I do not think I have a single tree left to-day. If I have, they are a few Wealthy and Duchess.

Mr. Brodie.—No Russians among them?

Mr. Hamilton.—Not among that lot. Later on I grew my own trees, when I had a number of handsome trees of a sort I did not want to plant, I exchanged. I exchanged 50 Alexander for 50 Wealthy, and had the same luck with them as the first 1500. They died, but were not a total loss, as they came up again, and now make very good trees. That is a fair test of western trees. When one loses 1500, he does not care to go into it the second time. After that I began to grow my own trees, and they are ahead of those I got from the Western States.

So that I can emphasise what Mr. Shepherd says: If you are going to plant trees, buy them from the home nursery.

Mr. Shepherd.—I would like to ask Mr. Brodie, if he were going to plant 1000 trees this next spring, would he prefer to procure them from western Ontario?

Mr. Brodie.—No; but so far the trees that I got from the West have a cleaner bark, no bark lice, and are better shaped than some I have usually seen growing around the Province of Quebec. I have grown two thousand trees of my own, and they are better than anything I got from anywhere else. They were under my own supervision.

Mr. Shepherd.—As long as the trees are grown here from root grafts, they are likely to live longer than any grown in a nursery in the West or South. Your Fameuse scions were procured from Montreal, which accounts for their being good, and the Plum's Cider were probably procured from Wisconsin or Minnesota. Mr. Dougall could not have had Plum's Cider very long. They could not have grown in the district of Windsor for many years. Take Fameuse cultivated and grown in western Ontario for fifty years, and the scions from those trees will not be as good as those from trees grown in the Province of Quebec.

Mr. Brodie.—Golden Russets are the healthiest trees I have on the farm.

Mr. Shepherd.—The American Golden Russet?

Mr. Brodie.—Yes.

Mr. Hamilton.—They are perfect I should say.

Mr. Shepherd.—I got American Golden Russets, and only a few of them are alive. The Russet I got from Abbotsford nurseries is the English Golden Russet, I call it the Fisk Golden Russet, to distinguish it from the American. I consider it a hardy tree, though not as fine a quality as the American and as large an apple.

Mr. Brodie,—Those I planted are A 1. Some years I put in as much as 50 tons of manure to the acre. The soil is black sandy loam well drained. I ordered a few lots of Grime's Golden, Maiden's Blush, and one or two others from Mr. Macdougall. The Maiden's Blush are very delicate; the Grime's Golden are not hardy trees, but I have fairly good crops.

Mr. Gill.—What kind of apple is the Plum's Cider?

Mr. Brodie.—Large, fairly well coloured, conical in shape, with a good subacic flavour. Some of my friends in the city prefer it, as an eating apple, to the Fameuse. It is a fall apple, and will keep on until perhaps the middle of December. I procured trees from Mr. Fisk, Fameuse, and have a young orchard of them, which is the healthiest orchard I have.

Mr. President.—It is generally conceded by people having experience in planting trees that the nearer you can get them from where you intend to plant them, the better. Better get them North of you than South. Take the Russian varieties. They come from a climate colder than our own, and most of them are hardier than our native. A tree grown in a Northern exposure is consequently hardier than one grown South.

Mr. Brodie.—Do you think a tender tree grown in the north is as hardy as a tender tree grown in the South?

Mr. President.—Many of the trees we get from the South, especially from Rochester, where they go into this business largely and use artificial means, steam pipes burrowed into the earth—for propagation, are forced into rapid growth, and

are full of sap when they come out, and will not stand exposure. When one goes into the nursery business simply to make all the money he can, regardless of successful planting, the result does not prove satisfactory.

The meeting adjourned until evening.

Evening Session.

Mr. R. Hamilton made some remarks on Russian apples. He said: The first question I feel called upon to ask myself is: Have we derived any tangible, immediate benefit from the introduction of the Russian apples? Our late lamented friend, Mr. Charles Gibb, who was very enthusiastic on the subject, thought we should get something that would prove of very great value to our country. Probably he was right in his conjecture, and we may receive something of very great value; but from my experience I am not able to say that we have got anything of very great advantage as yet. I would not argue from that that the labours of Mr. Gibb were in vain. I think if we have not yet benefited very much yet, we shall later, by the fact that we shall get seedling hybrids from those and some of our best long keepers, which will be of great benefit to the country. And then there is the effect of new blood being introduced. With the exception of Duchess, Red Astrachan and Alexander, we had none others from that country; and these sorts had grown so long here that they had become acclimated, and probably many of the seedlings of this country have the blood of these varieties in them. Many of our old varieties may be said to be effete and worn out. I suppose there was never a better apple than the Fameuse, and you all see what it has come to to-day. It does not seem to have vitality enough in itself to resist the encroachment of disease. The introduction of new blood may be the means of our coming into possession later of a race of apples very much superior in many respects to those we have already. While many of the Russian apples are not fine in quality, a great many have a very fine aroma. Even the very coarsest of them, those of the Alexander family, have something indescribable. You can hardly describe it, but you feel it when you use them. Some of them have that so strongly marked that the Russians themselves have named them "smelling apples" and two or three in a room are as good as a sprinkling of Cologne water, they so fill the room with perfume. We have some that are of great importance, and amongst these I should put, in almost the first place, the Yellow Transparent. It is true, it will keep only a very short time. I think it was Charles Gibb who used to say if it were ripe in the morning, you had to eat it before dinner; but it is a great bearer. And if it is thinned on the tree while young or the branches thinned out, the apple is of good size. I had specimens from quite a number of places, in different directions for the Chicago exhibit, showing what was produced by young, healthy, vigourous trees, and probably on garden soil. If thinned there is no loss, but rather a great gain. If you take two trees of equal size with the same quantity of fruit upon each, take them when the fruit is quite young, before the pips have set, and thin them out, leaving one-fifth of the apples on the tree, at picking time you will have a greater bulk of handsome fruit off the thinned tree than off the other. When you take the fruit to market in that state, you will hear people say, as I have heard them say on several occasions: I have never tasted a peach more luscious than that. When they are allowed to fully ripen on

the trees, on which you have thinned the apples, such is their delicious character that people have said again and again they are almost equal to a peach. But you cannot carry them any distance. Put up in boxes like those of Mr. Shepherd, you could send them safely from this to Montreal. I have sent them from my place to Montreal, fifty-six miles, and one season I got seventy-five cents for a basket that would not certainly hold a peck. They were large and fine. I cannot always get this price; but if we can get 30 or 35 cents for a basket of that sort, they will always pay very well. The Titovka and apples of that family, which are quite vigourous, are good varieties. The Titovka is a very fine apple, and splendid to look at, but comes in at a bad season. It comes in just when the Duches,s and such apples as the St. Lawrence are quite abundant; so that it may not be of as much benefit as it would if it came at a time when we had not the other fruit.

Mr. H. C. Fisk.—My experience in Russian fruit is that there are only three varieties worth cultivation at all—Yellow Transparent, Arabka and Titovka.

Mr. Brodie.—I can name a few more. I find, apart from the Duchess, the Golden White is my most profitable apple. I can get $4.00 a barrel for it in falls like last fall. I sell them by the basket.

Mr. Fisher.—Are they more profitable than Yellow Transparents?

Mr. Brodie.—I have more of them. The trees are larger and bear more fruit. My first Yellow Transparent was top grafted. I top grafted them on some Siberian crabs, and each tree will bear a couple of bushels. Another one is Basil The Great. Anything of the Alexander type will always sell on our market.

Mr. Shepherd.—One of the handsomest Russians, which will become valuable in the fall market, is the Gypsy Girl. I saw it the first time it fruited at the Experimental Farm two years ago. Last year it fruited at Como. It is very handsome, as large as Winter St. Lawrence. The Switzer is another apple, one of the best quality of Russians,—a handsome apple about the size of the Fameuse, and a very profuse bearer.

Mr. Brodie.—I planted about twelve trees of Switzer and twelve of Yellow Transparent at the same time. The Yellow Transparents are going ahead making a fine growth, but the Switzers are at a standstill.

Mr. Shepherd.—In the nursery the Switzer is a very rapid grower, the very best grower I ever saw.

Mr. Fregeau.—I have a tree I got from the late Mr. Gibb, the Lowland Raspberry. It bears fruit every other year, and has the finest fruit I ever ate. It is even better flavoured than the Fameuse.

Mr. President.—I cannot quite agree with Mr. Fregeau in saying it is better than the Fameuse. It is a very good apple for a Russian, and has a good flavour, but I prefer the Fameuse.

Mr. Fregeau.—I took some to St. Hilaire to the apple growers there, and they were of the same opinion as myself.

Mr. Fisher.—I have a tree of the Lowland Raspberry, and I almost agree with Mr. Fregeau. It is the most delicious apple I ever ate, except perhaps the Fameuse. The trees are very hardy and thrifty, and bear well. It has borne with me two years. The first year I had a few apples, and last year quite a number. It comes to market at the same time as the Duchess, and I would not touch the Duchess when I can get it.

Mr. Shepherd.—Are the apples uniform in size ?

Mr. Fisher.—Yes, a good size.

Mr. Shepherd.—There are no doubt a number of Russians that are very high-flavoured apples. It is the first time I heard of this apple being a fine quality. I have one called the White Pigeon, which is of exceptional quality; I class it equal to the Early Joe. Early Joe is considered one of the most delicious table apples in the world. I class White Pigeon quite equal to it just for dessert. It would never do to grow White Pigeon for market, its appearance is not fine enough, but for quality it stands high. Early Joe is a very delicious apple. In Ontario and western New York it is considered one of the highest class. It is medium-sized, and has a pear-like flavour and yellowish flesh. The Switzer is more like the Fameuse in type. It has the texture of the Fameuse in flesh but is not quite so good a keeper. I think Mr. Hamilton overlooked that variety.

Mr. Hamilton.—To give you an idea of how I appreciate the Switzer, I planted 400. It is the one tree in my place that attracts the eye of all visitors the moment they come into the orchard—the ladies especially go into ecstacies over it. The apple has a delightful flavour, and the tree is the thriftiest in the whole lot. The apple Mr. Fregeau spoke of, the Lowland Raspberry, I had some specimens of to send to Chicago. All who tasted it praised its delightful flavour. Its flesh is very soft, softer than the Fameuse, and the flavour has something of the strawberry. Without exception, the apple has the loveliest colour of any apple I ever saw. Mr. Fregeau sent me a couple of trees which made good and rapid growth and were not injured by the winter, though started rather late in the season.

Mr. Fisher.—The tree I have came from Mr. Budd of Iowa in 1888. The Horticultural Society sent an order for Russian trees, and left the choice to him. I am not aware that any other member of the Society got one of those trees. The tree is now I think five years planted. It was but two years old when it came. It seems to be a vigourous grower and very healthy. Have not noticed any appearance at all of blight or sickness in it.

Mr. Brodie.—Have you tried the Blush Calville ?

Mr. Dunlop.—I fruited it last year. It is an apple of the same class as the Yellow Transparent, but a little later and not so uniform in shape.

Mr. President.—I would like to say with regard to Russian fruits, that there is no doubt there is much that will be discarded, especially for our western and southern portions. The Russian will suit better the northern part of this province. There is quite an area north, where probably they will be of great value ; but while we can grow St. Lawrence and apples of that class, we will not care much for Russian varieties.

Mr. Shepherd.—I think it will become the duty of this Society to eliminate out of a great number of Russian varieties a certain number for the districts north, districts Nos. 6 and 7 and those north of Montreal and Quebec. It will be the duty of this Society to recommend half a dozen of the best Russian varieties for planting out in those districts. Before proceeding any further, Mr. President, if you will allow me, I would like to move, seconded by Mr. S. A. Fisher, the following resolutions :—Moved by R. W. Shepherd, jr., seconded by S. A. Fisher—"That the thanks of those members of the Society who have come from a "distance are due and hereby tendered to the good people of Abbotsford for their "kindness and hospitality in entertaining the members of the Society during "the sessions."

Few country places would have taken us in as the good people of Abbotsford have done, and we are very thankful for the kind way in which they have treated us throughout.

Mr. Fisher.—In seconding that motion, let me say that like Mr. Shepherd I have known Abbotsford for a long time, and knew what we might expect from the people here. On this occasion I feel they have surpassed themselves in their kindly hospitality, and have shown the interest they feel in the Society. And if the Society will do the good work it ought to do, that will be largely due to the initiative of the people of Abbotsford.

Mr. President.—In reply, I should like to say, that as far as Abbotsford is concerned, it has been a great pleasure for us to have been given the opportunity of entertaining the members of the Society from Montreal and other parts, from whose visit we cannot fail to derive much benefit, and I must not forget to mention the debt we owe to the gentlemen from the Experimental Farm. Nothing could please us more than the addresses we received from those gentlemen, especially the address of Professor Robertson on the Dairy question. The opportunity is one we cannot always hope to enjoy in a country place like this, and we feel very grateful to those gentlemen for having made an extra effort to come here.

Mr. Hamilton moved that the thanks of the Association are due and hereby tendered to the Methodist congregation for having kindly given the use of the church to this meeting. Mr. Dunlop seconded that motion with pleasure.

Mr. President.—When the proposition was made to hold a meeting at Abbotsford, we were quite at a loss to find a place in which to hold it. It struck me that this building might possibly be available, as it had been used at one time for a lecture on Agriculture. It is certainly the only building suitable to be had, and although a church, I am confident that the good work we are doing will not in any way detract from its character.

DISCUSSION ON VARIETIES RESUMED.

Mr. Guay.—What do you think of the Tetofsky?

Mr. Brodie. Since I have had the Yellow Transparent I do not want any more Tetofsky; I find the Yellow Transparent supersedes it altogether. In quality it is not nearly as good as the Yellow Transparent, and is something like that aromatic apple Mr. Hamilton talks about—very sweet-scented, but in quality it does not compete with the Yellow Transparent. It is not so nice a shape, and the trees are not so vigourous growers.

Mr. Shepherd.—I do not quite agree that it is no earlier, because it is earlier than Yellow Transparent with me always. It is the first apple that is ripe out of forty varieties. I have only a few trees, and the children pick them with a great deal of pleasure; but I do not think it is an apple that will ever come to be a market variety. It is too small to ship in baskets, and it would not fetch any price in the barrel.

Mr. Guay.—Behind Quebec, at St. Anne's, the Redemptorists have planted Transparent and Tetofsky. The Tetofsky gives large admirable apples, whereas the Transparents have failed. In some places the Tetofsky must have better properties.

Mr. Brodie.—It requires good land.

Mr. Guay.—It proves very vigourous in the North.

Mr. Brodie.—I find where I got the best Tetofsky is in an old melon patch ; where heavily manured every year and cultivated, it made vigourous growth. For earliness when they are stung with the codling moth they ripen quicker, but of course are then no good.

Mr. Shepherd.—You, Mr. Brodie, put Yellow Transparents on the market before they were ripe. You acknowledged that some years ago. I contend that the Tetofsky is ripe earlier than the Yellow Transparent.

Mr. Fregeau.—They ripen about ten days before the Yellow Transparent, but I prefer the latter as they are more profitable.

Mr. President.—I prefer the Yellow Transparent. The Tetofsky texture is so hard and firm that it requires good teeth to eat it.

ORCHARD CULTURE.

The next item on the programme was a discussion on Orchard Culture and Fruit Packages.

Mr. Brodie asked whether to cultivate or leave in grass was the best for orchards. I broke up, he said, half the orchard that was in grass, and left the other half still in grass. It was an orchard where I had mostly Red Astrachan and Montreal Strawberry, and a few St. Lawrence. To my surprise I found that where I ploughed up—I planted corn the first year on the sod—the apples where I ploughed were ripe fully a week earlier than alongside in the sod.

Mr. Shepherd.—Did you notice any difference in the growth of the trees ?

Mr. Brodie.—I did not take any particular notice of the growth of the trees, but looked more to the fruit. This was the first season under ploughing. The fruit was of a much better colour and matured earlier.

Mr. Fisher.—Had you manured *the* land for your corn ?

Mr. Brodie.—I did not give it a heavy manure, but I ploughed under the old crop of orchard grass. I was a little short of manure, and along with my corn planted I used a standard fertiliser. The following summer I manured heavier.

Mr. Fisher.—Ploughing down the sod of the orchard grass was a good manure, and would have more effect than if left to the surface to rot down. The superphosphate you used on the corn plant would have some effect. Whether that enrichment would have the effect of ripening the apple I do not know, but no doubt these trees felt the benefit.

Mr. Fisk.—I do not think Abbotsford orchardists can give information on that point, because most orchards are set on soil that never was or could be ploughed and very little grass among the trees.

Mr. Brodie.—Most of my trees are as much as thirty (30) feet apart. I find when I look at the orchards here that my trees are very much scattered.

Mr. H. Bachelor.—Mr. Fregeau had an orchard some year or two ago, which he manured before he broke it up. He then put on potatoes, and there was a marked difference in the fruit. It did better than it had done for years. The manure was put on before he ploughed it under.

Mr. Dunlop.—All these things mentioned may have had some influence. The mere fact of the ground having been turned up to the action of the sun and the air might also have an influence, and with the increased manure might be sufficient to account for the difference in the ripening of the fruit.

Mr. Brodie.—When you came to get apples for the Chicago Exhibition,

Mr. Secretary, you got more where the ground was cultivated than where it was not.

Mr. Fisher.—I do not think it is a fair comparison to compare a piece of cultivated ground which has been manured, with a piece of old sod that has not been. If the same quantity of manure had been top dressed on the sod and scattered by the harrow, that would be a fair comparison.

Mr. Brodie.—I had manured around the trees the year previous, but with my orchard grass. It is supposed you cannot cut orchard grass twice in the season. I found that was going to exhaust the soil too much unless I manured heavily. I cut the first crop, and the second crop I allowed to lie on the ground.

Mr. Shepherd.—The only difference was in the ripening of the fruit. You did not get more fruit?

Mr. Brodie.—No.

Mr. Shepherd.—If you did, I would say that the action of the plough in cutting the roots would affect the crop.

Mr. Brodie.—I have ploughed in the fall.

Mr. Fisher.—My Fameuse orchard near the road which I ploughed for six (6) years has never been as well as the orchard I did not plough. I dress the trees with wood ashes principally, and I have not had as much satisfaction with the orchard that I ploughed up, and now it is in grass again.

Mr. Brodie.—What grass do you sod down with?

Mr. Fisher.—Just the ordinary clover.

Mr. Hamilton,—Did you take any crop?

Mr. Fisher.—Yes, one crop. About six years ago, the orchard was ploughed up.

Mr. Brodie.—I have heard Dr. Hoskins say that the most natural grass for an orchard was ordinary June grass. After the orchard had been sodded down for years, naturally it went into June grass.

Mr. Hamilton.—The year before last I made a collection of fruit for Chicago. I visited a good many orchards, probably more than half on the Island of Montreal and many outside of it. I found that where the land was in cultivation the fruit was larger and finer and very much less spotted. Where orchards were recently put in grass, while there was some spot, it was not so bad as where they had been a long time in grass. Some large and valuable orchards that had been a long time in grass gave absolutely nothing. I met a French Canadian, a large dealer, and he told me that an orchard he had paid $700.00 for he could not get $50.00 worth of fruit off it.

Mr. Shepherd.—That was when?

Mr. Hamilton.—In the year 1892. Every tree loaded with apples, but seriously tainted and worthless. I asked him the question, and found that the orchard had been in grass a very long time. Several years ago, when Mr. Charles Gibb and myself made a collection for the Centennial Exhibition, we found an apple in two or three orchards which Mr. Gibb noticed.

We tasted it and found it to be a very fine apple. We came along two or three miles nearer the City and got into a cultivated market garden. In this orchard were onions, potatoes, etc., and we found that same apple, the Decary apple, larger than the Alexander. We concluded that the only reason for its extraordinary size was the tillage and fine condition of the ground. It is chiefly

in regard to spotting that I would ask your attention to the fact that the apples spots very little in orchards that are cultivated, but in orchards that have been a long time in grass the apples are utterly worthless.

Mr. Wilkins.—Is top grafting seedling trees the best thing?

Mr. Hamilton.—Yes, better then chopping them out. After a tree has grown a considerable time it is great folly to cut it out and throw it away. The best way is to top graft it. By top grafting you save many years which you would lose by rooting out the trees and planting new ones.

Mr. Wilkins.—At Richmond I top grafted twenty varieties of so me very fine apples, but they did not all do well. The finest Red Astrachan I ever saw anywhere was top grafted on a seedling tree. The tree bore a very clean apple finer and larger than any I have ever seen.

Mr. Brodie.—I have had some of my best apples by top grafting on seedling trees.

Mr. Shepherd.—No doubt you can get as fine specimens top grafting as in any other way. The finest specimens I ever exhibited were Mackintosh Red in top grafts, and a number of other varieties. The Red Astrachan does very well top grafted.

Mr. Fisher.—Has anybody had any experience of pasturing sheep in grass orchards?

Mr. H. C. Fisk.—I have been pasturing my orchard now for probably twenty-five years. They keep down the sprouts and other little trees running up.

Mr. Brodie.—Will they eat the product?

