

TRANSACTIONS
AND
REPORTS
OF THE
Fruit Growers' Association
AND
INTERNATIONAL SHOW SOCIETY
OF
NOVA SCOTIA,

1894.

Published by Order of the Government of Nova Scotia.

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1894.

BERWICK, N. S., Feb'y. 1st., 1894.

TO ALL PERSONS INTERESTED IN FRUIT OR HORTICULTURE :

You are cordially invited to become members of the Nova Scotia Fruit Growers' Association, and aid in extending and developing the Fruit industry in Nova Scotia.

The annual membership fee is \$1.00 ; Life membership, \$5.00. This will entitle you to all the privileges and publications of the Society.

The Nova Scotia Horticultural School, established under the auspices of the Association, is located at Wolfville. The School has the use of class rooms and laboratory in Acadia University, and is doing efficient work. The class at present numbers some fifty pupils, including a number of ladies. Any person wishing instruction in scientific horticulture is invited to take advantage of the course here provided. Tuition free to all. Further information may be obtained on application to Prof. E. E. Faville, Wolfville, N. S.

Yours faithfully,

S. C. PARKER, *Secretary.*

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FRUIT GROWERS' ASSOCIATION
AND
INTERNATIONAL SHOW SOCIETY
OF
NOVA SCOTIA.

Patron.

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J. W. BIGELOW, Esq. Wolfville, N. S.

Senior Vice-President.

C. R. H. STARR, Esq. Wolfville, N. S.

Vice-President.

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INVERNESS	“	JOHN McKEEN, Esq.	Port Hood.
RICHMOND	“	HON. ISIDOR LeBLANC, M. L. C.	Arichat.

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Secretary.

S. C. PARKER Berwick, N. S.

Assistant Secretary.

R. W. STARR..... Wolfville, N. S.

Treasurer.

GEORGE THOMSON..... Wolfville, N. S.

Auditors.

J. W. CALDWELL, Esq. GEO. H. WALLACE, Esq.

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THE PRESIDENT, SENIOR VICE-PRESIDENT, SECRETARY, TREASURER, DR. H. CHIPMAN, A. McN. PATTERSON,	} <i>Ex officio.</i>	J. E. STARR, DR. G. E. DEWITT.
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Fruit Committee.

R. W. STARR, ISAAC SHAW, COL. S. SPURR, B. STARRATT, N. H. REID, W. A. HEBB,	J. E. SCHAFNER, C. E. BROWN, R. E. HARRIS, A. WHITMAN, T. R. JONES, W. A. MORSE.
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Small Fruit Committee.

G. C. MILLER, T. H. PARKER, GEO. B. MCGILL,	JOHN L. SHAW, L. D. ROBINSON, WM. McNEIL.
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Publication Committee.

THE PRESIDENT, THE SECRETARY,	}	<i>Ex officio.</i>	W. C. ARCHIBALD, R. W. STARR, PROFESSOR FAVILLE.
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FINANCIAL STATEMENT.

Nova Scotia Fruit Growers' Association in acct. with G. THOMSON, Treasurer.

1893.	By balance from 1892.....	\$ 436 22
	Amt. rec. from advertisers in Report.....	29 00
	Amt. rec. from Secretary members fees, '92	65 50
	Dr. A. P. Reid, Life membership fee.....	5 00
	86 members fees, \$86; and one lady, 50 cts.	86 50
	To Sundry accts. per Secretary.....\$	84 09
	Secretary's salary for 1892.....	100 00
	Sundry accounts.....	87 91
	Nova Scotia Printing Co'y.....	157 65
April 14.	Dep. Rec. No. 2046.....	800 00
	By W. C. Archibald for subscription fees.....	406 80
	Secretary, 13 life members fees.....	65 00
	" 15 members' fees.....	0 00
May 19.	Dep. Rec. No. 1907, \$873, and int. \$13.30.	886 30
	To Dep. Rec. 2096.....	700 00
Dec.	By N. S. Govt., 9 mos. allowance.....	225 00
	Dep. Rec. No. 2046, and int., \$800 & \$22.79	822 79
	Dep. Rec. No. 2096, and int., \$700 & \$17.26	717 26
	To Dep. Rec. No. 2340, \$800; No. 2339, \$700.	1500 00
	Balance to new account in bank.....	365 72
		<u>\$3795 37</u>
		<u>\$3795 37</u>

We have examined the foregoing account and compared the entries with the vouchers therefor, and find the same to be correct. The bank pass book shows \$365.81 at the credit of the Association. We have also seen the two Dep. Receipts for \$1500.

J. W. CALDWELL, } Auditors.
G. H. WALLACE, }

WOLFVILLE, 13th January, 1894.

GEO. THOMSON, Treas.

SPRING MEETING.

SHEFFIELD MILLS, KINGS CO.,

April 27th, 1893.

The day was fair and roads very good for the season. Quite a large gathering of farmers and fruit growers from the surrounding country gathered in Harris' Hall at 2 o'clock, for the regular Spring meeting of the Association. President BIGELOW was in the chair.

The Chicago fruit exhibit was the topic first under discussion. MR. BIGELOW detailed at some length the work that had been done up to this time in connection with gathering, packing, shipping, and storage of fruit in cold warehouses at Chicago. He also spoke of the work of the Secretary in compiling a pamphlet for distribution, setting forth the advantages of Nova Scotia as a fruit growing country, and stated it was the first time in the history of the country that any advertising had been done along this line. MR. BIGELOW said the Local Government had assumed the responsibility of the publication, and paid its cost. After a short discussion, the next topic was introduced, the very important subject of Fruit Transportation. MR. J. E. ELLS read the prospectus of the Annapolis Valley Shipping Co'y. MR. ELLS spoke at some length in support of the scheme proposed, stating it was the intention of the promoters of the company to get their stock list as widely signed as possible, then call a meeting of the company, appoint directors, and apply for a charter. Then this company would be in a position for business, and could either go to Pickford & Black, or other steamship agents at Halifax, and demand better boats and cheaper freights, or failing in that, would be in a position to charter boats on their own account.

T. H. PARKER thought this certainly was an important matter, we needed a change, and must find some way of breaking up the monopoly that now exists.

L. RAND said there would be no difficulty in chartering boats if we had capital enough behind the company.

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E. ILLSLEY had been interested in shipping fruit for ten years, and was disgusted with the way we were used by the steamship men. They had used the farmer shamefully. He thought the farmers of the Valley had capital enough, and energy enough to handle their own shipments, and do it in a satisfactory manner. Every fruit grower had a personal interest in this matter, and we should take decided steps for an improvement in our shipping facilities.

A. WHITMAN asked if the Association understood the significance of the rebate. He had heard in some instances of heavy shippers getting a rebate of 20 cents per barrel freight. If that were so, why could not the Association combine and make a large shipment, and thereby secure the rebate. He hoped this scheme would be successful, and would do all in his power to aid in making it a success. We were complete servants to the carrying companies, and if some change were not made we may as well stop growing apples.

MR. ELLS said he had been working on this scheme some time. He did not think it advisable to ask any guarantee as to shipments by the company, the company was only a guarantee of capital if needed. There were plenty of steamers in New York, and they would readily come if freight could be assured. He thought it advisable to make the company as large as possible, if we could get five hundred men in it, if only for one share each, it would create a wide-spread interest, and interested men were what we wanted.

The next topic, "Spraying for Fungous Diseases," was then introduced by the President.

E. ILLSLEY said his neighbor had sprayed thoroughly during the last season, and he could not see that his neighbor's fruit was any better than his own.

J. T. JACKSON.—Did not know if spraying was the cause, but he shipped about one-fourth of his apples, comprising the culls and scabby fruit to Halifax, and they realized more per barrel than his first apples did in London.

H. BOND had also sometimes had the same experience, getting as much for inferior fruit in Halifax as for choice in London.

A. WHITMAN was a believer in spraying with fungicides, and thought it was important that we should all use this means of freeing our orchards from scab and insects. He had noticed that the Ontario

apples were gaining on ours in the English market, and thought that it was because of more universal spraying.

J. E. ELLS had some experience in spraying with carbonate of copper. Had two Vandevere trees that had grown very spotted fruit. He sprayed one carefully, and left the other untouched. He did not see any particular difference the first year, but the second year the contrast was remarkable. In looking over the imports of Great Britain, he found they imported annually over £3,000,000 of preserved fruit, and thought it was well worth our while to look into this interest, and place some of our inferior fruit on this market in a preserved form, rather than allow it to be sold at a low rate as inferior stock.

The Association adjourned till 7.30 P. M.

EVENING SESSION.

A large number of farmers and fruit growers from the vicinity were in attendance at the Evening session.

Question.—Can any one give the cause or cure of the “collar rot,” or “bark burst,” that is causing so much loss in our orchards.

W. RAND thought there were three or four distinct diseases; there was one called the twig blight, another that split the bark on the trunk from top to bottom, and yet another that encircled the tree, called the collar rot.

Question.—Is there any preventative for the destruction caused by the black borer?

These questions were discussed at some length, and much information gained, but no gentleman present seemed prepared to offer an assured remedy.

The Horticultural School question was introduced by President BIGELOW, who said this scheme was introduced at the annual meeting, and an active effort made towards the accomplishment of this end. Already about 500 new members were enrolled by the Association, many of whom had become subscribers to encourage the school. We want to get every fruit growers' son in the Province interested. While our Government spends \$200,000 per annum in education, there is not a dollar spent in inducing our boys to go into fruit

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growing. Every right thinking man in Nova Scotia is with us. There is money in the business, and we have barely commenced to work in this line. We do business on too small a scale. We should put out our fruit trees by the thousand.

T. H. PARKER said with the knowledge he had gained by hard experience, he could do as much now in ten years as he had accomplished in the forty he had spent in fruit growing. In these days men can not afford to learn by experience, they must gain knowledge from the work and experience of others. An Experimental Farm is imperatively demanded to advance the interests of this Valley, and all should work towards this end.

LEANDER RAND was much in sympathy with this movement. He had received a great deal of information from this Association in its early days, from Dr. Hamilton and others, who took a deep interest in fruit growing. He had fifty acres in fruit, and the enemies of fruit growing were increasing at a rapid rate, and the country needed further information; would heartily support any thing that will further the end in view.

T. H. PARKER said we owed a deep debt of gratitude to those who preceded us, Dr. Hamilton, Richard Starr and others, and we could only repay this debt by extending our efforts along the same line.

A. WHITMAN was pleased to learn of the increase in membership, and prospect of success in the Horticultural School. He thought there was much for us to learn in shipping apples, as well as in growing. We had the reputation of shipping the best apples to the European market, and we should make every effort to maintain that reputation. More care should be exercised in packing and handling our fruit. Quality rather than quantity should be the aim of our growers.

J. E. ELLS' thought that an Experimental Farm would be a grand thing for Nova Scotia. He did not agree with the President that the markets would always take our fruit. He had noticed that when prices were good the fruit turned out good, but when prices ruled low, the returns said the apples were slack, spotted, wet, etc. In looking over statistics, he found Ontario grew $3\frac{1}{2}$ million barrels, and did not ship one-tenth of them across the ocean; their market was nearer home. In one county in New York, there were grown $1\frac{1}{2}$

million barrels. Nova Scotia has not yet shipped more than 120,000 barrels in a single year. The great market for apples in the United States and Ontario was in their own cities. As we had not extensive home markets, perhaps we should not produce in too great quantities

The following resolution was introduced and passed unanimously :

Whereas, The progress reported by the Committee appointed to secure members and promote the establishment of a Horticultural School and Experimental Fruit Station is most encouraging ;

Resolved, That this meeting fully endorse their efforts, and request them to continue their work until this desirable end is accomplished.

After a desultory discussion on various topics, the meeting adjourned at a late hour.

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JANUARY MEETING.

(*Stenographic Report by W. H. Huggins.*)

HELD AT WITTER'S HALL, WOLFVILLE, JANUARY 26TH AND 27TH, 1894.

30TH ANNUAL MEETING.

A large number of representative fruit growers were present, the weather being exceptionally fine. The proceedings opened at 2 o'clock, the President, J. W. BIGELOW, in the chair.

The PRESIDENT announced that the hour had arrived appointed for the meeting, and he would now call upon the SECRETARY to read the minutes of the last meeting.

Minutes of the preceding meeting read, and on motion the same were approved.

The PRESIDENT then read his annual address, which was as follows :—

PRESIDENT BIGELOW'S ADDRESS.

To the members of the Nova Scotia Fruit Growers' Association :

LADIES AND GENTLEMEN,—In reviewing the history of this Association for the past year, I have to report that it has been the most important and eventful year of any of the thirty years of its existence, and it affords me much pleasure to hand over to my successor in office the important charge with which you have honored me for the past three years, so much improved in the number of members and in financial standing.

The most important features of our year's work are : The successful exhibit of our fruit at the World's Columbian Exposition ; the increase of our membership to over four hundred, composed of the most influential men in almost every county of the province ; the establishment of a School of Horticulture,—and while a detailed account of either would be too long for this report, I will endeavor to refer to them briefly. The exhibit was opened and conducted by Mr. Robert Starr, in April and May last, and he was relieved by Mr. John Starr in

June; and amid the greatest discouragements and disadvantages, they secured an award for the green and bottled fruits of Nova Scotia's crop of 1892, in competition with the fruit growing countries of the world. When it was found that our large and excellent exhibit of fruits of 1892, which was placed in cold storage in Chicago by the commissioner for the Canadian Government in November, 1892, on examination in April, 1893, was so far injured as to be unfit for exhibition, and we had to depend on our bottled fruits and a few barrels of apples kept in Nova Scotia during the winter, many would have abandoned our exhibit as hopeless; but these gentlemen made a success of it, and deserve the highest tribute of praise from all Nova Scotia fruit growers for their noble efforts.

It was deemed advisable not to exhibit our summer fruits in 1893, owing to the great disadvantages under which we labored, by being situated over one thousand miles from the exhibit, and the expense and delay of carriage. On the 10th September, we commenced collecting fruit, and shipped a small exhibit of apples, pears and plums. Col. S. Spurr went to the fair with a small exhibit, and conducted the exhibit with good results. Until October 10th I collected fifteen barrels of autumn and winter apples and pears, and conducted the exhibit until its close, the result of which is shown by the following testimonials, and we have secured three awards, to be followed by medals for the fruits of Nova Scotia.

I carefully examined all the apple exhibits in Horticultural Hall, and concluded that in order to attract attention among that vast exhibit, (which the officials estimated would extend seven miles if placed in a straight line, plates touching), I must adopt some more striking method of exhibiting to bring our commercial varieties more prominently before the public. I accordingly grouped two barrels of gravensteins and made a pyramid of one barrel of kings, in the most conspicuous part of the court. I spent over a month in the Nova Scotia court, advertising the advantages of Nova Scotia as an apple producing country, and distributing pamphlets on Fruit Culture in Nova Scotia, and introducing Nova Scotia apples in the west, the result of which is most satisfactory, as all this year's crop can find a profitable market in the west, and Nova Scotia is known as never before to the western inhabitants, who till now considered it impossible to grow fruit in Nova Scotia. I canvassed the Chicago and other western buyers,

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and gave them samples of fruit, and used every means of introducing our fruits where we can find new markets, and as fruit growers in the middle states have decided that apples are with them too uncertain a crop to be cultivated, in future we will have an ample market in the large and growing cities of the west for all the apples we can produce; and when more reasonable trade relations remove the duty, a profitable market for Nova Scotia fruit growers is assured.

I was honored by a visit in Nova Scotia court from the Governor-General of Canada and his worthy lady, both of whom took a lively interest in our fruit exhibit, and expressed a wish to become better acquainted with our province. As it was decided by the Canadian Government to make a large exhibit of Canadian fruits at Antwerp in 1894, I concluded the best mode of disposing of what remained of the exhibit would be to hand it over to them for that purpose. We gave nearly all our 200 bottles of fruit and berries, which were well preserved, and a good collection of green fruits, which were bottled and filled with acid in Chicago, to be exhibited at Antwerp in 1894, as the Nova Scotia exhibit of fruit; and under the able and judicious management of Prof. Saunders, who has charge of preparing the exhibit, we may expect a most creditable display of Nova Scotia fruit.

In order to afford the world further proof of the importance of Nova Scotia as a fruit producing country, our worthy Secretary compiled and edited a pamphlet, entitled "Profits and Cost of Fruit Growing in Nova Scotia," ten thousand copies of which were printed—five thousand distributed at the World's Fair; two thousand distributed in Europe by the agents of the Canada Pacific railway; one thousand distributed in London by the W. & A. Railway Company; one thousand will be sent to Antwerp for distribution, and the remaining one thousand copies are being distributed in Nova Scotia.

Our exhibit of fruit at the World's Fair, and the judicious distribution of these pamphlets, have done more to bring the fruit industry of Nova Scotia before the world, and open up new markets for our fruit, than any previous effort of this Association, and beneficial results will be realized in the near future.

The expense of publishing the pamphlets and the cash outlay of collecting and exhibiting the fruit, was paid by the Nova Scotia Government. The cost of bottles and acids, expressing, care-taking,

and general expense of fitting up exhibition, etc., was paid by the Dominion Government, and this Association is under great obligations to both governments for having relieved us of any loss of funds in making this exhibit; and we, who have devoted much of our time during the last eighteen months to this exhibit, and the fruit growers who contributed fruit, have our reward in having demonstrated to the world the superior quality of our fruit, and the advantages of Nova Scotia as a fruit growing country.

The report of the chairman of the committee appointed to establish a School of Horticulture, will fully explain this subject, and I need only add that after having over 400 new members on the promise of establishing said school, and in answer to our petition, the Nova Scotia Legislature passed an act granting \$2,000 for the support of said school if 40 regular students attend, or *pro rata* for each student. The petitions to the Dominion Government for a grant to establish an Experimental Fruit Station in connection with the Horticultural School, will be presented to said Government as soon as parliament meets, and a similar amount from that source may be reasonably expected.

At a joint meeting of said committee and the executive committee of this Association, it was unanimously resolved to establish said school at Wolfville, under the control and management of the executive board of this Association, and employ Prof. E. E. Faville, B. Sc. A. of Ames Horticultural College, Iowa, who bears the highest testimonials both from the College and State authorities, as teacher of said school; and as a School of Horticulture is considered indispensable in every fruit growing country, its advantages can not be overestimated by every member of this Association, and it is to be hoped that all will join in making it a success, and of immense benefit to this country. In reviewing our history in fruit culture during the past year, we have as usual been blessed with a good crop of all small fruits, which have been sold at remunerative prices; and while the apple crop of this continent is estimated at 20 per cent., ours will reach 50 per cent. of superior fruit, and at present high prices will be the most profitable crop harvested in this country; and it again demonstrates the superiority of Nova Scotia over any other part of North America for apple culture.

Let us render thanks to Divine Providence for the many great advantages we enjoy as a province, and each do our share in improving

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On motion
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Mr. President

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those advantages, and developing our resources for the future well-being of our inhabitants.

On motion the President's address was received and adopted by the Association. MR. R. S. EATON then read the following valuable paper:

NOTES OF THE YEAR.

Mr. President, Ladies and Gentlemen:—

I take the earliest possible opportunity of congratulating, most cordially, the President and this Association for the honours won by our fruit display at the World's Columbian Exhibition, and for the Horticultural School, which has been established under such favourable auspices in our Province. We have great reason to be proud of the decided advance made this year in our Horticultural interests. These two important events will, no doubt, receive the attention they deserve during these meetings. Canada's best fruit paper, edited by Mr. Woolverton, who had charge of the Canadian exhibit at Chicago, says in the November number:—

“The fruit display made by the Nova Scotia Fruit Growers' Association during the month of October at the World's Fair, in charge of the excellent President, Mr. J. W. Bigelow, was most creditable to that Province. An excellent plan was the massing of varieties. At a World's Fair little attention is given a single plate or two of a variety, however fine, but when Nova Scotia set a hundred plates of attractive Gravenstein apples alone, and erected an elegant monument of magnificent Kings, from the Annapolis Valley, it was no wonder that people stopped and admired, asking many questions of Mr. Bigelow, and then passed on saying that it was the finest exhibit they had seen in the building.” This speaks for our fruit, and its arrangement made by our President.

While working among the fruit trees during the past year, talking with others interested in Horticulture and reading the different experiences brought by the fruit papers, some points have presented themselves which were not touched upon last year, and which in response to the request of the President and Secretary for a paper on this occasion, I thought might be interesting to refer to.

The *model* or *ideal* apple tree is undergoing a change in the minds of our best thinking orchardists. The splitting of crotched trees in the Autumn winds and heavy fruiting is making fruit growers favour

the central stem and horizontal branches, like the spruce tree, rather than the vase shape where three or four branches open out from the main trunk at five or six feet from the ground, making acute angles with the line of central stem. The nearer a right angle a side branch makes with the main stock, of course the stronger the joint. This pyramidal or spruce tree shape should be given to the tree when in the nursery by letting the central stem have its own head, instead of clipping it to induce side growth.

The question was asked a few days ago, as to whether or not the allowing of oats to grow around young trees would cause the trees to show signs of *black heart*. From the stunted and enfeebled condition which the trees would quickly assume through the lack of cultivation, it would be very much more susceptible to any disease, but the mere growing of oats would scarcely cause black heart. I did observe, however, a few years ago, that some trees which had been transplanted from the nursery in a perfectly healthy condition without the least appearance of black heart, showed it very plainly in the spring of the second year from transplanting. I am fully persuaded now, and my experience has been corroborated by others, that the cutting of *large side* branches from the main trunk *in winter*, and thus exposing the fresh wounds to severe frost, will cause the trouble. Invariably when the bark of a young tree shows that the black sap has been oozing down it from a wound where a limb has been taken away, an examination of the tree will show that the heart is black, and since in *tree* life once a black heart, always a black heart, it is little use to patch up the exterior.

It has been found during the past summer that the nursery trees that were cut by the hail storm of '92 have been damaged beyond recovery, largely by this black heart. I am indebted to Prof. Craig, of Ottawa, for this point about grafting, viz., the necessity of having the scion less forward in its growth than the stock. Had I realized this a year ago it would have saved me at least \$100. If scions are cut in winter or early spring for indoor use, great care must be taken not to let the buds start. Dry sawdust or forest leaves make a good covering, but the scions must be kept cold. If the ends are "heeled in" on the north side of a building where they will not be exposed to the sun, they will probably be safe until quite late in the season. Stock which is grafted and "heeled" in the cellar awaiting the spring

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planting should be kept as cold as possible and not wet. Prof. Baily says in his nursery book, that if the scions start in the cellar *they are gone*, and I have proved it to be true.

From my experience with liquid grafting wax and paint as covering for wounds, I am very much in favour of thick paint. A can with a hook on it can be easily carried in the tree when one is pruning.

Because our weather was particularly dry and fine during the early part of last season, when the fungous germs would have been commencing to form the black spots on our apples, we must not feel assured that we are going to escape spotted and cracked fruit next year. This work of spraying is far from being an experiment and although it is talked about a little each year, I fear we are going to suffer from the consequences if we do not soon give more real attention to it. After noticing carefully the evidence coming from the United States and Ontario, I find the concensus of opinion only substantiates *most emphatically* the use of the dilute Bordeaux Mixture, (4 lbs. lime, 4 lbs. sulphate of copper and 50 gals. water), which Prof. Craig made so plain to us last year. Prof. Green, of Ohio Experimental Station, states that the increase in market value of fruit from sprayed over unsprayed trees was from \$25 to \$28 in every hundred bushels. Prof. Taft from Michigan, has found that from 50 to 75 per cent. more fruit, free from scab, on the trees sprayed than on those unsprayed. Mr. Ford, a prominent fruit grower of Ohio, states that a fair examination was made of 100 apples from sprayed, and 100 from unsprayed trees. On the sprayed trees were 85 perfect apples, 8 seconds, 7 thirds; on the unsprayed there were 4 perfect, 58 seconds, 38 thirds.

In our own Province we have an orchardist to whom we are much indebted for valuable experience in spraying, Mr. Wm. Hardwick of Canard. Apart from the black spots he has made two important discoveries. The first is, that the Bordeaux mixture has had a particularly cleansing effect upon the upper branches, which, we know in every orchard, are more or less covered with mossy fungi. The second is perhaps more important still. He found that by increasing the number of pounds of lime in a fifty gal. cask of water, from 4 lbs. to 8 lbs. or more, that not 4 oz. of paris green, the orthodox amount—but 16 oz. and more can be used without the slightest injury to the foliage. I wish to lay special emphasis on this point, for in our work

of handling the codling moth, canker worm, and leaf roller it is going to be of immense value to us. It is very fortunate, too, that this excellent insecticide is also a good fungicide, Prof. Lodeman of Cornell, says that an examination of paris green shows 25% of copper, the base as we know of the Bordeaux mixture. Mr. Hardwick has found the Bordeaux mixture of great value in spraying pear trees.

We hear almost daily this libel against the apple tree; that it takes fifteen or sixteen years before it bears any paying quality. Do we consider that there should be as much difference between trees that are *well* cared for, and others that are not cared for, as we see in animals that are treated with different degrees of care. It is not an uncommon sight for us to see a three year old steer that will dress 300 lbs., we have all, too, seen numbers of three year old steers that would dress 600 to 800 lbs. We know what makes this difference, but do we realize that care and food will make the same difference in an apple tree. How are the young trees cared for that are planted in even our best farms in the Cornwallis Valley? It would be considered by most growers that they had been well cared for if they had been planted in a field where they would get the same cultivation as potatoes for two years, then the field would be two years in grain and hay, the fifth and sixth in potatoes, seventh and eighth in grain and hay, and so on. The ground near the trees would receive no more fertilizer, or cultivation than any other part, and potatoes, grain and grass would on the soil over the roots of the trees. Suppose the steer were given barely enough food and care to sustain life, and irregularly at that, how would he grow? I hear some say the analogy is not a correct one, for the tree takes its food when the ground above is in grain and hay. I doubt it very much, for without the moisture and air which the tree can only have when the ground is clean and stirred, the fertilizer will never assume the condition necessary to become available for the roots. If we make an examination of the tree at the end of the fourth year from planting, in what condition do we find it? The bark will be mossy and rough, the growth for the third and fourth years will be from 2 to 6 inches, when it ought to have been 12 to 18 inches at least. Any one driving through the best fruit districts of this county will be able to observe, even from the highway, that though the apple trees may appear regular in their planting and symmetrical in their form, yet they will almost invariably have the stunted appearance I speak of. Is it any wonder that

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trees do not come into bearing till they are a sixth of a century old. The most of us have seen what trees will do when they have had respectable care. Mr. Hanson, Kentville, has a Gravenstein apple tree in his garden that he obtained from Mr. T. E. Smith nine years ago last spring, which has had just ordinary garden care. It was a very ordinary tree when planted. I have watched it each year. The fifth autumn, Mr. Hanson took exactly half a bbl. of apples from it. The seventh autumn he took a full barrel, and last autumn a barrel and a half of No. 1's. Had it been Baldwins, Ben Davis, or Hulbert, I believe the crops would have been as large. Mr. James Blanchard, of Upper Dyke Village, has a young orchard seven years old which he has taken good care of. When it was five years old, a large portion of the orchard averaged a bushel to a tree. The crop of the sixth year was much larger, and, but for the heavy gale the crop of the seventh year would have been over a barrel to a tree. The field was cultivated each year for some root crop, and the trees were well fed. I believe that even better results than these can be obtained and on a larger scale.

Here is another pertinent question! Are our older orchards producing as much as they should? If not, why not? I believe the trouble is just here. They are not taken care of, or not fed sufficiently. If a good potato grower wants to get 200 to 300 bushels of potatoes per acre, he will give his field 20 loads of stable manure to the acre, and he will do it every year he wants to get a good crop of potatoes. Further he will be satisfied to get a good crop of potatoes off of that field. He will not try to get a good crop of barn grass, couch and pig weeds, between the rows. No, he says, one crop is enough. I will be satisfied with the potatoes, and I will be satisfied with 35 cents per bushel for 200 bushels to the acre, or \$70. But how is it with his apples? Is he satisfied to get one crop in his orchard, and does he apply 20 loads of stable manure to the acre every year? Oh, no! his apple trees must average 2 barrels each, or 80 barrels per acre, and give him \$160, and if he gives it a fair coat of manure he must have a potato crop out of it too. The next two years he must get a crop of grain and hay without giving any fertilizer, and wonder is expressed if his apple trees do not bear a good crop every year, or every other year, and that his apples are spotted, wormy and small. This is no exaggeration. This is exactly the way 99 per cent of the orchards in this country are treated. Fertilized once or twice in four years,

and a crop taken from the soil each year, besides the fruit from the trees. Are we not imposing upon our benefactors? Let us beware lest they resent it. Nature has done much for us in the adaption of our soil and climate. We are proud of our fruit trees. We say that we could hardly farm without them, and yet this is the way we treat them, and allow them to get so coated with moss and vermin that we can hardly see a piece of fresh bark. What would our orchards do for us if we treated them *yearly* the way we treat our potato fields when we want 300 bushels per acre, or \$105. Give them the same amount of fertilizer and we might reasonably expect at least an average of 3 barrels to a tree, or at \$2. per barrel for 120 barrels, \$240 per acre, with far less work than would be connected with \$105 worth of potatoes.

Further, I have often heard some of our best farmers advise that if a man has fertilizer enough at his barn for, say 10 acres of ground that he had better divide it, putting one half in his 10 acre bearing orchard, and the other half in his 10 acre potato field, in order that he may not have "all his eggs in one basket." Now, I ask if our apple crop would not be just as sure as our potato crop, if our trees were decently cared for? If so the above advice would be as practical as to propose distributing over twenty acres of potato ground the fertilizer that would be only enough for 10 acres.

If a farmer has no bearing orchard, let him grow potatoes, there is nothing that will pay so well in this country. But if he has an orchard old enough to give a good crop, let him take care of it, keep his trees clean and well cultivated, and if he has only fertilizer enough for 12 or 15 acres, and he has that acreage of orchard, let him put every particle of fertilizer in his orchard and leave the potatoes alone. Considering the less amount of labour an orchard requires compared with the same acreage of potatoes, his net profits, I think, will be ever so much larger. Besides, condensation is the order of the day whether in regard to brains, labour or fertilizers. We should work for the maximum amount of net proceeds from every acre. In this direction a very important change can be brought about. I think, relative to the annual bearing of even our heavy fruiting trees such as Gravenstein and Baldwin. Indisputable testimony can be given to show that by fertilization, cultivation, thinning of wood and fruit, and spraying, these trees can be made to bear regular crops of exclusively first grade fruit.

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I am exceedingly pleased to be able to congratulate Mr. A. S. Banks of Waterville, on the attention and praise which his Red Gravensteins received at the World's Fair. Enough was said in their favour to warrant us propagating extensively either this variety of Gravenstein or something better if we have it. There are a few trees in this Valley that are growing a Gravenstein much redder than the ordinary and not quite as deep a red as Mr. Banks, and which I personally like better, but it is not proved yet, I think, that this fruit will be reproduced if grafted into other trees. As the great fault with our Gravenstein is its lack of colour, this subject is worth our looking into. I understand that Mr. T. H. Parker grows some Ribston Pippins that are an improvement on our ordinary stock.

The question of giving up the King of Tompkin apple is under consideration. It is a pity that an apple so popular in the market, and one, which a few years ago was grown with success, should be allowed to drop out of our list without some experiments to restore it to its former good bearing qualities. It is very susceptible to the black spot, but that trouble can now be overcome. Can we make it produce well? We cannot say that it is running out. The Ribston Pippin, so good to-day, was discovered in England 200 years ago. The Jenetting was known in 1660. But here is a statement from the eminent American orchardist, Mr. Geo. T. Powell, before the Horticultural Society of New York last winter, regarding the Spitzenburg, that may put us on the right track, or at least is worth some consideration.

"The past year I have produced a third heavy crop of Spitzenburgs from the same orchard, three years in succession. The branches reached the ground, and the fruit lay upon the ground. And this from trees that for 10 or 12 years previously had not produced anything like paying crops. Four years ago I commenced to apply twice as much fertilizer as I did any others, stable manure and hard wood ashes. In addition, we have persistently sprayed with Paris Green and Bordeaux Mixture. In none of my orchards have I had more luxuriant foliage than on these trees, and I attribute it to the spraying. This is my experience, and I have great faith in the Spitzenburg, and I believe the same result can be obtained for other varieties."

PEACHES.

A grand start has been made in the peach industry by Mr. Archibald and a few others. When we know that the more tender varieties, such as Early Crawford are doing well, we need have no fear for the hardier ones. A list of those recommended by Mr. S. D. Willard was given last year. Since then I have been watching for testimony regarding the new peach, Crosby, started and grown largely by Hale Bros., Connecticut, who calls it the "Frost Proof Peach," and claim that it is the best peach in America. Some very reliable authorities speak highly of it, and I am convinced that it is worthy of a trial with us. We know that the Alexander does exceedingly well for Mr. Patriquin. The Elberta is a popular variety where hardy varieties are needed.

As to the early profits from peaches the few following figures will show: Captain Cox, of Canard, has taken three good crops from three Early Crawfords, six years old; this year over \$26 worth from the three trees. Mr. Merry, of Church St., took a half bushel of peaches from a tree the third year from planting, a good crop the fourth year, and I think $1\frac{1}{2}$ bushels the fifth year. A late copy of the *Rural New Yorker*, gives an account of a young orchard of six acres from which was taken \$300 worth of peaches last year, the *fifth* from planting.

With regard to *plums*, a growing interest is being manifested by some successful potato growers, who have been very conservative towards any fruit, even the apple. This is a good symptom. We all know what fine profits have been made by Messrs. Miller, Archibald, Johnson and Patriquin. The question is, what varieties shall be planted. If we had had our Horticultural School and Experimental Farm here ten years ago we would have much more light on the subject. Mr. G. C. Miller has made a splendid success of the Lombard, and Mr. Archibald of Moer's Arctic. But there are other plums, if they will succeed here, that are ahead of these in style and quality. I gave last year a list that Mr. S. D. Willard recommended. I have seen these approved by many others. Of the new varieties being tested, Mr. Willard has great faith in some of the Japan plums. But of four of these which are recommended, I find that the testimony is strongest for the Burbank. A colored plate and description of the plum is given in the last issue of the *Canadian Horticulturist*. Prof.

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Baily, of Cornell, says, "it is one of the handsomest tree fruits he has ever seen." Mr. Willard speaks as highly of it, and says he has had them, when ripe on the tree, at the rate of 100 to the square foot. There has been no evidence of black knot on any of these Japan varieties, and they will stand the thermometer at 20 below zero.

CHERRIES.

I believe we have one of the best climates in North America for Cherries. Cherry rot, the great enemy of the sweet varieties, is unknown here. Our trees are scarcely ever troubled with black knot. The new varieties that are being highly recommended are the Windsor, the Mercer, and the Cyclone. I think that none of these have been fruited in Nova Scotia. Mr. Willard says of the Cyclone, "it is exceedingly large, colour somewhat like Gov. Wood or Rockport, size and quality better than either."

This very practical paper was received with much applause by the Association.

The PRESIDENT said there were many points in Mr. Eaton's paper that should be discussed by the meeting. As Prof. Saunders was present to address the Association, they would listen to him now and take Mr. Eaton's paper up at a later hour.

PROF. WM. SAUNDERS, Director of the Dominion Experimental Farms, delivered the following instructive and comprehensive address :—

THE LIFE HISTORY OF AN APPLE TREE—WHAT AN ORCHARD TAKES FROM THE SOIL, AND HOW THIS MAY BE RESTORED.

Much of the success of every man, in every department of life, depends on how well he understands his business; and the man best fitted by long experience and a practical knowledge of all the details in connection with his work, will usually, all other things being equal, achieve the larger measure of success. This is a principle distinctly recognised in all other callings, and is at last beginning to be regarded as of some weight in connection with the occupation of the farmer and the fruit grower.

The laws protect the public from imposition by the charlatan who would palm himself off as a professional man, and no one would

think of employing an inexperienced man for any important work he had in hand.

In regard to the cultivating of the soil and the growing of all sorts of crops, the crudest experience, intermixed with all sorts of vague and superstitious notions, has been regarded by many as a better guide than the teachings of science. All this, however, is fast passing away and the intelligent farmer and fruit grower of to-day is a willing listener to anyone who can give him information in reference to his calling, and is eager to learn how he may improve his methods so as to carry on his work with greater profit.

On this occasion when addressing an audience so deeply interested in everything pertaining to fruit and fruit culture, especially of that of the apple, I might profitably occupy a portion of the time allotted to me by presenting some points in connection with the life history of an apple tree, and the circumstances most favorable to the accomplishment of the main object of its mature existence, that of the bearing of good crops of fruit. Come with me in imagination into an orchard in the morning of a bright summer day in the latter part of May, when the air is laden with the fragrance of spring flowers. The process of preparation, which has slowly but steadily progressed during the previous year in connection with the development and growth of your apple trees, has resulted in the formation on the branches of a multitude of buds all systematically arranged in harmony with certain botanical laws which we have not time now to explain. These buds are of two classes, leaf buds and blossom buds. The leaves are pushing rapidly, the tree is already tinted with the fresh green growth and the blossoms are just bursting in all their freshness and beauty. What delicate shades of pink and fresh color we find in this charming apple blossom, blended in delightful harmony. Everything in nature has some special office, and every part of this beautiful blossom has its own purpose to serve. Let us examine its several parts.

THE OUTER COVERING OR CALYX

is green and divided into sections or segments; it serves as a covering to the flower before it opens, and as a support to the blossom after it has expanded. It also assists in protecting the embryonic seeds after fertilization has taken place and is partially retained on the mature fruit, forming what is known to pomologists as the calyx end of an apple.

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THE COROLLA OR FLOWER PROPER

also consists of several divisions, which, in this instance, are equal and symmetrical, and protect the sexual organs before the flower is opened. When expanded the flower attracts not only the attention and admiration of mankind, but, what is of far greater moment in this instance, the attention also of the busy tribes of insects. In serving their various offices in nature they wander from flower to flower, and while sipping the sweet nectar stored at the base of the blossom, or feeding on the superabundant pollen, unconsciously carry with them, on their legs and wings, pollen from the anther of one flower and deposit on the sticky surface of the pistils of another flower. When a minute pollen grain is placed in contact with the pistil, it sends out a tiny thread-like growth, which, piercing the soft succulent substance of the pistil, gradually lengthens until it reaches the ovary. It enters forcing its way until the ova fertilizes them; here we begin with the life history of our future apple tree.

The fruit grows and ripens. A thick fleshy covering, the edible part of the fruit, encloses the central core, in one of the divisions of which is contained the particular seed with the history of which we are concerned. The apple eater disposes of the refreshing, acidulous and aromatic covering, and preserves the seed for sowing. Let us examine this seed, commonly called

AN APPLE PIP.

Of what does it consist? It has a tough dark colored coating which protects the white meaty substance inclosed. This, when opened, is found to consist of two equal halves, composed of albuminous and other substances, easy of assimilation by young plants, having at one end a tiny germ wherein is stored the principle we call life, and on the preservation of which all the future history of the apple tree depends. Nature, although in other ways sometimes apparently profligate with germs, has made careful preparation for the preservation of these, on each of which is stamped a remarkable individuality which regulates the form and character of the future tree as well as the quality of all the fruit it will hereafter bear. This living germ is so placed that when aroused from its condition of stupor by favorable conditions of warmth and moisture, it begins to grow. At first feeding on the store of food provided for its use in the seed, it develops a descending root, which strikes into the soil, also an ascending stem

which ruptures the tough seed cover. Leaving the seed cover in the soil, it carries the two halves of the seed to the surface, and appears above ground as a plant with two thick fleshy seed-leaves or cotyledons, at first whitish but under the influence of sunlight soon changing to green. On the contents of these seed leaves

THE YOUNG PLANTS

continues to feed until its roots have sufficiently developed to enable it to draw nourishment from the soil. Then its growth becomes more rapid, the seed leaves emptied of their contents, soon wither and fall to the ground, and in the course of a single season we have a thrifty young apple tree with a single stem sometimes a foot, and sometimes nearly two feet in height. While this rapid growth has been going on above a corresponding development has been in progress below, which has resulted in the production of an extensive root system of many fibres. Radiating in all directions, these have been drawing through the tips of their rootlets from the soil the plant food necessary for the growth of the young tree. We may for a time leave our seedling apple-tree now well established and enquire into the nature of the medium in which it has been placed, which we know as soil.

WHAT IS SOIL?

All soils are the result of the disintegration of rocks by the forces of nature, and the intermixture therewith of organic matter resulting from the decay of animal and vegetable remains. They vary much in fertility, partially owing to difference in composition of the rocks from which they have been formed, partly to the variable proportion of organic matter they contain, and partly to their mechanical condition and texture. These variations are commonly distinguished by special terms such as clayey, loamy, sandy or gravelly soils, indicating the larger proportions of their bulk. Soil is a resting place for the seed where in due season it finds appropriate nourishment. It may also be defined as Nature's great store-house of fertility, where untold treasures are laid up for man's use of far greater value to national life than silver or gold. It may further be regarded as

SAVINGS BANK RESERVE

for the farmer and fruit grower, which by judicious treatment may be conserved and added to, or by careless and injudicious management may be prodigally wasted. Fortunately, soil only parts with its

fertilizing constituents in a soluble form more available for the use of growing plants. A large proportion of the soil which the farmer cultivates is available gradually for the beneficial action of

The productiveness

and of drawing by the roots from below. Water, and less carbonic acid gas, are used to convey food to the plant. It holds much more moisture than is required for cultivation and therefore retaining moisture and evaporation lessened.

There are many different positions of every soil for living plants. Of these is the store of such contents

There are, however

which plants take in which must sooner or later continued good crops a *Acid, Potash.* All and usually in consist

It is estimated that on average, 3,600,000 tons are calculated from the soil of not less than 5,000 more than that. They vary from about 3,000,000 to 8,000 pounds. From the chemist of the Expt

fertilizing constituents gradually. There is always present in a soluble form more or less plant food which is immediately available for the use of growing plants. On the other hand, there is always a large proportion of the elements of fertility, the immediate use of which the farmer cannot command, and which can only be made available gradually by frequent and thorough cultivation, and the beneficial action of air and frost.

The productiveness of a soil also depends partly on its

POWER OF HOLDING WATER,

and of drawing by a sort of capillary attraction supplies of moisture from below. Water, which in the soil is usually charged with more or less carbonic acid gas, is the universal solvent which nature employs to convey food to the rootlets of plants. A good loamy soil will hold much more moisture than either clay or sand, and by good cultivation and thorough working, the power which every soil has of retaining moisture may be increased, and the loss of water by rapid evaporation lessened.

There are many mineral constituents which enter into the composition of every soil, and quite a number of these are taken up by living plants. Of many of them the quantities used are small, and the store of such contained in the soil is usually very ample.

There are, however,

THREE INGREDIENTS

which plants take in comparatively large proportions from the land which must sooner or later in some measure be restored to it if continued good crops are to be had. These are *Nitrogen*, *Phosphoric Acid*, *Potash*. All arable land contains these important ingredients, and usually in considerable proportions.

It is estimated that an acre of soil a foot deep weighs, on an average, 3,600,000 pounds, and that good ordinary loam in Europe, calculated from the results of many analyses, will contain an average of not less than 5,500 pounds per acre of nitrogen, and sometimes more than that. The quantities of phosphoric acid in the same area vary from about 3,600 to 6,000 pounds, and potash, from 5000 to 8,000 pounds. From the analyses which have been made by the chemist of the Experimental Farms, Mr. F. T. Shutt, during the

past three years, some of the samples being representative of large areas, it would appear that

THE SOILS OF CANADA

compare favorably with those of Europe in their richness in these important constituents. Seventeen samples analyzed from different parts of the Eastern Provinces, supposing the fertile soil to have a depth of nine inches, have averaged as follows: nitrogen, 6,247 pounds; phosphoric acid, 5,040 pounds, and of potash, 10,500 pounds. Thirteen samples from different parts of the Northwest plains have also been submitted to analysis. These soils average deeper, and may safely be estimated at twelve inches. On this basis they show an average in nitrogen of 10,114 pounds per acre, phosphoric acid, 6,040 pounds, and of potash, 10,500 pounds. Trees take a very large part of their substance

FROM THE AIR.

The carbonic dioxide or carbonic acid gas which animals are everywhere exhaling into the atmosphere, is seized by plants, and converted into woody tissue and starchy and other carbonaceous matters which are so necessary for the food and use of animals. If you burn a piece of applewood weighing 100 pounds you will find as a result a small proportion of ash, usually less than two per cent. The combustible matter destroyed has all been taking from the air a small proportion of nitrogen. Those ashes are said to contain about $3\frac{1}{4}$ per cent. of phosphoric acid, and a much larger proportion of lime. This is according to the analyses of Erdiann in Germany, and on this basis an apple tree would take from the soil for the production of 100 pounds weight of wood, estimating the ash at two per cent., less than one ounce each of potash and phosphoric acid, and probably not more than three or four ounces of nitrogen. This is all of the important fertilizing constituents of the soil which the trees take up for the production of 100 pounds in weight of its woody frame during the whole period of the growth required to produce that weight.

Let us next consider

THE CONSTITUENT PART OF THE LEAVES

which, however, are eventually all returned to the soil by their fall and gradual decay. The leaves of several varieties of apples have been analysed by the chemist of the Experimental Farms at different

stages in their growth. On the 25th of May, when the leaves contained on an average a fraction less than $\frac{1}{4}$ of their weight in nitrogen, a fraction over a $\frac{1}{4}$ of

The mature leaves were found to contain, when compared with the percentages of nitrogen and phosphoric acid. The leaves contained nearly $\frac{1}{10}$ of one per cent. of phosphoric acid in each 100 pounds

If we examine

we find it to consist of a residue which is the compressed carbonaceous matter of the seeds, and a small amount of other materials. The proportion of nitrogen is about 1 per cent., although the whole of this. The proportion of phosphoric acid which is the acid part of the leaves contain less than $\frac{1}{4}$ per cent. contain from 1 to 1.5 per cent. to contain about 1 per cent. Greening at the same time the process goes on the leaves increases, and R. I. leaves contain more than 1 per cent. of nitrogen. In different varieties of apples about 1.2 per cent. of phosphoric acid. The water with a little nitrogen, excepting the water, is taken from the atmosphere during the formation of this matter.

will be found the cellular structure of

stages in their growth, with the following results: Gathered on the 25th of May, when they were not fully expanded, each 100 pounds contained on an average about $\frac{3}{4}$ of a pound of nitrogen—(.742) a fraction less than $\frac{1}{4}$ of a pound of phosphoric acid—(.248) and a fraction over a $\frac{1}{4}$ of a pound of potash—(.252).

The mature leaves collected on the 20th of September were found to contain, when compared with the newly expanded leaves, larger percentages of nitrogen and potash, and smaller proportion of phosphoric acid. The nitrogen was present in the proportion of .867, nearly $\frac{9}{10}$ of one per cent.; phosphoric acid, .104, or nearly $\frac{1}{10}$ of a pound in 100 pounds; and the potash, .392, or nearly $\frac{4}{10}$ of a pound in each 100 pounds of the leaves.

If we examine

THE FRUIT OF THE APPLE

we find it to consist mainly of juice, and when this is expressed, we have a residue which cider makers call pomace, composed mainly of the compressed cellular structure of the fruit with the cores and seeds, and a small remaining proportion of juice and flavoring materials. The proportion of juice in apples will average about 80 per cent., although it is not possible in cider making to recover the whole of this. The juice contains varying proportions of malic acid, which is the acid principally in apples. Sweet apples sometimes contain less than $\frac{1}{4}$ per cent. of this acid, while the sour varieties contain from 1 to $1\frac{1}{4}$ per cent. The Baldwin apple has been found to contain about 1 per cent. when tested in October, and the R. I. Greening at the same time about $1\frac{1}{4}$ per cent. As the ripening process goes on the proportion of ashes diminishes, while the sugar increases, and R. I. Greenings analysed in December have given less than 1 per cent. of this acid. The proportion of sugar varies in different varieties and at different periods of ripeness, from 6 to about 12 per cent. Beyond these ingredients, the juice consists of water with a little flavoring material. Everything in the juice, excepting the water, is compounded by the plant from the gases taken from the atmosphere, and hence there is no drain on the soil in the formation of this material.

IN THE POMACE

will be found the cores and seeds with the skin and the compressed cellular structure of the fruit. The seeds are especially rich in

nitrogen, and their formation and maturing is a considerable tax on the vital forces of the tree. For this reason heavy crops exhaust the tree very much less if the fruit be thinned. In apple growing this is in every sense economical, for when a heavily laden tree is thinned the fruit produced is much improved in size and quality, and hence commands a higher price, while the vigor of the tree is less impaired and its productive capacity for the future economised and increased.

Apple pomace is found to contain, as it comes from the cider press, in every 100 pounds, as shown by the analysis of Dr. Goessman, of Amherst, Mass., about $4\frac{1}{2}$ ounces of nitrogen, about 2 ounces of potash, and less than $\frac{1}{3}$ of an ounce of phosphoric acid.

The question is often asked as to

THE FOOD VALUE OF APPLES FOR STOCK.

Much will necessarily depend on the condition of ripeness of the fruit, also on the variety of the apple from which the supply is to be furnished. European authorities consider the money value of the fodder constituents in ordinary varieties of apples and pears as somewhat higher than those contained in an equal weight of turnips, and those of the apple pomace as about one-third higher in feeding value than the whole apple, which has served for its production, and about equal in value to sugar beets.

Where apples are fed to stock they should be given in moderate quantities, and should be liberally supplemented with more nutritious and more highly nitrogenous food, such as bran, shorts, or oil cake, with a fair proportion of hay.

A HINT TO NURSERYMEN.

It is now time that we returned to our yearling apple tree, which we left standing as a single slender stem from one to two feet in height. The second year it makes a nice stocky, well-branched little tree, and if left to itself, and not crowded for space, will always make a low-branched, stocky tree. These leggy, top-heavy trees, such as some nurserymen too often send out, are usually the result of high stimulation and overcrowding in the nursery rows. After three years of growth in the dense shade of their fellows, they are dug up and sold to be planted out thirty or forty feet apart. There the tender bark of the long naked trunk, which has seldom seen much sunshine before, is exposed all seasons to the action of the hot sun,

alternated by bleak changed conditions of disease of the tender given sufficient space branched, the lower bark, and thus serv

Eight or ten years resulted from the maturity to bear fructification of apples worthless thing. Until it has been tested seeds of cultivated variety in nature is

A HEAD

Supposing that secured in the new ten years more will and with ordinary What the full per cent difference of opinion sometimes bring on Much depends on had. If properly duration to that of child which first germinated become be so seared, weather probability be desirable young and vigorous

Let us consider

in producing the weight needed to produce the estimate the weight ten hundred pounds

alternated by bleak winds and frosty nights. The results from these changed conditions are too often sun-scald or some other serious disease of the tender, succulent bark. Where young trees have been given sufficient space in which to develop, and are sent out low-branched, the lower branches afford shade and shelter for the tender bark, and thus serve to protect it from injury.

NATURE'S INFINITE VARIETY.

Eight or ten years must pass away before the tree which has resulted from the planting of our apple pip has reached sufficient maturity to bear fruit. Then our hopes may be realized by the production of apples of fine quality, or the seedling may be a sour, worthless thing. There is no way of telling how it may turn out until it has been tested. No two varieties of apples grown from the seeds of cultivated sorts will ever be in all respects alike. The variety in nature is infinite.