Mr. Fisk.—No, they are particularly fond of the apple leaf. Before I pastured all my orchard with sheep I had one young orchard with small trees, and those sheep were bound to have the smallest trees from the top down. I do not know why it is, but a sheep will eat the leaves of the small apple tree with great relish. They will eat it before anything else and will browse as high as they can reach. They do a great deal of good in eating up the little apples and wormy apples that fall. Where you fertilise with sheep, keep a large number and feed them extra. Do not let them take a living out of the orchard, but give them extra feed. With the exception of hogs perhaps, sheep are the best animal you can use to pasture an orchard. Any large animals injure the trees more or less.

Mr. Fisher.—Do you protect the trees from the sheep?

Mr. Fisk.—Not if the trees are large enough. In renewing your trees in the orchard you have to put in a pretty good sized tree, say an inch to an inch and a quarter in diameter.

Mr. Fisher.—Were your trees all so high that the sheep could not reach the boughs?

Mr. Fisk.—No, they were low, and the low branches died.

Mr. Brodie. The fruit that grows on low branches does not amount to much any way. Will hogs hurt the tree?

Mr. Fisk.—No, I would let them work. They will not root so as to hurt the bark, but will root among the dirt, and plough it up pretty thoroughly.

Mr. Brodie.—The great objection I think to ploughing ground is that in the fall of the year, if it rains, you have a lot of muddy apples.

Mr. Fisher.—How about the sheep for the wind falls?

Mr. Brodie.—The only way would be shut them up when the apples are matured, or change their pasture.

Mr. Fisk.—Hogs will eat lots of apples, too.

Mr. Fisher.—Do you take the sheep out of the pasture when the apples are ripe enough to pick ?

Mr. Fisk.—Yes.

Mr. Shepherd.—The late Sir John Abbott pastured his sheep in his orchard at Ste. Anne de Bellevue ; he had a very large orchard there, some fifteen hundred trees. In replacing his old trees he always got high-branched trees, and I suppose protected the trunk in some way. I noticed in going through his orchard that all the lower limbs had been nibbled and were bare of leaves.

Mr. Fisher.—That is no great harm.

Mr. Shepherd.—No; he had very good crops of apples. I do not know that there is any great advantage in pasturing sheep, but he had always a good crop of apples.

Mr. Johnston.—Sheep are likely to destroy apple trees by barking them.

Mr. Shepherd.—They ought to be fed,and then they will not bark the trees.

This closed the business of the Society, and Mr. Marshall, before the members dispersed, said a few words expressing his appreciation of the pleasant time they had had, and his belief that a great deal of profit would result from the discussion.

QUEBEC APPLES AT THE WORLD'S FAIR.

CANADA.

Department B. Horticulture.

Exhibitor Province of Quebec. **Address Quebec.**

Group 21, Class 133.

EXHIBIT COLLECTION OF APPLES

(Crops of '92 and '93).

AWARD.

Apples Crop of 1892.

This exhibit consists of fifty-three varieties of apples correctly named and carefully selected. The fruit is of uniform size and color. The beauty of the display was greatly enhanced by a number of duplicate varieties.

Apples Crop of 1893.

This exhibit consists of fifty-five varieties of apples, carefully selected, of uniform size, well colored and free from blemishes. This exhibit demonstrates the possibilities of the Province in the branch of Pomology.

Signed

E. F. BABCOCK,
Individual Judge.

Approved

B. STARRATT,
President Departmental Committee.

Approved

JOHN BOYD THACHER,
Chairman, Executive Committee on Awards.

SUMMER MEETING.

The first summer meeting of the Pomological and Fruit Growing Society of the Province of Quebec was held in Knowlton, P.Q., in the Pettes Memorial Hall, on the 14th and 15th August, 1894.

The opening session took place on Tuesday at 8 p.m., before a large audience. J. M. Fisk, Esq., of Abbotsford, President of the Society, occupied the chair. The following members of the Society were present :—

Hon. H. J. Joly, Messrs. J. C. Chapais, St. Denis ; R. Brodie, St. Henri ; Professor John Craig, Ottawa ; W. W. Dunlop, Outremont ; R. W. Shepherd, jun., Como ; Professor Fletcher, Ottawa ; T. Slack, Waterloo ; N. C. Fisk, Abbotsford ; — Fisk, Abbotsford ; Dr. Hoskins, Newport, Vermont ; E. A. Barnard, Secretary of Agriculture Province of Quebec ; G. E. Cooke, Outremont ; R. Hamilton, Grenville, and a very large number of the members residing in the vicinity and adjoining townships.

The President, in his opening remarks, said : —

I am very much pleased to see that we are opening the first session of this our first summer meeting, under very favorable circumstances. It is very pleasant to meet our friends again, especially in this pleasant centre and in so handsome a hall, and it is doubly pleasant to us especially to see so many ladies present. We like to know that we have the ladies with us,—we need their countenance and encouragement, and we all know that when the ladies smile on a cause it is bound to prosper. As the French proverb says : "What woman wills God wills." (Applause and laughter.) We are entering upon a new era—a revolution, so to speak, and as a young society we want their help, and hope they will continue to give us the encouragement of which we see so good a promise in their presence here to-night. (Applause.)

I do not propose to take up any of your time to-night, ladies and gentlemen, as other gentlemen more able than I are going to address you, and I will call on Mr. Fisher to perform his part in the programme, by giving you a welcome to Knowlton.

Mr. S. Fisher, of Knowlton, then came forward, amidst loud and continued applause.

He said : I am so much at home here that I hardly think it would be becoming in me to address this audience at any length, more especially as I know that by so doing I would be imposing on the good will and patience of the people of Knowlton by delaying the treat they cannot fail to enjoy in the addresses of other gentlemen to which we are all looking forward with great interest.

I would, however, for a moment or two, with your kind permission, Mr. President, ladies and gentlemen, give my endorsement to the words of our President in congratulating the Fruit-Growing Society of the Province of Quebec on so successful and satisfactory a meeting. (Applause.)

I need hardly say that it was with a great deal of—I will not say trepidation—but at all events of anxiety, that, as a director of the Association for this district, I invited the Society to hold their first Summer meeting in Knowlton. In this I was of course moved by the desire that we should in our neighbor-

hood have the advantage of such a meeting as this. I believe that to be an immense advantage. (Applause.)

I remember when the Dairy Association of this Province, of which I was one of the directors, was first established, we went about the Province, almost begging for a place to hold our meetings, and how our first meetings were only attended by those interested in that particular branch. To-day, however, the position is reversed. All the districts in the Province are fighting for the preference, each urging us to pay it a visit, and at every meeting we have an audience too large to be contained in any ordinary public hall of a country place.

I am confident our Provincial Association of Fruit Growers will have a similar experience, and before long we will see the different parts of the Province vieing with each other to have the privilege of entertaining us and reap the benfits which must accrue from meetings such as this. (Applause.)

We, in Knowlton, have for a long time been doing something in the way of fruit growing, with varied success. The majority of us have often almost felt despair because our success has not been so great as we would like. In this meeting we shall have the opportunity of learning from men who have given years of study to this branch and can reap enormous advantage from the results of their experience. (Hear. Hear.)

I wish to thank the Society, on behalf of the people of Knowlton, for having accepted our invitation. We feel indeed grateful to these gentlemen, and assure them of the heartiest welcome. (Applause.)

As a director of the Society, I ask the ladies and members of the local committee to accept our most cordial thanks. The arrangements are in every respect most satisfactory. This beautiful display of flowers on the stage is a most graceful expression of your welcome. In the hall we have, notwithstanding the early season, a number of very beautiful fruits, and I am glad to know our neighborhood can do something in this direction, but still we have not had that great success in fruit growing which some other sections of our Province have had. We shall be glad to learn from the representatives of those more successful districts some of the secrets of their success.

There are one or two points we would do well to bear in mind and bring forward for discussion.

As this is a summer meeting, and the larger fruits, such as apples, plums, etc., are hardly ripe, it would be well for us to devote some attention to small fruits. These have not received as much attention as they might. Our farmers do not raise as many of them as they might. They do not seem to think it possible to raise them in large quantities, while, as a matter of fact, it is quite easy, with a little attention at certain seasons of the year, to have an abundance of these small fruits—currants, strawberries, raspberries, blackberries.

Another point is the use of insecticides and fungicides. This is a most important and comparatively new subject for fruit growers to turn their attention to. No doubt by means of appliances lately invented and discoveries lately made by chemists and naturalists, our fruit growers have much more effective means of fighting their insect and other enemies than they formerly had. It is important that our people, throughout the length and breadth of the Province, should turn their attention to these things, study them out, and profit by them.

We have had during the past season ocular demonstration, in various parts of our Province, of the unqualified success of these means of destroying our opponents, and it is well these should be brought out prominently at these meetings.

As a director of the Society, I sent out invitations to a number of fruit growers to attend these meetings, and I am glad to notice the large number present from Abbotsford, the cradle of the Association, because it was last winter at Abbotsford—the birth-place and home of our lamented friend the late Mr. Charles Gibb, who did more for fruit-growing in this Province and, I believe, the Dominion than any other man—that this Society was formed. And Mr. Gibb did this in the fullness of his heart and patriotism, through the strong conviction that the men who had means should devote their energies to the formation of the public interests. (Applause.) The result has been that Abbotsford has gone forward in a most extraordinary degree as a fruit-growing section.

I am very happy to have this opportunity of addressing the Association, but shall still more willingly give way to others, who will give us practical illustrations of the work they have done.

It is from this practical work and the addresses of practical men that we will reap the greatest benefit, and I would ask you, ladies and gentlemen, to listen with the greatest care and take note of the various items.

THE PRESIDENT.—I hope Mr. Fisher's predictions will prove true, and that the time is not far distant when all the districts will be vieing for the honor of having our Society holding its meetings in their midst. I will now call upon Mr. Chapais for his experiences in planting an orchard in the Province of Quebec.

ORCHARD PLANTING.

MR. J. C. CHAPAIS of St. Denis spoke as follows:——

I wondered how my name came to be put down first in your programme to give an address, and the only reason I could find was that, following the custom in giving dinners, you wished to present the grosser food first, and then bring on the delicacies afterwards. You cannot fail to perceive from my speech that I am a Frenchman, and therefore entitled to claim your indulgence when trying to convey my ideas in your tongue—an indulgence I would fain have you extend to my ideas as well as expressions. I am a little what you call a Jack of all trades—I hope you will not say, and master of none—but, at all events, more of a dairy man than a fruit grower. In my moments of leisure, I indulge in fruit growing because I like it. I travel the whole year round in the Province of Quebec, as Assistant Dairy Commissioner; but I have eyes to see, and when I pass through a parish or township, I always look out for the fruit; and finding so many places where good fruit could be grown and is not, I thought I could not do better than indicate some of the rules to be followed in order to grow fruit everywhere in our Province. I am sure that, with a knowledge of the principles of fruit growing, we could have good fruit in the most remote parts of our Province.

I know this by experience, because I have made experiments in my own place, ninety miles below the city of Quebec, where the weather is very cold, where there is plenty of snow, and which was thought, some years ago, to be one of the worst localities for fruit culture you could possibly find. It was an article of faith with us down there that we could not grow any fruit; but from what I had seen in some places with a climate like ours, I became somewhat of a sceptic, and thought I would try what I could do. So I set to work, about seven years ago, to plant an orchard; and to-night, all I intend to do is to describe what I did, for I have had pretty good success, and I am sure if others will do the same they will succeed just as well.

The first thing to be considered in planting an orchard is to find proper soil. Trees will not grow everywhere. Apple trees will not grow in the clay or with a clay subsoil or in wet soil. There is no use taking the trouble to plant an orchard on a clay ground and wet place. The best ground you can find for an orchard is gravelly, sandy soil mixed with clay, and very well drained. Water does not agree at all with the roots of trees. That is a thing we must bear in mind in growing fruit.

After selecting the right kind of soil, then fix the situation of the orchard. For many years, in the cold parts of this Province, we thought the best exposure for an orchard was the southerly, but we have found by experience that this is not the right exposure. We find now that a gentle slope to the north is the best direction in which to plant an orchard, and the reason is this : in our cold region, in April we have sometimes some very hot days—so hot that the buds will start a little. Then very hard frost will follow, which will burst the bark of the trees, and injure them. This will not happen if your orchard slopes to the north, because then you will not have that hot sun acting on the bark of your trees and starting the sap.

The preparation of the soil is one of the most important things. I have seen many people buy trees at very high prices, and then dig a hole about two feet in circumference in the sod, plant the tree in it, and leave it to its fate. Of course that won't do. Two years later, they would say that the gentleman who sold the trees was a fraud, while the fraud was in the planter and not in the seller.

You must prepare your soil about two years in advance. The first year, plough in the spring. Then sow some wheat, oats or barley, and have a crop. Then in the fall of that first year, put a lot of manure in the field and plough it in, and the next spring sow it with oats. In the fall of the second year prepare your ground for planting, and plant the next spring.

The way I planted was this : I marked out my orchard, and at the place for each tree I dug a trench four feet square and two feet deep. The soil from the surface I put at one side, and the soil from the bottom I put on the other side. I left things that way the whole winter. In the spring I found my ground all worked up by the frost. Two feet along the trench was broken by the frost and one foot in the bottom, so that almost the whole field was very deeply worked.

Then I filled up the trenches I had made with the earth around, taking care to keep the soil of the top to plant my trees. When the holes were filled, I placed stakes in the centre, and then planted my trees.

You must get the best trees you can. Get trees grown in the Province of Quebec if possible. They will be much hardier and better than those grown in the South. Then when you plant your trees, you have to trim the roots well and then proceed to plant, filling well the interstices of the roots with the soil from the top. When the roots are well covered, put the soil gently on them, and trample the earth around the tree.

You must plant early in the spring, and there is no use in watering. Too much water on the roots is injurious. After this is done, you have only to keep the orchard clean for the first few years. You tie your trees to the poles you have put into the ground, and work your orchard to keep it clean and clear of weeds. You may plant potatoes or cabbages, or things of that kind. In my orchard I leave at least a space between the rows of trees to plant small fruits—

gooseberries, raspberries, currants, etc. They grow very nicely the first few years. After seven or eight years you will have to take them up, but they will have given you pleasure and profit in the meantime.

As to the space between the trees, all apple trees, those that have spreading tops like the Fameuse, ought to be planted in rows thirty feet apart. Those of upright growth, such as Duchess, etc., ought to be twenty feet apart. For cherries and plums, a space of fifteen to eighteen feet is enough.

There are many ways of doing a thing. The one I have followed, I am sure, is a good one, because I have succeeded, and when a thing succeeds with one man it is equally good with another.

As to the quantity of fruit we can grow in our place, I have been quite astounded with my success. I planted thirty-six varieties of apples, sixteen of plums, and seven or eight of cherries. I cannot say that all have grown well, but twenty-two apple trees are in fruit this year, growing good fruit, and the plums and cherries are all bearing and looking very nice.

Where we live is 48 x 30 latitude, pretty far north. Two years ago we had the most severe winter we experienced for thirty years. As a rule we have an immense quantity of snow, not less than four feet, but that year we had very little, and the thermometer went down often as low as thirty below zero. Yet not one of my trees was touched by frost, so that I am sure all the trees in my orchard will stand our climate, and if they do well in 48 x 30 degrees latitude, they will do well further south.

I made that experiment to show we could grow fruit in many places where it was formerly thought impossible. Though the rules I have indicated are well known, no doubt, to those who are listening to me, they may be of some use, when published, to those who do not know as well as we do the proper method of planting an orchard.

A French boy, learning to read English, was one day asked to read the text: "Keep thy tongue from evil and thy lips from guile;" and he read it: "Keep thy tongue from evil and thy lips from girls."

And after the bald essay I have given you, you will much better appreciate the delicacies and fruits that will follow later.

MR. JUSTICE LYNCH.—On behalf of the citizens of Knowlton, I call on our Mayor, Mr. Davignon, to present you, Mr. President, with an Address.

Mr. Davignon, Mayor of Knowlton, read the following address:—

THE MAYOR'S ADDRESS OF WELCOME.

To the President, Officers and Members of the Pomological and Fruit Growers Association of the Province of Quebec.

GENTLEMEN:

I understand that this is the first summer meeting of your Association. We feel honored that Knowlton should have been selected as the place of such meeting; and on behalf of its Corporation and citizens I extend to you all a hearty welcome.

We endeavor here in this small community to know no distinction of race or creed, believing that the resources of our country and the capabilities of our

people are sufficient, when properly appreciated, to afford ample scope for the energies and industries of a united whole.

The objects and purposes of your Association are most commendable, and cannot fail to have an important influence in making the home lives of our citizens more pleasant and attractive, as well as contributing to the general prosperity and advancement of our country.

Permit me to express the earnest hope and wish that your brief stay with us may be made happy and agreeable, and that you may carry away with you pleasant souvenirs of your visit to and among us.

KNOWLTON, 14th June, 1894.

JOSEPH N. DAVIGNON,

Mayor.

THE PRESIDENT replied:—Your worthy Mayor has certainly taken us by surprise in presenting us with this address of welcome. For my part, I feel very grateful for this proof of the good will of the people of Knowlton and the interest they take in our efforts to promote fruit culture, and on behalf of the Society, I most heartily thank you, Mr. Mayor, for your very flattering and cordial address. It is indeed in keeping with the reception you have given us —a reception very encouraging and gratifying to our young Society.

MR. JUSTICE LYNCH.—We recognize in you, Mr. President, a gentleman who has done much to build up the horticultural and fruit-growing interests of this Province. Coming to Brome county from your beautiful home in Abbotsford, you will not find yourself among strangers in a strange land, but among people who are most earnest and enthusiastic in the work in which you are engaged. (Applause.) That work is one of great benefit to mankind, both as increasing our appreciation of the refined and beautiful and as ministering to our comfort, and in everything you, Mr. President, and your associates, can do to further it, you will have the support and sympathy of every well-wisher of his country. (Applause.) Who can look at these beautiful plants and not feel an interest in your Society? Your work must commend itself to the co-operation of everybody who believes in the progress and well being of his country. (Applause.) Our Mayor has expressed to you the hearty, kind and enthusiastic wishes of our people. Our good wishes are always with you, Mr. President, and your associates, wherever you may be. I am asked to say that it is the desire of the Committee that we should take a little recess from labor, and if during the recess any members from a distance will kindly communicate to me their wishes, it is the desire of the resident committee to meet them as far as possible.

AFTER RECESS.

MR. PRESIDENT.—As Mr. Chapais resides in a very difficult section of country, there are many points in connection with his work well worth enquiring into. He said he had a number of varieties succeeding well, but did not say what varieties they were.

MR. CHAPAIS.—As my experience is only of seven years, I am not sure what varieties have succeeded. I may give a list of those that have fruited, and you

will see there is a good choice. I have St. Lawrence, Fameuse, Duchess, Transcendent, and Louis Favorite, a crab apple—you see I just give them as they come—Red Astrachan, Golden Russet, Longfield, Macintosh Red, Charlottenthaler.

When Mr. Gibb was alive, he advised me to plant the Longfield, because he thought it would be a late winter apple, and it has proved to be so.

I have tried the Russian Trabische plum—it is a splendid plum, red, looking like the Lombard, very hardy and fleshy—the Lombard, Coe's Golden Drop, Smith's Orleans, Blue Damson, Shropshire Damson. The latter ripens only at the beginning of November. Until then they are quite hard and good for nothing, but after that, even if touched by the frost, they are in splendid condition. I am told that in more southern regions it ripens much earlier.

In cherries, I find the old French cherry, imported by the old French settlers from France, the best. It is the same thing as the Early Richmond. If put side by side, I do not see any difference.

Four varieties of Russian cherries, the Lutovka, Bessarabian, Vladimir, and Ostheim.

Did not see any difference between them and Montmorency. The only thing is they grow more quickly. The tree becomes very large in three years. It was one inch in diameter three years ago, and is now 3 inches in diameter. We cannot, however, do better than with French cherries.

I am trying two Russian pears. They have grown very well, and are not touched by frost but have not fruited yet.

MR. PRESIDENT.—With reference to the Trabische, it is so like Lombard, you can hardly distinguish the difference, except that it is some eight or ten days earlier in ripening. Had it not been that it was ripe so much earlier than Lombard, I should have thought I had Lombard in place of Trabische. It is a valuable plum, because to a certain extent it prolongs the season, coming in eight or ten days before the Lombard, so that practically the Lombard is extended by that period.

MR. SHEPHERD.—Mr. Chapais says he has fruited Yellow Transparent and Charlottenthaler, and classes them as two different apples. Has he observed the fruit from the two trees carefully? My experience is they are the same apple.

MR. CHAPAIS.—I think they are the same. They ripen at the same time and have the same nice, strong smell.

The President submitted a question which had been handed in: What are the best ten varieties of apples for this district?

PROFESSOR FLETCHER.—The question is one of great importance, and I would suggest that the Association strike a committee to examine into it.

MR. PRESIDENT.—Mr. Chapais says the Longfield becomes a winter fruit with him. With us it cannot pass as a winter fruit; it is more a fall fruit. There are several other varieties which may be affected by climatic influence in the same way—the Astrachan and Duchess.

MR. CHAPAIS.—They are late fall with us. The Fameuse keeps with us as late as March. There is a month's difference in the ripening of the fruit.

MR. SHEPHERD.—How long is it since you fruited the Macintosh Red?