A HEALTHY TREE LIVES AS LONG AS A MAN.

Supposing that all has gone well with the tree, and we have secured in the new variety a good and useful sort of fruit, eight or ten years more will bring the tree into the full vigor of its growth, and with ordinary care many years of usefulness are before it. What the full period of mature age in an apple tree is, there is great difference of opinion, but bad usage and privation, as with us, will sometimes bring on with a weakening constitution premature old age. Much depends on the variety, and on the care which the tree has had. If properly looked after, its life will probably be equal in duration to that of the average healthy, vigorous man, and when the child which first saw the light about the time that our apple pip germinated becomes gray and feeble with age, the old tree will also be so seared, weather-beaten and hollow-hearted that it will in all probability be desirable and profitable that it should give place to a young and vigorous specimen of its race.

Let us consider what an acre of such trees will probably

TAKE FROM THE SOIL

in producing the woody frame-work, also the fertilizing constituents needed to produce the annual crop of fruit and foliage. Suppose we estimate the weight of the trunk and branches of an average tree at ten hundred pounds, which is only a rough guess, and that we have

seventy of such trees on an acre. These on the basis of the calculation we have given will have taken from the soil to produce their wood growth about two to three pounds each of nitrogen, or 140 to 210 pounds in all, and not more than ten ounces each of potash and phosphoric acid, or about 44 pounds of each of these elements for the full acre. As this is the entire consumption of these important constituents of the soil during the whole period of the life thus far of the acre of orchard, for its wood growth, this small proportion can be easily supplied by the poorest soil without severely taxing its capacity. It is, indeed, wonderful that so great a growth can be brought about with so small a consumption of fertilizing material. This may well serve to lessen the astonishment one often feels at seeing a thrifty and vigorous forest tree growing in the crevice of a rock where it would seem that but little nourishment could possibly be had from the small quantity of soil available to its roots.

As the leaves of the apple tree are always allowed to fall on the ground, where they gradually decay and are returned to the soil, the full quantity of fertilizing constituents they take from the land need not be considered here. It will be a fairly liberal estimate if we take half the quantity as requiring to be replaced. I know of no estimate which would guide one in ascertaining the approximate weight of leaves on a full sized apple tree, but supposing we guess it at 100 pounds, we shall then consider the fertilizing ingredients which enter into 50 pounds of apple leaves for each of the seventy trees. These taken at their maturity will be found to contain about 31½ pounds of nitrogen, 14 pounds of potash, and about 7 pounds of phosphoric acid.

Supposing the crop to average annually two barrels per tree, each barrel containing 120 pounds of apples, we should have for the seventy trees an annual production of 16,800 pounds, which would take from the soil yearly about 19 pounds of nitrogen, 8½ pounds of potash, and less than 1½ pounds of phosphoric acid. Adding to the fertilizing constituents required for the fruit those necessary for the production of half the annual crop of leaves, we have:—

	LBS.
Leaves, nitrogen	31½
Fruit, "	19
	—
Total	50½

Leaves, potash	
Fruit, "	
	Total
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	LBS.
Leaves, potash	14
Fruit, "	8½
Total	22½
Leaves, phosphoric acid	7
Fruit, " "	1½
Total	8½

If the fertilizers which are taken from the soil could be replaced in their original position and evenly distributed just where the exhaustion has taken place, the original fertility of the orchard could be maintained by this small annual addition. But as this is practically impossible, the returns should be much more liberal.

COMPARATIVE VALUE OF MANURES.

Animal manure varies in value, from several causes. It depends somewhat on the animal from which it is obtained; next on the character of the food with which the animal is supplied, and more on the care given to the proper mixing of the liquid with the solid ingredients, and to the proper handling of the material. The solid excreta of sheep stands highest in value, giving per ton of 2,000 pounds nitrogen, 12 pounds phosphoric acid, and 6 pounds of potash. Swine give a manure nearly equal in proportion of nitrogen and phosphoric acid, with about ten pounds of potash per ton. A ton of the solid portion of horse manure contains about 10 pounds of nitrogen, 7 pounds of phosphoric acid, and 6 pounds of potash, and the same quantity of cow manure 6 pounds of nitrogen, 5 pounds of phosphoric acid and 2 pounds of potash. The liquid constituents of the manures of the horse and cow stand much higher in regard to some ingredients, and contain in each ton from the horse, 24 pounds nitrogen, and 30 pounds of alkalies, largely potash; and from the cow, 16 pounds nitrogen, and 28 pounds of alkalies. Hence the statement given by Storrs may be regarded as fairly reliable, that fifteen tons of good half rotted stable manure will supply to an acre of land about 150 pounds of potash and 140 pounds of phosphoric acid. The nitrogen in this quantity of manure would probably average from 200 to 250 pounds. One such dressing every five years, with the occasional ploughing under of a crop of clover or peas, to furnish additional nitrogen, should fully supply the waste which the constant cropping with apples would cause. If barnyard

manure cannot be had, the waste of nitrogen may be entirely returned by the more frequent ploughing under of crops of clover or peas, or the nitrogen may in part be supplied more directly and promptly by giving the orchard a dressing of 200 pounds of nitrate of soda to the acre, which quantity will at once supply about 31 pounds of nitrogen per acre in a form immediately available. The potash taken from the soil may be returned to it by an occasional dressing of unleached wood ashes, which contain from 6 to 8 pounds potash in every 100 pounds. Unleached wood ashes also contain about 2 pounds of phosphoric acid in each 100 pounds.

Thus by ploughing under a crop of peas or clover every second year, the orchardist may return to the soil the nitrogen his crop has taken. Ten hundred pounds of unleached wood ashes per acre would fully restore the potash used during the same period, and about half the phosphoric acid, while the deficiency in this latter article could easily be made up by an application once in three or four years of 300 or 400 pounds of superphosphate of lime per acre.

I trust I have succeeded in making clear to you the important facts I have endeavored to present, and that you will ever bear in mind a maxim, the truth of which should be impressed on the mind of every fruit grower and every farmer—"feed the soil and it will feed you."

REV. H. HOW said he would like to know whether the quantity of nitrogen required by the apple tree could not be taken from the air? If a crop of peas or clover would not be more beneficial in this respect than a crop of buckwheat? I know a great many of our fruit growers who sow buckwheat in their orchards, and I tried it last year and ploughed it in, and I would like to know whether this would be as beneficial to the trees as the clover?

PROF. SAUNDERS. The buckwheat has no power to take nitrogen from the air, and can restore to the soil very little more than it takes from the land. There is a large amount of fertilizing constituents in the soil which is not immediately available to plants. The buckwheat converts a part of this into a soluble condition and acts as a carrier in presenting it to the next crop in a more available form,—in that way it does good, but it does it at the expense of the fertility of the soil; but in using peas or clover nitrogen is taken directly from the air, and when the crop is ploughed under this is given to the land.

MONTAGUE MANNI
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possible?

PROF. SAUNDERS
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PROF. SAUNDERS.
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It is sometimes found
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In regard to the soil
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result was surprising.
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MONTAGUE MANNI
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that would be as good
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MONTAGUE MANNING. I have seen in one or two American papers that buckwheat impoverishes the soil—is such a thing possible?

PROF. SAUNDERS. It is on much the same principle as if two people draw on one account in a savings bank, they will exhaust it more quickly than if only one person drew on it. If you use the buckwheat to bring insoluble plant food into soluble forms for the next crop, a more rapid exhaustion of the soil goes on. It is much in the same way with lime; an immediate increase in crops is usually noticed after its use, but, if continued, it eventually impoverishes the soil.

Q. At what stage of growth should these crops be ploughed under?

PROF. SAUNDERS. Clover is useful at almost any stage because a large amount of nitrogen is stored in its roots—they are very deep and spread through the soil. But it is better to plow a whole clover crop under, as you then have the nitrogen which has been stored in the leaves added to that which is in the roots.

It is sometimes found profitable to turn young pigs in on a crop of peas sown for ploughing under, as there is a great deal of fertilization in their excretion, which they deposit on the soil, and they carry very little away except the carbonaceous matter, which is taken from the air.

In regard to the stage at which peas should be ploughed under, it should be about the time when the first pods are well formed. With peas we can grow two crops in one season, which cannot be done with clover. In an experiment tried on a piece of land at the Experimental Farm at Ottawa, which was in very poor condition, two crops of peas were sown and ploughed under in this way, and the following season a crop of barley was grown on this land, and the result was surprising. The exact area which had been covered by the peas was distinctly marked by the greater luxuriance of growth of the grain crop.

MONTAGUE MANNING. I presume the more spreading the pea is, the better, and I would like to know also whether the Sainfoin or Lupin would be equally good. The Lupin is considered extremely valuable in some parts of Europe, and I would like to know whether that would be as good as clover. I believe the Sainfoin has very much larger roots than the clover.

PROF. SAUNDERS. The Sainfoin is a clover, and as a conveyor of nitrogen from the air to the soil it is probably as useful as ordinary clover. The Sainfoin is much grown in France, where it yields heavy crops, but we have not had much success with it at Ottawa. As for the Lupin, wherever a good crop of it can be raised it will be found a useful plant to grow for the same reason.

DR. REID. With regard to clover, would not our common white clover, which grows everywhere and is very hardy, be an equally valuable crop to plough under?

PROF. SAUNDERS. I think it would not be as good, because it produces less growth; the larger the growth the better, as there is much nitrogen stored up in the leaves and stalks. For that reason the stronger growing clovers are preferred. I think the Bokhara clover and the Red clover are among the best varieties.

GEORGE THOMPSON. I remember sometime ago reading about some experiments in which clover was sown, and while only two tons to the acre of the tops were harvested, and the roots were estimated to weigh from fifteen to twenty tons.

PROF. SAUNDERS. I know the proportion of root to top is relatively large; in addition to the root-stocks, the fibres are very numerous and find their way all through the soil.

GEORGE THOMPSON. We have roots here almost as large as parsnips.

PROF. SAUNDERS. The top roots contain a large proportion of nitrogen, but it is on the fibres that the nodules are formed which collect the nitrogen from the air.

GEORGE THOMPSON. There was one thing which struck me. I understood you to say that apple trees require very little fertilization or manure. We are all here for our mutual advantage and I think that much can be gained by each one giving the results of their own experiments. In 1890 my orchard produced seventy-five barrels of apples. The following year I manured it on the surface, putting probably an inch to two inches of manure over the surface, and that year it bore me eighty-five barrels. The next year I got one hundred and forty-six barrels, and this last year one hundred and seventy-five barrels. Now it seems to me that the more manure you put on, the more apples you will get, and by manuring your orchard you improve the quality of fruit.

PROF. SAUNDERS. I do not know what I stood what I have done, but I have done it by chemical means, and I think it is which an application of manure, comparatively speaking, is the best treatment of the tree, taking into account the manuring part.

DR. G. E. REID. I think the condition of the soil has been neglected, and I think the reason to be given for the something more.

GEORGE THOMPSON. I think and I may say that it is years of age, and I think it is beneficial. I think of potash.

DR. DEWEY.

GEORGE THOMPSON. I think old broom was used, and this soon gave.

PROF. FAULKNER. I think varieties coming from Iowa they are some varieties.

PROF. SAUNDERS. I think varieties of Japanese Agriculture are equal to some of the best sorts; I think found in the United States. The best myth. The best of the greatest and.

RALPH EATON. I think wheat under. I think difficult matter.

PROF. SAUNDERS. I think Mr. Thompson has not fully understood what I said. I presented the facts as they have been determined by chemical analysis of the proportions of the elements of fertility which an apple tree actually takes from the soil, and while this is comparatively small, I endeavored to show that a much more liberal treatment of the soil is needed than the return of the quantity which the tree takes from the land. There is no doubt that liberal manuring pays well.

DR. G. E. DEWITT. I would like to know from Mr. Thompson the condition of his trees in 1890. Were they old? Had they been neglected? And did he use modern appliances for the removal of fungous diseases? I am asking this for information, and I have reason to believe that this orchard was in a condition to need something more than fertilization, and I think it got it.

GEORGE THOMPSON. Not only did I use manure on the surface, and I may state that they were full grown trees, over twenty-five years of age, but I used in addition potash wash and found it beneficial. I used a mixture of two gallons of water to one pound of potash.

DR. DEWITT. For what purpose?

GEORGE THOMPSON. I took this liquid mixture, and with an old broom washed the trees as far up as the large limbs extended. This soon gave them a clean bark and a healthy appearance.

PROF. FAVILLE. Referring to the peas, are there not certain varieties coming into use which promise to be better than others. In Iowa they are experimenting with a Japanese pea. Are there not some varieties better than others?

PROF. SAUNDERS. Some years ago we received a number of varieties of Japanese peas for test, from the Imperial College of Agriculture at Tokio, but we did not find among them any that were equal to some of those we already have. The Mummy pea is one of the best sorts; it was so named because it was supposed to have been found in the wrappings around a mummy. This, no doubt, is a myth. The best variety for this purpose is that which will produce the greatest amount of vine and root.

RALPH EATON. We have had some difficulty in ploughing buck-wheat under. If it is not ploughed in young, it is sometimes a difficult matter to cover it well.

PROF. SAUNDERS. We plough with a sharp pointed plough, and use a chain that drags all the vines into the furrow, and there does not seem to be much difficulty in covering the plants.

COLONEL BLAIR. I have had some experience in this matter, and have found it an advantage to roll them. We used a small scallop plough with a small shear before the cutter. I have been trying an experiment on the Nappan farm, on a piece of poor soil, a heavy clay with a hard subsoil. In the endeavor to improve this land, we tried ploughing peas under, and they were rolled before ploughing. The second years with the peas I used four dollars worth to the acre of fertilizer—just the ordinary phosphates—and I found the crop very much larger. I continued this for two more years, and this last year I had an excellent crop. I find the buckwheat a very useful crop, especially the Silver Hulled buckwheat, the seed of which does not live in the ground over winter.

PROF. SAUNDERS. Although buckwheat has not the power of collecting nitrogen directly from the air, there is no doubt that in common with other plants it makes use of any fertilizing material brought down with the rain and thus adds to the richness of the soil.

There is nothing lost in nature, and wasteful and extravagant methods which indolent or indifferent farmers adopt with their manures lead to the escape of much ammonia. The showers which fall from heaven dissolve this fertiliser and bring it to the earth, and when you have a crop growing on your land it gets the benefit of this ammonia in addition to what the plants get from the soil. It is becoming the custom now all over Europe, also in Great Britain, among the best farmers, to sow what they call "catch crops" in the autumn—usually peas, sometimes rape, and sometimes buckwheat—simply for the purpose of catching the valuable material which comes down in the rain. The plant appropriates it and holds it, and thus it serves to enrich the soil.

The PRESIDENT said a few moments would now be given to the discussion of Mr. R. S. Eaton's paper, read at an early stage of the meeting, "Notes of the Year."

PROF. SAUNDERS. So many ideas have been suggested in this excellent paper, that I may perhaps be pardoned for calling attention to one or two things which, if allowed to pass without

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further remark, may not be clearly understood. The writer refers to one experimenter who has been trying the Bordeaux mixture, and who has been varying the proportion of lime from the usual standard, and has found that by a large increase in the quantity of lime he has also been enabled to increase the quantity of Paris Green from four ounces to sixteen ounces, without injuring the foliage of his trees. The efforts of entomologists who have been studying the best methods of combating these insect pests have usually been devoted towards lessening the quantity of arsenical and other poisons used, so as to bring them down to the smallest quantity consistent with efficiency. Paris Green has been largely used for poisoning the potato beetle, and the mixture formerly used was quite strong; but of late it has been reduced to a quarter of a pound to fifty gallons of water. There is no doubt that by increasing the quantity of lime we can increase the quantity of Paris Green used without injury, but we will have a preparation just as effective with a lesser proportion of Paris Green. The fact is that Paris Green consists of a certain proportion of copper which acts as a base, which combined with arsenic, when this is mixed with an excess of lime a considerable proportion of the Paris Green is decomposed and formed into an insoluble and inactive compound with the lime. Hence the additional quantity of Paris Green does not increase the efficiency of the insecticide but makes it more costly.

There is still another point worth referring to. By this action of the lime in decomposing the Paris Green a certain proportion of oxide of copper is liberated, and this may, as suggested, act to some extent the part of a fungicide. It is one of these experimental tests which should be thoroughly tried in a small way before it is recommended for use on a large scale.

The author also refers to those sports in apple trees which are so unaccountable. Why one branch of a tree should suddenly begin to bear a different looking fruit from all the other parts of the tree is a most difficult thing to account for. Such an example occurred some years ago on a Spitzenburg apple, and a russet sport was produced which has since been propagated under the name of Moyle. Recently you have had a marked example in your valley in the red sport of the Gravenstein which has been referred to.

Another point which has been referred to in connection with the fertilization of apples brings to mind the recent experiments which

have been carried on under Prof. Galloway, from which the conclusion has been reached that none of the cultivated varieties of apple are capable of self fertilization.

JOHN E. STARR. I would like Prof. Saunders to give us an idea of the distance one tree should be planted from another in order to fertilize it?

PROF. SAUNDERS. That is a question which would not admit of a specific answer. Fertilization is carried on by insects. How far a particular insect could carry pollen and dust it on the pistils of another tree, is a question which is not very easy to determine. I think it is very wise in planting orchards to have just a reasonable distance between suitable trees, so that this crossing may be more easily affected. We know in planting strawberries which are pistillate it is necessary to have staminate sorts near by to produce full crops of fruit. It is usual in such a case to plant every third or fourth row with a staminate sort.

MONTAGUE MANNING. I would like to know whether any experiment has been made as to the number of bee-hives necessary in the neighborhood to produce the desired effect?

PROF. SAUNDERS. This I cannot answer, but one morning when I had a spare hour I watched some blossoms on a raspberry bush to find out how many insects would visit those flowers within an hour, and I found that some fifty or sixty insects visited a blossom in that time.

C. R. H. STARR. In spraying the trees for canker worm it is not desirable to injure the foliage, but the principal object is to get the Bordeaux mixture strong enough. Mr. Hardwick's idea was to get it strong enough to kill the worms and at the same time to guard against the destruction of the foliage. Could Prof. Saunders give us some information in respect to the strength which it is desirable to use to kill the canker worm?

PROF. SAUNDERS. It is probable that one pound of Paris Green to one hundred and fifty to two hundred gallons would be about right,—much will depend on condition and quality of the lime used, but if you add more lime and increase the quantity of the Paris Green you do not, as I have already explained, necessarily increase the strength of the poison, as the insoluble arsenate of lime formed has very little effect on insect life. That is just why London

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Purple is so unreliable. This is a compound of arsenic and lime of undetermined strength, a waste product obtained during the manufacture of aniline dyes. Sometimes it has a good deal of activity and at other times you get a sample which is of little or no strength, and the lime is the agent which renders the arsenic inactive. Hence, by adding more lime in the case Mr. Starr has referred to, you will not necessarily have more strength in the solution.

W. A. HARDWICKE. If an additional quantity of Paris Green were added without more lime, would it not be more effective to kill these worms, provided it did not destroy the leaves?

PROF. SAUNDERS. As an insecticide it is better to use the Paris Green alone, but the use of the Bordeaux mixture is recommended to save labor. If you use the Paris Green in the proportion of one pound to one hundred and fifty gallons of water it will seldom injure the foliage of apple trees. After a little practice one will be able to find what strength they can use this substance without injuring the foliage of their trees.

MR. HARDWICKE. In my first experience with Paris Green, I used it in accordance with a bulletin of one of the Colleges of the United States. I think the proportions were five ounces to fifty gallons of water. It also recommended using water of lime—not the lime itself—and I did so, and applied it to trees of thirty years of age, and in twenty-four hours they were as brown as the roots, and I thought from that it could not be used in any strength without the addition of lime.

PROF. SAUNDERS. It has been the custom up until late years to use Paris Green alone with water. The quantity which was recommended was four ounces to fifty gallons of water, but that may be too strong for some trees. I know that small quantities of these arsenical poisons are effective.

DR. REID. There is one point which has not been brought out clearly enough. The object of using the Bordeaux mixture is to make use of the copper so as to prevent any injury being done to the leaves,—that is the Bordeaux mixture pure and simple. Now they come with the Paris Green, and in order to save time, in other words two different sprayings, they run the two together, and that is the reason you do not manage to get good results with both. Now, if you take the Bordeaux mixture, which contains a certain definite

portion of lime and sulphate of copper, and you add more Paris Green to it and more lime, you are going to render it inoperative and insoluble. You should only use the Bordeaux mixture for the purposes for which it is required. If you use Paris Green with the Bordeaux mixture you should only have a sufficient quantity of lime to act with the sulphate of copper in order that the Paris Green should have its effect. In other words, the extra amount of arsenic combined with lime renders it inoperative, and it is only the small amount of arsenic which has not been interfered with by the lime which acts as an insecticide.

MR. HARDWICKE. I made a mistake in my remarks a few minutes ago. It was sulphate of copper I used instead of the Paris Green.

PROF. SAUNDERS. I tried an experiment of that sort on some raspberries last year, affected with a fungous growth, and I succeeded in killing nearly all the fruit.

PRESIDENT BIGELOW said that Mr. Eaton's paper and the present discussion had been of a most practical character, and might be referred to with great profit.

There was barely time for the closing paper of the session, which was one that would interest all of us, and he had much pleasure in calling on MR. JOHN DONALDSON, of Port Williams, who would tell us

HOW TO MAKE FARMING PAY.

How to make farming pay is always an important question for farmers, but at this season in the year of our Lord, 1894, it appears especially interesting. The past year has just drawn to a close, and the season has come when farmers bills are being sent broadcast over the land with pressing invitations to pay up. Thus it happens that it is at this season, more than at any other, that farmers are brought face to face with their financial position, and many I fear there will be who this year will exclaim emphatically, "I don't believe farming pays." The subject I have chosen is a broad one, and—I will not attempt to deny it—a difficult one. As a practical farmer, I allow that it is far easier to-day, in anticipation, to estimate your farm profits on paper than it is to realize them at the close of the year. It is not unlike building a house; the expenses are apt to be so much more than were expected; but in farming there is also this fact in addition, that the sales are apt to turn out much less than was

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In all ways of gaining a livelihood, the man is more important than the business, e. g., as you all know some men are bound to succeed in whatever they undertake ; other men are almost as bound to fail ; and thus we might say that the right kind of man will make farming pay. Then the question is, "What do you mean by the right kind of man? what qualities must he possess, and what principles must he adhere to?" Or, again, others would say it all depends upon the kind of farming you adopt. Thus page after page might be written upon this subject, according as it is viewed from different stand-points. But in order not to attempt too much, and to make this paper as practical as possible, I will confine myself to a few thoughts on only two fundamental principles.

The first is, "Farming should be conducted upon business principles." That this should now be advocated is indeed strange, but it is nevertheless only too true. Our farmers, as a rule, are very poor business men. In what are called "the busy seasons," they rush and tear and work, early and late ; then they lay by, loaf around town, or go off pleasure driving, etc. The employees get into the same irregular habits as their employers, and there are no regular hours for work. Some farmers make a great howl about the short hours for their working men, but if they would only, during the coming season, keep a daily record of "Hours spent in working at crops," they would be amazed to discover how many had been spent in idleness or unprofitable labor. Lack of education, lack of training, has brought about this state of affairs ; the son follows in his father's footsteps and lightly heeds the passing hours spent in idleness and talk. There are others again, well educated men, who pin their faith to book-farming, but who are utterly devoid of business principles, e. g., they have read of the valuable fertilizing properties of leaves, and in the busy short days in the autumn will pay a man a dollar a day for raking up twenty-five cents worth of leaves. Or, like some others, feed their cows twenty-five cents worth of feed per day for fifteen cents worth of milk. This is not economy, this is not business, but it comes about from farmers not putting proper value upon their time. They keep no account of their time,—neither, indeed, of anything else,—they do not know whether they are working profitably or whether they are feeding stock at a loss. No successful

business man ever does business in that way, and no man can tell whether his farming pays or not unless he keeps farm accounts. Here, then, the question comes up,—“What do we mean by making farming pay?”

At the beginning of the year, every farmer should take an inventory of his property. On one side of this inventory account we will have the “liabilities,” and on the other side the “resources” of the farmer. The liabilities will be—

- (1) All borrowed capital.
- (2) All debts of any and every kind.

The resources will be—

- (1) The farm.
- (2) Live stock.
- (3) Implements.
- (4) Crops on land.
- (5) Cash on hand.
- (6) Bills due.

This is the farmer's inventory, and a comparison of these two accounts will show just what a farmer is worth at the end of the year. But in order to show whether a man is making his farm pay from year to year, another statement is necessary, which I have called the “farm inventory” :—

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| (1) Live stock | } | on hand at beginning of year. |
| Implements | | |
| Crops | | |
| (2) Year's expenses. | | |
| (3) Interest on capital invested. | | |
| (4) Owners remuneration. | | |

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| (1) Live stock | } | on hand at end of year. |
| Implements | | |
| Crops | | |
| (2) Sales of farm produce. | | |
| (3) House rent and family supplies. | | |

When the credit side is larger than the debit side, the farm pays. There is one error, however, which I wish to call your attention to : If a man is not able to meet his bills at the end of the year, he thinks

his farm is not pay profitable after all. and yet, on account in debt. •With a fa are kept so togeth farmers come to t a balance on hand b Repairs to farm bui these are all improv expenses, but as ext which to be profitab return yearly intere

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But, in addition t this business quality t almost got to be syno exactly. We do not c yet that man may ma

his farm is not paying, whereas, really his farming may have been profitable after all. Many a merchant may do a very good business, and yet, on account of an extravagant family, may come out heavily in debt. With a farmer, his farm, personal and household expenses are kept so together that they are all regarded as one; and so farmers come to think that unless they are all squared off, and a balance on hand besides, they are not making their farming pay. Repairs to farm buildings, draining, planting fruit trees, and the like, these are all improvements which should not be charged as yearly expenses, but as extra capital invested in the farm business, all of which to be profitably invested should be of such a character as to return yearly interest to the farmer.

To keep such accounts as these intelligently the farmer should be an educated man. But what does this mean? Does it mean education in the popular use of the term, that is, to have his mind a storehouse of facts and figures? No; a man to be educated must have his mind trained to think for himself, to be capable of concentrating his mental powers so that after repeated study his mind grows, becomes expanded and enlarged, his powers of observation become quickened, and he becomes capable of solving the problems daily presented to him. But the course of study in our different colleges is not adapted to the wants of a farmer. The great importance and the time spent upon the dead languages, makes the student's mind dwell too much in the far away ages of antiquity; and many young men upon leaving college are far more conversant with the works, the thoughts and the lives of Socrates, Sophocles, and Plato, than they are with modern thought and science. They live too much in the realms of thought, and too little in the practical every-day world. So that I would say, at present, such an education repels rather than attracts men to farm life. Why cannot English literature, the natural sciences, mathematics, political economy, and the study of agriculture, sufficiently train a man's mind for the active duties of the nineteenth century?

But, in addition to education, he needs to be business-like. Now this business quality that is so much needed is hard to define; it has almost got to be synonymous with money-making, but it is not that exactly. We do not call a successful horse trader a business man, and yet that man may make money easily. An inventive genius who

makes lots of money with his inventions may be a very poor business man. A fruit grower may find out this long looked for, this much needed new apple that is going to revolutionize the apple trade, and yet who would call him a good business man on account of that discovery? But the man who can get the largest returns from his farm and his crops at the least expenditure, I call a good business man. A business farmer and an educated farmer are not synonymous terms, but he should be both—an *educated business* man. This practical scientific element in education completes my idea of a business farmer. Some men appear to be heartily ashamed of manual labour. I have heard of a man who wrote in the census returns "agriculturist" as his occupation, instead of "farmer," and there are lots of such men in the country yet. But while such men may rank themselves away above the business farmers, they are not the men in these hard times who make farming pay. Such men either have capital invested outside of their farms, or they soon have to advertise an auction and clear out. There is no such thing as manual labour degrading any farmer; in fact, Nova Scotia farming, without outside capital, cannot be successfully carried on without it. To manage our farm labour most economically requires our head and hands both.

My second principle is:— "Adapt your produce to the demands of your markets." I shall have to touch upon this as briefly as possible. This implies not only the growing of such kind of crops as have the best market demand, but also the receiving for them the highest possible price. It is one thing to raise crops, it is another to sell them. Agricultural papers are constantly telling us we must lessen the cost of production, but if more attention was given to the marketing of farm produce, the question of profits would be much better solved. If we know what crops to grow from certain soils, and how to grow them; what to feed certain animals, and how to feed them; and yet not know how to dispose of them, what is the good of our farming? As regards the disposal of farm crops, they can be divided into three classes: those designed for the home market, those for the local markets, and those for the foreign markets. By the home market is meant the farmers own family. Now, to my mind, a great deal of the failures in farming come from the neglect of supplying the wants of one's own family. This is especially seen in times of depression like the present, when the

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farmer who supplies most of his household necessities from his own farm, is obliged to buy but little, and thus, even though he has but little to sell, he will come out financially better than his neighbour who, going in for scientific farming, is only growing that crop that is best adapted to his farm, and expects to buy everything he wants with the product of this crop, without realizing that the season or market might make the crop fail. The great drawback to this scientific method of farming is chiefly in the question of markets. I consider it is not good farming generally to depend wholly upon the sale of one crop. Transportation is so efficient in these days that all countries are brought into competition with one another, and over-production in one country will make itself felt in the world's markets. This scientific farming is similar to the old question, Free Trade vs. Protection. The free trade theory is all right on paper, and protection is all right for the country. So it is with the scientific farming. It is all right in theory, but not always just the thing in practice to make farming pay. This question of home production, our local and foreign markets, is a big subject, which I have been scarcely able to touch; but if some qualified person could but be induced to take up its discussion in a future paper before the F. G. A. I am sure he would have a most attentive hearing.

These two points, then, "Keeping a good system of farm accounts," and "Farming to suit the markets," are what I want to impress upon you as most necessary in order to make farming pay. I do not say that farming cannot be made to pay without them. Amongst our farmers are clever men who, had they had education, would have adorned any profession in life. Example: In your very midst is one who transformed that unsightly piece of land near which the old cotton factory used to stand, into a beautiful fruit garden, the admiration and wonder of us all. Such a man can create markets for himself, but for the most of us whom Providence has not endowed with such gifts of genius, we must work along ordinary lines. Yet we all should discharge our complex duties intelligently; and have the satisfaction of knowing that *we* at least are making *our* farming pay.

EVENING SESSION.

The Evening Session opened at 7.30. A large audience of ladies and gentlemen was present. The first event on the programme was the following paper by DR. A. P. REID, of Halifax :—

THE ORCHARD AND THE GARDEN.

Mr. President, Ladies and Gentlemen,—This Association has always taken a deep interest in the orchard and the garden, and efforts have been directed towards their extension and improvement.

Before going into details, it may be well to take stock of our position and use this as a basis for our remarks. Any want of knowledge on the part of the writer does not necessarily nullify observations made in travelling over the province, and these will be used as the basis for suggestions, the value of which can be correctly appreciated by this Association and accepted at their value.

Along the Atlantic coast we may notice orchards large, small, old and young, and also fruit that would compare favorably with that from any locality, and this particularly in Queens and Lunenburg counties. Also in other counties, apple trees flourish, though the fruit is poor in quantity and quality. It may also be noticed, however, that no orchard has received the cultivation and attention it deserved, and we would be justified in saying that the orchards in our famed valley would not do much better than those referred to did they receive no more care. Hence arises the question, Would not the orchards respond to skilled cultivation in the other counties of the province? Those apples which are most successfully cultivated in this valley may not be equally as productive with other soils and situations, but there are many varieties of apples,—is it not likely that experiment, with judgment, would disclose types suitable for all our soils and locations? This work is now being done at the farms at Nappan and Truro. In conversation with farmers in different sections, the orchard is looked on much as the fisherman regards his fishing location,—this year may or may not be a bountiful one, but an equal trust is placed in Providence whether it be codfish or apples, and human effort is assumed to be as useless in one case as the other. Too often we may notice in passing through an orchard that the trees are full of dead limbs and covered with suckers, dotted also with the

caterpillar and other ground, and the only animals that use it : orchard turned out, t very well, but in otl good district for fruit them, and they look get something out of and we generally hav don't pay, there is no managed in the val perchance the owner failure, the answer wa use in trying them he hay, and grain crops,

As to plums, they knot, and the same an as to the black knot, must give way. Ther tree trying to produ visible, large limbs sw condition. Enquiry o trees do not thrive o anything for them,—h good, some say salt is don't thrive, and it is other varieties of fruit paid, even the cherry varieties, are rarely see sections.

In Halifax and i gardening, and in the l great bulk of the agric run on commercial prin farmer. How many car etc., etc.? Habitude ar for the great lack of ta supply, not taking int

caterpillar and other of like ilk, a tough greensward covers the ground, and the only manure the orchard receives are the dropping of animals that use it as pasture. On enquiry of the owner how his orchard turned out, the general answer would be, "Some years it did very well, but in others it did nothing at all; this county is not a good district for fruit; an orchard does not pay. Of course we have them, and they look well and don't cost anything, and we generally get something out of them. Some years we can sell a few apples, and we generally have what we want for our own use; but orchards don't pay, there is no money in them. How would orchards similarly managed in the valley pay? When it is mildly suggested that perchance the owner rather than the orchard was to blame for failure, the answer was, "Oh, the valley is the place for apples; no use in trying them here; we find we can do better with cattle, and hay, and grain crops, and roots."

As to plums, they flourish in most places, but so also does black knot, and the same amount of want of attention is paid to the plum as to the black knot, with the to be expected result, the plum tree must give way. There is an element of sadness in looking at a plum tree trying to produce fruit and this without one healthy branch visible, large limbs swollen and disfigured, and the smaller in similar condition. Enquiry of the farmer would elicit the fact that plum trees do not thrive owing to the black knot. Ask him if he did anything for them,—his answer, "Well, no. Some say turpentine is good, some say salt is good, or kerosene oil, but the fact is that plums don't thrive, and it is not worth while to bother with them." As to other varieties of fruit trees, unless in special sections, no attention is paid, even the cherry is a rarity. Small fruit, except the wild varieties, are rarely seen, and but little thought of outside of special sections.

In Halifax and its neighborhood much attention is paid to gardening, and in the larger towns similar skill prevails, but with the great bulk of the agricultural population the garden is not only not run on commercial principles, but it is a sorry help to the table of the farmer. How many can indulge in celery, asparagus, spinach, radishes, etc., etc.? Habitude and the want of knowledge is chiefly to blame for the great lack of table comforts that a fairly good garden could supply, not taking into consideration its commercial possibilities.

Yet, I doubt not, this last observation will be warmly contradicted, and it would be a source of the utmost pleasure to me if (excepting a few of the more common vegetables) it could be successfully contradicted.

In my experience with farmers I do not recollect of meeting one who would confess to his ignorance on this subject, but when his practice is enquired into there is a something wanting. It is either want of knowledge, want of time, or want of push and energy, possibly all may more or less contribute to the result; but it is no doubt chiefly due to a want of correct knowledge, associated with the too common habit of depending but little on the garden for its many and varied products, as an addition to his too often meagre table.

There is scarcely a residence in the province, no matter how lowly, that does not show an attempt at floral decoration. This is an index of the taste of the people and a guarantee that, with sufficient knowledge, the best results are to be expected. Finally, the whole question is centralized in this: How are we to give such a knowledge to our people as will enable them to make the most out of their farms and opportunities?

All agree as to the desirability, and this Association not only affirmed it, but recommended that certain steps be taken towards the solution of the question. On the threshold we are met by diverse opinions as to the method, and with your permission, Mr. President, let me in as few words as possible lay down a plan which appears to have the largest prospect of success. To remedy a defect we must first know the cause. This is conceded by all to be ignorance, and how is this to be overcome? An honest and self-satisfied ignorance is a more difficult problem to solve than any other in the whole range of human affairs, so much so that there is but little hope of influencing the present generation, and even the coming one will test our ability to the utmost. It is quite natural that the first idea which would suggest itself would be a school to impart the special knowledge, and we may briefly consider its prospects.

This subject has occupied my attention for a long time, and last year I had the honor to read a paper on "The Fruit Growers Association and the Public School," with the object of making this widely distributed and patronized piece of machinery an active factor in dispelling technical ignorance; or, in other words, to teach the

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youth how to make a living as well as to become acquainted with the "3 R's" how to utilize our natural resources; how to manage an orchard and a garden. The public school is a practical way of reaching the rising population of the province, and of imparting to them much needed instruction. The next question, Why not have a special instruction such as obtains in other technical departments? The only answer can be, theoretically, yes; but practically schools of agriculture and allied subjects, run on a basis similar to what obtains in other technical departments, have not succeeded. Many voices will be raised to refute this assertion, yet the fact remains, that schools of law, medicine, theology, engineering, and every department of applied science are, and always have been successful, but such is not the fact with agriculture. And it is in order to ask, Why? Though this query is difficult to answer, yet I will present some ideas for your consideration. Let us assume that a young man desires to be an engineer or a lawyer. He gathers all the information he can on the subject and decides on the best way to proceed. He then bends every energy he has to accomplish the desired result.

If a man wants to be a farmer, or orchardist, or gardener, he assumes that there is no very special intelligence required; "anything will do for a farmer." (Just think of it; anything will do to superintend and direct the most intricate, sublime and beautiful operations of nature!) Agricultural schools have been established in most countries, and young men attend them, but the majority branch off into something quite foreign to agriculture. Why? This question has been variously answered, and I would suggest that the farmer's son has life presented in a rather disagreeable aspect; he is not taught to be proud of his calling—by example—and town life is held up to him as most desirable. The city boy has but little chance to know anything about it, and thinks not of it. The taste for these branches must be cultivated, and this can only be done by practical demonstration. Schools can do something, but I fear before they will be successful the desire for them must be acquired, and how can this be stimulated into actual life. No plan has more appearance of success than to demonstrate to the farmer, orchardist, etc., the best method of practice, and a means to this end. Experimental farms have been established in most countries, and with more success than any other form of public instruction. But they have not accomplished

all that they are capable of, and the fault is not with the farm but with the people. How are we to get at the people? And there appears to be only one way. Let a sufficient number of capable instructors be appointed, a district allotted to each, and their business would be to visit every farm, orchard and garden, and instruct the occupiers on the ground; but few would be required for the province, and as only a portion of their time would be occupied, the expense would be less than at first sight would appear to be necessary. During these visits, meetings could be held in each neighborhood which would be well attended, and verbal instructions given, which would be illustrated on each farm. The instructor would go into an orchard, trim the trees, in explaining how and why; show how to graft and how to cultivate and fertilize the orchard and garden; how to defend it against pests, and to instil into the owner a pride in his possessions; and though not much may be expected of the old, yet these object lessons to the young would impress them with the greatness and independence of the calling, and in time they will fill the schools for special instruction in the same spirit and in greater numbers than now obtains in the other technical schools above referred to. Three or four visits a year would be sufficient, and the vegetable and flower garden could at the same time receive attention. Other departments might be added, but sufficient for this paper is the subject it proposes to deal with.

As a result, in time we would have a population proud of their calling and its surroundings, the farm, orchard and garden, while being independent of financial or political reverses, hard times or hard seasons, and dependent only on that all-wise and over-ruling Providence that never has failed to furnish man with everything needful, if he observingly, judiciously and faithfully carried out the mandates inscribed in the books of observation and experience.

PROF. SAUNDERS. In the paper just read, Dr. Reid has presented in a forcible way some important facts. While we have everywhere throughout these provinces a large number of intelligent farmers who are fully alive to the importance of obtaining all the information they can in regard to their daily calling; on the other hand, there are many in whose minds it seems difficult to awaken any general interest in regard to the interesting work in which they are engaged. There are, however, undoubted evidences now of a more general

awakening throughout this respect the Experim ary work, especially by bulletins giving valuable venture to say that any the importance of his c and gaining in experienc A spirit of enquiry is at the future. I am sure t the people of this count farm life in preference towards providing agreee and help to keep them at to the importance of the regard to vegetables, I farmers are not alive t asparagus, celery, caulifi abundance. A few yea vate asparagus successfull about three feet deep, an and earth. Now, it is fo same way as you plant c you can, in two or three the old method. The fa which can be cultivated v work each week will be A small flower garden, w with plenty of flowers t system prevail, and cult products of the farm, and both vegetables and flow

T. E. SMITH. I have remarks which have been teachers are learning. I in the eastern part of the ready to answer any ques him? He was asked sev them. I have listened papers here, and I think

awakening throughout the farming community in this particular. In this respect the Experimental Farms have been doing good missionary work, especially by a very large distribution of reports and bulletins giving valuable and general information on farm topics. I venture to say that any farmer who is once awakened to a sense of the importance of his calling, will go on advancing in knowledge and gaining in experience which will surely raise to a higher manhood. A spirit of enquiry is abroad in the land which augurs very well for the future. I am sure there is no calling which is so important to the people of this country as farming, and to stimulate a love for farm life in preference to that in a crowded city, will do much towards providing agreeable occupation to many of our young men, and help to keep them at home. I was very glad the Doctor referred to the importance of the cultivation of vegetables and flowers. In regard to vegetables, I think it is a pity that the great bulk of farmers are not alive to the usefulness of such vegetables as asparagus, celery, cauliflower, which every farmer might have in abundance. A few years ago it was thought that, in order to cultivate asparagus successfully, it was necessary to prepare a special bed about three feet deep, and fill this with a rich compost of manure and earth. Now, it is found that if you plant asparagus seed in the same way as you plant corn, and give it a fair dressing of manure, you can, in two or three years, have as fine a bed of asparagus as by the old method. The farmer should plant his vegetables in rows which can be cultivated with a horse cultivator; then a few hours work each week will be sufficient to keep the garden in good order. A small flower garden, well looked after, will keep the house supplied with plenty of flowers to decorate the table. Let a commonsense system prevail, and cultivate the garden as you do the ordinary products of the farm, and you can then have a plentiful supply of both vegetables and flowers with very little trouble.

T. E. SMITH. I have listened with a great deal of interest to the remarks which have been made, and I think not only farmers but our teachers are learning. I remember some time ago being in a meeting in the eastern part of the province, when a doctor there said he was ready to answer any question on horticulture or agriculture put to him? He was asked several questions and could not answer any of them. I have listened to the doctor and those who have given us papers here, and I think we have all profited by them. Evidently

there is ignorance in the minds of a great many in the cultivation of many things, and if we can educate people to proper methods in fruit growing and farming we shall be doing a great deal for this country.

MONTAGUE MANNING. I must say that in too many cases agricultural and horticultural colleges have failed in what has been expected of them. The graduates do not often go out as practical farmers. After having gone through the course, they do not go back to the farm, but go as teachers. A horticultural college was started in Kent county, England, some years ago, and it has proved to be an unqualified success, and I think that ought to be an encouragement to those starting the horticultural college here.

DR. G. E. DEWITT. I agree with Prof. Saunders, that the valuable suggestions thrown out by Dr. Reid are deserving of consideration. The reference to the teaching of horticulture in our public schools was one of the strong points in Dr. Reid's paper. In his paper last year he referred to it. He also thinks that a sufficient number of instructors should be appointed, and a district allotted to each, and that their business would be to visit every farm, orchard and garden, and instruct the occupiers on the ground. I do not know how this country is going to get capable instructors before the people are instructed; and I do not know any better way to instruct them than in horticultural schools. If a course of horticulture was in the curriculum of every school in the province, making it imperative on the teachers to teach it, I do not think there are twenty persons in the province who could teach it. If they cannot teach it, how are the people to be instructed except by special horticultural teaching, and I think that is what we want in order to improve fruit growing in this country,—to teach how to prune trees, make solutions to destroy fungi, and otherwise keep their orchards in good condition.

PROF. SAUNDERS. With reference to the question of instructors I might refer to the dairy work which is now being carried on under Prof. Robertson, much on this principle. In the Dominion dairy service, seven instructors are employed, who visit the different provinces of the Dominion. These instructors are expected to visit every cheese factory and creamery in their district, and where difficulties occur in such factories, to investigate them and render all the assistance in their power to the parties running them. We

have found throughout steady persons. Possibly this is a valuable and quiet in getting done of by many difficult to there might from such

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have found that system to work well, and the progress in dairying throughout the Dominion has been greatly aided by this constant and steady personal assistance given to the cheese-men and butter-makers. Possibly this plan could be made to work if you could only get suitable and qualified instructors. There has not been much difficulty in getting dairy instructors, because dairying has been made a specialty of by many people in the West for some time past; but it might be difficult to secure such instructors in agriculture and horticulture, there might also be objections on the part of some to receive help from such instructors.

DR. REID. I feel complimented by the remarks this paper has elicited, and appreciate what has been said. There is no doubt a need of a much greater awakening among farmers in order to induce them to make the best of their surroundings. Last summer I travelled through the Island of Cape Breton, and it is a wonderful country, and yet a miserable country. There is scarcely a farm house that has a single shade tree, not even a common spruce. Think of a country like that, where the people could raise apples and plums in abundance, and yet not a tree of any sort around their houses. This result is simply from a want of desire to have these things. Again we hear that people have been ruined on account of the dry season, that they have no hay, and you will find that they have been importing hay from Montreal, perhaps for years. I saw there thousands of acres which had not been cleared, which would produce all the hay they required. Why do they not improve the opportunities they have? It is not because they are lazy, but because the subject has never been presented to them in such a way as they could fully understand it. If you had a man to go there like Prof. Robertson, in whom they have confidence, who could show them how they could devote their labor to the best advantage, this could be followed by system and practical instruction on the principles I have laid down, you would soon find our whole country blossoming like the rose.

DR. BOWLES. Being a medical man, I feel qualified to address this meeting. (Laughter). If I were a farmer I would provide myself with a shot-gun, and the first man I caught trespassing on my property to instruct me in farming, I would warm him. (Laughter.) I have been coming to these meetings from time to time, and listening to the proceedings, and I think the farmers as a class are the

most patient and enduring people upon the face of the globe. They hear their ignorance spoken of at every meeting, and if they do not believe they are ignorant it is not any fault of their teachers. I would like to know if farmers undertook to instruct professional men in their pursuits, if they would take it kindly. It is perfectly absurd,—the farmers in this valley know more than those attempting to teach them. It would be a cheeky farmer who would dare to attempt to instruct a meeting like this of another profession. Now, as I said before, I am engaged in medical work, and I do not want any farmer attempting to teach me medicine, and there is no farmer would think of doing such a thing. What is the matter with farmers? Let them alone. They can see where a dollar is to be made as quickly as anyone. In reference to agriculture, men who are engaged in other occupations are not competent to teach you. Let some of you gentlemen give us the two sides in dollars and cents, the cost and the profits. When you can do that, you will have no trouble in explaining to the farmers where their interest lies.

NOTES FROM THE FAIR.

ADDRESS BY MR. B. STARRAT, PARADISE, N. S.

I am down on the programme in respect to the subject of "Notes from the Chicago Worlds' Fair." The question is, I suppose, What were the lessons to be learned from the Fair, that is, from a visit to this great exhibition? And what could we learn there that will be of practical use to us as fruit growers, that will teach us to grow fruit better, and more of it? In fact, what ideas did we gain that we can turn into dollars? These are practical questions and are of importance to us all. Although this is a very broad question, "Notes from the Fair," yet I am restricted to the horticultural part of it; as that is the subject which is of paramount interest to you here to-night. I suppose I have been forestalled on that subject by our President, and I fear what I shall say might be a repetition of what he has already said. In addition to that, I will be followed by Colonel Spurr, to whom has been assigned a subject which will interest you most,—"Nova Scotia at the Fair,—and so I am restricted to a small portion of that subject. I was at the Fair nearly four months. I left home on the 17th July, and returned on the 10th of

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November, so I had ample opportunity to learn a good deal, and I have obtained a few ideas; but whether I am able to impart that knowledge to you is a question. When I arrived there and had time to look around me, I found a good deal of confusion in the department assigned to us. There seemed to be a want of system, and want of business methods. You may judge of that by the fact that I was appointed judge of peaches, nectarines and apricots—that class of fruit, and you can imagine how much I knew of that class of fruit. However, I went to work to the best of my ability, and worked away without a complaint, until I raised sufficient courage and asked if it would be possible to put me on something I had some knowledge of. I proposed apples, and at last I was assigned with Colonel Babcock to pomaceous fruit,—apples, pears and quinces, and I may say that the people of Canada were especially fortunate in having so efficient and so capable and fair minded man as Colonel Babcock to judge their fruit. Your President and Colonel Spurr will bear me out in this. Although he was sometimes abrupt and outspoken, yet he was sound at the heart as a Nonpareil apple. He was inclined to do what was right, and he learned to like Canadians. He took a particular fancy to our President. Canada was also fortunate in the selection of judges in other classes,—in the case of grapes, Mr. Sylvester Johnson of Indiana, an honest old Quaker, and in plums and peaches by Mr. George J. Motz of Alabama. I cannot speak too highly of these gentlemen. I was present when the apples from Nova Scotia were spread. There was no other Nova Scotian on the ground when the first two barrels and a box arrived. I with my own hands opened the packages and put them on the plates. They were placed on the tables by Mr. Petit, Mr. Swanson and Mr. Cameron, Canadians, who kindly assisted me in placing them on the tables to the best advantage. Those apples opened very well, and kept excellently with the exception of the plums, and they did not last very long. There were seventeen varieties of apples, twelve of pears, and eighteen of plums. I think these were opened about the 16th September, and a week or so after that Colonel Spurr came, and shortly after the President arrived and took care of the fruit, and exhibited it to the best advantage. The Gravensteins, Kings, and an apple that is not much thought of with us, the Emperor, made a fine impression, and people were surprised to find that such apples were grown in Nova Scotia, a country which was supposed to produce

icebergs, snow and frost, generally,— they could not believe it. I occasionally helped the matter along, and I am very sorry our friends did not send some peaches. I informed them that we raised in Nova Scotia as fine peaches as they did in the State of New York, but they took that statement with a grain of salt.

I will now say something about the exhibit of fruit from Ontario, Ontario made a magnificent display of fruit, which was a great surprise to the people of the United States. Colonel Babcock would come upstairs to the office and say, "Well, Mr. Starrat, that Ontario fruit surprises me. It is wonderful about the apples they raise. Those exhibitors know something. They know how to place their fruit. I am a sort of prosecuting attorney; it is my business to look for defects and imperfections, but there is not even a stem missing." It was a great contrast to the apples of some of the States. I was surprised at the apple exhibit of the States of New York and New Jersey. These were the States of the Union celebrated for their fruit, and exhibited by men who have had large experience. In the exhibit, from these States, the apples were poor, deficient in size and color, full of defects, small, wormy and scabby.

After having been assigned to the judging of pomaceous fruits, the next thing was to divide the different States between Colonel Babcock and myself. We had to judge all the apples and pears on exhibition, no matter from what place they came. All the apples exhibited were judged by Colonel Babcock and myself. Previous to my going there, my office had been filled by a gentleman from Ontario, and in some respects his judgment did not altogether suit the board of judges; and he was instructed to revise his awards, and reconsider them. He was much disinclined to do this, but so heavy a pressure was brought to bear upon him that he was compelled to do so, and this created a prejudice against other judges. So I came there handicapped, and had to work off that prejudice.