MR. CHAPAIS.—This is the first year. The tree was planted just the Spring before the cold winter we had. It has grown very well, and fruited this year.

MR. SHEPHERD.—Is the tree hardy ?

MR. CHAPAIS.—Yes ; never had a touch of frost.

MR. BARNARD.—Mr. Chapais is in a district where there is no thawing in winter. The danger is as great in thawing as in freezing. In that district there is no winter thaw at all. The frost is very heavy, but generally there is plenty of snow. Mr. Chapais, however, has had the experience of one winter when the cold was intense and the snow very light.

MR. CHAPAIS.—There is very little thaw in our place ; we have a great quantity of snow. In 1887, in April, we had about four feet of snow in our orchard, and had three very hot days, when almost all the buds started at the tops of the branches. In June, when the trees began to flower, I had not a single flower on the branches that were exposed, but all those under the snow blossomed. The snow is a very good protection for our trees.

MR. BARNARD.—Duchess were shown from the district of Quebec in December or January, when we had a meeting there. Dr. Bolduc, who lives in Beauport, showed us some Duchess then in splendid condition, and which would keep a month or six weeks, showing that in our district of Quebec it becomes an early winter apple whilst here it is a summer apple.

MR. PRESIDENT.—The remarks of Mr. Barnard show that in this Province we can grow the same variety in different parts and keep it in market. In the eastern and southern parts we can have the fruit ready for market in August, and in the northern part we can have the same fruit in good condition in January. That is a good point in a good apple like the Duchess, and well worth knowing. I recollect my attention being called, a few years ago, at one of our exhibitions in Montreal, to an apple which I studied with considerable curiosity, not quite certain what it was. At that exhibition we had given prizes to the variety Red Astrachan. In most instances these apples had been kept in cold storage ; in some cases the skins were actually bursting on the tables, but there was a plate fresh as those that came off the tree in the month of August. Mr. Gibb and I looked at, and wondered where the fruit was grown. We found it was grown by Mr. Dupuis at l'Islet, and that explained its condition. That is another variety which could be grown and kept in our market.

I would like Mr. Chapais to tell us his experience of apple spotting. With us that has become a very serious question. Our Fameuse especially are very badly spotted.

MR. CHAPAIS.—Yes, that is the only variety with me that has spotted yet. The Transcendents are showing signs of spots. The leaves are very badly spotted, and some of the fruit. Next year I intend using a mixture to prevent it.

MR. SHEPHERD.—Is the Golden Russet you have at Kamouraska the English Golden Russet ?

MR. CHAPAIS.—I could not say. It is Golden Russet from Smith of Winona.

MR. SHEPHERD.—That would be Golden Russet of Western New York.

MR. CHAPAIS.—It was planted three years ago, and grew very quickly. The apples look very well.

MR. BARNARD.—I would suggest that at our winter meeting as many samples of the fruit of this Province as possible be brought together, so as to show the different varieties in the different localities. This Association is going to meet with great success because its members see the importance of doing all the work they

can. This first "go off" in Knowlton is a great encouragement, and I hope our winter meeting will be equally successful. It is remarkable how little attention is paid to the cultivation of fruit in this country. Not only from a commercial standpoint, but from a hygienic point of view and of family comfort and the encouragement of love of home, this branch is deserving of every attention. A winter meeting held in the city of Quebec during the session would be productive of much good as the members of the Legislature would have an opportunity of attending and seeing for themselves the business of the Society. Many would no doubt become subscribers; and there are five hundred farmers clubs in the Province, each of which should have a representative in our Association.

MR. PRESIDENT.—I may say that a part of our programme is to collect, and exhibit, the different varieties of fruits. With regard to next winter's meeting, it was definitely settled last year that it should be held at St. Johns, but of course that decision may be altered by the Society, and Quebec chosen.

MR. FISHER then announced that to-morrow morning the Society would meet at nine o'clock, and that the local committee, consisting of Judge Lynch and others, had arranged to take the members out for a drive. He also invited the Society to hold their afternoon meeting in the open air, on his grounds, and would be happy to see all those present at this session attend, as well as the members of the Association. He would do his best, with the invaluable aid of the Knowlton young ladies, to make the afternoon pass pleasantly.

15th AUGUST, 1894.

MORNING SESSION.

The Society again met in the Memorial Hall; the President in the chair. The first paper read was one contributed by the President:—

NOTES ON SOME OF OUR SUMMER AND FALL APPLES.

By J. M. FISK, Abbotsford.

We have many varieties of summer and fall apples which are grown with success throughout the Province, and it is often a matter of opinion with the grower as to which is the most desirable for home use or profitable for the local markets; for without a proper refrigerating service over our railroad and steamship lines, we must continue to depend upon the local demand for the consumption of our perishable fruits.

Each locality has its favorites, but there are a few varieties which are more generally grown, and adapt themselves to a variety of soils.

Of summer apples, those of Russian origin succeed best. Possessing more vitality than most of our American varieties, their foliage is less susceptible to disease, and as a consequence are better bearers, yielding good crops of comparatively clean apples.

The present season has specially demonstrated this point; for never did our orchards carry more bloom than they did last spring. Summer, fall and winter varieties all promised good crops; but the month of June had not passed before most of the apples and many of the leaves lay blighted upon the ground. Especi-

ally was this the case with Fameuse, St. Lawrence, Blue Pearmain, Baldwin, and many others, while most of the Russians held their fruit and are giving good returns.

One of the earliest of these to ripen is the Yellow Transparent, which is ready for market the last of July or the first of August. It is an apple of good quality, but owing to mellow flesh and yellow skin, which shows a bruise readily, should be marketed in baskets. Charlottenthaler and Grand Sultan are so like Yellow Transparent that they should be classed as one variety.

Tetofsky and Red Astrachan are both desirable varieties, and follow close upon Yellow Transparent.

The Red Astrachan when well grown is very attractive in appearance, and on account of its high color and good quality commands a good price in the market; another point in its favor is the thick, leathery nature of its leaf, which is a safeguard against the attacks of the leaf-roller, and its foliage is seldom affected by this insect. Its faults are its tendency to scab, and when grown upon its own stalk, to early decay in the trunk of the tree, when the main branches loaded with fruit readily break down and so destroy the tree. This variety should be grown as a top graft on the Talman Sweet, or some other hardy stock, when it would prove a profitable market variety.

The Duchess of Oldenburg for its productiveness and uniformity of well grown clean fruit of excellent cooking qualities holds its own against all comers as a profitable summer apple, and while in season is a general favorite for sauce, pies and puddings, and when well ripened as a dessert fruit for *la table d'hôtel*.

There is no reason why this variety should not become both popular and profitable for evaporating purposes, in which form it would be available for the table the year round,

Pointed Pipka, or Summer Arabka, is another promising variety of about the same season as Duchess; hardy and productive, with markings somewhat like Duchess but more oblong in form, with less acidity, and should be classed as a dessert fruit, and as such marketed in baskets.

Peach is another variety which should be grown more as a dessert apple than cooking, and marketed in the same way.

Alexander is the largest fall apple we have; productive and of fine appearance, it sells readily as a cooking apple, and may thus be classed as a profitable variety to grow.

Titovka is another large attractive variety, and coarse in texture like Alexander; its chief value is for cooking. Both these varieties during the last two seasons at Abbotsford have been subject to the Pear blight, by which the trees have been more or less injured.

The St. Lawrence, the old favorite for quality as a fall apple, is fast losing its place for profit owing to its tendency to scab; the crop this year at Abbotsford is almost worthless. The same may be said of Fameuse; and unless our seasons change, or our methods of cultivation and spraying are more effectual, these old favorites will soon cease to be of any value.

Wealthy, which a few years ago promised to supersede Fameuse as being spot proof, is also losing ground in this respect, as most of its fruit this season is more or less affected; and the question naturally suggests itself, as to how long the other varieties which up to the present have withstood this disease will yield to its influence.

PROFESSOR FLETCHER.—There is no reason why everybody should not grow clean fruit entirely free from scab, if they will take the means adopted by Mr. Fisher in his orchard, where you will not find a single apple with any scab on it; and until he sprayed, the fruit was almost entirely worthless. You will see there what can be done by a careful application of the proper method. It is an object lesson which will well repay inspection.

MR. SHEPHERD.—I understood you to say, Mr. President, that the St. Lawrence, as grown at Abbotsford, has become almost absolutely worthless in consequence of spotting.

MR. PRESIDENT.—Almost.

MR. SHEPHERD.—Is the Fameuse in the same condition ?

MR. PRESIDENT.—Yes.

MR. SHEPHERD.—Have you sprayed carefully and thoroughly ?

MR. PRESIDENT.—We have sprayed and we have prayed. (Laughter.) Mr. Fletcher says everybody can have clean fruit if he sprays properly. I think Mr. Fletcher must depend a great deal on circumstances. I admit that it is good for a man to spray in a young orchard like Mr. Fisher's, which is, to a great extent, isolated from other orchards. In our neighborhood we have acres of orchards, which in the last fifteen or twenty years have become more or less affected, and consequently the vitality of the trees has become very largely impaired. We cannot expect consequently to attain the same results as Mr. Fisher. The tree has been subject to this disease for years, and it has not vitality, and it is a question of time whether we will ever overcome this evil. I am sure we will not.

PROFESSOR FLETCHER.—I can tell you, Mr. President, that you certainly will not overcome it if you start out firmly convinced that you will not. Until Mr. Fisher's orchard was sprayed, all the fruit was diseased.

MR. BARNARD.—I heard this afternoon that an orchard planted forty or fifty years had been sprayed, with excellent results. Mr. Brodie can give us information on that point.

MR. BRODIE.—Some of the orchards were planted by my grandfather before I was born. My experience is totally different from that of our President. I have a young orchard at the back end of my farm which has been bearing three years in succession, and around it are all old trees. Last year I did not spray, and had worse fruit from that orchard than from any of the old trees. This year I sprayed every week, from the time the leaves opened right on to the first week of July, and it is from this orchard I have my very best fruit. The age of the trees has not to do with it so much as the nature of the soil. I have one orchard planted in black, sandy loam, and the spots were worse on that land than on higher, gravelly land, or on *terre grise*, clay loam. There the apples are quite clear, though the trees are forty or fifty years old. Those trees I gave the same treatment to as the young orchard. On the top branches, the apples are quite clear, but on the lower branches, where the liquor did not fall evenl y, the frut is much more spotted. As to summer fruits, I agree in what Mr. President has said about Yellow Transparent: it is one of the best early fruits for our market.

MR. SHEPHERD.—Situated as you are, within two miles of the market.

MR. BRODIE.—The next is Duchess, which is larger in size. It can be pulled in the green state, immediately after Yellow Transparent, and is fit for cooking. I sent twenty-five barrels to Glasgow last week, to see if it would stand

shipment, and have not yet got the results. I have hopes that it will turn out one of the best apples for export. On the same steamer there was a consignment of Duchess from the West to Edinburgh.

MR. PRESIDENT.—Was this shipped in cold storage ?

MR. BRODIE.—No, but most of our steamers give good ventilation. The Montreal Peach I would not recommend for commercial purposes at all. It is the best in quality, but is the hardest apple we have to sell. It spots badly, and is so easily bruised that it turns black unless it is handled like eggs. Red Astrachan is the best apple—what our fruit sellers call a fancy apple. It is a showy, pretty apple. When very well colored, we can always command a good price for them.

MR. SHEPHERD.—With reference to Yellow Transparent, it makes all the difference where your orchard is situated. If you are situated, as Mr. Brodie's orchard is, within a couple of miles of Montreal, Yellow Transparent is a good apple to grow ; but if grown fifty miles from Montreal, it is not the best. Red Astrachan is better. They will carry better and take the eye better when shipped in baskets. Yellow Transparent does not sell well in baskets as compared with Red Astrachan. Red Astrachan trees yield me between $7 and $8 a tree, shipped in baskets. Yellow Transparent I do not pretend to plant for market purposes at all. I have half a dozen trees for home use, and shall not plant any more.

MR. BRODIE.—As Mr. Shepherd has said, in handling a delicate apple like the Yellow Transparent, it must be put in the market immediately, and when there is no other apple competing with it. The question of spotting is one of the most important we have to discuss. I am sorry to hear the orchards at Abbotsford are badly affected. One of the reasons the Abbotsford growers have so much difficulty is that their orchards are too closely planted. The first thing remarked by fruit growers from a distance is that the trees are too closely planted. I have been experimenting this year on spraying, and think favorably of it. I left three or four trees in each orchard not sprayed, so as to see the difference.

MR. BARNARD.—Mr. Shepherd is in the best circumstances to ship from fifty miles outside the market, because he ships by water. If he had to ship by railway, he would find considerable difference.

MR. BRODIE.—I can land my apples in Quebec market just in as good condition as in the Montreal market. They remain in the boat all night.

MR. PRESIDENT.—I cannot see why we should not be able to ship our fruit to distant markets just as well as to local markets, provided we had cold storage over our railways and steamships. If we had proper accommodation, we could place Duchess in London market in as good condition as in Montreal. The Dairy Association require the same transportation facilities for cheese and butter as fruit men do ; and these two associations will endeavor to obtain more improved facilities from the transportation companies than we have to-day. Mr. Brodie said he would not recommend Montreal Peach, because it spotted, yet it was extensively sprayed. There are circumstances governing the effect of spraying as everything else, and the question is one which should be thoroughly discussed.

MR. BRODIE.—I sent 15 barrels fine colored Montreal Peach to the Montreal market, and they only brought ($1) one dollar a barrel, while Duchess sells

for ($2) two dollars a barrel. Cannot see therefore any object in planting Montreal Peach. For one's own use, however, they are one of the finest apples we can grow.

With regard to spraying, all I can say is that anyone who will visit my place and compare my orchard with the neighbors' who have not sprayed, will see the difference.

Although my apples are not quite free from spot, the trees and foliage are in a healthy condition. I may not be able to effect a cure in one season's application of the mixture, but expect in two or three years I will be able to banish this disease from my trees.

MR. FISHER.—Last year Professor Fletcher made allusion to my success. I must say this with regard to it, that last year my success was really phenomenal in spraying. Up to last year I never got a crop of decent apples, but last season I had a very nice crop of remarkably clean fine fruit. I continued the work this year as nearly as possible as last year—spraying altogether six times; once before the blossoms opened, and immediately after with the Bordeaux mixture and Paris green to kill the codling moth, and later on I sprayed three times with the Bordeaux mixture alone. The result is very satisfactory as far as the cleanliness of the fruit is concerned—there being only a few spotted apples in the orchard. There are one or two trees on which the spot seemed to have commenced, but was arrested before it did any harm. The foliage is particularly free. In other respects my orchard is not nearly so good as last year. I suppose it is my off year for fruit. I regret that several of the trees appear to be dying, and what the reason is I do not know. The fruit also is smaller than it was last year, but the codling moth seems to have entirely disappeared, so that I feel that the spraying has been successful. It was certainly thorough. My orchard is composed of young trees, very easy to get about in it, and to every part of the tree. The only danger is perhaps that I have sprayed them too much. I have sprayed with the knapsack sprayer only. There are one or two others in the neighborhood, all of which seem to work very well.

A sprayer costs in the neighborhood of $14 or $15, laid down here complete. I have used mine three years, and find it works very satisfactorily.

There is a better one now, which one of my neighbors, Mr. Caldwell, uses. It has a stirrer in it, which keeps the liquor stirred up. But with the knapsack sprayer, the motion of the body keeps the liquor agitated, and a stirrer is not necessary, although it might be for a larger reservoir.

MR. SHEPHERD.—I never tried the spraying until this year. After the meeting we had last winter, I came to the conclusion that it was necessary to attempt, at any rate, to give a thorough trial to the spraying. I considered that the first thing was to get a complete outfit, and I wanted to get the best spraying outfit possible. I imported a spray pump from Quincy, Illinois. It had in it a discharge pipe, one of those tubes that return into the barrels and stir up the mixture. I think that is very necessary. This spraying pump of mine is what they use in the States for large orchards, and the whole thing costs $14 or $15. It is certainly very satisfactory. My man thoroughly sprayed all the trees in my orchard twice. We were not able to spray the third time any other trees than the McIntosh Red, the Fameuse, and the Wealthy.

The grass growing so rapidly in the orchard, it was difficult to get about, and there was so much interruption in consequence of wet, unsettled weather that it

was impossible to make more than the three sprayings. I would not recommend Mr. Fisher, if he were growing apples for market, to spray so late as to leave the mixture on the fruit. A serious objection to marketing the fruit would be to have the mixture appear on it, and it would be impossible to wipe the mixture off every apple. If we want to have our fruit of good appearance, we must not spray so late in the season, and I fancy spraying ought to be done in June, about 20th of June, the last spraying.

MR. BRODIE.—Or the first week in July.

MR. SHEPHERD.—Or the first week in July. My spraying apparatus is an ordinary pump, fitted on to a coal oil barrel; we mix up fifty gallons of the mixture at once, and we fasten the pump on to the end of the barrel. The first time we tried it, we put it into an express waggon, but found a four-wheeled vehicle more difficult to pass among the trees than a two-wheeled one, so the next time we put the pump and barrel into a Scotch cart, and found it worked very nicely. It takes a boy to drive the cart and a man to work the pump. It took my man nearly a week to make the third spraying. We did it thoroughly. In each orchard I reserved two or three trees, which I did not spray for purposes of comparison. I have six orchards, and there are three or four trees in each which have not been sprayed. I made two or three close observations, and I find that the trees which have been sprayed are healthier in foliage, so that the Bordeaux mixture must have killed some insects that feed on the foliage.

The leaf-roller particularly seems to have been entirely got rid of on the trees that were thoroughly sprayed, while the trees that were not sprayed suffered very much from the effects of insects that prey on the leaves. Consequently I can see a vast difference between the sprayed and the unsprayed trees as regards freedom from spotting. On the unsprayed trees I consider fully fifty per cent. of the fruit is spotted badly; on the sprayed, I do not think more than ten or fifteen per cent. is spotted. I speak of the Fameuse particularly. They show only ten or fifteen per cent. spotted, whereas two years ago fully fifty per cent. of the fruit was entirely worthless. I am thoroughly convinced spraying is of great benefit, and was not convinced until I made the trial myself. I purpose doing it thoroughly next year. A great many trees that a few years ago were not subject to spotting have developed spotting the last year.

The Wealthy begins to show spotting. Two or three years ago we were of opinion that the Wealthy was free from this disease, but it is beginning to spot, and unless we can stop it we will have the same difficulty growing Wealthy as we have had growing Fameuse.

I have also tried spraying upon the English gooseberries with great success, to prevent mildew.

I have also tried it on potatoes, to prevent rust, and shall be better able to speak of its effects later on; but from what I have seen, it is a good thing.

The Fameuse trees that I spoke of, which were thoroughly sprayed, and which showed that the spraying was of great benefit, are about twenty years of age. Many of them are twenty and some only fifteen years old. In one of my orchards, where the trees are all twenty years old, it is particularly noticeable that those which were left unsprayed are very badly spotted, and their foliage is unhealthy-looking, whereas the trees thoroughly sprayed show a healthy appearance. This orchard is planted with Fameuse and St. Lawrence, and the sprayed St. Lawrence show the same advantage over the unsprayed as in the case of the Fameuse.

The very first thing that an orchardist must make up his mind to do is to get a complete spraying outfit. No use attempting the work with an ordinary pump or taking half measures. The only way to carry out the experiment is to do it thoroughly. The pump should be a good one. I merely mention this pump from Quincy, Illinois, because it is the only one I have had experience of. It throws a very fine spray; the spraying must be done in calm weather, it cannot be done when there is a wind. The spray looks like a fog, and after spraying around the four sides of the tree, if you examine the tree carefully afterwards, you cannot find a bit of foliage which had not been covered with the mixture, both the under side and the upper side of the leaf. One of the difficulties of spraying a large orchard is to get a dry spell in order to do it thoroughly. It is a great deal of trouble, but we must do something or cut down our trees. There is no use growing a lot of unmarketable apples. It is more trouble to get rid of a lot of worthless trash than it is to spray the trees and get marketable fruit. Orchardists must make up their minds to work to prevent loss through spotting.

I am sorry the results of the experiments of our friends at Abbotsford have not been so successful as in other parts of the province, but am satisfied that if in the Abbotsford orchards the trees were planted as wide apart as in other sections, there would be better opportunity to thoroughly spray the trees in those orchards than there is at present.

The great difficulty with the Abbotsford orchardists seems to be to get their trees thoroughly sprayed. You must throw your spray on top of the tree, and underneath, and on the two sides; and if the trees are planted too closely together, there is very serious difficulty in doing the spraying thoroughly. The Abbotsford people ought to make a thorough trial of a certain section if they cannot spray the whole, and then wait results.

MR. BARNARD.—Respecting the appliances, it would be important to experiment with our own pumps. What we want is a fine sprayer. The nozzle is all we need import, and I see no reason why we should not use pumps manufactured in Canada. If we have to import the complete machinery from the States, it will become a source of considerable expense to our Canadian farmers Having good pumps in our own market, a fine sprayer is all we need. Our farmers could select the pump recommended by this Society, screw the nozzle on, and then have a machine which would cost very little, and prove useful, not only in the orchard but on potatoes and vegetables. The pump must be such that the poison will not act on it and ruin it in a year or so,—to my mind, any good force pump such as we have, provided we had a good nozzle.