When the dividing of the States and Provinces came up, I thought it the better policy that Colonel Babcock should judge Canadian fruit. He was very willing to do that, because he thought that would be an easy matter, and that Canada would send a small exhibit. I took New England, New York, New Jersey, Illinois, Missouri, Colorado, Arkansas, Iowa, and one or two other States, so I had the heaviest fruit growing States. Pennsylvania did not exhibit an apple. The Colonel took Canada, Wisconsin, Michigan, Idaho,

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Oregon, and a few others. My proposition to have Canadian fruit judged by an American created rather a favorable impression. When Colonel Babcock was assigned to the Canadian exhibit, now, they said, "that is fair."

One of the subjects that interested me a great deal, and which I wanted to get some information upon, was that of fruit pests. There were two exhibits from the State of New York illustrating this subject,—one of pears from the Experimental Station, Geneva, and one of apples, by George P. Powell, of Ghent. Mr. Powell's exhibit consisted of four varieties, Cranberry Pippin, Fall Strawberry, Siamese, and Esopus Spitzenburg. This was a purely educational exhibit, to demonstrate the efficiency of spraying with Bordeaux mixture to prevent apple scab, and Paris Green to prevent the work of the Codling moth and other insects of leaf eating character. These varieties have been particularly subject to severe attacks from apple scab; so much so, that they have been unsaleable in that State for years. By very thoroughly spraying with Bordeaux mixture, which was applied as soon as the blossoms had fallen, and three times afterwards at intervals of two days, the fruit was grown clear of all defects, and was exceedingly brilliant in color and attractive in appearance. Paris Green was applied with the mixture, one pound to two hundred and fifty gallons of water.

The exhibit from the Experimental Station consisted of *Seckel* pears. These exhibits were placed side by side. Here was fruit from trees which had been sprayed, and fruit grown on trees not sprayed. The sprayed fruit was clean, well grown, well developed, handsome and good. The fruit which had been grown on the trees not sprayed was practically worthless.

Efforts are being made in some of the States of the Union to have legislation on this subject. California has already taken an advanced step in this direction, and has enacted laws by which any man who allows his orchard to become a breeding place for fruit pests shall be punished, and the mode adopted to remedy the difficulty is to have it done at his expense.

I received a letter from Colonel Babcock a few days ago. He is now in Walla Walla, Washington. He says they intended to introduce a bill in that State this winter, which will doubtless be followed in other States as well. I would be glad to see legislation obtained in Nova Scotia. I have in my own mind at this moment an orchard in

my own neighborhood which has been over-run with insect pests. The owner of the adjoining orchard, Mr. William Henry Bishop, says it is impossible to keep his orchard clear when the orchard across the street is full of pests. I know of this case from my own knowledge.

One thing that attracted my attention very much was the magnificent fruit grown in the Western States. We, here in this valley, think we raise the best fruit in the whole world, but we do not. There is quite as good grown in other parts. We raise very good fruit; we have advantages in some respects over other places, no doubt. We are nearer to market,—to England, which is our best market. We have an advantage over Ontario and the Western States in this respect, but in the matter of fine looking fruit they can beat us every time. Their fruit is larger, cleaner, and free from pest marks; no worm holes, no scabs, but all clean and nice.

A VOICE. What about the flavor?

We have the best flavor for those who like an acid apple; we have the advantage in this respect; but a large proportion of the people do not like a sharp apple, they like a mild acid apple. Many of the people in the Annapolis Valley have thought that the fruit from this valley beats all the world, but it is a mistake. The apples of Colorado, Arkansas, and Oregon are larger, handsomer, equally as good flavor, and equally as good keepers. Will you believe that? I saw apples of the crops of 1890, 1891, 1892, and 1893, of Missouri, sound and good, all on the table together. These were kept by a secret process.

A VOICE. What varieties?

Ben Davis and Willow Twig. The Ben Davis is the favorite apple in the Western States; it seems to be the best keeper and they do better with it commercially. Now with reference to the Ben Davis in Nova Scotia, they have a fine color, it is an excellent keeper. The tree itself is vigorous. It comes into bearing early, and bears well; the only point is they have not the flavor. They are a good market apple, and that is all we care about. They bring us in the money; that is what we are here for. I saw apples of 1892 crop opened on October 7th, which had been grown in the State of Missouri, sound and of good flavor. Those apples were not put up for exhibition; they were put up for commercial purposes; they were all number ones.

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PROF. SAUNDERS. What guarantee would you have that they were of that age; did they furnish any evidence?

I knew it by the flavor and appearance of them. And, in addition to that, I have sufficient confidence in the men who put them up. I refer you to Major Evans, of Missouri, on whose farm they were grown. They were kept in cold storage, of course. And you will scarcely believe it, I saw Kings grown in the State of Illinois, in 1892, opened on the first of August; they were not in as good condition as the Willow Twig or the Ben Davis—they had lost their flavor—but the others had kept their flavor remarkably well.

I had the pleasure of examining and judging sixty varieties of seedling apples from the State of Arkansas. I was assisted by Prof. John Craig of the Experimental Farm, Ottawa, and Prof. Harris of Minnesota. They assisted me in examining the first eighteen varieties; and after that I was assisted by Prof. Stinson of Arkansas, T. T. Lyons of Michigan, and Col. Babcock. We found them an excellent lot of apples. There was nothing among them of exceptional value; they did not exceed or were not better than other recognized varieties, but they were really a fine exhibit of apples. But it certainly was a remarkable thing to have sixty seedlings from one State, and not a poor apple among them, showing how well adapted that country is to the growth of fruit. I saw Gravensteins grown in Oregon as big as two of those on the table, of marked flavor, sound and good. The Yellow Bellefleur were simply immense, but the shape of theirs differs somewhat from ours; but still I have seen them growing here in the same way. There they grow long, running up to quite a sharp point, and very corrugated.

RALPH EATON. Will you tell us why those apples were larger than ours; was it because of special fertilization or better soil?

Simply because the soil and climate of that country is particularly adapted to the growth of fruit. To give you an illustration of this I will mention a few orchards that I became acquainted with, or rather I became acquainted with the owners and they described them to me. One is in Missouri, and I will mention one in Colorado. One of the exhibitors of Colorado is the Hon. Sam Wade, and also another W. S. Coburn, who has an orchard on the western slope of Colorado. W. S. Coburn is a man of not more than thirty-five years of age. He started an orchard on his place ten or twelve

years ago, and now is growing apples and selling them from the trees planted then by him. I cannot give you now from memory the quantity he sold last year, but I know what he got a barrel for them, —he got \$5.30 per barrel last year. They were sold to the miners of Colorado. This year he will be unable to sell his apples so high on account of the silver question. The trees will come into bearing on that coast, in the State of Oregon and State of Colorado, on the western slope of the Rocky Mountains, in much shorter time than with us.

I mentioned Major Evans, of Missouri. He resides at North Kansas City, and is the owner of the famous "Olden Fruit Farm." This farm of twenty-six hundred acres is situated in the State of Missouri, on an elevated tableland, thirteen hundred feet above sea level. He has twelve hundred acres of orchard and seventy-five acres in small fruit, principally blackberries and raspberries. Last year he had four thousand barrels of apples and sixty thousand bushels of peaches. He sold the latter for one dollar per bushel. He also had three hundred acres in corn and does general farming, and employs forty families on his farm. He commenced on this farm ten years ago, and was then fifty years of age. It was then a howling wilderness. He will clear this year, fifty thousand dollars. He had an immense exhibit of apples, pears, plums and peaches at the Fair. Your President may not be able to confirm these figures, but he will confirm my statement with regard to Major Evans. A large proportion of the Missouri exhibit was grown upon his farm. He says what every one else says, that small fruits pay the best profit. That is true in Missouri as it is in Nova Scotia.

I will just simply mention one thing more, and that is with reference to an organization that started while I was there, and that is "The World's Fruit Growers Association." This association was formed while I was there, and though it did not meet with the encouragement it should have met with, yet it has got practical and capable horticulturists at its head, and I have no doubt it will prove a success. The president is a gentleman living in Georgia, who is a practical and thorough-going agriculturist; and the secretary is a gentleman in England. The officers of the organization are distributed over the world, and the members that joined that association represent the various countries of the world. It should prove a success, and I have no doubt it will. It is hoped it will be a nucleus around which

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the horticultural societies of the world may center, and from which they can obtain information. Prof. Bailey, of Cornell University, is secretary for the United States and Canada. Our Prof. Faville knows him, and any information you desire with reference to "The World's Fruit Growers' Association" can be obtained from him. I thank you for listening to the remarks I have made.

R. E. HARRIS. In reference to that orchard which you spoke about, of twenty-six hundred acres under cultivation, and set out for about ten years and growing the fruit that it does, can you state whether the owner has made it a practice of keeping those trees cultivated from the time they were set out up to the present time?

MR. STARRAT. Yes, I think I can. The land is cultivated, highly cultivated.

PROF. SAUNDERS. Is it irrigated?

MR. STARRAT. No, it is not. In Colorado they irrigate. That is, Wade and Coburg do.

R. E. HARRIS. Do you know whether he takes up that style of cultivating which Judge Weatherbe does?

MR. STARRAT. He does not; he cultivates in the ordinary manner.

NOVA SCOTIA AT THE FAIR.

BY COL. S. SPURR, MELVERN SQUARE, N. S.

I feel a little delicate in addressing you on this occasion. I was only at the Chicago World's Fair for twenty days, as I had a cast-iron ticket which allowed me only thirty days. I managed to over-run it a couple of days. When I was first asked by your Secretary to read a paper, or give an address, I thought the matter over and I came to the conclusion that I would not write a paper for two reasons. The first reason was that I did not feel myself capable of doing it; and in the next place I cannot read my own writing. (Laughter.) Some say that they cannot see when there is a crowd before them and I am somewhat troubled that way too. So I wrote your secretary, that I would favor you with a few remarks, on my experience at the Fair. I had an idea that I would like to see our own country. I could have gone by steamer to Boston, and gone up to Chicago by the

railways in the United States, but I preferred to take the Intercolonial Railway and see Canada. The first night I could not sleep very much, the sleeping cars thumped so hard that I could not sleep. (Laughter.) I was not used to travelling, anyway. They say I am an annexationist—well, I never had any desire to become a hewer of wood or a drawer of water for the neighboring Republic; or, as our friend Mr. How put it, a Gideonite. In the tunnel at Port Huron they told me I was on American territory, but I was under the sea, so I could not see it. (Laughter.) When we got to the Fair it was very pleasant. I had not much to do the first few days. I had packed a barrel of fruit out of my own orchard. I arrived at the Fair on Thursday about noon, and it was not until the following Monday that I got it; and in the course of the next few days the consignments began to come from the Association. I saw the fruit that Mr. Starr had. The tables were bare, and I got out a big card and wrote on it, "Nova Scotia Apples Expected Daily"; they looked at it and passed on. (Laughter.)

When I got a card from the Secretary of this Association with respect to this annual meeting, I found that "Colonel Spurr" was to address you on "Notes on the Fair," and that has a pretty wide range. Well, I thought, I can talk on that; but last night I got a regular programme—it was delayed, the mails did not get up on time—and when I received this notice I found I was to speak of "Nova Scotia at the Fair." I saw a good deal of Nova Scotia at the exhibition, and it was through the courtesy of my friend, President Bigelow, who did not have the desire to go around like some of us younger men. The only time he said to me that, "I want you to look after the exhibit," was when the managers gave a banquet to the representatives of all nations. He went down to the great banquet—and if you had only seen the menu! Anyway, they got through it the same night, and the way that man—the President—stood up and played his part—the way he did it—he is a man that the fruit growers in Nova Scotia need not feel ashamed of. (Great applause.) I was called upon by the President in the first instance to come up here and help him prepare an exhibit. He met me here and drove me around that fifty acre orchard. He treated me like a prince; that is the kind of man I like to fall in with. (Laughter.)

In Chicago, I used to go away up to Michigan Avenue, where the big churches are, and I heard the great Moody. He was speaking

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about ministers preaching, and he said that the man that could not preach without his notes should not preach at all. So I have come without any notes. (Applause).

I am sorry that I do not recognize among the faces before me to-night that of Mr. John Starr. I have a little story to tell and so will defer it until he is present. (Applause). I have not had the advantages of a practical education. I am something like what Mr. Oxley said, "he was just grown up, and had been picking up ever since."

When the apples from Nova Scotia first came in, which was before your honored President arrived, I opened a barrel or two of them and put them out on plates. They were principally Gravensteins. There was a barrel of medium sized apples, as handsome as I ever saw. The whole lot seemed to be perfect apples, and they arrived in good condition. But the apples which attracted most attention was a barrel of large Gravensteins. You are all aware that we did not have as large Gravensteins in the year of 1893 as in 1892. It was also an off year in the State of New York, and they did not have the apples in 1893 they had in 1892, and they did not have the apples to bring. This barrel of Gravensteins I spoke of we put out on the table four on a plate, and they certainly did show to good advantage. Then we opened a barrel of King of Tompkins. The President said we must make a show out of these. We sawed a barrel in halves, and took some red paper, but they would not stand up, so we put a prop inside and built up a cone with the apples all around it. Our court was right in the centre of the Horticultural Building, on the east side, right by the central arch. When you came in you turned to your left. Quebec would be straight in front, Ontario would be to your right, and Nova Scotia to your left; there were three courts there and they gave us a table by the archway, and we had our fruit also along the side of the court. Mr. Starrat may talk about the apples, but I had to answer questions there—it was answering questions continually, morning, noon, and night. I asked the guards, "Do you ever get tired of answering questions? They used to wheel old ladies around in arm chairs, and one old lady said to me, "Are you from Nova Scotia?" I said, "Yes, ma'am." She asked, "Did those apples grow in Nova Scotia?" I said, "Yes." She said,

"Oh, I am so glad to know this. I have great sympathy for the people in that cold, frozen-up place." (Laughter). I told her she need not waste her sympathy, that we were all contented and happy, and could grow that fruit and plenty of it. (Applause.) I said it only dropped down below zero there occasionally. If there was one, there were ten thousand who came along, and were surprised that we could grow such fruit. The question usually was, "Did it grow in Nova Scotia? How did it grow?" They seemed to be ignorant of Nova Scotia. They were well-dressed, educated people, looked as if they should have known better. Your President was a man among men there. I am not an Annapolis man, I was born in Kings County, although I have been living in Annapolis County since I was born. (Laughter). I was also going to say of our friend (Mr. Starrat) here he was a man among men also; he was chairman of the committee of judges, and occupied a prominent position there.

Now, this is my first lecture on the Fair since I came home. I have said nothing about the Fair till now. I feel that it would be trespassing on your time for me to speak longer. But I am pleased to be here to-night, for I have learned a great deal that has been of interest to me, and I regret exceedingly that it was not possible for me to be here this morning. I do not know whether I have contradicted anything our President has said. I intended to have come up on the freight train this morning, but on account of the sad accident a few days ago, the trains have been demoralized.

I am a farmer of the old school. I love farming. I started out on a poor, sterile place, and the first year I started out I thought I was going to own the homestead. I was thrown out when I was twenty-five years old. Then I got a piece of land worn out with rye and I went to work on that. I had a little interest in another piece on which I tried to pasture a cow, but could not do it. (Laughter). I started without anything. If the people would do the work here that they do for somebody else away, it would be better for Nova Scotia. Now, friends, I am not here to tell you what to do. There are a great many people who will stand up here and tell you what to do. Could they do any better if they were placed in the same circumstances? I was not favored with an education, but I worked along and got a property around me. I was thirty-five before I got married. I did not get married before because I wanted to save something, but I found out after I got married that I

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saved more than I did before. (Laughter and applause). Just get a wife and you will find it out for yourself. Nova Scotians can hold their own anywhere in the world. In Ames College, Iowa, from which Prof. Faville came, Miss Thomas, a Kings County girl, is getting a salary of \$1500 per year. That is the kind of people we raise here in Nova Scotia.

The PRESIDENT here called upon Prof. McGill.

PROF. MCGILL. At this late hour, and considering the cold I have taken to-day, you will please excuse me. Perhaps to-morrow I may offer some remarks.

PROF. CALDWELL. Was it a competitive exhibition at the World's Fair?

MR. STARRAT. It was not a competitive exhibition. It was conducted on a different principle from ordinary exhibitions. There were no money prizes excepting in some departments, like live stock; and the awards were of equal value. The different States or countries were not supposed to go into competition with each other. Every award went on its own merits, and the awards were all one kind, of the same value. So far as I know there were no other awards except bronze medals. Each department had its set of judges. For instance, in the horticultural department, when I first put in an appearance, there were thirty-three judges, but it was weeded out until at the close there were only six of us; the others received their pay and had a good time and did precious little work. Foreign judges got seven hundred and fifty dollars and paid their own expenses; and I have in mind judges who were there who did not do a week's work. The domestic judges, like myself, received pay by the day. Colonel Babcock commenced on the first of May and continued in active service until the close of the Fair. He, in the same way, received pay by the day. He was the hardest worked man with the exception of myself there. (Laughter). Our instructions were that the awards were all alike. The bronze medals were represented at the end of the Fair by paper medals—John Boyd Thatcher's paper medals, and the opinion expressed was that the bronze medals would not be out for six months. There was no reason in the world why the medals might not just as well have been ready at the close of the Fair, and delivered then. So I may say there was no competition in answer to your question.

PROF. W. SAUNDERS moved a vote of thanks to the President for his excellent work at the Chicago World's Fair. He said, I know the President to be a very modest man, and perhaps I might say more if he were absent. I would, however, say this, that while you had many representative men from Nova Scotia who did excellent work there, none did so much to influence visitors favorably and inform them with regard to the great work in progress in Nova Scotia in fruit growing as your President. I was standing one day beside the exhibit from Nova Scotia at the Fair, when a very intelligent looking man came along with his wife. He addressed me and said, "Are you from Canada?" I said, "Yes." He said, "I would like to ask you a question, and I would like you to give me a truthful answer. Is it really true that these apples and fruits are grown in Nova Scotia?" I said, "It is a fact, and I have seen abundance of such fruits on the trees there, and know what I am speaking about." He replied, "I had no idea that in that frozen country fruit could be produced." He belonged to Wisconsin, but he did not know anything about Nova Scotia. I had a little chat with him, and he went away very much better informed. Similar cases were continually occurring, and thousands of people were seeking information in a constant steady stream, and no one man or any two or three men could attend to all the people who were asking questions, and give the information they were constantly seeking. It was a privilege to help in this work,—one that I am sure that your President greatly enjoyed,—and the information given will, I believe, have the effect of opening new markets for Canadian fruit in many parts of the United States, as well as in other countries.

DR. A. P. REID said he had very much pleasure in seconding the vote of thanks, and if the President was not present he might also say something about the ability he has shown. If there is a gentleman who will receive his deserts in this world, it is our President, who has displayed great energy in bringing the fruits of this Province before the world at the Exposition at Chicago. I second the vote of thanks with more than ordinary pleasure, and I trust that it will not be the only thing he receives for the amount of labor he has given to this good object.

The PRESIDENT said he was flattered with the remarks which had been made, and he thought that one of the greatest rewards a man

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could receive was a vote of thanks from those he had endeavored to serve.

PROF. FAVILLE of the Nova Scotia Horticultural School, was here-upon introduced to the audience, and addressed the meeting as follows :—

PROGRESS IN HORTICULTURE.

Mr. Chairman, Fruit Growers of Nova Scotia, Ladies and Gentlemen—

I would first desire to ask your pardon if I appear somewhat abashed at coming before you to-night for the first time, an entire stranger to most of you present, simply because I have been the text in one sense of the word from which much of the discussion this evening has arisen. In the matter of horticultural and agricultural colleges being failures, I must say that I cannot agree with some of the speakers. Statistics and modern observation go to show a decided different state of affairs than that represented, in the Old World and our neighboring Republic. I would further state, ladies and gentlemen, that I was born on a farm, raised on a farm, and I am proud of it, that I pursued a four years course in agriculture and horticulture, and that I have been chosen to work in your Province in the instruction of the young more than the old, to aid in the formation and building up of an institution where the practical as well as the theoretical knowledge of horticulture can be obtained. To fit the young men to take the places of their fathers in this grand and remunerative work of fruit raising. Not wishing to enter into the merits and demerits of Dr. Reid's address, I will discuss briefly the topic which has been assigned me for this evening. The progress of any country, nation or people, is judged justly only by the progress of the past and present. As we meet here to-night, co-operating in a general information meeting, and reflect but for a moment on the past and present, we can readily see a great impetus has been given to this industry within the last few years. An industry that comes to us teeming with nature's beauty and wealth, her bounteous gift unto man. Horticulture, literally speaking, is not new. It may be said to date back to the Alpha of the earth. The universe itself was not considered complete until the Garden of Eden was annexed (a most valuable acquisition to its completeness). As we observe the nations of the past, we find those advanced in the

highest scale of civilization where fruit culture was practiced the most. This was true from the barbarian to the civilized being. Some one has most appropriately said, "Show me the horticulture of a country and I will tell you of its civilization." Although horticulture may in one instance be old, yet progressive horticulture is ever new. Problems are continually arising, unlike mathematical problems, to be applied only when needed, they are solved only to accrue—to their solution other problems arising of impending importance, creating in the investigating mind an earnest effort to be ever reaching out and beyond, bringing to the fruit grower of to-day bountiful remunerations viewed on every hand. Progressive horticulture is the acmè of progressive agriculture, one is the keynote of the other, and as we look at the advance that has been made in the past and the prospects of the future, we cannot but think of the possibilities that are in store for us, aided by the educational advantages of to-day. Education and horticulture go hand in hand, one is the *sine qua non* of the other. A student with a thorough knowledge of the fundamental principles of horticulture, together with a practical knowledge of it in detail, places himself in possession of an industry which will some day claim his attention, be he man or woman. The most healthful of all industries, its practical use is apparent on every hand. Nearly all professions give this some attention. Agriculture is pursued by one class, commerce by another, mechanics, arts, fine arts, and professions by others, but fruit culture is practised to a greater or less extent by all. Hence its importance and the desirability of a knowledge of it. Representing as I do an institution which we are endeavoring to establish in your midst, it would seem but proper that I should say a few words in its behalf, and along the lines of the advantages to be gained by the securing or obtaining of a horticultural education. Were the boy to go in search of apples, he would certainly visit the great orchard. If the sparrow is in search of grain, you will find him at the fullest granary. So the young man seeking an education to-day impartially or otherwise, should seek the largest field in which to use his knowledge when acquired, and I am safe in saying that there is no field larger, more thickly populated, with numerous rewards, than horticulture. The speakers before me have all alluded to the broadness of the field and opportunities always in sight. There never was a time when the man with a thorough scientific horticultural and agricultural education, with practice, has

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presented before him such advantages and opportunities as he has to-day. In our sister Republic statistics show that fifty-five experimental stations, with sub-stations, are scattered all over the United States, supported by the Government, employing hundreds of men in the work of investigation, forty-eight agricultural and horticultural colleges, with a large corps of instructors, over ten thousand presses proclaiming to the world the knowledge of this science, where men are wanted with ready pen. The platform is not idle, there are increasing demands for competent men to fill all these positions. Having looked at the opportunities away from the farm let us see the outlook as a fruit raiser. Is it not true that the great drawback to the amateur fruit raiser is due to the many surprises which he must encounter—the problems—of vital importance? If he is equipped to battle with them, they are easily set aside; if not, he must suffer dire consequences. Here are two men, one without the knowledge of the fundamental principles of horticulture, relying upon the experience of others before acting; he is afraid to put a dollar into the ground unless to-morrow it bring to his larder two. His apathy causes his antipathy for the cultivation of anything which is not sure; he must see at once returns from his investment. The other, with science and practice, has a most encouraging work before him. Unhesitatingly he ventures out, makes investments in the virgin soil; passing by the experience of others, he becomes an original investigator, producing grand results, his work becomes an example for all. He is a person "read of all men." These are the men that are to-day raising higher the standard of horticulture and agriculture, imbuing this age with the thought that brain as well as brawn should enter into the work of the fruit grower. Referring to the Institution established in your valley, can it be a success? It depends largely upon the fruit growers, and their earnest co-operation. It has succeeded in other countries, why not here? Switzerland, Germany and Russia to-day require that horticulture be taught in all their schools; besides this, institutions are established where the young are instructed in horticulture, theoretical and practical. If this has been done in other localities, it most certainly should prove a success here, with natural resources at hand, and orchards in all stages of development. Is horticulture making the progress that it ought, compared with other industries? In answer we must say, "Is it not abreast, if not ahead of all industries in progress?" Let us

submit our record. What industry would be willing to compete with it. But the fruit raiser must not stop and rest upon the laurels that have been won, but press onward, marching in the van of the procession of all industries, bearing direct toward the magnet of perfection, eagerly sought for, never fully attained.

The remarks of Prof. Faville were heard with much attention, and as the evening was advanced, PRESIDENT BIGELOW called on REV. H. HOW, B. A., of Annapolis, who addressed the meeting as follows:—

Over a decade of years ago, when the Board of Governors of King's College were about to appoint a steward, I made a motion, at a meeting of the Alumni Association, that the services of a graduate of the Ontario Agricultural School, at Guelph, be secured. I hoped that this might lead to the development of a School of Agriculture at Old King's, with which would have been associated the study of horticulture. You can readily understand that I should like to see King's College, my Alma Mater, the seat of the School of Horticulture, upon whose successful establishment it is now my duty and pleasure to congratulate the Fruit Growers Association. I shall gladly do everything in my power to further its interests, and I trust that to-day may be the hour of its least usefulness and prosperity. It is but natural that I should continue my father's work of love, and identify myself with the Fruit Growers Association, for which he had the honor of serving as judge on more than one occasion. (Henry How, D. C. L., was formerly Professor of Chemistry and Natural History at King's College). Yet I was amazed when W. C. Archibald, Esq., whose absence through sickness we all deeply deplore, showed me that the widening interest in fruit growing was due to the indefatigable labor of a compactive hand-full of enthusiasts. It was my pleasure to show your accredited agent (W. C. Archibald) about Annapolis for a couple of days. I worked him hard. Hence he returns my kindness by now working me, though I declined to inflict an address upon you. Few, however, could adhere to such a resolution. I shall therefore endeavor to aid so enthusiastic an advocate of plum culture. He depicted in glowing colors the value and size of such crops, that our mouths watered. To him is due the large addition to your membership. It is the duty of every member to co-operate with your officers by increasing this list, and to see that the present names are continued on the roll. It would

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materially facilitate this work if Prof. Faville could be induced to give an address on horticulture in the various centres represented by your membership.