MR. SHEPHERD.—I would ask Mr. Brodie what nozzle he uses.

MR. BRODIE.—I use the McGowen nozzle. I tried the Vermorel nozzle and one or two others, but found the McGowen nozzle the best. With reference to the formula recommended by Professor Craig, 4 lbs. sulphate of copper and 4 lbs. lime, I found it a little weak, and made it a good deal stronger. I had a good deal more Paris green than a quarter of a pound. Until we can get a guaranteed analysis of Paris green so that we may know what we are trying, we cannot be certain what strength to apply.

MR. SHEPHERD.—How much lime?

MR. BRODIE.—Six pounds of blue stone to four pounds of lime.

MR. SHEPHERD.—I find the only root crop we can grow successfully in an orchard is potatoes.

MR. BRODIE.—When the mixture falls on the potatoes it will not be wasted, but will kill two birds with one stone. We have no mixing apparatus in our machine, but we put it on a Scotch cart, and I find that driving around the orchard shakes up the mixture pretty well.

MR. SHEPHERD.—Not when it gets half way down the barrel. I find when the barrel is half full, you require something to stir up the mixture well.

MR. CHAPAIS.—If you use Paris green, it is much better to wet it in a small vessel the night before you use it. If you put it dry in the barrel, there will always be lumps.

DOCTOR FAFARD.—How did he grow potatoes and then drive around the trees without damaging the potatoes?

PROFESSOR FLETCHER.—Any crop planted in an orchard must be planted in such a way that you can work among the trees without injuring it. I am very much pleased that this discussion came up, as in my official position I am very much responsible for encouraging the use of spraying with these different mixtures. My own experiments have brought me to the conclusion that the treatment of fungous diseases and insects by means of arsenical spray is all that is required by orchardists to destroy the greater number.

Occasionally we will have failures, but they can be traced to three different causes:—First, improper apparatus; as Mr. Barnard has said, the nozzle is just as important as the pump—in fact, if one part can be more important than the other, that is the most important. In spraying, the liquid must be driven through the nozzle with such force as to be actually a spray—actually what is meant in the English language, and not as is generally applied. It must be driven through in a spray for two reasons: first, not to put too much solution on the plant, and possibly injure it; and secondly, to economize your material. Some of the mixtures are rather expensive to be used in a wasteful manner. If put on in a spray, we secure great immunity from the pests which have caused enormous loss. The use of the Bordeaux mixture is effective against fungous disease, and Paris green against insects which chew their food. As a general rule, any insect that chews the leaves or foliage of a plant can be treated by those arsenical poisons, and any fungous disease which is on the outside of the plant can be treated by the Bordeaux mixture.

We have certain fungi which work inside the plant, such as the potatoe rot, and there is no use putting the Bordeaux mixture outside the potato, because the fungus is inside. The rot grows with the potato through the vegetation, and about the first of August appears in its first stage outside the leaves. When you see the leaves fold and contract, with a white film underneath, that is the fruit of the potato rot fungus. We find when it gets outside the plant, we can treat it with Bordeaux mixture.

For all fungi which attack the fruit, treat with the Bordeaux mixture made.

Six pounds copper sulphate, 4 pounds lime, and 45 gallons water. The original formula was 20 gallons water, but that was rather thick and difficult to use

When you use the Bordeaux mixture which contains lime, you have an element in the lime which neutralizes the effect of the Paris green. That was the reason Mr. Brodie could put more on of the Paris green than would be safe.

Mr. Fisher's experience last year was phenomenal, and I did not then anticipate he would have quite as good results this year, not from any fault of the

treatment, but because he had the best results that could possibly be gained We do not claim that this treatment will give immunity against more than 75 per cent. of the loss.

Mr. Fisher's treatment this year has given results which everybody who sees his orchard will consider perfectly satisfactory, and which he will find will pay him well at the end of the season.

All the different methods of treating our crops must be paying, or they will not be satisfactory; it is all very well to get a remedy that will save property at all hazards and costs, but that is not what we want. What we want is a remedy that will pay in its application, and this we have in the Bordeaux mixture.

We have excellent Canadian pumps, but the Canadian nozzles are not sufficiently good to warrant anyone in running the risk of spoiling an experiment by buying a cheap instrument. One of the causes why people have improper operations is trying to save a few dollars in the purchase of the instrument. That is the greatest fallacy. It is analogous to the case of a farmer who tries to get a good crop of hay while sowing only half the amount of seed that he ought. The lowest amount of clover and timothy that I consider should be put in is about 20 pounds. Yet, 9, 10 and 12 pounds is the amount sown over large districts. What is the result? Just the same with your pump; by paying an extra dollar or two you get good results instead of an enormous amount of trouble and great disappointment. The Lewis pump is a good pump. There are three kinds of pumps, there is the small hand pump which costs five dollars and will do for a few trees. For anything up to three acres, the Knapsack pump will be all that you require. After that you can get for about the same money a pump which can be attached to a barrel, and drawn over the land by horse power. If you have a very large orchard it may be necessary to have the power girt on the vehicle, but it is more satisfactory to have the power detached from the cart, other wise it is difficult to stop when you want to, and you cannot do such good work.

Among the many nozzles which make fine spray is the Vermorel nozzle. This was improved on by Vermorel, in Paris. The improvement consists of an addition to the nozzle of a pin, to clear it of anything that may be collected in it.

The nozzle which Mr. Brodie uses is an excellent instrument. It has an automatic spring that releases any small obstacles that may get into the nozzle.

Another cause of failure is irregular work. That may result from the weather. A rain falling immediately after spraying makes it necessary to have the spraying repeated. When the farmer starts with vigor and the intention to carry out the work thoroughly, everything seems easy; but when the spraying has to be repeated several times, he loses temper, he finds other things more pressing, and once he allows himself to get a day or two late, he is apt to be a week or two late.

In making your application, you must use weights, as everything must be done regularly and in proper proportions. The work no doubt is heavy, but the results pay enormously. And there is the collateral advantage, that for a long time anything that involves a great deal of work will be left undone by the majority, so that the minority will not only reap the advantage of saving their fruit, but will get higher prices because of the laxity of their neighbors.

Mr. Shepherd spoke of the healthier appearance of the foliage. This is due to the distasteful nature of the mixture, many of the insects finding the food rendered so distasteful that they will not touch it.

MR. PRESIDENT.—How long does the Bordeaux mixture affect the plants ?

PROF. FLETCHER.—The part that remains on the foliage is chiefly the lime. The copper salt which is in solution has probably lost its effect, and experience shows these sprays should be repeated twice a month. After rain I should put it on again almost at once. The lime is not in solution, or the Paris green. The lime settles and requires to be stirred up.

MR. BARNARD.--What do you consider a good pump ?

PROF. FLETCHER.—An excellent one advertised in the *Canadian Horticulturist* is, I think, called the Little Giant. The pump should be brass. Copper sulphate attacks iron; but if you use a pump every year, the spraying will still pay. The Bordeaux mixture is wearing on the nozzle. Nozzles cost from 75 cts. to $2.00. The American nozzle costs $2.00 or $1.50. Most of the makers make a deduction.

One of the greatest disadvantages in using the Bordeaux mixture is the discoloration of your hands, which become a beautiful purple. A good plan is to rub a little glycerine over them, or wash them in soap and water and then put on glycerine.

MR.——Have you ever used the Masson nozzle ?

PROF. FLETCHER.—No.

MR. ——It is highly spoken of by Woolverton in the *Canadian Horticulturist*. For low shrubbery he prefers the Masson nozzle.

PROF. FLETCHER.—In the case of high trees, a very simple apparatus is to attach to your pump a light piece of rubber tubing, and then you can raise the nozzle to any height.

MR. BARNARD suggested that the Federal Government should be requested to enable Mr. Fletcher to test the different nozzles, and decide which was the best, so that our horticulturists would know which one to purchase.

MR. BALL asked how late spraying could be done without affecting the appearance of the fruit.

PROFESSOR FLETCHER.—With regard to spraying with the Bordeaux mixture after the first week in July affecting the appearance of the fruit for the market, you can spray to the 1st of July. After that, if further spraying be necessary, you can use the ammoniacal solution of copper carbonate,— that is, copper carbonate dissolved in ammonia, and then sprayed. This leaves no deposit, yet is a strong fungicide.

MR. SHEPHERD.—With reference to the first spraying, what proportion of sulphate of copper do you use ?

PROF. FLETCHER.—One pound to 25 gallons water.

MR. SHEPHERD.—I used 4 pounds to 50 gallons water, and saw afterwards in the *Canadian Horticulturist* that 1 pound to 50 gallons is the correct proportion.

PROFESSOR FLETCHER. —1 pound to 25 gallons is the proportion.

MR. SHEPHERD.—If a rain storm comes on shortly after the mixture dries on the leaves, is it not necessary to spray the second time ?

PROF. FLETCHER.—After the second day I would not spray again.

MR. CALDWELL.—I made a few experiments on a small scale, although a little later. I made the first application about the 3rd of May, and another one from the 17th to the 22nd. There was some rainy weather, and did not put all on in one day. Made the next application about the 5th June, and the next about 20th to 22nd June. Only made four applications. As regards results, I can see practically very little benefit to the Fameuse.

On the St. Lawrence, I find it has been a benefit, as they have not the scales nearly so bad as they had. My Red Astrachan or Duchess never spotted any. My Wealthy have not spotted this year. I find, however, that on some of the trees the fruit has a russet appearance. It is more the color of a russet apple, and it had never that color with me before.

PROF. FLETCHER.—That is one of the results of the Bordeaux mixture on some varieties. It does not affect the growth but only the appearance in a few varieties.

MR. SHEPHERD.—Did you leave any trees unsprayed?

MR. CALDWELL.—I shall continue another year and do the work in a more thorough manner. With regard to the Fameuse, the result is not satisfactory. In our orchard, the trees are far too close together. In some of the other varieties, it was of great benefit. I only made four applications, and used a weaker solution than is recommended.

MR. SHEPHERD.—What are the ages of the trees?

MR. CALDWELL.—The Fameuse trees are old—probably 25 years.

MR. SHEPHERD.—They are probably large trees, and somewhat difficult to spray thoroughly. If you had spent double the time over the large that you did over the small, the result would have been different. The reason the results were not more satisfactory with the Fameuse is because the larger trees are not so thoroughly sprayed as the smaller ones.

MR. CALDWELL.—I used the knapsack pump; but on some trees I used a step ladder, so as to get the spray high enough. The small trees I could spray from the ground.

MR. SHEPHERD.—The knapsack pump is not sufficiently powerful to spray a tree 20 years of age. The pump I have is mounted on a barrel, and the whole thing put into a Scotch cart. Then I have a rubber hose extension, by means of which I reach to the top of the tree with the nozzle.

MR. BARNARD.—We know that the disease on the Fameuse has been in existence many years. The disease may be in the soil, and possibly may be carried through the sap of the tree. If the disease is in the ground, it may take several years to destroy these spores.

PROF. FLETCHER.—Undoubtedly the good effects of this treatment are cumulative. Everyone that can be induced to spray is by that means going to reduce disease in the district. Every tree thoroughly sprayed will have less plants to bear seeds and do injury another year.

The life history of the black spot is well known. It is entirely on the surface of the plant. It lives on the leaves and twigs and fruit. As a rule, it passes the winter on the dead leaves which have fallen and the twigs of the tree, so that by treatment with ashes or lime, you destroy the leaves and twigs which bear the spores.

Late in the autumn, after the fruit is grown, you can find on the leaves little spots, not so pronounced as on the fruit, but still quite perceptible, running through the centre.

This is the same fungus that attacks the fruit. While these pests may develop very freely in one particular season, they may not, in some seasons, develop at all.

It is quite possible to have the disease in one form and not in another. The disease may be on the leaves and not on the fruit. But all treatment of

the disease in any stage reduces the quantity of the plants which may produce seed to injure future crops. All treatment will not only produce results in the year made, but must have beneficial results in future years. Every farmer who treats his plants eradicates disease-bearing plants which would bear fruit another season.

There is no doubt the Colorado beetle could be swept out of Canada if every farmer would, for two or three years, systematically treat his potatoes with Paris green.

Among the fungus diseases, the black spot seems to confine itself entirely to the apple and pear. Even the Mountain Ash, which belongs to the same family, is not attacked, except in a few instances. If thorough treatment were given, this disease could be wiped out practically.

Mr. BARNARD.—With trees that have been diseased for many years, will the spraying in one year destroy the disease?

PROF. FLETCHER.—I fancy that the spores of every year germinate that or the next year, and produce their plants, so that if they are destroyed thoroughly on one tree, the disease will not be produced again by its own spores. Of course spores are exceedingly light, and carried by the wind long distances,—a hundred miles would be a small distance. And if you destroy the spores on your own trees, those from other trees may be carried.

Mr. Shepherd called on Mr. Dunlop to give his experience.

MR. DUNLOP.—My spraying has been confined principally to gooseberries. My orchard is composed of young trees of varieties not subject to spot. Have been growing English varieties of gooseberries for a number of years past, and have been experimenting for treatment of mildew during the past three or four years. I tried two or three different preventives, and succeeded in getting the mildew under control by applying the Bordeaux mixture. Applied properly, three applications are usually sufficient for a season. I at first applied it to the bushes, that is from the surface, but found that was not sufficient. I then had a man to hold up the branches, and sprayed from under, so that the liquid came in contact with the fruit. I then had very little damage.

In conducting these experiments, I have invariably left a few bushes unsprayed, with the result that the fruit on these was almost entirely destroyed, while on those properly sprayed no injury was perceptible. I am quite convinced that by spraying we can save not only a proportion, but the whole of the fruit of varieties liable to be attacked by mildew.

With regard to spraying to prevent the apple spot, I think it is a very good thing; but something further is required.

I have examined many orchards on Montreal Island and elsewhere, and find the greater part of them to be *starved;* and if the owners of these orchards expect by spraying alone to obtain large crops of fine apples as in the past, I fear they will be disappointed.

Spraying will no doubt help to restore the vitality of the trees by its beneficial effects upon the foliage; but as this disease is more probably the effect than the cause of this want of vitality, we must look further for a radical cure. If exhaustion of the tree through a deficiency of nutriment should prove to be the primary cause, the disease may be finally overcome by a systematic course of spraying combined with feeding.

This might mean a considerable reduction in our orchards; but there is little

doubt that 100 healthy trees producing sound fruit are worth more than 1000 producing the average quality taken from our Fameuse orchards of to-day.

MR. BARNARD.—What nozzle do you use?

MR. DUNLOP.— I use the Vermorel.

Mr. BARNARD.—I have seen an appliance for bringing the nozzle right under the bushes.

MR. DUNLOP.— To be successful in treating gooseberries, you have to bring the liquid in contact with every berry. The only way is to have a man hold up the branches and expose all the fruit. You cannot do it thoroughly even with a nozzle that goes under the bushes.

Mr. BRODIE.—I agree with Mr. Dunlop in what he says about starvation of the orchards. I find that when I can get hardwood ashes at a reasonable price, they are the best manure. The lye from the ashes destroys any insects that may be on the ground, and the fruit the following year is healthier. I would put half a barrel to a large tree, scattered all over. I have applied the ashes both in the fall and spring. If I cannot get ashes, I prefer to use muriate of potash.

MR. PRESIDENT.—This discussion has been very interesting. As I have said, spraying has not been as successful at Abbotsford as elsewhere, but only a few of us made the experiments, and we hope to be more successful in the future.

DR. HOSKINS.—I have done no spraying yet on my orchards, because I have had no particular occasion for it. But the fungi are gathering around us, and I do not know how soon they may make a raid on our fruit.

MR. PRESIDENT.—Dr. Hoskins is in the same position as we were ten years ago. Our orchards were then young, and the fungus had not come to us.

DR. HOSKINS.—My idea is that while we may be having an era of fungus disease, we shall find we are having an era of mistakes. I think there is no great increase in fungi, except in so far as there is an increase in fruit growing without sufficient experience. We are all given to planting our trees too close together. Then hill tops are the place for orchards. The best orchards I have visited in Maine are on the tops of hills, among rocks, where the soil could never yield anything but weeds.

There may be places where the fungi flourish more than in others; but I think if we give the trees plenty of room and fresh air, and plant them on the hills when we can, we shall have less trouble than when we crowd them up in valleys. You want good land. No use planting an orchard on poor land.

MR. BARNARD suggested that the Department at Ottawa be requested to make a particular study of the different kinds of spraying apparatus and decide which to recommend.

MR. SHEPHERD.—The Experimental Farm could not very well recommend anything but an article of Canadian manufacture. It could not recommend an American pump in preference to a Canadian article.

PROFESSOR FLETCHER.—The work is already on hand, and I will promise a paper on Spraying Apparatus at the next meeting. With regard to Mr. Shepherd's remark about the Experimental Farm not being able to recommend an American instrument, I say that should the American prove better than the Canadian article I shall not hesitate to give it the preference on every occasion.

MR. SHEPHERD.—Mr. N. C. Fisk thinks that in a few years the orchards here and the younger orchards in different parts of the country will be as badly affected as the orchards at Abbotsford are at present with the scab. My opinion is that if the Abbotsford men cut down every second tree, and spray around all the trees remaining, they will have a different story to tell. No doubt trees planted too close together, growing in the shade, or near large forest trees, are more badly spotted than those grown in the open. I have an example of that in several cases. In one row of Fameuse trees growing near some hard maple on the northwest side, and sheltered by a hedge of firs on the northeast side, the spots are worse than on other trees I have, because they are in the shade three-fourths of the day and do not get the circulation of air.

As regards the application of ashes as a fertilizer, probably I have used more ashes than anybody. I am pretty well situated for procuring ashes. I have applied thousands of barrels which I procured from the steamboats. They are from soft wood with hard wood mixed, and no doubt very satisfactory results are obtained from their application. Apply them in the fall of the year, spread around the trees, half a barrel to each tree. One good result is that the fruit has a deeper color. Winter St. Lawrence are very much benefited. The dark streak in the fruit is owing, in my opinion, to the application of the ashes, and the fruit is larger and better. The trees grow better and have a better foliage.

MR. N. C. FISK.—Mr. Shepherd was at Abbotsford, and saw the trees there very thickly planted. That we will admit. But he must understand they were planted thirty to thirty-eight years ago, and fungi were then unknown in this Province. We will admit they are too close; but if you will take trees that were planted ten or fifteen years ago in isolated places, on good soil, you will find the fungi just as bad on them as in the old orchards. That shows that the fungi are not confined to the orchards that are planted closely.

MR. SHEPHERD.—That is not my experience.

MR. N. C. FISK.—That is mine. I have no doubt if we cut down one-half of the orchard, and sprayed thoroughly, we would be benefited; but the spraying is in its infancy, and we will have a repetition of our experience with the potato bug. It took about three years to get in a poison to subdue the potato bug, and it will take five or ten years to subdue the apple fungus. They have had it in St. Catharines and the western part of New York for over thirty years, to my knowledge. It has been gradually coming this way; and as our orchards increase, no doubt we shall have it to a greater extent, for the greater number of trees you grow the greater amount of fungi you will have.

MR. BALL.—I planted some strawberry plants under a Wealthy apple tree. I know that ashes are as good for strawberries as for apples, and last fall I scattered under that tree a bushel of good hardwood ashes. To-day that tree is bearing apples of a very large size, 3½ inches in diameter, and none of the other trees in the row have apples half as large.

MR. N. C. FISK.—I have tried as many as three barrels good hardwood ashes to a Fameuse tree. I thought I could succeed in reducing the fungi, but did not.

MR. BARNARD.—We do not give the ashes as a cure for fungi but as a food for the tree, which will enable the tree to be so healthy as to resist the fungi.

MELONS.

Mr. Brodie, St. Henri, read the following paper :

A FEW NOTES ON MELONS.

By Robert Brodie.

Melons require a light, rich soil. To have them early, we start the plants in April, in a hot bed, sowing the seeds in six inch pots buried in the soil, about five seeds to each pot, afterwards thinning to four plants. In preparing the permanent plot we dig trenches twelve feet apart, two feet wide by eighteen inches deep, filling these trenches with hot manure, and covering it with eight inches of soil ; then placing hot bed boxes and sashes on these trenches, we plant two pots to each box, or six feet apart, shading from the hot sun till the plants take root. Cultivate frequently with shallow culture, as the roots grow near the surface and extend underground as far as the vines do on top. A handful of special fertilizer around each hill mixed with the soil works wonders.

The best variety for forcing in this manner is a strain of our Montreal Nutmeg ; it is early, of large size, handsome appearance and the best in quality.

The extra early Hackensack is a very good medium-sized melon of good quality, better suited to poor soil, as in rich soil it makes a vigorous growth to vine without much fruit. Among small varieties for amateurs are Jennie Lind, one of the earliest, sweetest and best green fleshed varieties, suited for open air culture. Surprise, very early, with thick salmon-colored flesh, exquisite flavor.

Water-melons may be grown in the same way, but planted eight feet apart in the hill. Among the best varieties for our climate are the Peerless, the Green and Gold, and the Volga.

Mr. Ball.—Do you grow any other variety ?

Mr. Brodie.—I tried about ten varieties a year ago, but did not find it a very profitable experiment. I had the Imperial Gem, highly recommended by Henderson of New York, a very fine eating little melon, but which cracked open before ripe, and insects and flies got in. Another trouble is, they were very sweet to begin with, but were indigestible.

Mr. Ball.—How long do you keep glass over your melons ?

Mr. Brodie.—Until the beginning of July, until the melons are about as large as one's finger.

Mr. Ball.—What temperature in the beds while covered ?

Mr. Brodie.—A number of melons can stand very high temperature, even up to 100 degrees, but give them plenty of air.

Mr. Hamilton.—What time do you put them down ?

Mr. Brodie.—The beginning of May.

Mr. Slack.—How do you water them ?

Mr. Brodie.—In planting them twelve feet apart, you can go between them with the hose. About twice a week in dry weather, give them a thorough drenching. As soon as the vines fill up the frames we raise them, putting blocks at the corners, and let the vines run underneath. When the plants get to the third leaf, some nip off the point. Some people pretend to great secrecy in this, but I have had great crops without pruning at all. When the vines extend a long distance out, I nip off the end.

Mr. Barnard.—How many to a sash ?

MR. BRODIE.—I have seen a dozen on a single sash. I only plant on every second sash, and leave them at six feet in width.

MR. HAMILTON.—Some recommend watering without drenching the foliage. Is there anything in that?

MR. BRODIE.—The great danger when the plant is newly set out is that by turning the hose right on the ground, you might wash out some of the roots. In general we water right on the whole plant.

MR. SLACK.—After the frames are raised, how do you water?

MR. BRODIE.—We do not water any more.

MR. SLACK.—Any difficulty in the plants damping off in the frame?

MR. BRODIE.—Yes, in the first sowing. Very often in the week after sown, they are apt to damp off. The remedy is to give plenty of air. Generally the cause is having the hot bed too warm to start with.

PROF. FLETCHER.—Give as much air as you can and lots of water is the general treatment.

MR. HAMILTON.—Too rich a soil is not good?

MR. BRODIE.—No; they go too much to wood.

MR. SLACK.—Would the same treatment work with regard to cucumbers as regards damping off? They damp off much more than melons. I have had great trouble in greenhouses with damping.

MR. BRODIE.—Very often too much heat causes too rapid growth, and they damp off.

MR. SLACK.—In this case there were others growing in different parts in the greenhouse that damped off at the same time, and I did not know whether there was something in the soil or the treatment.

MR. BRODIE.—Very often there may not be germ enough in the seed to start a good plant.

MR. SLACK.—I was talking to a gentleman in Montreal, who said he got seed from you, which gave large beautiful melons the first year, but the seed from these now produces melons utterly worthless.

PROF. FLETCHER.—I think Montreal is specially suited for the growth of melons. I have taken seeds on two or three occasions from Montreal grown fruit, but never succeeded at Ottawa as at Montreal.

MR. PRESIDENT.—Has there been any attempt to place Montreal Nutmegs on the English market?

MR. BRODIE.—Not to my knowledge.

MR. PRESIDENT.—Could it be done by cold storage?

MR. BRODIE.—I am afraid not, because if melons are pulled the least on the green side, the quality is poor. They need to be pulled when ripe, and will not keep long.

ORNAMENTAL TREES.

The following paper, sent by Wm. Craig, of Abbotsford, was read by the Secretary:—

SOME DESIRABLE ORNAMENTAL TREES.

BY WM. CRAIG, JR., Gibbland Farm, Abbotsford.

A valuable paper appeared on this subject in the Seventh Report of the Montreal Horticultural Society, by the late Chas. Gibb. In it a comprehensive

list is given descriptive of the most desirable varieties of ornamental trees not natives of the Province of Quebec. Most of the trees mentioned in the paper referred to were planted by Mr. Gibb 15 or more years ago at Gibbland Farm, Abbotsford, and the object of presenting these brief notes to the Society is to draw attention to those varieties which have succeeded best, and which seem worthy additions to our list of native ornamental trees.

The list is brief, but each variety mentioned is well worthy a place on the lawn or roadside of every lover of trees in the Province. Among the many kinds of the Norway maple, none is more beautiful and desirable than that form known as Schwerdler's Maple, *Acer platanoides* var *Schwerdleri*. Mr. Gibb says that this is an Asiatic variety, probably a native of Northern China. Its beauty consists in the color of the leaves of the young shoots, which are often a bright crimson. In July I have seen young trees dotted all over with rich bouquets, as it were, of rich rosy red leaves. This has been one of the most attractive of the roadside trees on Gibbland farm. In rapidity of growth it resembles Norway maple, but its wealth of rich dark green foliage, tipped here and there with tufts of crimson, renders it a most desirable tree for the lawn or roadside. In form and habit of growth it resembles Norway, upon which it may be readily propagated by stock or top grafting.

Ginnalian Maple, *Acer Ginnala*.—This is a dwarf form of the maple coming from the valley of the Amur in Asia. Its strong points are perfect hardiness and the beauty of its autumn foliage. Early in September it takes on a most brilliant crimson color, and continues glowing like a ball of fire on the lawn till the leaves fall.

Of the many beautiful varieties of the Alder none have succeeded perfectly except the cut-leaved form of the common European Alder, *Alnus glutinosa* var. *laciniata*. In moist, gravelly situations this has done well, though it does not equal in gracefulness or rapidity of growth its beautiful relative the cut-leaved birch.

Imperial cut-leaved Alder killed out after two successive trials.

Purple-leaved birch, *Betula alba* var *folis purpuris*.—This resembles the ordinary form of the European white birch, except in the color of the foliage, which in early spring is a deep purple, but later in the season shades off to a bronzy green, quite hardy and a rapid grower. It is very useful in adding variety of tint to the landscape.

I need say little about that well-known favorite, the cut-leaved weeping birch. Its range of successful growth is very wide. I am informed that it succeeds perfectly as far west as Brandon, Manitoba, and can be grown at Indian Head, Northwest Territories. Single trees planted so that they may develop symmetrically are indeed living objects of beauty upon the lawn.

Another weeping form of the birch is that known as Young's weeping birch. This, however, is rather a slow grower, and not to be compared with the former.

American Chestnut.—In a concluding paragraph regarding the hardiness of this tree, Mr. Gibb says : " I wish I could offer stronger hopes of our being able to grow this beautiful tree." Would that I could show him the three healthy and beautiful specimens fruiting for the first time this year, which he planted with so much care twelve years ago. They nearly equal in size and surpass in symmetry black walnuts planted alongside at the same time. Although it is generally stated that chestnuts do best on dry and somewhat gravelly soil, yet these trees are growing in situations always moist, sometimes approaching to wetness;

seeds of these trees will be carefully planted with a view of securing hardier seedlings.

Honey Locust. *Gleditschia triacanthos.*—This is a beautiful tree when in full leaf, and presents a very graceful appearance on account of its large compound leaves. It varies greatly both in regard to abundance of thorns and hardiness, the latter characteristic depending to a great extent upon the source from which the seed was obtained. This tree attains a large size, does not sprout, and should not be confounded with the black or yellow locusts which are not hardy in the Province of Quebec. Very useful for hedging when the hardy form is obtained

Kentucky Coffee Tree. *Gymnocladus canadensis.*—Resembling somewhat the black walnut in appearance, but of much slower growth. Hardy and desirable by way of variation.

Tulip Tree. *Liriodendron Tulipifera.*—This beautiful tree sometimes kills back when young, but after becoming established grows rapidly without losing any of its terminal wood. There are some fine specimens of this on Gibbland farm now about 15 years old. Mr. Dupuis reports it hardy at l'Islet.

I would like to say a word in favor of the American Sycamore, *Platanus occidentalis*. It can well be substituted for the basswood, succeeding well on the same character of soil. Southern Missouri grown stock is not hardy in Quebec or Eastern Ontario.

Other desirable trees which have proved hardy I will merely mention by name; among them may be included Ginko or Maiden Hair tree, Buffalo Berry, Nettle-leaved Elm and Grape-leaved Linden. There are many beautiful conifers which have been on trial at Gibbland farm contemporaneously with the above, and which may be noted in a future paper.

PLUMS AND PLUM CULTURE.

The Secretary read the following paper sent by Mr. Aug. Dupuis of l'Islet:

GENTLEMEN.

If your time was not so precious I would address you the compliments you deserve for having organized this meeting to discuss subjects of so great importance to the Fruit Growers of this Province as those mentioned on the Programme before us.

Seeing my name associated to the subject of plum culture, I hastened to prepare the following questions, anticipating that the distinguished orchardists of the Western part of the Province present at this meeting will consider and answer them.

1. What varieties of plums shall we plant for market and for home use in this Province?

2. What stock do you consider the best for grafting?

3. Is there any variety of plums you could recommend for planting in orchards when the Damas or Orleans plums have been destroyed by the black-knot?

4. Is it possible to establish an orchard (plum) on yellow, clayey land which freezes very deep and heaves considerably in spring?

5. How to do it?

I hope that the answers to these questions shall be recorded and published

in English and French, for the benefit of orchardists of the eastern part of the Province who owe so much already to the horticulturists of the West for their initiative in the trial of varieties of fruit trees, for the reports of their experiments through the Montreal Horticultural Society, etc.

The reports of this Society have been guides to thousands of farmers in the selection of the trees to plant for profit and for home use.

The reports of the Central Experimental Farm containing valuable information on fruit growing are distributed by the thousand in the rural districts, and are carefully read; therefore, if your answers to these questions were published in the next Report, it would greatly benefit intending planters, especially men of small means. I am convinced that *plum culture* is profitable if trees of varieties suitable to soil and climate are planted, trees producing abundantly and regularly good fruit.

Few are those of twenty to thirty years' experience who have not planted some trees of varieties which are so unproductive or bear so unsaleable fruits that they do not pay even the interest on the land they occupy.

Thousands of farmers and owners of village lots, guided only by the plate book of the tree agent, are now purchasing unprofitable trees as some of us did formerly, and will soon sustain the same deceptions and losses.

It is on account of this that I desire earnestly that the list of fruit you may recommend shall be published in the Central Experimental Farm's next report.

In localities where good plums can be grown as the Damas or Orleans Reine Claude or Green Gage, Smith Orleans and Bradshaw, Washington and Coe's Golden Drop Pond Seedling, etc., what advantage is there in planting the American varieties (Prunus Americana and Chickasa) "De Soto," "Miner," "Wolf," "Weaver," "Rollingston," and the Japan plums "Simoni," "Abundance"?

In the districts of Quebec, Montmagny and Kamouraska, many thousands of plum trees of the above named American and Japan varieties were purchased by the farmers on whose land the best European varieties could succeed.

According to some agents, these trees of Japan and American varieties were grafted on the hawthorn, and therefore were proof against the black knot.

Some agents had copies of the Central Experimental Farm Report of 1892, to prove to the farmers that the "Prunus Americana" or "Japan" sorts were recommended for the Province of Quebec.

In the opinion of several members of the Co. L'Islet Hort. Society, the list contained in the Report of 1892 should be amended as regards the Eastern part of the Province, and they believe that the American plums are of more value as *stock* for *grafting* upon than for their fruits.

It is still doubtful if the American plums are superior as stock for grafting to the "Wild Canada" (la Prune rouge) or the Damas or Orleans.

The Lombard, Imperial Gage, Bradshaw, and Pond seedling grow very well in wild Canada plum roots, and if grafted low or below the surface of the ground the graft takes root. It is asserted that such trees live longer and suffer less from the effects of heavy crops than trees dependent only on the stock for nourishment.

The "Reine Claude" or "Green Gage" and "Jefferson" seem to thrive better grafted upon the "Damas" plum than on the wild American and Myrobolan plums, they make less suckers, they are more prolific; and if the scion dies, the loss is not complete, for the suckers from the roots will soon produce very good fruit.

The Canada wild and Damas plum at one year from the seed make good stock for root grafting, and the seeds of both are so easily procured that it ought to induce experiments.

The Damas or Blue Orleans and the Reine Claude de Montmorency (yellow), both distinct species, reproduce themselves from seed, from suckers and from layers.

The layers produce shoots on each bud generally, and these shoots after one year can be used for stock for grafting.

In the most northeastern part of the Province, at 15 to 20 miles north of the town of Chicoutimi there is in the middle of the forest a grove of wild plum trees producing red and yellow fruit. These trees lying in one of the coldest sections of the Province are expected to supply the hardiest stock for grafting, and might be used with success in parts of the country where other kinds have failed.

I saw trees at Messrs. Petit and Tessier, Chicoutimi, 15 to 20 feet high, from seeds of these wild plum trees. They are healthy, vigorous, mature their wood perfectly, though growing on wet, clayey soil which freezes to the depth of over 6 feet.

The grove of wild plum trees lies on Government property, and on the requisition of the Co. L'Islet Hort. Society, last year, to Hon. L. Beaubien, Com. of Agriculture, the land on which the plum trees grow has been reserved, and shall not be sold for any consideration.

Mr. Saunders, Director of the Experimental Farm, having confidence in the hardiness of this race of plums for planting in the N. W. Territories, has ordered to gather plums for seed, and I am confident that Mr. John Craig, the devoted horticulturist, who shall make the experiments, will report favorably on the hardiness of the race, even when planted on the hardest and deepest clay soils.

Canada imports millions of pounds of plums from California and from Europe which the fruit growers of Canada could supply, and which they will soon supply if they unite to second the efforts of the Pomological Society of the Province of Quebec. Some of you may be astonished to learn that plums are used as olives in the United States, and with your permission I will read the extract from the Binghampton *Call*, August 2nd, 1894:

"Representatives of pickling, curing and preserving houses of New York and other cities are making their annual visits to the fruit-growing districts of the State, contracting for plums, peaches, pears and other small fruits. The particular fruit now being purchased is green plums. This fruit is now approaching its size and appearance when it is especially desired by pickling establishments, from which it is turned out on the market as the olive—either French or Italian, as the demand may be. John F. White of Leicester, N.Y., has 7,000 plum trees in his orchard. He has sold the entire product, between 15,000 and 20,000 bushels, to olive picklers. The extent of this home-grown olive business may be imagined when it is known that Mr. White's orchard provides only a small portion of the green plums that are sold for olive pickling by the fruit growers of this part of the State."

If the Canadian orchards cannot supply the actual demand for plums, if new channels are opened for the use of the fruit, the farmers of this Province ought not to be afraid of a glut in the market as they say will exist if new plum orchards are planted.

In beginning I alluded to what the residents of the eastern part of the Province owe you gentlemen for the diffusion of Horticultural knowledge

amongst them whilst you were members of the Montreal Horticultural Society and since the foundation of the Pomological Society. I omitted to name the man from this western part of the Province to whom we owe the most gratitude, and you know that I mean the greatly regretted Mr. Charles Gibb of Abbotsford, who devoted his life to the cause of fruit-growing, and who died in a far foreign country whilst continuing his researches in Horticulture for the benefit of his country. In order to perpetuate his memory and our gratitude, I propose that the members of the Pomological and Fruit Growers Society of the Province of Quebec plant a tree—oak, elm or other long-lived tree—on Arbor Day next, and call it the Gibb tree.

That the local or county Horticultural Societies of the Province be requested to unite in this duty to a departed friend.

MR. BALL.—There was an article in the *Rural New Yorker*, two or three weeks ago, about the selling of plums for olives. Some one wrote a letter to Mr. John F. White, asking if this article published were true. He wrote back, saying it was all humbug,—that there was nothing to it.

MEMORIAL TREE.

MR. BARNARD thought a tree should be planted in every locality where there is a Society, in honor of the late Mr. Gibb.

PROF. FLETCHER.—Why not have one Society tree at Abbotsford as well. I would move that the President be requested, in the name of the Society, to plant one tree at Abbotsford in honor of the late Mr. Gibb, to whom we owe so much. Hon. Mr. Justice Lynch seconded the motion, which was unanimously adopted.

DRAINING ORCHARDS.

MR. BARNARD raised the question of draining orchards. Professor Chamberlain, he said, a great orchardist in the States, had given some excellent lectures on drainage, which were published. Professor Chamberlain had drained that part of an orchard where the trees had been killed regularly several years, and it soon became the very best part of the orchard. Where there was a spring, he had to carry the water away in a closed drain securely tiled, but in carrying away the surface water which affects the roots, ordinary drainage was most useful to trees.

MR. BRODIE.—I would not attempt to plant an orchard that was not drained or that could not be drained.

MR. BARNARD.—Did you try under-drainage?

MR. BRODIE.—With stones and tiles, both with great success. I have got stone drains that my grandfather planted, that have been in use about eighty years, and they are doing great service. Where tile drains are apt to go wrong is at the mouth of the drain, at the outlet of the main discharge. The frost will break them away there, while it will not injure them anywhere else. I finish off some of these drains in wood. Another obstruction was in not having limit ditches which would intercept the brush. We cannot always keep our limit fences in good order. In one of our tile drains, where there was a stoppage and

the ground wet on that account, I followed the root of an ash 25 feet up in the tile. On another occasion, one of my neighbors found a muskrat choking up his drain ;—it got in and could not get out.

MR. BARNARD.—Showing the necessity of having a trap at the issue, so as to prevent animals reaching the drain.

NATIVE AND FOREIGN PLUMS.

DR. HOSKINS.—It has been a subject of consideration to me for quite a while, why it is we see so few plums, even our native plums, in the market. All our blue plums are foreign plums.

Some facts about them I have observed. One is that the two families are of entirely opposite habits in regard to moisture and soil.

Our native plums all prefer light soils, and most of them do better with plenty of water around their roots. If you notice them wild, you will find them almost all by brook-sides and other places where there is water.

Most of the European plums prefer clay. In Maine, on the Kennebec River, all the land near the river is marine clay. The river makes very little fall, and the current runs one way or the other according to the tides, and from Bath upwards the European plums grow very well in that marine bay.

In Vermont we do not get blue plums good except on clay land. My place is sandy. It has the appearance of sandy soil, but before you get down sixteen inches, you find hard, dark soil, and my whole farm is on that clay, although it has every appearance of being a sandy farm. I do not know how deep the clay goes, but I found out the first year we could not grow vegetables in that soil, as in the spring the trenches were filled with water and the roots out.

On that clay land in the Kennebec valley the blue plums, being European, are successfully raised ; but go up the river where the clay land disappears, and they do not succeed. It will be found universally that the European plum succeeds best where there is clay.

MR. N. C. FISK.—Do plums grow where there is stagnant water ?

MR. CHAPAIS.—I do not think any trees grow where there is stagnant water.

MR. BARNARD.—There must be a natural underdrainage, because clay will fill up with water in the fall and remain wet until the dry season in the summer.

DR. HOSKINS.—Stagnant water will kill any apple or plum tree, but living water will not. Where there is natural underdrainage, you need not be afraid of plums or apples ; but where there is stagnant water, you must have tile underdrainage.

MR. BARNARD.—In the valley of the St. Lawrence, the clay land may reach 70 feet to 80 feet, and no underdrainage ; and in that case we cannot get fruit, which brings up naturally the question of underdrainage raised by Mr. Dupuis.

DR. HOSKINS.—I have used the red plum for stock for the blue plum, and did not change its soil. I find it does well on sandy land. I am planting a good many Russians, and find they do well indeed. The trees are hardy and they bear young.

MR. SHEPHERD.—On sandy land ?

Dr. HOSKINS.—Sandy on surface and clay below. I am grafting the Euro-

pean plums on native stocks, and that may enable them to do better on lighter soils than they otherwise would.

If we understand rightly the raising of plums, I do not see why they should not be very plentiful. The Russian plums I have not had long enough to speak authoritatively on them, but they have done well as far as they have gone. They are a handsome plum, eminently adapted for a market plum—early and large.

MR. SHEPHERD.—Is that the Early Red?

DR. HOSKINS.—Yes.

MR. SHEPHERD.—Mr. Fisk has an Early Red and so has Mr. Dunlop, and they are very unlike.

MR. DUNLOP.—My Early Red resembles Dr. Hoskins' more, but is not so matured.

MR. BRODIE.—Your Early Red looks like my White Nicholas.

M . DUNLOP.—I am not surprised to find different varieties grown under the name of the Early Red. In the Bulletin of the Iowa Agricultural College for 1890, Professor Budd states that this variety was sent out quite extensively under the name of Mixed Arab. The sorts mixed were Early Red, White Nicholas and Black Prune. The trees labelled Early Red and White Nicholas received by me are the same. I do not think they are the Early Red.

MR. JAS. SNADEN, of Danville.—I found it a very difficult task to grow plums, pears and cherries in the section of country I come from. I tried it fifteen years ago, and succeeded in growing trees to a certain extent, but never got any fruit. Three years ago, however, I took fresh courage, and since then have been trying to grow plums and pears. The kinds of plums I have grown are the Lombard, Shippers Pride, Moore's Arctic and Green Gage. The way I plant my trees is as follows: When I go to plant my trees, I merely dig out a trench and force my roots east and west, and I lay my tree down either towards the north or the south. The reason I do that is, the west winds generally carry the tree over towards the east, and by letting the roots run east and west the wind has not such a tendency to carry them over, for our heaviest winds come from the west,

Then I put a stake on the north or south side, and tie the tree to it. Those who have these tender varieties of fruits planted out and have not made provision for laying the tree down, all they have to do is to cut the roots of the tree about two inches back from the root on the east side, and lay them down towards the west. By doing so you only require one stake on the east side to support the tree. By growing trees in this way, we can compare very favorably with growers on the other side of the line.