It is a subject of congratulation that already over half a hundred pupils are receiving instruction from Prof. Faville. This is comparatively a large class. But we must not conclude that our local government would continue the handsome grant if it could be shown that the benefit was very largely confined to the residents of Wolfville. Jealousies would be aroused in other towns where educational institutions flourish, for a similar amount could not be bestowed upon each university in the Province. I am glad that the government that has the reins of power duly recognised the petition of this Association, and immediately made the necessary handsome appropriation. It has at least done one good deed. We must endeavor to awaken an interest in horticulture among the youth of the whole country, that this school may be a permanent institution.

The object of education is to develop the latent powers of mind and hand. An educated man is one who has been taught how to teach himself. We must not fancy that when one has "finished his course" at a college that he has nothing more to acquire. He has then but learned how to learn. His tutors have succeeded if they have infused a thirst for knowledge. They will have turned out a *student*. His ignorance will be more than ever apparent to him, and the conviction be deep-rooted that if he lived to the age of Methuselah he would but be on the threshold of the vistas of knowledge that open to any specialist.

What is there to awaken an intelligent love for agriculture throughout the land? What will induce the youth of our lovely country to remain within her ample border, and be content with the necessary daily routine work that attaches to the honorable occupation of a farmer? It is a lamentable fact that this magnificent Province is too largely a breeding ground for the New England States, where five out of ten of our hearty Nova Scotians, who should succeed to the homesteads of their respected fathers and subdue the virgin soil, serve as Gibeonites to Americans, and that not in the sanctuary of God. It is intimate knowledge that begets abiding affection. We must then disseminate knowledge. If necessary, this Association should augment the salary of its present efficient secretary, in order that he should weekly furnish, to some duly accredited paper, one

column of accurate information, which the members in their several districts, might have reproduced in our local papers. Make the *Acadian Orchardist* your official organ, and thus set the stamp of approval on the enterprise of the editor; and let the School of Horticulture be regularly written up in its columns, and the reports of work done by it be therein recorded.

If these valuable official articles were reproduced, in the manner specified, the desire for increased knowledge would be awakened and thus, would be guaranteed the attendance of prospective farmers from many sections of the country. The farmers of this generation, more than of any former day, and they of the next more than those of this, need technical education not merely in manual labor and use of tools, in which our farmers are quite as proficient as those of any country, but in science applied to agriculture. The value of such training their intelligent fathers accord and its absence they deplore with a sorrow they are not slow to express. Let the coming farmers use the advantages your School of Horticulture gratuitously offer, that they may be spared such regrets.

I should like to see, in the forthcoming Report, a syllabus of the instruction to be furnished. We might induce many who cannot attend to study at home. Let there be selected centres in the several counties where examination papers could be annually sent by our Professor of Horticulture, and upon securing a sufficiently large percentage let a parchment be issued. Make the successful candidates "Bachelors of Horticulture," or "Spinsters of Horticulture," if the young ladies agree to remain in the state of single felicity. These young graduates might well aspire to fill, upon the receipt of further accurate training, chairs as professors of horticulture, that we be not compelled ever to look abroad for qualified instructors. I trust this scheme of holding local examinations may be feasible, for there must be many bright sons of farmers who would be desirous of acquiring scientific knowledge, without which no agriculturist can work in the light. Let this be his primary ambition. To be a success it is surely not needful that our education fill our pockets with gold. If we can co-operate with a seed or young animal that a perfect specimen be obtained, then success has been achieved. There will be a competence, and a small surplu, for perseverance.

I met, a short time ago, an Englishman who had lately arrived, and asked him the natural question, "How do you like this country."

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As no immediate reply was made, I continued, "I suppose I should hardly expect you to give an answer." However he states that he had been watching the actions and examining the conditions of his happy independent neighbors. "They have," said he, "horses and carriages, and organs and pianos, and leave their work for Mason's picnics, Oddfellow's picnics, temperance picnics, church picnics, to such an extent that I believe they have this summer attended as many as I did in my life. A country that can furnish such privileges and a comfortable competence, must be a blessed land. I heard it was; and that is why I left 'Old England,' where my rents and taxes were excessive." Our youth should aspire to become land owners in such a Province, and not be satisfied with dependence upon the wiles of some capricious master in the United States, where every educated Nova Scotian adds five thousand dollars capital stock to the wealth of a foreign nation.

I was deeply interested in listening to the lucid paper of Prof. Saunders. I followed the germ of life treasured up within the cotyledons, until it gradually attained that perfection so graphically described. We learned that any leguminous plant had the power of treasuring up nitrogen in the nodules at the axils of the roots. I was wondering in what form that nitrogen was stored? You all know that gas is commingled with oxygen in the air. Yet any gas can be liquified, or even solidified, by the application of sufficient pressure and cold. Is that nodule like a balloon inflated with gas? Or, is the nitrogen in a liquid state? I fancy it is liquified. This is, however, mere conjecture on my part. Again, can the plant while growing protect that nitrogen from assimilation by the advancing rootlet which, following the line of least pressure, now seeks to be enriched? Or must the top of the clover be cut off, and decay cause the destruction of the tissue of the nodule that the apple tree may get the benefit of the clover's hoarding? How delightful to find the sons of our happy farmers covetous of such knowledge, that they may maintain the status gladly accorded their worthy sires, and share in that progression towards perfection that to-day so abundantly characterizes every other profession. I beg most cordially to thank you for the very hearty reception you have accorded my maiden speech as a member of this Association. I trust it will steadily grow like that seed of which we have so lately heard: so that even the fattest of farmers may *lodge on its benches*.

WEDNESDAY MORNING.

JANUARY 17th, 1894.

As usual, the attendance at the morning session was comparatively small. The SECRETARY'S REPORT was read, as follows:—

Mr. President, Gentlemen of the Association,—

I have the the honor at this, the thirtieth annual meeting of the Nova Scotia Fruit Growers Association, to present to you my Second Annual Report as Secretary. It is my privilege to report to you a very decided change in the prospects of the society. From a puny institution of some sixty members, in one short year it has become a vigorous society of five hundred members, comprising not only the best class of our fruit growers, but also the professional classes, our legislators and law-givers, our doctors and teachers. This remarkable increase has been brought about principally through the energy of a few members, among whom it will be no invidious distinction to name J. W. Bigelow, W. C. Archibald, T. H. Parker, and F. E. Cox. These gentlemen, in a few days canvass, and touching only a few counties of the Province, have rolled up this large membership; and a very gratifying feature of the canvass is the fact, that they report the utmost *willingness of all classes to ally themselves with the Society*, and advance, as their own, the interests of this Association and the Province at large. But this is not all; while thus adding to our capacity for work we, at this meeting, find our responsibility tremendously increased. This Association has to-day under its control an active Horticultural School, and stands pledged for its support. Your committee, appointed at the last annual meeting to found a Horticultural School, have reported it as accomplished. This step cannot but result in unqualified good to the agriculturists of this Province. The crying need of our country to-day is educated farmers and fruit growers, educated in this profession, practical in their attainments, qualified to advance our interests in every department of life. A practical horticultural training is bound to make every man who receives its advantages more loyal to his country, a better citizen, and a larger wealth producer. This child of the Association is yet in swaddling clothes, and needs delicate handling, substantial nourishment, and the sympathy and support of its progenitors. In Mr.

Faville, as a Professor will succeed,—a gentleman of energy and resources of this country will prove to a sure many of which are situated in the near future. during the establishment of Mr. Fielding and Government, we are in its inception, and we are able assistance towards.

The result of the think, be considered a followed by a very dry a beautiful autumn. berries, etc., was abundant excessive drouth, and abundant and made good is our main dependence of causes have conspired them being extraordinary large quantities of imported high. Communication season reported immediate Continent, and assured at least till late in the realize the measure of the winter supply, and when Canada failed to go forward has realized extra forward. A shipment to my notice netted £3 London, who handles on 21st, 1893, he says; “ have any high colored silk can give you a satisfactory not come before the first a lot of money then.”

Faville, as a Professor of Horticulture, we have a man who, if possible, will succeed,—a gentleman of culture and ability, qualified for his work, full of energy and enthusiasm, with unbounded faith in the resources of this constituency. The very establishment of the School will prove to a surety its necessity, and any temporary difficulty, many of which are sure to arise, will, we fondly hope, be overcome in the near future. A very gratifying feature that has been shown during the establishment of the School is the attitude of the Hon. Mr. Fielding and Government towards the measure. The Local Government, we are proud to say, have encouraged the scheme from its inception, and we are induced to believe will render any reasonable assistance towards the success of the measure.

The result of the year's operations to the fruit grower should, we think, be considered as fairly satisfactory. A favorable spring was followed by a very dry summer, and that, in turn, was succeeded by a beautiful autumn. The crop of small fruit, strawberries, raspberries, etc., was abundant, though no doubt much reduced by the excessive drouth, and realized good prices. Plums and pears were abundant and made good returns. The apple crop, which of course is our main dependence, has been the smallest for years. A number of causes have conspired to cause this shortage, prominent among them being extraordinary gales in August and September, shaking of large quantities of immature fruit. Prices are ruling exceedingly high. Communications from the English market during the early season reported immense crops of fruit in England and on the Continent, and assured us that our apples would not be wanted there at least till late in the season. It is evident English dealers did not realize the measure of their dependence on fruit from this side for their winter supply, and when consignments from the United States and Canada failed to go forward in any large quantity, excessive competition has realized extraordinary prices for the few parcels going forward. A shipment of thirty-one barrels of Baldwins that came to my notice netted £32 10s. In a private letter from a dealer in London, who handles many Nova Scotia apples, under date of Dec. 21st, 1893, he says; "Good Ribstons to-day are worth 30s. If you have any high colored Spys, send by first boat, and we are sure we can give you a satisfactory account of them. Golden Russets should not come before the first of February, but they are sure to be worth a lot of money then." We can safely say to-day a barrel of good

apples will buy a barrel of good flour, and a barrel of choice apples will buy the best barrel of flour in the market. What's the matter with a country in which a ten barrel Baldwin tree (and there are many such trees) will produce ten barrels of flour? Is this a country to depreciate? Is this a country in which to talk of hard times? Let us look the matter straight in the face, and see if our claim of being the chosen valley of the world is not backed up by hard facts. The *New York Tribune*, a few days since, stated that the wheat crop of Kansas State this year averaged seven bushels to the acre, and was worth to the farmer forty-three cents per bushel. Thus \$3.01 is the average gross return of Kansas per acre in wheat. How many of us this year have picked ten acres of Kansas wheat from a single tree? How many of you have a single acre of orchard whose product this year will buy up the crop of a quarter section Kansas farm? In this time of financial depression, when banks are crashing and millionaires become beggars, when tens of thousands of people in the neighboring cities are starving and living on charity, many of them, no doubt, natives of Canada, and perhaps some of them from Nova Scotia, who among us has not bread and to spare? Who is there among us, although he may feel the pinch of the prevailing depression, cannot be fed and warmed and clothed at his own charges, and have enough left to aid his comrade in distress? In view of all this, have we not abundant reason to thank God and take courage?

A gratifying feature of our future prospect is increasing orchard extension. There has been, perhaps, a little slackening among individual orchardists, many no doubt feeling that the acreage already planted is as large as they can care for. This may be true, but a new feature is coming into prominence, that is, commercial orcharding on commercial principles. The Association and country at large are much indebted to President Bigelow for his estimate of the commercial capabilities of our fruit lands as a financial investment, published in the report of 1887, and as you are aware he is backing up his theory with practice. I personally inspected his fifty acre orchard just ready to come into fruiting, and am convinced it is worth more to-day than a gold mine. Judge Wetherbe, R. S. Eaton and Dr. Borden, M. P., are among the pioneers in this scheme for enlarged orcharding. The Wolfville Land Improvement Co. have also entered the field on a large scale with abundant capital, and in

my opinion have the best business. Yarmouth near Berwick station, under the plough, and man is a "public benefactor" where but one grew best strong enough to apply of worthless bush into wealth of the country for commercial fertilizers re for the Gravenstein and to roll-up wealth on our

The spring meeting on the 26th of April attendance, and much is delayed from time to time concerning the season became advance cancel it and place the

The President of the fruit growers of Nova Scotia. My work with him during his special fitness for the President Bigelow below success our exhibit at largely due the honor of to him is due much of the past year, and it is to fill this position.

In this paper, already a few of the points that Others you will have in various committees. I members of the Association under obligations to the notices from time to time consented to entertain us

my opinion have the biggest thing in sight there is in the Maritime Provinces. Yarmouth capital is also learning there is morey in the business. A syndicate of Yarmouth men bought eighty acres of bush near Berwick station, last summer; they already have sixty acres under the plough, and will set it with trees in the spring. If the man is a "public benefactor who makes two blades of grass grow where but one grew before," we have no term in the English language strong enough to apply to the individual who turns one hundred acres of worthless bush into a fruitful orchard, to add to the permanent wealth of the country for a century to come. With our cheap lands, commercial fertilizers readily obtainable, the best climate in the world for the Gravenstein and Nonpareil, it only needs capital and energy to roll up wealth on our fertile hillsides, all up and down this valley.

The spring meeting of the Association was held at Sheffield Mills on the 26th of April. A fair gathering of fruit men were in attendance, and much interest manifested. The summer meeting was delayed from time to time, on account of the preliminary arrangements concerning the Horticultural School, and, finally, as the season became advanced, it was deemed best by the executive to cancel it and place the annual meeting at an early date.

The President of this Association has placed the society and the fruit growers of Nova Scotia under an everlasting debt of gratitude. My work with him during the past year has again convinced me of his special fitness for the position. You may be assured that to President Bigelow belongs whatever credit there may be in the success our exhibit at Chicago attained. To President Bigelow is largely due the honor of establishing the Horticultural School, and to him is due much of the progressive work in fruit growing during the past year, and it is my earnest wish that he may long be spared to fill this position.

In this paper, already too long, I have only been able to touch a few of the points that have come to my notice during the year. Others you will have in the President's report, and reports of the various committees. In closing I have to thank the officers and members of the Association for all assistance rendered. I am also under obligations to the Press for their readiness in publishing our notices from time to time, and to the gentlemen who have so readily consented to entertain us at this meeting of the Association.

MR. THOMSON, Treasurer, read a statement of the financial affairs of the Association, that showed the finances of the society to be in a very healthy state. The full statement may be found in the opening pages of the Report.

MR. R. W. STARR, for the Fruit Committee, presented an exhaustive Report, giving statistics from some fifty sections of the Province, and proving that a rapidly increasing interest is being taken in horticulture throughout the Province.

MR. STARR read a number of letters, and we only wish there were space and time to place them all here, as in no other way could such a general and comprehensive idea of the capacities of Nova Scotia as a fruit growing country be obtained. The following letter from Mr. George Bonner, of Point Aconi, Cape Breton, will prove that even in the far East good results can be obtained by any one who has energy and perseverance:—

R. W. STARR, ESQ.,

Dear Sir,—Thinking it may be of interest, I take the liberty to make a few remarks on my experience in the line of fruit raising in Cape Breton, and also give a full list of trees grown by me. Of course I do not pretend that fruit can be raised as large here as in your more favored part of the Province, but I think the quality of apples cannot be excelled anywhere, being close grained, containing a large percentage of cider. I also find that what I am doing in the business has given me better return for capital expended than aught else in the agricultural line, and I consider it a pity that farmers do not take more interest in the business. They seem to be satisfied with a little barley, oats, and a few root crops, neither of them I find being as sure a crop as fruit, nor nearly as remunerative. Of course trees require to be well fed, and well taken care of,—scraping, washing, spraying, and trimming,—for now-a-days it is a general fight with insect life. Still it is an easy matter to clean trees, when there is an inclination to do so. Almost anything of a cleansing nature will exterminate bark lice, if applied at the proper season. With me, it is not a matter of what to use, but when to use it. Some time ago I was troubled with borers, but of late I use a top dressing of seaweed (kelp) around my trees, and have no trouble since. For black-knot, I cut out the knot and saturate with kerosene oil, but find it best to incorporate the oil with soap, either soft or hard—it prevents the volatility of the oil. I have tried several insecticides for the bark louse, and find the kerosene oil emulsion as recommended by the Government Report, very effectual; but I use soap made from the blubber of cod oil preferably. For sun-scald a sheet

of paper wound around of the sap starting prevents happens that a tree is inserted and banked about all right. My trees are Early Harvest, Golden S Williams Favorite, Ha Gravenstein, Twenty O Hyslop and Queen's C posed barn manure; also fully saved and applied stable for holding stable boys haul it around the most of the farms in the think such work the height Insect life is on the in we will through the Island every farm, old insect-kill care of themselves and so while the forest trees the country at large are destroyed to get the more sensible part of tree (forest) planting care to take any interest of destruction goes on. I that it ought to be the aid growers throughout the w Sable, to do all they possible, not to interfere with me a very great inconsistency send them out by the thousand North West, while we here them as fast as possible. destroying our primeval forest the denuding has taken place worse hundreds of miles away last ten years I have planted and other deciduous forest placed one tree in a way to increase

I am, sir, your obedient

Point Aconi, Little Bras d'Or

PROF. SAUNDERS said, I remarkable and attractive speaker President of this Association

of paper wound around the trunk near the ground, if there is danger of the sap starting prematurely, will keep things all right; but if it happens that a tree is badly injured, a few artificial roots can be inserted and banked above the injured part—the tree will keep on all right. My trees are Northern Spy, Wagner, King of Tompkins, Early Harvest, Golden Sweet, Dutchess, Emperor Alexander, Peach Williams Favorite, Hass, Ben Davis, White Astrachan, Wealthy, Gravenstein, Twenty Ounce, Baldwin; Crab Apples—Transcendent, Hyslop and Queen's Choice. The manure I use is well decomposed barn manure; also, all soap slops from the kitchen are carefully saved and applied in the orchard. I have a tank in my cow stable for holding stable water, and with a hand sleigh and tub the boys haul it around the trees, while as a rule it all goes to waste on most of the farms in the county; but the most of the farmers would think such work the height of nonsense.

Insect life is on the increase; how can it be otherwise; go where we will through the Island we see along the road side and on nearly every farm, old insect-infested trees, apple and plum, left to take care of themselves and scatter their pests broadcast over the country, while the forest trees that would be a beauty and benefit to the country at large are destroyed by the wholesale. I have endeavored to get the more sensible people of the county interested in the matter of tree (forest) planting and protecting, but they do not seem to care to take any interest whatever in the matter. So the work of destruction goes on. I consider the matter of so serious a nature that it ought to be the aim of all the intelligent farmers and fruit growers throughout the whole Province, from Cape North to Cape Sable, to do all they possibly can to protect our forest trees so far as possible, not to interfere with the cultivation of the lands. It seems to me a very great inconsistency for the Government to grow trees and send them out by the thousands to plant the treeless plains of the North West, while we here in the Maritime Provinces are destroying them as fast as possible. I do not consider that the evil effects of destroying our primeval forests are confined to the locality where the denuding has taken place, but the effect may be as bad and even worse hundreds of miles away. In conclusion I may say that in the last ten years I have planted about four thousand spruce and fir trees, and other deciduous forest trees, and I may say that I have not placed one tree in a way to interfere with my farm work.

I am, sir, your obedient servant,

GEORGE BONNER, Light Keeper.

Point Aconi, Little Bras d'Or, C. B. Jan. 6th, 1894.

PROF. SAUNDERS said, I desire to call special attention to a remarkable and attractive sport of the Gravenstein apple which the President of this Association showed me at the World's Fair in

Chicago. This apple is, I believe, known as the Banks' Gravenstein, and originated in Nova Scotia. This variety is remarkable for the brightness and beauty of its color, retaining at the same time the high perfume and flavor of the standard Gravenstein. I think this sport, which I understand has occurred on a limb of the variety Gravenstein, is well worthy of further propagation and being widely disseminated.

R. W. STARR. We have better results from the Gravenstein here in this valley than from any other apple.

COLONEL SPURR. They cannot produce Gravensteins elsewhere as well commercially as in this valley. I think that the Nonpareil can be grown in Ontario as good as in Nova Scotia.

PROF. SAUNDERS. It can no doubt be grown in Ontario well.

COLONEL SPURR. Colonel Babcock said he wanted Banks' Gravenstein—he would not have any but Banks' Gravenstein.

B. STARRAT. I saw Gravensteins at the Fair grown in Colorado and Oregon. The fruit grown, especially in Oregon, was large and smooth, and very handsome. The Rocky Mountain coast seems peculiarly adapted for growing apples. All over the country apple trees are springing up—from seed probably dropped by cattle—fine, large, good eating apples. There were sixty varieties of seedlings shown by the State of Arkansas. There is this difference between their fruit and ours,—their's is much milder. I do not state this to deter any farmer from growing apples, but simply to show that there are other countries which can compete successfully in the growing of apples. I am very much of the opinion of Colonel Spurr that Gravensteins can be grown here more successfully than any other apple. Take the different varieties of trees and the Gravensteins beat every time.

PROF. SAUNDERS. Mr. Starrat is no doubt correct with regard to the apples exhibited at the World's Fair from Colorado, in regard to their smoothness of form. But at the same time the average samples grown there are more ribbed and angular than those grown here. It should be remembered that the specimens sent to Chicago were all carefully selected. I have examined a good many orchards on the Pacific Slope, and have also visited some in Washington State, and I do not think they can send into the market barrels of apples as

uniformly smooth and produce.

DR. DEWITT. Wh

PROF. SAUNDERS. I admit of answering that coast is a moist one and their orchards require more tendency to parasitic for shorter lived. In the ir conditions are altogether c rain-fall, and nearly ever in these dry climates are however, that apples grow flavor and quality, and w grown in the East under

B. STARRAT. I found California were devoid of grown in British Colum from the eastern and was different. The largest po the western slope, and w last night. And there w the Colorado apples—the Russett, for instance, and green. It is free from rus Fair, and showed him son "What do you call them" he did not know. I said could scarcely believe it. the Golden Russett, and t all kinds.

DR. DEWITT said he convictions as to the merit grown in Colorado and Ore ever heard say that the a rich in flavor as ours. He ago, and took particular pai hotel, and also in the shops.

uniformly smooth and handsome, on the average, as this valley can produce.

DR. DEWITT. What is the life of a tree out there?

PROF. SAUNDERS. The settlements are scarcely old enough yet to admit of answering that question satisfactorily. The climate on the coast is a moist one and produces fungous growths very freely, and their orchards require more treatment than yours here. This greater tendency to parasitic form of diseases may possibly make the trees shorter lived. In the interior districts on the Pacific coast the conditions are altogether different, for there you have practically no rain-fall, and nearly everything is grown by irrigation. Fruits grown in these dry climates are remarkably free from spot. I have observed, however, that apples grown by irrigation are necessarily deficient in flavor and quality, and will not compare favorably with similar fruits grown in the East under more natural conditions.

B. STARRAT. I found that the apples which were grown in California were devoid of flavor; and it was the same with apples grown in British Columbia. But the apples from Colorado, both from the eastern and western slope, so far as I could judge, were not different. The largest portion of the apples exhibited were grown on the western slope, and were grown largely by the men I mentioned last night. And there was another point I noticed with reference to the Colorado apples—they were free from rust. Take the Golden Russett, for instance, and grow it in Colorado, and it looks quite green. It is free from rust, and is smooth. I met Mr. Craig at the Fair, and showed him some specimens on the Colorado table. I said, "What do you call them?" Well, he looked them over and replied, he did not know. I said it was a Golden Russett. He said he could scarcely believe it. He said, "I find the distinctive marks of the Golden Russett, and they are exceptionally free from defects of all kinds.

DR. DEWITT said he believed Mr. Starrat was honest in his convictions as to the merits of the Nova Scotian apples and those grown in Colorado and Oregon. Yet he was the first man he had ever heard say that the apples of these western countries were as rich in flavor as ours. He had visited that country about two years ago, and took particular pains to test the apples on the table of the hotel, and also in the shops. He did not come across a Gravenstein,

but saw Baldwins and other apples which he could not remember, and he was of the opinion as also the friend who was with him, that the flavor and texture of the western apples were not as fine as ours. They were not as juicy. They were large and fine. He noticed corrugated apples on the table also. He said in five-sixths of Colorado you could scarcely grow apples at all, but you have got to get away up in the foot hills, like Canyon City, which was started nine years ago. It is in these foot hills of the Rocky Mountains where they are raising this fruit, where it is sheltered. But go out in the vicinity of Denver or Colorado Springs, and try to put out an orchard; the sand storms there would ruin the trees in no time. Scarcely anything would grow there except the cotton tree. There is no irrigation in the world as good as water from the clouds. He had driven out to Pueblo to visit a ranch there, and saw an orchard of several thousand trees which had been put out during the last few years,—during the former spring the owner had put out a thousand—and one out of every five trees died owing to the high winds. They were out on the plains and the sand storms killed them. He believed that after all was said of other countries, we had yet the best place for producing fruit.

The following interesting letter from PROF. CRAIG was read by the Secretary :

DEAR MR. PARKER,—

It is with sincere and deep regret that I find myself unable to renew, by attending your annual meeting, the many friendships so pleasantly begun last winter. My absence is to your advantage, however, this time, as by it you gain the presence of Mr. Saunders, the value of whose wide experience at meetings of this kind you well understand.