By laying the trees down in this position, they can be kept under the snow all winter; and if they are in an exposed place, where the snow will blow off, put a few hemlock or spruce broughs on to the top of the tree after putting it down. The snow protects the fruit buds. The right way to lay those trees down, if very large, is to put a rail or any long stick over the tops of the limbs and peg the near end of the rail down to keep the branches of the tree down; then go back to the other end of the rail and bear that down, and peg that down also. Then throw a few hemlock boughs over the top to keep the snow on.

I am experimenting with pears and peaches in the same manner, and think by next year my pears will bear. The varieties of pears I am growing are the Flemish Beauty, the Idaho, and the Bessemianca.

MR. SHEPHERD.—This manner of laying down plum trees is an old idea, and has been followed in New Brunswick successfully for years. Mr. Sharpe of New Brunswick has a very large plum orchard, and has been very successful. He has had quantities of plums every year, and that is the system he takes. When he plants out young plum trees, he is careful to have the roots cut on one side, lays the trees down in the fall, and covers them with hemlock branches to gather the snow.

In this connection it may not be out of place to say that when in Ottawa this spring, I got into conversation with Mr. Macdowall, member for Prince Albert. He told me that out there they had never been able to fruit any kind of apple. They have fruited a crab, but would give anything for a summer apple in the month of August. I said that if he would follow my instructions I would send them half a dozen apple trees carefully packed in a box, and that in a few years he would be able to raise at least one apple. I sent him half a dozen Tetofsky apple trees, two years old, by express, in a box, the roots carefully packed in moss and the stems in straw. I asked him to lay them down every fall in that way, the same as practised by Mr. Sharpe of New Brunswick,—that is, to be careful that the snow covers the branches entirely. They have any quantity of snow at Prince Albert, but the thermometer drops as low as 40 below zero. I asked him to let me know every year how the trees are growing, and I have great hope he will be able to raise Tetofsky apples in Prince Albert. The reason I sent Tetofsky is, it is a very hardy tree, and being an early apple it prepares for winter early. It ripens its buds perhaps earlier than any other apple tree we have. The leaves fall off sooner than from any other apple trees. After the fruit has ripened, which is about 5th or 6th August, a few weeks later the leaves begin to turn yellow, and fall. The tree is preparing itself for the winter. I thought the Tetofsky the best variety, as it never gets to be very large, and letting down the tree is not so difficult as in the case of a very large tree.

MR. BALL.—I received from St. Catharines among other trees, a peach tree. I should say it was at least three years old when I received it. I set it out last fall, and this spring it had some blossoms, but the children picked them off. The tree is eight or ten feet high, and some branches are 2½ feet long.

PROF. FLETCHER.—In connection with the discussion on Mr. Dupuis' paper, Mr. Dupuis spoke of grafting plums on some other plant, such as hawthorn, as a preventive. This would be most desirable if possible, but I doubt it very strongly. I merely mention this so as not to sanction the statement without some discussion.

The meeting then adjourned until the afternoon, when the Society was invited to hold its meeting on Mr. Fisher's grounds.

THE AFTERNOON MEETING

Was held on Mr. Fisher's grounds, where the members were entertained to a garden party. In the course of the afternoon, several addresses were made.

PROFESSOR FLETCHER said: We have had a very interesting and useful meeting. Some of the information that has been brought out during our discussions cannot fail to be of use to the fruit growers and those interested in fruit growing. Not the least enjoyable and important chapter of our meeting is this gathering here

at Mr. Fisher's beautiful place. You can here see the results of Mr. Fisher's work in his treatment of plants for the prevention of disease, and in cultivation, according to the most approved methods, for the production of a large crop.

I would draw your attention particularly to some things which have interested myself. Among these is the way his gardener is cultivating tomatoes. They are exceptionally well grown plants, and are kept off the ground with little trouble, pruned, and are trained *en espalier* on wires, an excellent plan which, although new to me, may be known to some of you with larger experience.

All Mr. Fisher's different growing crops are particularly clean of weeds. This is so important that I will dwell on it now at some length. Undoubtedly it is important to know the best treatment for all our different crops; but there is no disease that is doing more harm than the enormous number of weeds allowed to multiply throughout the land.

In the Eastern Townships, as everywhere else, there are some special weeds which if neglected are going to give much trouble, and are giving trouble now. You may use Mr. Fisher's—a model farm, as an example of what may be done in the case of one of the worst weeds, the Ox-eyed Daisy. There is not one plant of this pernicious weed in the whole farm. Every year Mr. Fisher gives a whole day to the hunting up of this weed, his men doing nothing else on that day.

In the Eastern Townships you have one or two weeds peculiar to this district. "The Scented Fern," usually spoken of here as "the Brake," must be got rid of, or it will gradually get rid of your pastures.

Another weed which has spread from the State of Vermont to our pastures is the "Paint brush" (*Heracium aurantiacum*), a small plant, but very aggressive, which has spread in the pastures because some farmers will not take the trouble to dig it out. If every body would co-operate, there would be little trouble with many weeds.

To show you to what extent a weed which is not native to the country may increase, I will merely mention a weed which has been lately announced as an immigrant to Canada from the United States—the Russian Thistle. This, like most other weeds, is not called by its right name. It is not a thistle or in any way like a thistle, and does not call for the same treatment. It belongs to the spinach family, and is an annual. This is going to give us a great deal of trouble, and I may use it as an illustration of what neglect finally may do. It has been introduced into North America now about fifteen years, and the United States have already spent hundreds of thousands of dollars fighting against it in a desultory manner. The United States Government have taken the matter up, and during last session of Congress a million dollars was asked for to eradicate this weed. The Manitoba Government are also trying every means to destroy it.

The perennial sow thistle is one of the features of the landscape around Quebec, and extends from the Atlantic ocean to the prairie region in small patches. It is one of the weeds everybody must fight against and try to get rid of. It looks like the ordinary sow thistle, but has the bad character of being perennial, lasting from year to year. This can be destroyed by pulling it out when in flower. You will recognize it by its leaves, which are soft but prickly, and it has in all parts when broken a milky juice. The large yellow flowers may be seen in fields of small grain, and generally stand up an inch or so above the grain. This plant increases by means of underground stems, each of which bears a rosette of leaves at the summit.

If you see this weed, destroy it at once, or it will give you a great deal of trouble. If farmers were as afraid of this as they are of the Canada thistle and quack grass, it would be a good thing for them.

With regard to quack grass, it may really be considered a blessing in disguise because people have got frightened of it. It is not as bad a weed as some people think; but when a farmer sees it, he at once sets to work to get rid of it. It only grows about four inches down from the surface of the ground. If the farmer will plow only about four inches, as shallow and flat as he can, he will bring it to the surface, where it dries out, and is more easily destroyed than many other weeds.

You all recognize the difference between Mr. Fisher's apple trees which have been sprayed and those in the other orchards around us. The experience of all who have sprayed for fungous diseases is that spraying is eminently successful when done carefully. You have to spray three or four times. The first spraying should be done after the leaves open, the next after the flowers appear.

Take the chief enemies of the apple trees—and all trees subject to fungous or insect enemies may be treated in the same way—we have, first of all, the bud moth which destroys the buds, then we have the codling moth;—these can be destroyed by spraying the trees immediately after the flowers have fallen. A sufficient quantity of the poison falls into the calyx, and the insect is destroyed before it enters the apple. After that come the leaf roller and other insects, which may be exterminated by this treatment. Later on we have the canker worm, which strips the trees of their leaves, and does great injury. If a tree is stripped of its leaves one year, it suffers in future years, and particularly the year following. The economy of all plants is this: the leaves are analogous to the lungs and stomachs of animals, and the trees store up through the leaves materials to feed the twigs and boughs next year. If you allow the canker worm to attack the leaves, you will have no fruit the next year, because the trees will not have sufficient strength to throw out their buds and mature their fruit, and any fruit that is formed will be poor.

All weeds are great enemies. See that your gardens are kept clean. All plants feeding on the nourishment put into the soils are much better and healthier where there are no weeds. When one starts early in the season, and nips the weeds in the bud before they have made much growth, there is much less labour and expense than when they are allowed to acquire strength and growth before they are taken out. One of the implements everyone with a large garden should be possessed of is known as the Planet wheel hoe. Anyone who cannot get a large supply of labor would do well to buy one of these small instruments, which costs something like ten dollars.

The whole secret lies in attacking the weeds when weak, and never giving them a chance to grow at all. The great growth of all plants is made early in the season. If anyone has a weed, and thinks he has a new enemy, let him send it to Ottawa, and I shall be very glad to explain what it is.

MR. BARNARD was then called upon to address the audience. He said:—I did not expect to have to speak here, and came unprepared. I have been in bad health, and hoped to have the opportunity of seeing the country. I must say I am delighted with all that I have heard and seen.

I know something of weeds—unfortunately we farmers know too much of weeds. We have had some good advice given us by Prof. Fletcher, which should

sink deep into our minds. I should like to have Mr. Fisher's secret for getting rid of the marguerite, by giving one day in the year to the work. This weed bothers our farmers very much, but I am consoled to know that in the Islands of Jersey and Alderney they have no objections to it in the pastures, provided they are pastured young enough; with us, however, we cannot get rid of them before the flower has appeared. It is a good plan to run over the farm with a scythe or a mowing machine, and cut it down while in flower.

I was glad to hear that couch grass is not a thing we should have any love for. Switch grass is another troublesome weed in light soils. The best cure is plenty and clean cultivation.

If we cannot do anything else, let us put on a little manure of any kind, even fertilizers. I do not know that we have heard enough of fertilizers, but they are the enemies of weeds. A weed does not require much manure, and the moment you give strength to its neighbor to fight it, the good plant will try to outgrow and kill the weed.

I asked the late Colonel Rhodes about the Ox-eyed Daisy, and he said: "I am not afraid of it; there are plenty of them, but I manure my grass in time."

One of the best ways of fighting our weeds would be to fatten our fields. Our farmers allow too much of their farm and house fertilizers to run to the river. When we have utilized all our fertilizers, let us go to the merchant and secure the best phosphate and even ammonia. Fertilizers are the farmer's friend, and those who know how to use them will be repaid their cost tenfold.

The Hon. J. G. Joly, amidst much applause, then advanced to the front, and gave his promised treatise on

THE PROPER METHOD OF PRUNING TREES.

He said: I have something in this book by which I mean to illustrate the truth of what I am about to state. It is all very well to plant trees, but when once planted you must trim them and prune them carefully—not only orchard but every kind of trees. What is worth doing is worth doing well. I have here some specimens of pruning badly done, to show you how useless it is to plant if when once planted you do not take any care in pruning.

[Mr. Joly exhibited several samples of bad pruning as he proceeded.]

This monstrous excretion with that hole in the middle, I cut in the churchyard of the Cathedral in Quebec. The trees there are magnificent basswood, which are the admiration of all those who come to Quebec and who see them at a distance; but when you come close, you discover that everyone is completely hollow inside and rotten to the core, though some of them are two or three feet in diameter. All this mischief arose from the fact that these trees were not properly pruned. The dead branches, instead of being removed, were allowed to decay and to bring the rottenness into the very heart of the tree. Here is a case in point [showing a cutting]. The branch that grew there [pointing to a hole in the trunk] was allowed to rot, and was not removed in time. The rottenness introduced itself into the heart of the tree, and the tree was at the point of death. You can see here how nature tries to repair the wounds made. If you look inside this hollow at the covering of bark that nature attempted to put over this limb, you can easily conclude that if this branch had been removed close to the trunk of the tree, the amount of work which has been expended by nature in its attempt to

cover the stump with bark would have been much more than sufficient to cover completely a well made amputation and to heal it. Here is another branch of one of the same trees which was allowed to rot and to bring death into the very heart of the tree. You see how nature has attempted, but in vain, to heal it. It is not only the pruning of forest trees I would like in this instance to bring to your attention. Here are some sections of apple trees; I am sorry to say that I am the owner of the orchard from which they come, though not answerable exactly for their sad condition.

Just look,—when this tree was pruned, if it had been pruned half an inch closer to the stem, this would not have taken place. But the pruning was not close enough, and although nature tried to cover the wound, she had not time before the destroying influence which is at work all the time in every wound—before the deathly rottenness was introduced into the tree and went to its very heart.

Here is a number of other samples which show exactly the danger, when the tree is pruned—whether an apple or any other kind of a tree—of leaving any kind of a stump. If you leave a stump, sooner or later, if it is too long to be covered by the bark, before it decays it will bring rottenness into the heart of the tree.

Here is another case where the bark certainly made a very strong effort to grow over the stump. It nearly covered it, and in a couple of years would have done so; but in the meantime the destructive power overcame the healing power, and the tree is rotten. This means that in pruning trees, we must adopt a system that will allow nature to heal the wound as soon as possible.

After giving you my personal experience for what it is worth, I would like to quote the opinion of a man who is looked upon as the great authority on this subject—Count des Cars; his book, written in French, has been translated by Professor Sargent of Harvard, who is devoted to the cause of Forestry and Horticulture. Des Cars says:—

"The secret of obtaining a complete cure in all operations requiring the "removal of a branch, either living or dead, consists in cutting close to and per- "fectly even with the trunks."—"The amputation having been made even with "the trunk, new wood would soon appear, forming first round the top and sides "of the wound, which is soon completely surrounded by the new growth; the "wound is gradually healed over, and the decay of the trunk prevented. It is "preferable to avoid, of course, the necessity of making large wounds, by properly "pruning trees when young."

There are many people who think it is better to leave a little part of the branch rather than make the wound too large in the trunk. I have had occasion, after years' experience, especially in the cultivation of black walnut, to find that the size of the wound is not material, provided it does not of course go the whole way around the tree. Better lift the bark from one-half of the tree rather than leave any stump or projection at all. You should be able to pass your hand over the trunk without feeling any projection.

As Professor Sargent, in his introduction to Des Cars' book, says:

"The cut should always be made close to and perfectly even with the out- "line of the trunk, without regard to the size of the wound thus made. This is "the essential rule in all pruning, and on its observance the success of the opera- "tion depends."

What is worth doing is worth doing well. If you take the trouble of planting trees, you must look after them and correct them, when young when it is much easier than when old.

HON. MR. JUSTICE LYNCH.—How do you cover the wound of the tree?

HON. MR. JOLY.—Des Cars recommends coal tar. It is rather startling at first, but you must remember that you are warned to use it with a good deal of prudence. Des Cars says: "There is no substance that can replace coal tar in "the treatment of large wounds on trees; but it should be used cautiously, espe- "cially in the case of young trees, and should not be allowed to run needlessly "down the trunk; it is well to remember that the more active a remedy the "greater the care necessary in its application."

MR. SHEPHERD.—The Trappists at Oka, who are very good agriculturists, had difficulty with their trees the first year they had an orchard, in protecting them against field mice. They were advised to paint them thoroughly from the ground with coal tar, and did so, thus stopping all the pores of the bark, and the trees could not live. Of course in France, where there is no snow, they had no experience in this, and were simply badly advised.

MR. ——Take a maple: if the mice have eaten the bark all the way round, is there a way to save the tree?

HON. MR. JOLY.—I tried a wonderfully ingenious thing which I saw in some book, but did not succeed. I attempted to bridge a tree which had been gnawed all around by mice.

MR. SHEPHERD.—When the British Medical Association was in Montreal in 1884, I had a young Duchess orchard, in which two of the trees were badly eaten by mice. We cut off considerable from the top of the trees, and with the top branches thus cut off we bridged over the wounds, making three or four bridges on each tree, which conveyed the sap from below the gnawed portion to above the gnawed portion. The trees were just beginning to bear when we cut off the tops. One purpose was to get the twigs to bridge. The other was, we considered, if we did not reduce the tops, the twigs could not carry enough sap to supply the whole tree. We took off two-thirds of the blossoms to help each tree to bear, and the result was these four bridges have all taken, and convey an enormous quantity of sap to the reduced top, and the extra vigor was sent into the fruit. I sent several specimens to the Horticultural Exhibition in 1883, and the judges would not believe they were Duchess. They were as large as Alexanders. My brother, Dr. Shepherd, brought two or three surgeons of the British Association to Como to spend the Sunday. They were shown over the orchard, and when they saw these trees, they said it was the best piece of surgery they had seen in Canada. The trees were living, and almost grown together. The meeting then adjourned until the evening, when the Society again met in Memorial Hall.

THE BEST TEN VARIETIES OF APPLES.

The President opened the meeting by submitting a question handed in for discussion: what are the best ten varieties of apples?

MR. HAMILTON.—I think ten varieties could be named that could be suitable for any district, that is, for their hardiness and permanence and fine quality for the various seasons. I think that ten varieties could be named that would be

good, not only for this but any district. For a very early apple, first, the Yellow Transparent. No doubt as to its being a very early, hardy, productive apple, and a very good apple both for the table and for cooking. That is an apple that almost everybody should plant. It is not a good marketing apple, certainly, for a district at a distance from the market, but there can be no doubt as to its value for home use. It is fit for making pies and stewing as early as the middle of July, and is an addition for the dessert by the end of July and beginning of August. It begins to bear almost from the year it is planted if you will allow it. I do not think it is advisable for anyone to allow young trees to bear heavily at first, as it only stunts them and prevents their giving reasonable crops a year or two later. It begins to bear right away, so that one can have the gratification of having one or two apples on the tree the year after it is planted. It is always a satisfactory tree to plant, because it takes well at once and begins to show its quality right away. Consequently, in any collection of apples in any district, the Yellow Transparent might come in as the very earliest apple.

An apple that succeeds it very rapidly in season is the Strawberry of Montreal; but it is not as satisfactory as the Yellow Transparent.

Then an apple that is always satisfactory is the Duchess. Have not seen any person who found fault with the Duchess as a tree to plant. It is very hardy and productive, bears very early, and is one of the best to be had for cooking. For a very short time it is a very good dessert apple, but for a long season it is one of the very best cooking apples. It gives such large, fine crops and so regular that there can be no doubt as to its value.

For one to succeed it, I would name the Wealthy. The Wealthy is not so satisfactory a tree in every respect as the Duchess and Yellow Transparent. I planted some hundreds of it, and find it is very subject to bark disease, which very often destroys its usefulness if not noticed in time; but if noticed in time, the disease may be prevented. It begins to harden at one side of the tree at a small spot. If taken at that stage and the hard outer bark picked off, and the inner bark notched with a knife, so as to give it room for expansion, the disease may be prevented; but if not notched at first and allowed to go on for some time, it will encircle the tree and is very difficult to arrest.

These are three varieties anyone may include in any ten that may be planted in any district in this country. They have good fruit, great hardiness, productiveness, and succeed almost everywhere. I do not know that I can go beyond those three.

MR. BALL.—You have not spoken of Astrachan?

MR. HAMILTON.—I have planted Red Astrachan, but it has not been a success with me, and I cannot recommend it from my experience. I know it does very well in Montreal and the Townships, but with me it does not bear. The tree seems to be perfectly hardy, but does not give me a crop. I have got more off the Duchess in one year than off the Red Astrachan in six.

The Alexander is a tree that does fairly well with me, but, like the Astrachan, it is not satisfactory. It gives a few apples almost every year, but never seems to give a heavy crop. Consequently, it lacks in the good features of the three I have mentioned.

I will mention one or two more. The Switzer, one of the Russians, is one of the handsomest apples that can be found. The tree bears heavily and young, but the fruit begins to fall while it is yet early in the season. It begins to fall

as early as July, and keeps on dropping until the end of the season, so that by the middle of September you do not get a fair crop on the tree. It is a lovely apple, and attracts the attention of everyone. It is of a most glowing red, fine quality, tender, and with a flesh like the Fameuse. Not as fine quality, but still a very good quality. One I would strongly recommend, but I would not put it in the same category as the three first mentioned, because they are perfect, it seems to me, in every respect. The Switzer is a better dessert apple, I think, than any of the three.

Dr. Hoskins, who is to address us by and by, can say something on the Switzer. I will not name any others, but have started the discussion, and hope other varieties will be named to fill up the list of ten asked for.

MR. BRODIE.—I can give a list of ten suitable to our locality for the whole year round in all the seasons: Yellow Transparent, Red Astrachan, Duchess, Montreal Peach, for summer and fall; the St. Lawrence, Fameuse, Wealthy, for early winter; the Grimes Golden, for February. For a dessert apple, that is the best we have for that month—latter part of January and month of February, Golden Russet for the spring, and right on to the month of June.

MR. N. C. FISK.—I think it would be advisable for this Society to allow each local association to name a certain number of fruits which would answer their locality best, according to their ideas. Then this Society should choose ten varieties which would suit generally all the Province, and report accordingly.

MR. PRESIDENT.—I think the suggestion of Mr. N. C. Fisk very reasonable. It is impossible to name ten varieties which would apply to all parts of the Province, and we cannot, until we get information from the different districts, make out fruit lists from which growers in different parts will be able to make selections. That is one part of the work which the Society will endeavor to carry out in its operations. I think the list Mr. Brodie has given regarding Montreal district is a very good one. I do not know anything personally about Grimes Golden, and possibly in this county the people might prefer some other variety.