I regret the more my inability to attend as I think the session of last year marked the beginning of, and this meeting will inaugurate a new era in the prosperity and useful life work of the Nova Scotia Fruit Growers' Association.

With the opening of the School of Horticulture, let us look for increased enthusiasm, greater hopefulness, and a more accurate study of the laws relating to and governing plant growth; as well as the adaptation of particular environment.

With much satisfaction I noted the beginning of a movement last year in Nova Scotia towards a more diversified system of fruit culture. There is no valid reason why peaches in quantity sufficient

to supply the trade of the Annapolis Valley. pears and cherries and ment that can be easily

The successful cult other fruits, resolves its apart from a study of t ings, a continuous warf enemies which, like the

In spraying during enemies, the experience the main, and the neces details connected with partial failure in some c results reported to me h conclusion that Paris Gr attacks when applied al fruit growers who have 1 My own experiments lea is so little as to be of no

I have found Borda submitted to your Societ from grape and goosebe and pear scab, raspberry instances the fruit growe vention—not cure: so th to success. Therefore, sp is certain to follow intellig

I am pleased to take fruit growers of the Prov this "flower of commodit Nova Scotia—was display tural and other sight-see Nova Scotia did not atten features which she endeav from her exhibit with a reg sample some of the tempti also with a firm resolve to worthy President, Mr. Bigg accorded in connection with

I fear I have written a wishing your Society and though I do not know Mr. future, yet, coming from my of sympathy between us, a

to supply the trade of the Lower Provinces should not be grown in the Annapolis Valley. That the area devoted to the cultivation of pears and cherries and plums might be profitably increased is a statement that can be easily defended with strong argument.

The successful cultivation of the apple, perhaps more so than other fruits, resolves itself into a careful appreciation of the fact that apart from a study of the adaptability of varieties to local surroundings, a continuous warfare must be waged against fungous and insect enemies which, like the poor in these hard times, are ever with us.

In spraying during the past season for the prevention of fungous enemies, the experience of previous years has been corroborated in the main, and the necessity of carrying out faithfully all the minor details connected with the work has been strongly emphasized by partial failure in some cases where due care was not exercised. Some results reported to me by Ontario fruit growers seem to point to the conclusion that Paris Green is not so effective in preventing insect attacks when applied alone. I would like to hear from any of your fruit growers who have made observations with regard to this point. My own experiments lead me to believe that the difference, if any, is so little as to be of no practical importance.

I have found Bordeaux mixture made according to the formula submitted to your Society last winter, to give absolute protection from grape and gooseberry mildew, practical immunity from apple and pear scab, raspberry and bean anthracnose. But in all these instances the fruit grower must remember that it is a case of prevention—not cure: so that early treatment is an imperative essential to success. Therefore, spray in season, and perseveringly, and success is certain to follow intelligent, well directed effort.

I am pleased to take this opportunity of congratulating the fruit growers of the Province upon the effective manner in which this "flower of commodities"—and how true this is when applied to Nova Scotia—was displayed before the critical gaze of the horticultural and other sight-seers at the World's Columbian Exposition. Nova Scotia did not attempt all things, but made her mark in those features which she endeavored to make prominent. Thousands passed from her exhibit with a regretful sensation of having been unable to sample some of the tempting Gravensteins, Kings, or Ribstons, but also with a firm resolve to do so at the earliest opportunity. Your worthy President, Mr. Bigelow, deserves a large share of the credit accorded in connection with this magnificent exhibit.

I fear I have written a very lengthy epistle, and I will close by wishing your Society and Horticultural School every success, and though I do not know Mr. Faville as well as I hope to in the near future, yet, coming from my own alma mater, we have a strong bond of sympathy between us, apart from the kinship of pursuit, and I

trust he will always obtain from the Provincial Society that support which his earnest efforts for the advancement of horticulture are sure to deserve, and with kindest wishes for a very successful meeting, believe me, yours for the advancement of horticulture,

JOHN CRAIG,

Horticulturist Dominion Experimental Farms.

AFTERNOON SESSION.

FRUIT TESTS AT THE EXPERIMENTAL FARM.

ADDRESS BY PROF. SAUNDERS.

As my esteemed friend, Colonel Blair, is here, and will probably have occasion to speak to you later on in the afternoon, I shall not make any reference to the progress of horticultural work at Nappan, but will leave that to him. I may, however, say that the results of the tests there are very encouraging, and show that the Nappan district as well as this world renowned valley is also capable of producing excellent fruit. Objections were made at the time that the Experimental Farm was located at Nappan, on the ground that a farm there would not afford opportunity for testing the fruits which can be produced in Nova Scotia. But in view of the results obtained, these objections are losing their force, and I believe it will not be long before it will be demonstrated that the Province of Nova Scotia is capable of producing good fruit almost everywhere, and if that can be proved it will be of very great importance to the Province generally.

Permit me, first, to call your attention to fruit growing at the Central Experimental Farm at Ottawa. This farm is located about two miles from the city, on the southern side, on rather a high, commanding position, overlooking the city, and contains 465 acres. About 45 acres of this is laid out in orchard for testing the various fruits which can be grown in that district. The large fruits under test there at the present time consist of about 400 varieties of apples, 230 of which have been obtained from various portions of Europe—more particularly from Russia and the northern portions of Germany—that leaves 170 varieties, which comprise the old and new varieties of American and European production. Most of these have succeeded

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fairly well. Last year we had an extraordinary visitation of blight. Most of you know what pear blight is, and have also had experience with the apple twig blight. It may not, however, be generally known that these are one and the same thing manifested in different methods on these different trees. In order to prove this you can take the sap from an apple tree affected with twig blight and inoculate a pear tree and produce pear blight, or vice versa. This apple twig blight has affected the orchard on the Experimental Farm in Ottawa seriously this year. Heretofore it has usually affected only terminal twigs, but this year it has extended to the larger limbs, and in some instances the trees were actually killed by the blight. This attack has not been confined to particular varieties but has been very general. Many of the hardiest of the Ressian trees were among the worst affected this year, and the necessary removal of many affected limbs has disfigured our orchards considerably. Many trees have, however, escaped the blight, and have made very good growth, are clean in the bark, and are handsome specimens, so that the orchard on the whole looks fairly well.

I have been asked several times about the action of potash on the bark in preventing insect attacks, and I will give you the particulars of our practice at Ottawa. We make a mixture by dissolving either hard or soft soap in about enough of the cold saturated solution of washing soda as is sufficient to reduce the soap to the consistency of paint, and then take an ordinary white-wash or paint brush and paint the bark over, about the middle of June, with a single coating of that material, from the base up to the first large branches. It costs but very little to go over the trees in this way, and if the tree is coated on a hot summer's day with that mixture, it will in the course of an hour or two dry up and form a sort of varnish, which a shower of rain will not wash off. In this way the alkaline material is kept in contact with the bark, and will kill parasitic fungi and young insects lodged there. By frequent rains it is gradually removed, and no injury results from its use. There are several borers which injure the apple tree, and most of them deposit their eggs about the middle of June, and if this alkaline solution of soap is applied about that time, the insects are prevented from depositing their eggs on trees so protected, or if they are laid there the young larvæ, when hatched, will be destroyed by the alkali. These are among the worst enemies of the apple tree, in most parts of the Dominion.

With regard to pears, the Ottawa climate is very much less favourable than your valley here, and indeed less favorable than any part of Nova Scotia, for the cultivation of this tree. The cold is too severe for any of the European varieties to succeed. We have tried up to date, more than one hundred varieties of pears, and very few trees have survived. In most cases we have had from two to six of each sort for a test. In addition to these, quite a number of Russian varieties have been tested. These have been recommended as iron-clads. They have stood the climate at Ottawa very well, but quite a number have been lost from blight, and up to the present time, although these experiments have been going on for five years, we have had no fruit yet on any of the trees. Pear growing has not been a success with us, but we have gained some information on the subject of hardiness of trees. The tests have been repeated two or three times with most of the cultivated sorts which have shown themselves hardy elsewhere, and I think we may now safely say that pear growing at Ottawa is not likely at any time to be a profitable investment.

With regard to cherries, the experience has been quite favorable. Seventy-four varieties have been under test during the past five or six years, and quite a number of them have fruited fairly well. The larger proportion are varieties from the north-eastern parts of Europe, of the Duke and Morello types. They are very good acid cherries and excellent for cooking. The Bigarreau type of cherries is not hardy at Ottawa.

The experience at Ottawa with plums of the European sorts has been very much the same as with the pears; none of the varieties have yet proven hardy enough to stand the climate and bear regular crops. The varieties of the wild type such as the Weaver, Wolff, and De Soto have succeeded remarkably well. The Weaver especially has done well, and has borne so heavily that the trees had to be propped up in order to prevent them from breaking.

This information has been exceedingly useful. Particulars regarding the several varieties have been given by Mr. Craig in the reports of the Experimental Farms, and those who desire to plant plums in the northern parts of Ontario and Quebec, have information at hand which will prevent them wasting their money on varieties with which there is no probability that they will succeed.

With the small fruits we have been successful. One hundred and eighty varieties of grapes have been under test; and at the

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recent Exhibition at Chicago, in the collections sent from the Experimental Farm, there were 122 varieties, which were fairly well ripened, most of them being in good condition for the table. This was quite a revelation to many fruit growers from other parts of the world. The idea of so many varieties of grapes being ripened out of doors in Ottawa, was something they could scarcely understand, and they were still further surprised when they tested them at their sweetness and the fullness of their ripening. About 150 varieties in all have fruited in the vineyard at Ottawa up to the present. Some of these we do not expect to be able to ripen fully, but it is desirable that we test them so as to gain the experience which will enable us to give sound advice.

Among the grapes there are two or three seedlings worth calling attention to. One of these is the Kensington, a grape of a greenish yellow color, and about the size of the Isabella. The bunch is large and loose, and the grape has a very pleasant, refreshing flavor. This grape is a hybrid, the female being Clinton crossed by the Buckland's Sweetwater. The seedling in this instance takes after the female in the character of the foliage and the growth of the vine, and after the male in the form and color of the fruit, showing already that there has been a cross in this particular instance. The other grape, known as the Emerald, was first shown in connection with the Canadian exhibit at the Colonial Exhibition in London, and received commendation from the judges as the best grape of all the varieties sent from Canada. It has rather a small bunch, not much larger than the Delaware, is of a greenish yellow color, sweet and of good flavor. This is a grape worthy of being disseminated.

Of currants, both black and white, we have at Ottawa about twenty-five varieties, which cover all the leading sorts. We have also quite a number of seedling black currants, some of which are remarkably good. They have been tested at the Experimental Farm, Ottawa, and are also being tested at the branch Experimental Farms. A few of these were sent out to some of the members of the Fruit Growers Association of Ontario last year. If the officers and members of this Association would care to take part in this work of testing some of these new varieties, I should be very glad to have some of the surplus plants placed at their disposal. They would be supplied to Nova Scotia quite as readily as to Ontario.

In connection with this question of currants, other interesting experiments have been tried. A number of new varieties have been raised by crossing the Wild Black currant of Manitoba, which is a very strong growing currant which bears a large fruit having a rather strong, rank taste. Some of the seedlings appear to have the good qualities of the Manitoba currant, with the high flavor of the European.

A still more interesting line of work has been carried on by crossing the Black currant with the Red currant, and the Black currant with the gooseberry, and quite a number of hybrids have been produced which vary much in the character of their foliage, but they have not fruited yet. It is singular that the insects that do not attack the Black currant recognize the introduction of new blood in these hybrids, and feed on them freely. Mildew, also, which affects the gooseberry but is not found on the Black currant, is quite partial to the hybrids crossed with the gooseberry.

In respect to raspberries, we have cultivated about fifty varieties, Red and Black, and nearly all of them have done well. A few are, however, tender. The Gregg and some of the other Black Caps, are more tender than the Red varieties, and usually winter kill more or less. Among the varieties tested there are many which are very productive, and give large crops of fruit every year. We also have a number of new seedlings, which are crosses between the Black and Red varieties, and are intermediate in color, but they vary much in flavor and general character. A number of seedlings have also been raised from the standard named varieties, among the most promising of these is one which has been named Sarah, a seedling of Shaffer. I think this is one of the most valuable raspberries which has been introduced of late years. It is a large berry like the Shaffer, but of better quality, and later.

QUESTION. Does it grow from the tip?

No, it is propagated from suckers, which are produced freely. In the report of the Horticulturist in the forthcoming Annual Report of the Experimental Farms, a figure is given of this variety, taken from a photograph.

In reference to strawberries, we have tested a very large number of different sorts, and many of them have succeeded well.

QUESTION. Have you tried the Parker Earle?

Yes, we have the P. has succeeded fairly well, promising among the new when asked.

Having referred to the Central Farm at Ottawa in reference to the tree grown there, we have one at Brandon in the summer of 1888, and in 1889. About twenty to twelve thousand more of seedlings of box elder, farm during both seasons partly in the valley of the which form the northern mostly prairie, but in the bluffs, there are large scrub oak, hazel, and on the bank there is a small growth of willow, to be seen that the land is climatic conditions by within its area most of the tree growing in the better West. Plantations of scrub referred to, while and much useful information established, many thousand settlers in Manitoba in not succeed there. No Experimental Farm to be prevented.

The next farm west of Head. There we have climatic conditions are at Brandon, yet most small attended the efforts to select, a section of the

Yes, we have the Parker Earle. It is one of the varieties which has succeeded fairly well with us. We endeavor to test all the more promising among the new sorts, so that we may be able to give advice when asked.

Having referred to the different divisions of fruit growing at the Central Farm at Ottawa, I would like now to say something with reference to the tree growing on the Western Branch Farms. We have one at Brandon. The Brandon farm was selected during the summer of 1888, and tree planting was begun there in the spring of 1889. About twenty thousand trees were set that year and ten or twelve thousand more during the present year. A large number of seedlings of box elder, ash and elm have also been grown on the farm during both seasons referred to. The Brandon farm is situated partly in the valley of the Assiniboine River and partly on the bluffs which form the northern boundary of that valley. This farm is mostly prairie, but in the ravines in the bluffs, and also on the face of the bluffs, there are large patches of scrub, consisting of small poplars, scrub oak, hazel, eleagnus and other low bushes, while near the river bank there is a small grove of elm, ash and box elder trees, with undergrowth of willow, rose, etc. From this brief description it will be seen that the land is varied as to exposure, while the soil and the climatic conditions by which it is surrounded is such as to include within its area most of the difficulties which stand in the way of tree growing in the better farming districts in the Canadian North-West. Plantations of fruits have been made in the shelter of the scrub referred to, while others have been planted on the open plains, and much useful information has been gained. Before this farm was established, many thousands of dollars were spent every year by settlers in Manitoba in the purchase of tender varieties which will not succeed there. Now, having the recorded experience of the Experimental Farm to guide them, much of this waste of money is prevented.

The next farm west is in the North West Territories at Indian Head. There we have 680 acres of land under cultivation. The climatic conditions are less favorable for fruit than they are at Brandon, yet most small fruits succeed very well, but no success has attended the efforts to grow the larger fruits. This farm was, when selected, a section of bare prairie land without shelter, but large

numbers of trees have been planted there, and it is hoped that in the shelter which these will in time afford, that some larger fruits may be found, with sufficient hardiness, to endure the climate. The only variety which has yet proven hardy is a very small crab from Europe, known as the *Pyrus Baccata*. The fruit is very small, no larger than a cherry, with a long stem. It is possible that this may be the starting point for apples in the North West.

Last autumn I was at Edmonton, two hundred miles north of Calgary, on the C. P. R. When I arrived there I heard of an extraordinary apple, which I was asked to go and see. It was the first apple which had been grown in the North West, and was said to be a Tetovsky. I went to see the apple and found it to be a good specimen of Whitney's No. 20 crab. To find an apple so good as this so far north was quite encouraging.

The hardiest pears are less hardy than the apple trees, and we have had no success with them. The only hardy plum which yet gives any promise is the native wild plum of the country, of which we now have quite a number on both of the western farms.

Cherries have also been a failure, excepting the Sand cherry (*Prunns Punula*), which grows native in the country. A bush of this sort had some fruit this year, at Indian Head, but if one was not fruit hungry, they would not care much for such cherries as these.

Currants and raspberries are grown successfully both at Brandon and Indian Head. The varieties of raspberries which have thus far succeeded best, are the Turner, Philadelphia, Queen of the Market, and Kerden. All of the cultivated varieties of currants, and most of the gooseberries, succeed well.

Going further west, we have a Branch Experimental Farm in British Columbia, at Agassiz, nearly four thousand miles from here, in what is known as the coast climate of British Columbia, which includes all that part of the country lying west of the coast range of mountains. This farm is situated about seventy miles from Vancouver, in the valley of the Fraser River. About 120 acres of land have been cleared and brought under cultivation, which has involved much heavy labor in removing large trees and stumps; but under the energetic management of the superintendent, Mr. T. A. Sharpe, rapid progress has been made with the work. Several large orchards

of fruit trees have been planted, and a number of blocks of small fruits set out. Fruit and hardwood forest trees have also been planted on the bench land on the slopes of the mountain. The usefulness of large experimental orchards in a country so well adapted for fruit culture can scarcely be overestimated, as these will furnish in a short time, reliable sources of information to the settler concerning the most suitable and profitable sorts for him to plant. The experimental farm work there is very much appreciated by the farmers and fruit growers. On this farm we have now one of the largest collections of fruits to be found in any place in the world. There are about 1150 varieties, including large and small fruits, including nearly all the different sorts to be had in Europe, the United States and Canada. The object in bringing all these different sorts together is to have an opportunity of comparing them under like conditions, so as to form more correct ideas as to their relative quality and productiveness in that climate. The large fruits consist principally of apples, pears, plums and cherries. When I visited this farm last spring I was struck with the rapid advancement which young orchards make there by the blossoming of the trees in an orchard that have only been out for three years. They were simply white with blossom, and I thought we were going to have a fine crop of fruit, but the unusually cold weather of the previous winter had injured them. Many of the plum trees gave from twenty-five to fifty pounds, and they now give promise of an abundant yield during the coming season. And I would say, Mr. Chairman, with all due deference to the Annapolis Valley, that there is no place in the world quite so favorable for growing pears, plums and cherries as in some parts of the coast climate of British Columbia. I do not think their apples have quite so high a flavor as yours, but the trees bear heavy crops. They are, however, in that moist climate, subject to spot and fungous growths. The pear trees are free from blight.

Plums and cherries also succeed remarkably well. I have frequently seen plums which would go four to the pound. This shows the suitability of the climate for bringing these productions to a high degree of perfection.

I do not suppose that British Columbia will ever be a keen competitor with you here in green fruit, but she probably will with preserved and canned goods. The cost of shipping green fruits over

the mountains and plains and down to this Eastern section of the country is so high that the probabilities are you will have your market here undisturbed from this source ; but British Columbia will probably compete in supplying the fruit required as far east as about the middle of the Western Plains, and Ontario will be able to compete with fruits from British Columbia east of this.

On this farm experiments are also being carried on with cattle, sheep, swine, and poultry, also with many varieties of grain, grasses, fodder plants and roots.

There is also another line of experimental work in progress which is likely to prove useful there. We began last year a system of experiments with regard to the propagation of hardwood timber trees, including Black Walnut, Butternut, Oak, Elm, Ash, Hickory, and Black Cherry. These have been planted on the broken land on the mountain sides, which is unsuitable for agriculture, and the young trees are doing well and making rapid growth. The scarcity of hard woods in British Columbia makes it probable that these new introductions will in time be of value to that country.

The PRESIDENT then introduced MRS. A. H. JOHNSON of Wolfville, who was the first, and for some years the only lady member of the Association. MRS. JOHNSON responded with the following very interesting paper :—

WOMEN AS HORTICULTURISTS.

Over the whole continent and from across the sea comes to us a pitiful wail from starving men and women, "Give us work that we may have bread, lest we and our little ones perish by the way." From across the border this cry comes home to our hearts with keenest blow, for thither during past years have drifted hundreds of thousands of our sons and daughters, but who to-day, after years of fairly remunerative toil, are menaced by starvation in the land of their adoption, and are turning their eyes towards this, the only country where as yet there are no strikes, lockouts, closed factories, or deserted mines. Already we hear the tramp, tramp of their returning feet, and as we extend to them the welcoming hand, we cast a questioning glance over our Dominion's resources to see if we can give to them that which is bread ! Thank God, we can answer,

"Yes,!" with an affirmative wide as the continent, with its ocean adjuncts broad as our prairies, long as our rivers, and deep as our lakes. While we regret the calamity that has turned them adrift, we can but rejoice that they are coming back to their native land. Too long have we supplied material from our good Saxon stock to help strengthen our neighbors bulwarks; we need our bricks at home to build a broad and firm foundation for our free and fair Dominion, that the superstructure may be a credit to herself and the mother land.

Among these home comers, a large proportion are women, who have been toiling in hospitals, schools, factories, stores, behind desks, and in the thousand ways in which the women of to-day are working shoulder to shoulder with their brothers. We cannot give them all the same employment to which they have been accustomed, we are too young a nation for that, but to them and to the young daughters of our land now at home, who, standing on the threshold of the twentieth century, are bravely fitting themselves for work and independence, we say, "We will open to you new avenues of labor, and here is one broad, respectable, and above all highly lucrative, as yet but little trodden by women, but admirably adapted to their capabilities, requiring but little capital, a fair education, a brave heart, industrious habits, and above all the ineffable patience of a woman I refer to the science and profession of horticulture.

To-day, in the crowded ranks of medicine, law, literature, science and art, to the highest only comes the golden reward, but here is a profession that never fails to fill the coffers of every honest, diligent practitioner. In this country this a comparatively new departure, but not so in the neighboring Republic. In the State of California some of the best managers are women, and prosperous vineyards and orange groves are owned and directed by women, and to a woman belongs the honor of owning, aye, and planting, cultivating and managing the largest and most prolific grape vine in the world. The wonderful vine of Santa Barber, with its romantic history, a poem in itself and ending as poems should, practically and profitably.

One of the best known horticulturists of the State of Indiana for the last twenty years is Mrs. Helen Austin, who represented the Horticultural Society of that State at the Philadelphia Exposition seventeen years ago, and next to her comes Mrs. Myra Haines, a well-known practical fruit grower of the same State; while all through

the Western and Middle States are well-known and well-managed orchards and fruit farms, market gardens and florists' establishments owned, controlled and managed by women—and well managed, too.

The recent developments of woman's work in this department, as shown at the World's Fair, are too well known to need comment. Some of the best writers on horticultural subjects are women, of whom but a few can be mentioned, notably, however, Mrs. Eleanor Omerod, of London, England, author of "Agricultural Etymology"; Mrs. Mary Treat, author of "Injurious Insects of Farm and Garden," (Darwin quotes from both these works); while Mrs. Horace Mann, of New York State, proves herself the intellectual equal of her illustrious husband in her able volume on "Forest and Garden."

Landscape gardening, too, seems to be peculiarly a woman's province, since the planning, adornment and disposition of garden, front yard, lawn or pleasure grounds belonging to our homes, generally speaking, come under her especial supervision; and is it not a fact that to her energy, skill and good taste, aided largely by practical work with eye and hand, we owe the existence of gardens or lawns around our homes at all? Is it not at her instigation that the wood pile has long since ceased to be a prominent feature in front yard decoration, and how many of you are there to-day who would permit the hay cart, mowing machine, or express wagon to occupy the foreground of the front lawn were it not for the argus-eyed vigilance of your unsalaried feminine landscape gardener within doors? There is no existing reason why a woman should not be a successful horticulturist, since there is nothing about the work that she cannot do; but then, what is there that a woman cannot do if she sees profit and advantage in it? "Sharpen a lead pencil," suggests some masculine skeptic; yes, she can, and cut a scion or prune a tree, too, if she be properly and scientifically trained; and without that you can not do either properly, my critical brother.

Ah, this art of knowing how,—the doing of everything in the right time and way. Who knows better than we older fruit growers its rarity? Long and wearily have we arrived at our successes by winding paths, when a little knowledge at the start would have made the way short. What darkness have we groped in for want of the light of instruction! But day has dawned, it is ours to offer to the coming fruit grower the opportunity of studying both the theory and

practice of the oldest, and yet most modern, the most agreeable and yet most profitable of all scientific professions.

May I live to see the day when the girls of Canada will fling the crazy patch work over a pole in the corn field for the edification of the crows, while they study the germination of seed, light bonfires in the orchard with the atrocious caricatures of apple blossoms done in paint smudges to keep the codlin moth from defiling the petals of the fair original. Those bunches of wax flowers that are not in the likeness of anything created,—melt them into grafting material to aid in producing the beautiful reality, and leave the long-suffering piano to rest from its torture while we listen to the ever-changing waves of melody, without one false chord, that issue from the throats of the feathered guardian of our orchard wealth.

Oh ! Painter of the fruits and flowers,
We thank Thee for Thy wise design,
Whereby these human hands of ours,
In nature's garden work with Thine.

Give fools their gold and knaves their power,
Let fortune's bubble rise and fall,
Who sows a field, or trains a flower,
Or plants a tree, is more than all.

The first horticultural society of which we have any knowledge, met in Eden, in the year one, and I observe from the membership list that there was an equal number of male and female members, namely, one of each. That must have been a very aristocratic society, by the way, since none but the first families belonged, but then every one knows that horticulture should be regarded as a most aristocratic science, as it was the earliest profession known. This report further states that the management of the first orchard was a partnership concern, that one of the partners was a woman, but nowhere does it intimate that she was less a worker than he, or that she did her work in less workmanlike manner as far as care and cultivation went. True, when gathering time came a difficulty arose owing primarily to her, but it was not that she gathered carelessly or unskillfully,—she simply made the mistake of taking it from the wrong tree ; and I think it doubtful if she would have done that had she had the advantage of training in the School of Horticulture, as her grand-daughters have to-day.

Why search the wide world everywhere
 For Eden's unknown ground?
 That garden of the primal pair
 May nevermore be found.