MR. BALL.—Has any gentleman ever grown Winter St. Lawrence, and what does he think of it? Is it not really a good winter apple? One that is hardy in tree and satisfactory in a good many respects?

MR. SHEPHERD.—I have cultivated Winter St. Lawrence since 1875. The trees have been very successful. I consider Winter St. Lawrence one of my leading export apples in cases. I have been exporting them for twelve years in cases like the one before you. I have shipped them to Germany, Ireland, Scotland, England and France, and they have been very successful and always in good condition. You cannot export them in barrels, because they are too delicate an apple, and rather large. They do not pack well in a barrel, but they have been very profitable apples with me, and the trees are to-day as fine as any I have.

I may say that the question asked is to name ten varieties for this district. I cannot do that. The local growers should be able, from their experience, to give their opinion as to the varieties that succeed best here. Ten varieties, however, are in my opinion too many to grow in a commercial orchard. If I were beginning again, I would not have more than six or perhaps eight. These are quite enough varieties for commercial purposes.

I consider Red Astrachan one of my leading varieties. I have a dozen

Astrachan trees. I understood Mr. Hamilton to say they are not profitable. Perhaps his trees are too young. After they have become fifteen or twenty years old, he will find they are heavy bearers. My Red Astrachan yielded me seven dollars per tree this year.

Duchess is one of my leading varieties, and St. Lawrence another. Fameuse, Wealthy, Winter St. Lawrence and McIntosh Red are also profitable varieties. We have no apple that meets all the requirements of a late keeping apple. The varieties I export in cases are Fameuse, Wealthy, Winter St. Lawrence and McIntosh Red. They are profitable to grow for export to England in cases. They are table apples, and it is their beauty that sells them. The Fameuse is a beautiful apple, and the highest in quality of any we grow in Quebec. The Wealthy is another fine apple, following very closely on Fameuse. Winter St. Lawrence is a beautiful apple, and quality very fine. McIntosh Red is the most beautiful apple grown in Canada. It is larger than the Fameuse or Wealthy, and it is a very deep red, with a bloom on it, and scarcely any white at all. It is supposed to be a seedling of Fameuse. It originated in Dundas county, not very far from Morrisburg, and the man who owns the original tree, Mr. McIntosh, says the tree is about eighty years of age. It originated in his father's time. It has been largely grown on that district on the St. Lawrence, and the trees now are becoming very profitable. I remember seeing forty barrels sold at Montreal at $4 per bbl., when Fameuse were selling at $2.75. The grocer who bought them said he cleared $3 a bbl. on them, selling them by the half-bushel or dozen.

As regards a late keeping apple, we have not yet discovered an apple that can be recommended to be grown over the apple region of Quebec which can compare with the American Baldwin or the Northern Spy.

I have within the last three years found an apple called the Canada Red. It is an old apple, well-known variety, which has proved to be hardy in the Province of Quebec. Within two miles of my own orchard, in an orchard planted thirty-five years ago by the late Mr. Matthews, there is a row of trees in very fine condition, notwithstanding the fact that the orchard has been subjected to the greatest neglect for over thirty years. It has been rented to different tenants from year to year, and of the 1200 trees planted there thirty-five years ago, the Canada Red are the most productive. The present tenant says he gathers six barrels per tree nearly every second year, and they sell at $4 per barrel. Canada Red keeps until June, and is of very fair size as grown at Hudson. I believe it is grown very largely at Ohio, Western New York, and parts of Ontario, but it is not one of the leading varieties, because they say it is not large enough. As grown at Hudson, the apples average the usual size. The chief feature is that it has proved hardy under neglect, and bears well for 35 years. It is a wonderful discovery for Quebec that such an apple is hardy enough to withstand our vigorous climate. The quality of the apple is well known.

Downing describes it in his book, and gives a cut of it. He describes it as an apple of very fine quality.

Golden Russet is a good late keeping apple, but is not always hardy. some districts it succeeds very well, but in others it does not.

MR. BALL.—It does not succeed here.

MR. SHEPHERD.—The only fault with Canada Red, in my experience, is that it is tender in the nursery; and the fact that the trees on Hudson are in good condition, notwithstanding bad treatment, shows that they must acquire hardiness.

The Golden Russet is always tender in the nursery; but when once it becomes established in orchards where it succeeds, it becomes very hardy. The Canada Red may be something like Golden Russet, tender when young.

If I were beginning again, I should not plant ten varieties for commercial purposes. It is a great mistake to plant too many varieties. People want to find out the best varieties for themselves. That is all very fine, but it is costly; and now that we have experimental stations, we should leave that work to them. I should recommend every man who wants to make money to confine himself to six or seven varieties.

MR. BALL.—With regard to Winter St. Lawrence, five years ago I purchased quite a number of varieties of apple trees from a local nurseryman in Dunham. Among the rest I bought a tree he called the Shenango Strawberry, but it has proved to be a Winter St. Lawrence. I took some scions from the tree, and grafted them into a crab tree. I grafted a good many scions into that tree, and this year —three years from the grafting—the limbs are laden with good sized, nice, clean fruit. It is a handsome apple, and it appears to me it can be grown here successfully.

MR. N. C. FISK.—We can see by Mr. Shepherd's remarks, that it will be very much to the advantage of the Province of Quebec to obtain the opinion of each local society as to the best six or eight or ten varieties, and this Society should, in my opinion, give a list that will answer universally. You will see in the reports from the Experimental Farm Mr. Craig's list of apples which he thinks will answer for each district, and I should think that this Association should give a list of what they consider would answer the Province of Quebec. I would also like to ask if anyone can give us any knowledge of what they used to call the Hardy apple. I think it was grown and cultivated by Mrs. Hiram Foster. Perhaps some one can give us information as to that apple. It was thought it would be a very valuable apple to propagate.

MR. BALL.—I have none of those trees set or bearing, but have seen a good many in the county, and from what I have seen of the Hardy, should set them down as one of the best winter varieties we can grow in the county. It is a good bearer, the tree is perfectly hardy, and I think it is an annual bearer. The fruit keeps well, and is a first-class cooking apple. It will keep in sound condition as late as first of June, and even later.

MR. N. C. FISK.—Undoubtedly this apple, by the name of Hardy, will be brought in as an apple to be cultivated in the county of Brome.

I will therefore move that each local Society be requested to give a list of a certain number of varieties which they think should be cultivated in their own district or county, and that this Society also choose the number of varieties which they think particularly should be cultivated in the Province of Quebec.

MR. FISHER.—To a great extent that was done last year by Mr. Craig. He communicated with the fruit growers in different parts, and obtained lists which were published in the bulletin last winter by the Experimental Farm. In that bulletin were given the names of apples peculiarly suitable to each locality, given largely by the local societies. Our own Society in Brome met, and discussed the question very thoroughly, and made up a list to be sent to Mr. Craig. I believe other societies did the same, and the list published in that bulletin is largely the result of such work. I do not mean to say the work should not be continued. New things come up from time to time, and our Society ought to know of these

and make them known. A number of apples were handed in to-day for which names were asked. We shall find among them some seedlings which the county has in considerable numbers, and are really good apples. Broome county has been producing many apples not named. I might allude to one of these, grown on the farm of Nathaniel Davis. It is a handsome, and good keeping, apple. It has not been distributed yet to any extent. Being a winter apple, there are none ripe for show to-night. I am satisfied we have some seedlings worthy of consideration as apples to be grown in other parts of the country.

HON. MR. JUSTICE LYNCH.—The name of Mrs. Hiram Foster was mentioned a few moments ago. I believe she is present, and it would certainly gratify us to learn her experience in cultivating the Hardy apple.

MRS. FOSTER.—About thirty years ago there came a very severe winter, which killed everything but the Hardy. I had a good many trees, which, through one cause or another, were neglected and not trimmed, but they always bore a crop of apples of very fair size and good for cooking. They are in their prime in March or April.

They are fair eating apples, but rather acid, and require a good deal of sugar to cook well, and they never fail. I have kept them until the summer apples come in, by taking good care of them; but they are at their best along in March and beginning of April. There is one merit they have: if you take them in your hand, you will find there is quite an oil over them.

MR. SHEPHERD.—I can bear out what Mrs. Foster says. I procured some scions ten years ago for a few trees. I always reserve a bushel of Hardy apples for my own use for winter cooking apples. They are the finest apples for pies that I know of, and they keep certainly until June. For commercial purposes, however, as an export apple, they do not fill the bill. We must have a more showy apple—a red apple is what we want. The Hardy is a yellow green, and quality only good enough for cooking. It certainly is a splendid cooking apple and keeper, and is a heavy bearer.

MR.———Does it spot?

MR. SHEPHERD.—No.

STRAWBERRY CULTURE.

MR. T. SLACK, Waterloo.—Before reading the short paper I have written on Strawberry Culture, I would like to make a few remarks in explanation. I was given to understand that the meeting would be composed principally of strawberry growers, so that my paper deals chiefly with growing for commercial purposes. For those growing for home use, I would make no difference in treatment beyond narrowing the rows down to two feet instead of three, because the fruit would be cultivated by hand instead of using a horse. In growing for market, the great aim is to reduce expenses, and horse power is cheaper than hand labor. As to varieties, Mr. Shepherd's remarks about apples would apply to strawberries. Out of five or six well-known varieties, you would probably get as much satisfaction as out of 500 or 600 which you see in most of the glowing catalogues—new varieties especially, in trying to grow which a great deal of money has been spent, I think, foolishly.

STRAWBERRIES.

It seems to me, as these meetings and discussions of various subjects have for their object the helping of one another on in the various branches of Horticulture that we may be engaged in, that my best way to contribute to that end would be to give a few points that I have learned in my many failures and few successes in growing a profitable strawberry crop ; and although my failures and successes are probably very much the same as many here as well as elsewhere have experienced, a summing up of them may be of some use, even to those who have had like experience with myself. In growing strawberries for the home table, the question of economy in production does not cut much of a figure, quality and a generous supply are about all that need be considered ; but in growing for the market, there are a great many points that need to be considered, and closely studied too, for it is quite useless to grow even a large crop if the cost of producing exceeds the sum realized for it.

The first expensive lesson I took in the business was what sort of plants to use. I was just simple enough to take a lot of plants from an old run out plantation at $2.00 a thousand, with the privilege of digging them myself. Result, not one single quart of berries was harvested from those plants, as they were set out rather late in an unfavorable season, 95 per cent. of them winter killed, although fairly well protected. This failure with several very unsatisfactory crops from plants obtained from reliable parties at a distance has led me to the opinion that I would not furnish ground for anything but the best plants, even if inferior plants were given me, and set for nothing, and I have adopted the following plan for getting good plants : Set out four rows three feet apart with plants one foot apart in the row, and as long as may be necessary to give me what plants I require, leave four feet blank in the row between different varieties, to prevent their running together and getting mixed. Make the soil very rich, cultivate well, and let run at will, pick the blossoms, and when digging plants dig everything and sort out the old and any inferior plants. The varieties I use at present are Haverland and Warfield, with Wilson to fertilize them. Wilson is the best thing I have found for this purpose so far, but it is failing, rusts badly. I should be exceedingly glad to know of any variety worthy to succeed it. I am trying Beder Wood, but cannot as yet say how it will turn out with me. Warfield is the berry for business, especially to ship. It will pick and ship with Wilson, few will tell them apart, a splendid cropper, and stands well up from the ground,—a weak point with the Haverland, which is also very soft, but will give a lot of large berries ; poor flavored in a wet season, but for home market they will sell and bring as much money as Warfield. Some 30 other varieties tried have been dropped for one reason or another.

A clover sod may work with some, and setting out plants after T. B. Terry's plan, 4 ft. x 2 ft., may also work well with some, but with me they are dead failures, for the following reasons : I am not Terry, and my ground has not been Terrified, as I have heard it called,—that is, filled with clover roots and worked as fine as an ash heap, although I try and lately have succeeded in getting it, as I thought, perfectly fitted, and for this purpose I have found nothing to compare with the home harrow and roller ; without these tools I never could get the ground level and smooth enough to suit me for marking and planting. Secondly, the white grub on any kind of sod ground with me will thin out the plants set as

above 4 ft. x 2 ft. to anywhere from 6 to 12 ft., which even with the runners they would make could not give much of a crop. After trying most of the distances and methods recommended, I have settled down to the following:

Long rows, in my case 175 yards long, rows three feet apart, plants one foot apart. Every fourth row, Wilson or some good fertilizing variety. Cut most of the runners, the first ones at least, and leave a very thin narrow row. I have lost very heavily by having too few fertilizing rows or mixed plants in those rows, thus not having pollen enough in the field to properly fertilize the imperfect plants, which will give a lot of ill-shaped, small berries, especially towards the end of the season. Ground heavily manured, and used for corn, cabbage or garden for two or three years is what I am forced to use on account of the white grub. Good cultivation with winter protection of straw, or some other suitable material; coarse, strawy manure will not do on account of the seeds in it. Remove the straw in the spring, cultivate and hoe twice, and replace the straw when the plants are in blossom.

Having the crops ready for picking, one of the most trying parts of the business comes in, namely, controlling and checking the pickers, mostly a lot of inexperienced boys and girls, a great deal more anxious to get their boxes full and earn a good day's wage than they are to look out for their employer's interest and pick clean, nice berries. I provide each picker with a tray holding six boxes, which when full are brought in and exchanged for empty ones. If any box is missing, a box of berries is charged to the picker, as the supposition is that a box of berries has been left in the field. I have each tray numbered, also a lot of stakes numbered to correspond with the trays, and sets enough of them to put one at each row in the field. Each picker takes the rows numbered to correspond with his tray. Any badly picked rows can at once be traced to the picker and the culprit sent back over the rows, or discharged if necessary. Only those who have had the pleasure of keeping track of a lot of pickers, on a balmy day in July, with the thermometer at 90°, as a friend of mine remarked, can appreciate the relief given by any method which will remove the friction attending this part of the work. As each picker delivers his berries at the packing shed he produces a ticket with my name printed on it, also numbers representing boxes 30 of 6, 10 of 3, 12 of 2, 10 of 1, which will give 240 boxes, and the packer who receives them punches out the number of boxes brought in, with a conductor's punch. A blank space is left on each card in which the picker's name is entered. This is the only way I have yet found of entirely stopping all disputes about the number of berries picked by each picker, as he can see at any time just how many boxes he has picked, and does not have to depend upon memory or a memorandum kept out of his sight. To encourage careful picking, those who pick all through the season and do their work well are paid $1\frac{1}{4}$ cents a box, others 1 cent. The $\frac{1}{4}$ cent is distinctly understood to be a bonus.

Having the crop nicely picked and packed in clean boxes and crates, the question is: what will you do with it? I have an exceedingly poor opinion of the large cities and commission men as the place or means of disposing of a strawberry crop; and if I had to depend on them I would go out of the business at once, as it pays none too well as it is. Very early in the season city prices may be high, but later on, just when the heaviest pickings come on, the bottom of the market often drops out, and it is getting to be rather a chronic complaint with it of late years. Taking out freight commission and other expenses leaves almost nothing

for the grower. In almost any village or small town in a few years a very considable quantity of nice fresh berries can be sold at a fair price, say 10 to 12½ cents a box retail, from house to house. A man going regularly from house to house will sell four times as many berries as the grocers in the town can at their stores. I have sold over 4,000 boxes in a season in the village I live in, at from 10 to 12½ cents a box, and I think at 10 cents 6,000 boxes could be worked off. I believe in cultivating a home market, saving freight and commission and retailers' profit.

For home use the question is not so much economy. In this or any similar audience, ten per cent. would be the most who grow their own berries. There is no fruit, with the exception of apples—and I doubt even that—which has so many friends as the strawberry, and no fruit could be grown easier. Neither strawberries nor anything else can be grown easy—that is, without any work; but with a little care and clean cultivation, there is no crop more certain. I should like to see more berries grown. The greatest help any market grower can have is for his neighbors to acquire a taste for strawberries. That does not hurt the market. Those who grow for themselves scarcely ever grow half their family consumes when they get into the way of eating berries. When first we grew berries for the market, a thousand boxes was considered a great supply. The question then with my customers was: would they buy any berries? Now the question is not: will you buy any berries? but how many do you want? People have come to consider the fruit as a necessity and not as a luxury.

MR. BRODIE.—What thickness of straw do you cover them with?

MR. SLACK.—Sufficient to cover the ground—enough to cover the rows. In the cities you can get straw, but we cannot always.

MR. SHEPHERD.—What fertilizers do you use?

MR. SLACK.—Of late years, we plant our strawberries on corn ground or cabbage ground that has been heavily manured. I use a quantity of ashes and as much fertilizers as necessary.

MR. HAMILTON.—What fertilizers?

MR. SLACK.—The Capleton various brands, and Montreal, Brodie and Harvies. I use the latter altogether.

MR. HAMILTON.—What particular brands?

MR. SLACK.—Anything with a little nitrogen in it. It is useless paying much for nitrogen for strawberries. You can get it in the form of ashes at lower prices than any fertilizer. Ashes at ten cents per bushel are less than half the price of any phosphate we can buy.

MR. BALL.—How does James Vick turn out with you? I have six rows James Vick and two of Wilson. The Wilsons do not amount to much. The rows were 115 ft. long, and the 8 rows measured 20 ft. wide. From those 8 rows I picked over 500 boxes. They were all the Vick, except two rows on one side, and they did not give half a crop.

MR. SLACK.—With me the Vick is a poor bearer.

MR. BALL.—Another berry which gives satisfaction in some places, the Captain Jack, is perfectly useless with me. Another new variety I tried is the Michel's Early, but it does not amount to anything. At one picking in that bed from four rows, we picked 119 boxes, and those were all Vick.

MR. SLACK.—I cannot get any such returns as you with this variety.

MR. BALL.—The plants set 30 inches one way and 15 inches the other, and

covered the ground completely. I had another bed of berries—3 short rows of the Haverland, set a year ago this spring, about 80 ft. long, and I am confident that I picked from them over 100 boxes The Haverland is very prolific, but does not hold the berries well up from the ground.

PEARS, PLUMS AND CHERRIES.

DR. HOSKINS, Newport, Vermont, was invited to speak. He said: I have had no particular topic suggested to me until a moment ago. Perhaps you would like to hear something of Russian pears, plums and cherries.

The leading Russian pear, the one which seems likely to be a popular pear, is one known by a number of names. The Russian name, I believe, is Bessemianca, and we call it the seedless pear, meaning the same thing. It is a pear which has absolutely no seeds, and we cannot hope to get any new varieties from it. It stands isolated from that point of view. The quality of the pear is very good. It is of medium size, perhaps a little less. It is a very good market pear, and suits the dealers and the buyers. It attracts a good deal of attention from the fact that it has no seeds. No pear has anything that answers really to a core—that is, the hard matter around the seeds of an apple. I have had a seedless Russian pear bearing abundantly some four or five years. As regards profit, I wish I had a hundred trees. They bear so profusely that one can afford to sell the fruit pretty cheap, and they pay better than any apple I know of.

MR. N. C. FISK.—With us the fruit of the Bessemianca is good for nothing. It rots on the tree before it ripens. I had a hundred of them, and turned them all into the Flemish Beauty.

DR. HOSKINS.—Where do you grow them ?

MR. N. C. FISK.—At Abbotsford.

DR. HOSKINS.—I do not know why you find them so different. Are you accustomed to handling pears ?

MR. N. C. FISK.—I know a good pear when I can stick my teeth into it, and that is all I know about it.

DR. HOSKINS.—It will not do to let many pears get ripe on the tree. Most of them should be picked when green, then there will be no difficulty about their getting rotten before being ripe. There is another pear, a Russian. It is about the same size as Bessemianca, but has a longer neck. It is of about the same season, and rather a better pear, but the tree is not so heavy a bearer. The difficulty mentioned by Mr. Fisk is quite common everywhere with people when they first begin to raise pears. The fruit rots on the trees, but that is regulated by picking them when green, and keeping them in house. I have not any other Russian pears yet bearing to any considerable extent, but have a good many trees. One variety I think I can identify has borne this year on quite young trees, not more than five feet high. The fruit is about the size of the Bessemianca when ripe.

MR. SLACK.—How does the Flemish Beauty bear with you ?

DR. HOSKINS.—I never got one big enough to bear. That is where the Russian pears have the advantage. When raised to bearing size, they do not mind the climate.

MR. N. C. FISK.—The Flemish Beauty does grandly with us, and is first-rate eating.

DR. HOSKINS.—I do not see what you want of any Russian pears then. The Flemish Beauty is one of the best pears—large and handsome.

MR. N. C. FISK.—I have had them for seven years, and not one has had a bud killed during winter.

DR. HOSKINS.—I think I shall have to move further north. I do not undertake to raise anything that is not perfectly ironclad. I have been for thirty years trying all kinds of American pears, and no American pear is hardier than the Flemish Beauty, and that is not hardy enough.

MR. N. C. FISK.—I would like you to take home these Bessemianca, and ripen them, and see if they are fit to eat.

DR. HOSKINS.—I have handled pears considerably, and consider myself an expert, and have had no difficulty ripening Bessemianca perfectly.

MR. N. C. FISK.—Your experience and mine differ. They must require special culture and climate to make them eatable.

DR. HOSKINS.—I do not think the climate has much to do with their eatability. I cannot ripen a pear picked off so green as this.

MR. N. C. FISK.—Leave them on ten days and they will ripen.

DR. HOSKINS.—Five days is quite an era in the life of a pear when ripening.

MR. N. C. FISK.—I have got a Bessemianca tree over twenty feet high, and I never grew a dozen pears on it.

DR. HOSKINS.—I have got one seventeen or eighteen feet high, and I have grown two bushels on it. My place is sandy ground on the banks of Lake Memphremagog, pretty nearly pure sand. My present place I am working on now is clay, 12 or 14 inches down. My pears may not do as well there, but we will see. Pears require more skill, knowledge and experience in handling than apples. It is quite a science to ripen pears.

MR. SHEPHERD.—You have had a great deal of experience in marketing summer apples. Could you give us some of your experience?

DR. HOSKINS.—My principal variety is the Yellow Transparent. There are three apples so near alike, hardly anybody could tell the difference—the Grand Sultan, the Yellow Transparent, and the Charlottenthaler. The Grand Sultan and the Charlottenthaler suffer from blight. The Yellow Transparent has never shown any flaw at all. If it has a fault, it is its profuse bearing. No apple I ever grew went off so fast, and none has been more profitable.

MR. FISHER.—What success have you had with cherries?

DR. HOSKINS.—The trouble with my knowledge about cherries is that it does not extend to the names. I have quite a number of Russian cherries bearing profusely, but I got my trees quite a number of years ago. A great many had no names, and I have never been able to identify them by their descriptions.

MR. FISHER.—Do you find it possible to raise cherries satisfactorily at Newport?

DR. HOSKINS.—My trees are still small; but, judging from my experience, cherries would pay very well. What I have raised, I have had no difficulty in selling at 25 cents a quart.

MR. SHEPHERD.—How do you protect them from the birds?

DR. HOSKIN.—I keep a good many cats. I have not seen the mark of a bird's bill on any of my cherries this year.

MR. SLACK.—The late Mr. Gibb's experience must have been something in

the line of a deterrent. I consulted him about growing cherries, and he advised me, as a friend, to let them alone. He said: "You will find the birds will get the bulk of the crop."

MR. SHEPHERD.—I am sorry Professor Craig is not here to give us some information about Russian cherries. I was at the Experimental Farm in July, and tasted at least half a dozen kinds grown there, which certainly were very fine.

MR. PRESIDENT drew attention to the fact that the place of their next meeting was changed to Quebec, instead of St. Johns, and would be held during the sitting of the Legislature. During the evening the orchestra of Knowlton played at intervals a number of choice selections. This orchestra was composed as follows:

Mrs. Robb.....piano.
Mrs. Fay.....first violin.
Mrs. Austin Pettes.....second violin.
Mr. Austin Pettes.....flute.
Mr. W. F. Robb.....base violin.
Mr. W. Lloyd.....clarionet.
Mr. E. E. Mill.....first cornet.
Mr. A. Hartwell.....second cornet.

MR. BRODIE, seconded by Mr. Craig, moved a vote of thanks to Mr. Fisher for the hospitable manner in which he had entertained the Society. They were indebted to Mr. Fisher and the ladies of his family for a very enjoyable afternoon and for a great deal of the pleasure of their visit. He also spoke very highly of the condition of Mr. Fisher's farm and grounds, a visit to which could not fail to be profitable as well as pleasant.

MR. FISHER responded. He had certainly felt it a great honor to entertain the Society, from which so much good was expected, and no one rejoiced more than he that their visit to Knowlton had been so successful. They had had most interesting discussions and papers, which could not fail to arouse new interest in fruit growing in that district. The people of Knowlton would be always glad to welcome the Society, and hoped this would not be the last meeting held there.

HON. MR. JOLY moved a vote of thanks to the ladies of the town of Knowlton, for the kind reception they had given the Society, and in particular to the members of the orchestra for their valuable contribution to the pleasure of the visit. Not only would the beauty of lake, wood and mountain linger long in their memories, but the kindness and hospitality of the people could never be forgotten. He felt sorry that the Association could not always meet at Knowlton; but they would certainly consider it a great pleasure to come back here. Not only were their discussions interesting and profitable, but the excellent orchestra had infused into their proceedings a harmony which promised well for the future of the Society.

MR. SHEPHERD, in seconding the motion, said that if the Society could always be as happy in the selection of a locality for its summer meeting as on this occasion, its success was assured. They should certainly, as Mr. Joly had said, all carry away very pleasant recollections of this visit. Everything had been in their favor. The weather, if not all that could be desired, had been on the whole very fair, the beauties of lake, hill and forest, for which Knowlton was so well known, were, at this season, seen at their best; their visit to Mr. Fisher's this afternoon had been particularly enjoyable; and the interest shown by the people generally in the proceedings and the invariable kindness and hospitality they

displayed, he assured his audience, the Society thoroughly appreciated. There could be no doubt that to the presence and encouragement of the ladies, the success of this meeting was chiefly to be attributed. The Society should certainly carry away with it a lively sense both of the intelligence and public spirit and the many social charms of the people of Knowlton. In this beautiful hall and building—one which would do credit to a much more pretentious place—they had a striking evidence of the public spirit and generosity of one of Knowlton's citizens; and in the excellent orchestra which had charmed their ears this evening, they had an evidence of how prompt the people were to reciprocate anything done in their behalf. He certainly looked forward to the Society meeting here again, and cordially endorsed Mr. Joly's wish that the interval would not be a long one.

MR. FISHER, seconded by Mr. Shepherd, moved a vote of thanks to the President. Every society, of course, must depend considerably for its success on the efficiency and zeal of its president and officers; and as head of this Association, Mr. Fisk certainly filled the bill in these respects. His conduct in the chair reflected credit on the Society, and it was only right that they should not separate without returning him a vote of thanks.

MR. PRESIDENT, in reply, said he felt very grateful for this expression of thanks. While deeply sensible of the honor of the position, he felt there were many members of the Society more competent to fill it than he, and he felt specially handicapped by the fact that he was in a sense the successor—and a very unworthy one—of the late Mr. Gibb, to whom beyond doubt this position would have fallen had he lived. He was glad to know that this first summer meeting had been so decided a success, and for his part he would be always ready to do everything in his power to further the interests of the Society.

The orchestra then played "God save the Queen," and the meeting adjourned.

EXPERIMENTS WITH FUNGICIDES, IN 1894.

BY

JOHN CRAIG, HORTICULTURIST, EXPERIMENTAL FARM, OTTAWA.

An extended series of experiments were carried on by the writer in conjunction with the Fruit Growers' Association of Ontario, with the object of determining (1) the practicability of the remedies recommended; and (2) to furnish instructive object-lessons in the *modus operandi* and the benefits of spraying. The following is a brief statement of the most important results gained.

Experiments were instituted at seven different centres in the Grimsby and St. Catharines district. It is a pleasure to record the cordial spirit of co-operation manifested by the Fruit Growers of the Grimsby and St. Catharines districts, and the helpful manner in which they facilitated the progress of the work. The inauguration of the experiments was unavoidably delayed till May 1st, which, on account of the abnormally early spring, was fully two weeks later than desired. This, followed by the unprecedented and continuous rains during May and June, coupled with the scorching heat and drought of midsummer and autumn, all combined to form a season with conditions most unfavourable to obtaining even average results.

Following on the heels of the downpour came a period of ideal weather for the development of fungous growth. Never, to my knowledge, has the apple scab (*Fusicladium*) appeared in such a virulent form, the fungus coming before the fruit had much more than formed, attacking the foliage so severely as to cause it to resemble and be easily mistaken for the ordinary twig blight. In many districts apple trees presented a scorched and browned appearance, as if suffering from blight and drought. Most varieties lost a large proportion of their leaves, which of course resulted in a corresponding loss of the fruit. This visitation, however, had the effect of emphasizing the value of spraying as a factor, having an important bearing on increasing the yield in seasons of severe fungous visitation, as well as improving the quality of the fruit. I mention this now to elucidate the apparent discrepancy in the yields of treated and untreated trees. To sum up briefly, untreated trees lost their foliage, and consequently their crop of fruit. Spraying prevented the growth of the fungus on the foliage, which was thereby retained, and with it a large proportion of the fruit. These are points worth remembering. Peaches, cherries and plums were treated with the two-fold object of preventing loss from a fungous disease—causing the fruit to rot on the tree—and insect attacks. Apples and pears,—to prevent injury from Fusicladium and insect pests.

I will not include in this brief paper the results of the experiments on peaches, as this class of fruit does not touch the grower of fruit in Quebec.

PLUMS.

I am glad to be able to report definite results regarding the treatment of plums. In an orchard a block of plums composed of Munro, Bradshaw and Lombard was selected, a part of each sprayed on the dates already given. The trees were young, just coming into bearing. Rot was more or less prevalent on all varieties,

but the greatest damage to the tree was wrought by the Shot-Hole fungus (*Septoria cerasina*), and in preventing this disease the best results were obtained. Fruit growers well know the effect on the fruit of the loss of the foliage previous to the harvesting period—decreased size and poor colouring are sure to follow.

Notes taken on June 26th and Aug. 29th emphasize the fact that the foliage of the sprayed trees was vastly superior to the unsprayed. In walking through the orchard, the difference in the health and luxuriance of the two series at once made itself apparent.

To obtain accurate data regarding the character of the fruit, two trees were selected, as much alike as possible in every respect, one sprayed, the other unsprayed. The fruit was on each gathered and weighed. The sprayed trees yielded 14¼ pounds of sound plums, the unsprayed 12 pounds. But the difference was most noticeable in the superior size and quality of the fruit from the sprayed tree. 100 plums from this tree weighed three pounds and nine ounces, while 100 plums unsprayed weighed two pounds and one ounce.

The sprayed plums would easily sell as good firsts, while the unsprayed, owing to small size and lack of colour, could hardly be classed as seconds.

In my opinion, no plum grower can afford to omit spraying with Bordeaux mixture and Paris green.

CHERRIES.

The results gained in treating cherries are more applicable to the Province of Ontario, where the large, sweet cherries are grown. These are much more affected by rot than the sour cherries of the Morello type commonly cultivated in Quebec.

Spraying began with Bordeaux mixture on May 1st, when the blossoms were beginning to open. Three additional applications were made with the same mixture with the addition of Paris green. Records of yields were obtainable from Messrs. Broderick and Woolverton. The former gives the yields of two trees of Yellow Spanish as nearly alike in every respect as possible in the beginning of the season :—

Sprayed tree ..... yielded 90 pounds of sound fruit.
Unsprayed tree... " 30 " " " fruit.

Mr. Broderick adds that the lower branches of the treated tree were well loaded with sound fruit, while there were a good many cherries at the top of the tree which were not thoroughly covered in spraying. This emphasizes the necessity of great care in applying the fungicide.

Mr. Woolverton's results were rather startling in their emphatic conclusiveness. He reports as follows :—

"Gave cherries three applications of Bordeaux mixture with four ounces of Paris green to 50 gallons of water, on the following dates, blossoms having fallen : May 10th, May 26th and June 4th, also one application of ammoniacal copper carbonate on July 4th." Note, June 4th, "Cherries already show good results ; the tree left unsprayed is much inferior in fruit and foliage to the one treated."

July 9th, "Picked fruit on unsprayed tree ; yield 17 pounds." July 10th, "Picked part of the fruit on sprayed tree, amounting to 112 pounds ; the remainder not quite ripe." July 17th, "Picked remainder of fruit on sprayed tree, 18 pounds. Total yield 130 pounds."

"Spraying cherry trees with Bordeaux mixture not only prevents rot, but seems to prolong the growing season, as will be seen from the above dates of picking." He further says that the advantage from spraying these trees is apparent from the following figures, which are absolutely correct: Cherries from sprayed trees netted $9.25, and were a choice sample. Cherries from unsprayed trees netted $1.20, and were a medium sample.

These are actual results, obtained from two large trees, the advantage being on the side of the unsprayed in point of size of tree and bearing capacity, at the time spraying began. One of the lessons this teaches is that, in the case of cherries, early spraying—that is, before the buds start—is not so important as the thorough and frequent application of the fungicide during the growing period of the fruit.

PEARS.

We do not in the Province of Quebec grow many varieties of pears, but I am of the opinion that those varieties which do in a measure succeed might be grown to a much greater extent with both pleasure and profit, especially in the Southern portion of the province. The Flemish Beauty has suffered in the past from fungous diseases attacking both fruit and foliage. These can be prevented by spraying, as is fully proved by the experience of Messrs. Pettit and Woolverton, who write as follows:—

Writing under date of Nov. 7th, Mr. Pettit says: "Regarding the yield of pears, I am unable to give you exact figures, but I think the sprayed trees of Flemish Beauty had fully 75 per cent. more fruit than those not sprayed. Beurri Gifford, sprayed twice before blooming, and regularly afterwards, were loaded with perfectly clean fruit, while trees of the same variety not sprayed until the fungus appeared—which was very soon after the pears had formed,—May 29th and June 9th—were almost entirely destroyed. There was not much difference in the Bartletts sprayed and unsprayed, as they were all a good, clean sample this year."

The trees were sprayed with copper sulphate on April 16th, Bordeaux mixture May 4th, 15th and 29th, and June 13th and 29th. Paris green was added in the latter sprayings. The best proof of Mr. Pettit's belief in the work is his statement that he fully intends to spray thoroughly next year. He also concludes as a result of the season's experiments on pears that two sprayings before the blooming period are of more value and have more effect than four sprayings after that period.

In the orchard of Mr. E. J. Woolverton, it was provided with a striking example of the effect of Bordeaux mixture on Flemish Beauty pears. Of two young trees of this variety standing alongside each other in the same row, one was sprayed, the other not treated. On Aug. 29th, the sprayed tree was clothed with luxuriant foliage, and carried an average crop of clean fruit, while its neighbour, the unsprayed, had lost fully 25 per cent. of its leaves and was almost bare of fruit. The result at harvest time was a bushel of good pears on the one hand and a few inferior specimens on the other.

Let us conclude then that the cracking and spotting of the pear may be prevented with great benefit to the tree by the timely application of Bordeaux mixture, and that in treating these diseases the early treatments are most important.

APPLES.

It is gratifying to be able to record results which cannot be accepted otherwise than as absolutely conclusive in connection with perhaps the most important class of fruit which entered into the experiment, viz., apples.

The unusual difficulties and hindrances encountered make the results all the more emphatic and valuable. I wish also to state that the work should have been commenced at least ten days earlier than it was begun, and that the first spraying should have been made with copper sulphate. This is in line with the experience of Mr. Murray Pettit.

The results of Messrs. M. Pettit, E. J. Woolverton and A. H. Pettit are given in detail in the accompanying tabulated statement.

In submitting his results, Mr. M. Pettit says "that the Snow apples were not quite free from fungus, but much better than those last season. Spys were much improved, while the test on Baldwins was a great success."

Mr. E. J. Woolverton, writing under date of Oct. 25th, says: "I have no doubt that had the experimental plots received an application of copper sulphate earlier in the season, the results would have been still more satisfactory; but even now, after all the fruit is picked, it is an easy matter to pick out the treated trees from the untreated, owing to the much richer and more healthy character of their foliage.

"I now enclose you a statement of the result of the spraying experiment with *Bordeaux mixture* conducted in my orchard under your direction during the past season. And in doing so I must express my great satisfaction in the results obtained. It has shown the effect in such a marked degree.

"The experiment you conducted here this season has demonstrated to me, and many other fruit growers, that spraying with Bordeaux, properly applied, and at regular intervals, will be of great practical value in destroying the fungus that is, I believe, causing the unfruitfulness of our orchards. The sprayed trees, aside from the large increase of crop, presented a fine healthy foliage, while those by the side of them, *unsprayed*, showed a very unhealthy appearance and no fruit.

"Now, I may go a little beyond the experiment proper, having sprayed a number of trees to a greater or less extent. The season, as you are aware, was most unfavorable in some respects, not only for spraying regularly, but for the cultivation of the orchard and vineyard, the extreme wet, followed by the rapid drying up of the land. I was pressed for time to get what spraying I did get done (beyond the experiment proper) with any regularity, and some were done moderately well, while other parts were not done so well; but I can distinctly trace the good effects of the application in the increased production and also in the improved condition of the foliage, even to the extent of one side of quite a number of the trees producing good results and good foliage on one side, while the other side of the tree was barren of fruit and unhealthy foliage."

An examination and analysis of the tabulated returns show that the sprayed trees yielded 24 per cent. more of first class fruit and 6 per cent. less of second class fruit and 18 per cent. less of third class fruit.

The effect of the improvements in quality on the gross receipts from an acre of bearing apple trees may be shown as follows:—Supposing the yield to be 50 barrels, we find, according to results gained, that spraying would give us

$56.75 worth of No. 1 fruit, $31.50 worth of seconds, and $6.97 of thirds, or a total of $95.22 per acre. The same unsprayed would give : No. 1 fruit $26.75 worth, $37 worth of seconds, and $13.64 worth of thirds, or a total of $77.40, leaving a balance of $17.82 in favour of the sprayed per acre. This is also supposing that all the seconds and thirds could be disposed of, which is very problematical. The cost of spraying an acre of apple trees five times with dilute Bordeaux mixture need not exceed $6.00 and may be under $5.00 ; there should be a net profit of $10.00 on the basis of equal yields and improved quality. But as a result of these experiments, and looking now at spraying as affecting the yield, we find that the sprayed trees gave 74.14 per cent. of the total yield. This return, added to the improved quality of the fruit, gives a difference in the net receipts of $51.53 in favour of the sprayed acre. I do not think this side of the argument need be pushed further, though it would probably prove interesting to know the effect of this on the crop of the province. Each grower will find it to his interest, however, to make a calculation for his own satisfaction on this basis.

EQUIPMENTS FOR SPRAYING.

Where the area to be sprayed exceeds 15 acres, it will probably pay to buy a horse power pump. These are now made by several firms dealing in force pumps. One which I have used with satisfaction at Ottawa during the past season was purchased from the Field Force Pump Co., of Lockport, N.Y.

Where a barrel pump is used,—and I may say that one of these will answer the requirements of all having 15 acres or less to spray—a strong force pump should be secured. The valves and inside working parts should be of brass, the metal chambers and all castings strong and heavy, and the packing of the most durable character. Nothing is more annoying, and nothing acts more as a deterrent to the introduction of the practice of spraying, than the "break-downs" which occur with irritating frequency at the beginning of the work each year. This matter has been represented so strongly to Canadian firms that I believe satisfactory pumps will be forthcoming next season. I have used with good results pumps manufactured by the Toronto Pump Co., and the Goold, Shapley, Muir Co., of Brantford, Ont., although the first "Ideal" pumps manufactured by the latter firm showed defect under strong pressure ; these, I believe, have been remedied. Each pump should be supplied with two lines of hose, the lengths proportionate to the heights of the trees, each fitted with a stop-cock will always be appreciated. The nozzles which gave greatest satisfaction were the "Vermorel" and the "McGowen" ; the latter is most economical of fluid, and should be used exclusively when the trees are small, or upon the lower branches. The McGowen is a valuable instrument for carrying the liquid to the upper branches with a minimum degree of waste. A bamboo pole, through which a light brass tube may be inserted, is an improvement over an ordinary pole for the purpose of elevating the nozzle. I wish to impress upon fruit growers the desirability of beginning the season's work with apparatus fully equipped and in good working order, as the ease with which the applications are made influences to a large extent the thoroughness of the work, and upon the thoroughness will depend in a large measure the success attending the undertaking.

PREPARATION OF BORDEAUX MIXTURE.

The ingredients are copper sulphate, lime and water. A good quality of copper sulphate should be secured. As pointed out by Mr. Fairchild, a brand which contains a large amount of iron and zinc sulphate should not be used, although it has not been proved that these ingredients actually injure the mixture. He further states that lime which is made from stone containing a large amount of clay is likely to be what is known as "dead" lime, and to contain small insoluble granules. This kind of lime may be used, but is likely to give trouble unless the resulting milk be well strained before adding it to the copper sulphate. Lime which is air-slaked should not be employed in any case, since its use results in injury to the foliage. The method of preparing the mixture has so often been described that I need not again repeat the directions.

Where large orchard areas are under treatment, the work of preparing Bordeaux mixture may be greatly lessened by making at the beginning of the season stock solutions of copper sulphate and lime, which may be diluted as needed. Dissolve 200 pounds of copper sulphate in 50 gallons of water, and each gallon when stirred will contain 4 pounds of the salt. In another barrel, slake 200 pounds of lime and make up to a milk by adding 50 gallons of water. Each gallon should contain 4 pounds of lime. Where it is desired to make a barrel of Bordeaux mixture, take 4 gallons of the stock solution of copper sulphate, and add a sufficient quantity of the milk of lime to neutralize it completely, as shown by the ferrocyanide test. If the lime is deficient, a drop of the ferrocyanide of potassium added to the mixture will turn brown. Add lime water till the ferrocyanide remains colourless.

Spraying with Bordeaux mixture has come to stay, at least till a more effective agent is discovered. The work of the season demonstrates the fact that it is efficacious and profitable in proportion as it is thoroughly and perseveringly practised.