Our homestead's flowers and fruited trees
 May Eden's orchard shame,
 We taste the tempting sweets of these
 Like Eve, without her blame.

And still with reverent hands we cull
 Thy gifts each year renewed,
 The good is always beautiful,
 The beautiful is good!

The PRESIDENT, said the name of COL. W. M. BLAIR, Superintendent of the Experimental Farm at Nappan, was next on the programme, and all present would be delighted to hear from him. COL. BLAIR in response said:—

Mr. Chairman,—As the day is nearly closed, I will only occupy a few moments. I do not feel like leaving the Hall, after enjoying your excellent meetings, without saying a few words. I am particularly pleased at the course matters have taken during the last two years, especially in regard to the establishment of a School of Horticulture here. We who have lived in a less favorable locality for fruit growing have been led to believe that there was no place in Nova Scotia where fruit could be grown successfully, except in this valley; and we have been told that every boy in this fruit region knew all about growing fruits. But it seems that opinions have changed, and you have come to the conclusion that something is yet to be learned, and taking that view of the matter, you have established a School of Horticulture and engaged the services of a Professor, who I trust will be a competent and judicious teacher, from whom the young will receive valuable knowledge of this useful art.

I must congratulate the Society on its success thus far. Now you have the School established and your teachers engaged, you are on the threshold of the project. Success or failure lies before you. The Professor requires your unbounded support, sympathy and confidence; with this success is assured, and without this failure is certain. The prejudices of many are to be overcome, and with success all prejudices will vanish and all will yield a willing support.

At Nappan we have nearly twelve acres in fruits, comprising one hundred and fifty varieties of apples, pears, plums and cherries. So far they have made fair growth. Several of the trees have died, but they were chiefly those planted out in the fall. We have been troubled some with the canker worm, and leaf-roller. Several of the varieties, now nine years old, have commenced to bear. The heavy gale of August 22nd did much damage to the young trees. But we hope to be able by care, attention, and good cultivation to demonstrate the fact that fruits of many kinds can be grown successfully in many parts of the Maritime Provinces where fruit growing is not attempted at present.

On the Experimental Farm at Nappan we are working out problems that we think will be beneficial to many farmers in these provinces. We are there doing practical work by Government aid, that the ordinary farmer is not in a position to do, from the want of time and funds at his disposal. When I say ordinary farmer, I do not mean those independent, wealthy farmers that are so situated that they can carry on any class of farming they see fit. But we wish to reach that class that are not so favorably situated as to soil, wealth and other advantages, and who are so often discouraged by the want of success, in many cases due to a want of knowledge, and who I find are always anxious to get information; and in conclusion I wish to say that if I can be of any service at any time in assisting your School, I shall be pleased to co-operate, and should we have any plants or shrubs at Nappan that would be of service to you, I would be pleased to supply them; and I trust that the labors of our schools and farms may be a lasting blessing to the people of our country.

MR. C. R. H. STARR here introduced the following resolution:—

“That this Association appreciates the efforts of the committee appointed to establish a Horticultural School, and congratulate them on their success, and would urge them to continue in the same line till we secure the necessary grant to establish an Experimental Station, and thereby ensure the permanency of the measure.

A. MCN. PATTERSON, in seconding the above resolution, said:—
When we find men accomplishing a good work we should stick to them; and when we find men filling situations who are capable, keep them there. I think it is a good thing that we have this School established here; and we have it established not through any government, by the way, but we have established it ourselves, and

we have asked the Government to support us--we are not supporting them. (Laughter). I rejoice to think of this thing. A few years ago I prophesied that agriculture had been inaugurated on College Hill to stay. We have set down a stake there, and I trust that this young shoot will be permanent (Prof. Faville) and that he will never leave this place until he makes that College field one great School of Horticulture.

The PRESIDENT said it was to be regretted that Mr. W. C. Archibald was absent, on account of sickness. He deserved a great deal of praise for his labors and success in increasing the membership from 50 to 500. (A list containing the names of 150 members had just been handed to him. These were taken by Mr. Archibald in Eastern Nova Scotia.)

Resolution passed unanimously.

MR. S. C. PARKER said it would be a good thing if we could induce the Beekeepers Convention, which meets in Wolfville to-morrow, to throw in their lot with this Association. Beekeeping was certainly in a line with the culture of fruit, and he would move that this convention make overtures to the Beekeepers' Association asking them to unite with this Society.

R. W. STARR. As a member of the Beekeepers' Convention, I have much pleasure in seconding this resolution, and will urge the Convention to entertain favorably any proposals that may come before that Society from this Association.

The resolution was carried unanimously, and a committee appointed to make proposals.

REV. J. H. AXFORD. Has anyone found any effectual remedy against the ravages of the leaf-killer. I sprayed last spring before the buds opened, but it was not effectual.

GEORGE THOMSON. In answer to that question I may say that I have a paper in my hand which refers to the *leaf roller*. It is here called the bud moth. In western New York it has been exceedingly troublesome. I will read the following extract:

"The number of insects that now prey upon the apple tree is great, but I shall speak now of but one whose mischievous work has been strangely overlooked, to wit: the bud-worm. Saunders, in "Insects Injurious to Fruits," speaks of two, the eye-spotted bud-moth (*timetocera ocellana*) and the apple bud-worm (*eccopsis*

malana), the former of which feeds upon both the blossoms and tender leaves, while the latter feeds upon the leaves only.

"If early in the spring, or during the winter, you will carefully examine the previous year's growth of apple twigs, you will probably discover, hidden in small grooves or rough places, small silken cells or hibernacula, about one-fourth of an inch in length and the size of a small cambric needle. If, after two or three warm days, which cause the buds to swell a little, you again visit the cells, you will very likely discover a very small hole near one end from which the larvæ has escaped. If then you will, with a magnifying glass examine the nearest terminal bud, you will probably discover the larvæ inside the folds of the bud, feeding upon the tender leaves, or possibly you may find him in a blossom bud feeding upon the enclosed blossom. After the blossom opens it will spin a web, drawing the edges of a leaf together, making a cosy dwelling, whence it issues seeking blossoms and leaves to devour. One of these small larvæ is, alone, able to destroy a great many clusters of blossoms, but when they are numerous, scattered over the branches of the tree, its capability of inflicting damage is very great.

"If the growth [of the apple trees is very carefully examined, between now and spring, a great many of the silken cells may be discovered, and the larvæ within crushed. Then, when we have had two or three warm days in spring, if the trees were sprayed with Paris Green, so as to cover the buds, many of the larvæ would probably be poisoned. At the same time the Bordeaux mixture could be applied with the Paris Green and thus reach the scab fungus."

If anyone wishes to follow this investigation further, I would refer him to Prof. Saunders work on insects. This bud-moth has been exceedingly destructive in New York—so much so that the crop is much reduced by its ravages.

REV. J. H. AXFORD. I would ask what is the proper time to spray with Paris Green? I sprayed last year before the buds opened. I do not know whether the Paris Green touched the leaves in the bud.

MR. MILBER. I have not had much experience in this line. We have all got to experiment.

MR. WILLIAM YOUNG read a paper, "The Orchard as an Investment," in which he showed the dark side of the business, and which caused a lively discussion.

MR. W. A. HARDWICK said in view of the increasing interest in and enlarged cultivation of the plum as a farm crop throughout

this valley, much of which is due to the enthusiasm and success of a few of our leading plum growers, and taking into consideration the pests which prey on this crop, among which stands very prominent the black-knot, I thought it well to bring the subject before this Association, in order to solicit an expression of opinion as to the wisdom of applying to our Legislature for an act that will assist our fruit growers in stamping out this disease, or in our plain English will compel every man either to take such care of his own trees as will keep them so well clear of black-knot that they will not be a source of danger to his neighbors, or be answerable to law. My remarks will be confined chiefly to the propagation and spread of the disease, as this phase of the subject bears upon the necessity of suitable legislation.

As one drives through the country, he cannot but observe the neglected state of many of the plum trees. Their owners seem to have been thoroughly disheartened, if not disgusted with plum culture, and have left the trees entirely to the ravages of the pest. Many of them are now not only worthless, but are a nucleus for the propagation and spread of the disease, not only to the adjoining trees of the garden, but also to all that are in the neighborhood.

This disease though known before, has like others of our fruit pests, made rapid increase during the last twenty-five years. Downing, nearly fifty years ago said of it, "It is a most troublesome disease, destroying the whole race of plum trees where it is suffered to take its course." At that period the real cause of the disease was not known, but the advice he gave, viz., the destruction of all affected parts, stands to-day.

As to the cause, several theories have been given, but the one put forward by Dr. Farlow several years ago as the result of his investigations, and which is confirmed more recently by many scientific men, and now most generally accepted, is that it is a parasitic fungous growth within the bark, known to science by the name *Plowrithia Morbosa*. The first outward sign of a new knot is seen in the swelling of the tissue within the bark, either in the growing season or in the fall. This increases until the bark is ruptured, and over the surface thus exposed the fungus sends out a number of threads. Microscopic examination reveals multitudes of newly formed and forming spores or seeds on these upright threads. These spores,

when mature, drop from their supporting threads, and when carried by the wind, insects or other agencies, to another host plant, under favorable conditions may start growth and form a new center, which in time may be a new spreader of the disease, and so continue without end. It is believed there are two crops of spores in a year, one in summer and the other in winter or early spring. These spores are produced in great numbers, and by their agency the disease assumes an infectious character, and spreads from tree to tree, and from one community to another. As it is not the object of this paper to speak of the various articles used as remedies, I will only say that the prompt and judicious use of the pruning knife on the first appearance of the disease, and the burning of all diseased wood, is the most effectual way to prevent spreading. But whatever may be the means used or the success attained by the careful and enthusiastic and painstaking grower, who by good cultivation and a liberal use of the best fertilizers, hopes to produce a strong and healthy growth of wood, such as will resist the attacks of disease, these efforts do not reach the production of spores on the trees of careless and indifferent neighbors, or shield them entirely from the danger. Against such, one can only use persuasion, hoping to secure his neighbor's co-operation.

It does seem to be unjust and extremely trying to one who has spent hundreds, and it may be thousands of dollars in planting a large orchard of plums, to be largely at the mercy of his neighbor who does not value his own trees enough to properly care for them. I think no one ought to be allowed to keep on his premises that which is a public nuisance, or which will unjustly injure him in any way.

Laws of this nature prevail in many of the States of the Union and also in Ontario, and I believe the time is opportune for us to follow suit. Much more might be said on this matter, but I prefer, and hope to hear expressions of opinion from many of the members present in regard to this matter.

The following resolution was moved by S. C. PARKER, and seconded by R. W. STARR, and carried unanimously:—

“Whereas, this Association has on former occasions expressed its views in regard to the necessity for some legislation to prevent the spread of injurious insects and diseases;

“Therefore resolved, that we now re-affirm our former action in this respect, and urge that further steps be taken to secure said legislation.”

PRESIDENT BIGELOW said Mr. Webster, M. P. P., had been interested in the subject, and had got a great deal of information about the losses in the State of New York and Ontario, but for some reason it was not brought before the Legislature in this Province. He had the idea from some source that in Provinces where they have laws in this direction they are not carried out successfully. As to what success they had in the State of New York and Ontario, he could only gather from their annual reports, and the last reports from Ontario said they were a failure. The laws in force in Ontario aimed particularly at the black-knot. If there was any person who could carry this thing through for them, it was Mr. Webster.

WILLIAM YOUNG said it would be well to get some effective legislation on the subject. He had studied the laws in the different States, and he did not see how an effective law could be enforced under our political conditions. Neighbors would not inform on each other. That they would not get a law which would ensure an efficient inspection. Would they give an inspector dictatorial powers? And it is very doubtful if it would be rendered effective then. He did not think it would be wise to give such power to an inspector who would be appointed under our present political conditions.

WILLIAM A. HARDWICK said it was a matter which touched them very closely, and some of them pretty hard. Those fruit growers who have large orchards of plums are at the mercy of pests. He said his object was to place the matter before this Association, and solicit information with regard to legislation on the matter,—whether it would be desirable and profitable to have such legislation. He had confined his remarks chiefly to black-knot and its propagation. He said some objections may be raised in regard to legislation, that this disease affects the cherry, and especially the wild cherry. It might be a strong objection in some districts—outlying districts where there are large groves of wild cherries—the law would not be applicable; or at least it would not be wise to enforce such a law; but the idea of having such a law in a section where the plum is highly cultured, and the fruit in danger of this disease, was apparent to everybody, and it would be of paramount importance to them. He said he offered these remarks to hear a free discussion on the subject, and he hoped that the efforts heretofore made by this Association towards

getting this law passed may be respected and enforced, and that it may produce good results.

The resolution upon being put to the meeting, passed unanimously.

MR. T. E. SMITH made the following remarks on

FRUIT GROWING IN PRINCE EDWARD ISLAND,
AND EASTERN NOVA SCOTIA.

Having been called upon to give a few facts on this subject, I shall only speak from what I have seen. I spent four weeks in midsummer, on the Island the past year, and had a fair opportunity of judging of the fertility of the soil, as well as its capabilities as a fruit growing district. The Island abounds in cherries, principally of the Old Kentish and Black-heart varieties, all trees giving abundant crops of good sized plump fruit. The soil being a fine sandy loam, and naturally quite fertile, is well adapted to fruit growing in general. The kind hand of Providence has done much for Prince Edward Island.

If orchards were planted and cared for, there would be another fruitful branch of industry. Two essential requisites are necessary before much progress can be made, viz., protection from winds and selection of varieties. High winds prevail, strongly impregnated with salt from the sea, and oft-times one sees trees where the upper half and exposed side of the tree is dead, while the lower half is well loaded with fruit. The soil is impoverished by growing oats from year to year. These are often sold in the fall for 28 cents per bushel, and in the spring hay is sometimes purchased at \$20 per ton. The mussel mud is a valuable fertilizer, but our Kings County farmers need not envy them while they can get the salt marsh mud which lies along the banks of our rivers.

Occasionally we meet a pioneer who has a lot 60 to 100 feet square, strongly barricaded as though it were a prison for unruly cattle, with a few fruit trees planted in it. If the Prince Edward Island farmers could be induced to plant orchards and give them proper attention, they would find it profitable. It would afford them fruit for their own families, as well as a supply for local markets. Their custom of planting trees in such small inclosures naturally induces

them to plant too closely, and the evil results of insects, want of sunshine, and improper cultivation follow. Others have been "gulled" by having ungrafted trees imposed upon them. In Charlottetown I visited the market and saw very fine specimens of gooseberries and currants of various kinds, raspberries and blackberries; while the ubiquitous cherry was seen in every stall. At Summerside I saw a small fruit garden with a very fine show of raspberries, blackberries, currants, gooseberries, strawberries, plums, and a fair show of apples coming to maturity. Strawberries are very little cultivated on the Island. The market was so poorly supplied that they were sold through the season for 25 to 30 cents per quart. Some of our enterprising young men who are going to the West, and crowded cities of the United States, might find fruit growing profitable in "The Garden by the Sea."

Cranberries grow well over large tracts of land. On the western part of the Island thousands of acres of bog-land can be bought at twenty-five cents an acre, and put in shape for planting the vines for from \$3 to \$6 per acre, the principal expense being ploughing. In many places there are several hundred acres in a block awaiting the plough. Good roads and nearness to railroads are noticeable features.

As to plum culture, this may be said,— the black-knot has been very troublesome, but has not made much growth the last year, and many are in hopes that it is dying out. The plum crop was abundant, principally of the large damson variety. I could not observe any canker sores, as is sometimes seen in this Province, and where well cared for, the trees presented a healthy appearance.

Oats and fruit trees do not grow well together, and as the Island farmers look well to their oat-fields, the fruit trees do not receive a fair share of attention. I cannot say "pruning is one of the lost arts," but certainly it is seldom practised here. When a limb dies it is left on the tree to decay, thus it remains an eyesore for years.

I saw a yellow transparent apple tree, the second year planted, with sixteen large apples on it. Another acre orchard from the Nova Scotia Nursery, second and third years planted, literally loaded with the weight of fruit. This was barricaded from the sea by a tight board fence twelve feet high. A Flemish Beauty pear tree that I saw, for clean healthy fruit and foliage, could not be equalled in

Nova Scotia. These were all from a quarter to a half mile from the sea. A other young orchard of six or eight acres, near Georgetown, looked very promising. These are living witnesses that fruit can be grown successfully. If necessary precautions could be taken for the destruction of insects, I would bespeak a brilliant future for the Island fruit growing.

In Cumberland County there are thousands of acres of land well adapted to fruit growing. Trees have not been cultivated, as is necessary. In some sections they complain of the bark bursting; this may be overcome by under-draining, and protecting the trunk during winter.

At New Glasgow we see the wholesome influence of Harris Shaw's operations in fruit growing. Although his plum orchard is now neglected, it nas borne enough to show what might be done. In other gardens I saw very fine specimens, and good crops of various kinds of fruits, among which were dwarf pears, loaded with choice specimens, while apples were of no mean order. At Antigonish town Adam Kirk's orchard was a marvel of productiveness. At Lochaber Lake an old orchard, with young trees planted in the broken places, with four years of care, was doing remarkably well. Kings, Russetts, Gravensteins and Ribstons vieing with each other in productiveness. At North Sydney and vicinity, wherever there was a plum tree that had any chance whatever, even after all the gales, had to be propped up on account of the weight of fruit. Capt. Wargen commenced five years ago on a small plot, and last season sold 800 gallons of fruit. I noticed such varieties in fruiting as the Magnum Bonum, it having been brought out from the Jersey Islands over one hundred years ago, the Lombard, Bradshaw, Washington, Green Gage, Imperial Gage, and Moer's Arctic. I also saw the German prune sold for the Marsters plum. The prune does not thrive there, the fruit not being one-quarter as large as it should be. The Cape Breton Black and White plums, two small seedling varieties, are found on every turn. The black-knot has been very troublesome, having destroyed the greater part of the trees. Many assured me, however, they now throw kelp and rock-weed over the trees in the fall, and the salt gradually soaking from the weeds by the influence of the rains, has completely killed out this scourge. Pears were of good size and a fair crop, but badly infested with hard spots in the fruit. A remedy was eagerly sought.

It being nearly six o'clock, resolutions were passed thanking the Windsor and Annapolis Railroad and the Press for courtesies extended from time to time, and to the gentlemen and ladies who had furnished matter for the meetings, and the Association adjourned *sine die*.

WEDNESDAY EVENING.

The evening was occupied with a Social in College Hall. A very large attendance filled the college building. The Wolfville brass band rendered a select programme, and all present voted it a fitting close for a very successful meeting.

SPRING MEETING.

It was deemed advisable to hold the quarterly meeting of the Association at an earlier date than usual, hoping thereby to find the fruit growers more at leisure, and willing to attend in larger numbers. The event justified this new arrangement.

The meeting was held at Middleton, Annapolis Co., on the 21st and 22nd days of March. The capacious Odd Fellows' Hall was nearly filled with ladies and gentlemen during the three sessions of the meeting.

PRESIDENT BIGELOW took the chair at two o'clock, and, after congratulating the people of Annapolis County on the large and enthusiastic meeting, called on GEORGE THOMPSON, Esq., of Wolfville, to introduce the subject of Pruning. Mr. Thompson, in a very capable manner, introduced this important subject, and showed by illustration the evil effects of improper pruning, and the importance of proper methods. Mr. Thompson's remarks were followed by an animated discussion, taken part in by a large number of those present.

The programme for the day was then taken up, and the following paper was read:—

PLUM CULTURE.

BY G. C. MILLER.

It is doubtful if among the very tempting and desirable fruits now grown, there is one more generally neglected than the plum. This should not be so, as no tree or fruit grown responds more quickly, or in a more liberal manner to generous care and high cultivation. I am glad that within a few years there has been an awakened interest in this fruit, and an enquiry as to the best mode of cultivating it, which indicates that in the near future it will take its rightful place among the profitable fruits in the Annapolis Valley.

In the briefest manner possible I will touch some of the points necessary for its successful culture, which may serve as texts for a full and free discussion to follow.

First procure good, thrifty trees, if you possibly can do so. Five cents saved in the price of a plum tree, or in fact, of any tree at the expense of quality, is very questionable economy. The fruit trees I planted were very fine in every way, and I paid a good price for them. When four years out rising five, these trees, some seventy-five in number, gave me an average of \$3.00 net per tree. A lot somewhat inferior planted one year later, when six years old had not reached the above result. As to soil, plums will grow on almost any kind, but much more easily on a well-drained loam or clay loam. One great reason of this is the shelter the light soil affords to all kinds of insects. The Lombard, above any other kind I know of, seems adapted to a variety of situations, and will give nearly or quite as good results on light soil as on heavy. It is one of the surest croppers yet introduced, and can be made to produce as many bushels of fruit acre for acre as the most productive potatoes. But to do this it wants feed, and (right here I would say to any prospective plum grower, don't think to be successful without high cultivation. This will insure you healthy wood growth and the response in the way of fruit will surprise you. No deep ploughing should ever be allowed among plum trees. They are surface rooters and all such culture only mangles and destroys the feeders in search of materials to make the crop. Three inches is quite deep enough to run the plow, and all subsequent cultivation can be done with a spring-tooth harrow or cultivator. Keep the soil well tilled till into July, and then sow buckwheat, allowing it to remain as a winter mulch, and to retain the leaves as they fall.

Quite a diversity of opinion exists as to the proper mode of trimming. Experience will in time teach most people, but generally after they have allowed more or less trees to be greatly injured or spoiled. We must prune the trees to fit them for the work they have to do, and also to adapt them for convenience in doing necessary work among them, such as trimming black-knot, picking fruit, etc. Naturally they want to shoot straight up into the air, going up often at the rate of four to five feet per year. If not checked your tree will be a mass of long, straight limbs like rake handles, with the fruiting branches ten to fifteen feet in the air. A very brief experience will show anyone that such trees cannot be kept upright. Loaded with fruit, with so great a leverage, if they catch a heavy wind immediately after a rain, the roots being so near

the surface they are about sure to go down flat, entailing loss of fruit and heavy damage to the trees. Mr. Willard, of New York, who is authority on the subject, says to cut in rapid growing trees from one-third to one-half. This causes laterals to be thrown out, and in consequence the head is low and compact, affording every facility for gathering the fruit and ease in finding and trimming the black-knot. Besides the cutting in, little trimming is needful, except to thin out limbs which cross and chafe each other.

We now come to the two great enemies of the plum crop, viz., the black-knot and the curculio. These have deterred more people from planting this fruit than all other causes combined. The impression seems quite general that when the black-knot makes its appearance the usefulness of that particular tree is about over. This is a great mistake, unless you make the greater mistake of letting it have its own way. A sharp knife and a little turpentine are all the remedies this evil requires. Whatever may be the cause of it, I will leave scientists to work out, but we know it is a fungous growth and that it ripens spores which detach themselves and catch in other places or on other trees, so that without attention a whole orchard would be speedily ruined. Watch it as it appears. It will be found in greatest abundance during the most rapid period of wood growth. As soon as possible, and always before it turns black, pare it from the limbs, or if on limbs of no great value, remove them. If after cutting, the wound be touched lightly with turpentine, being careful to keep it off the bark, there will be no return of the trouble to the spot. Make a business of going over all the trees three or four times during the season, the last time after the leaves have fallen, when there will be nothing to hide any overlooked pieces from view. It is not as heavy a job as it would seem, and a few days labor each year would keep every trace of it from hundreds of trees.

As with the black-knot, so with that active insect the curculio, it is more of a matter of watchful attention than of hard and impossible work. It begins its business when the plum is quite small, cutting a crescent shaped cavity into which an egg is deposited. It will thus sting about forty plums per day, or four hundred during the ten days in which the plum remains in condition suited to its purpose. If at all numerous it is easy to see how effectually an ordinary crop would be destroyed. Fortunately they do not work in

cool or wet weather, and when we happen to have these conditions at the time when the pest would be doing its work, we have what we call a "plum year" Spraying with a weak solution of Paris Green, a pound to two hundred and fifty gallons of water, after the bloom has fallen, is said to be an effectual remedy by some. It is supposed to poison the old curculio waiting among the foliage for the proper development of the fruit. A better known and more generally practised method is to spread a sheet under the trees in the cool of the morning, and then by a sharp blow on the stub of the limb jar them off and destroy them.

As to the profits of plum culture, that all depends on conditions. In a small way, I have grown them at the rate of two thousand pecks or five hundred bushels per acre. At the prices we have been accustomed to receive, such a crop would be immensely profitable; but at the present rate of planting we cannot count on any such prices. We shall, I think, have to figure largely on what they will be worth for canning purposes. If I were sure of even \$1.50 per bushel, I know of nothing that I would prefer to grow. A prominent fruit grower in New York State informs me that though he has thirty acres of plums, he has never yet sent any to the cannery, as he got much better prices in the city fruit markets than they can afford to pay. A neighbor who grows a cheaper grade of fruits for canning purposes tells him that he realizes about \$300 per acre.

Regretting that circumstances would not permit me to present a fuller or better prepared paper, I submit what I have as mere suggestions to draw out fuller and more complete information, from those present, on the subject.

Mr. Miller is known among the foremost of the progressive fruit growers in Nova Scotia. He has a technical and practical knowledge of his subject and was listened to with closest attention, being often cross-examined on particular points by enthusiasts in the audience. A lengthy discussion followed, and the afternoon session closed at six o'clock.

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EVENING SESSION.

The evening meeting was called to order at 7.30, PRESIDENT BIGELOW in the chair, and the following address was delivered :

CROSS FERTILIZATION.

E. E. FAVILLE, B. SC. AG.

The subject of cross fertilization for the advancement and improvement of our fruits is of great importance, and should claim the attention of all progressive fruit growers. Among the many problems entering into the advancement of horticulture, none have done more than that of cross fertilizers, and it has become a very pertinent subject, that should continually claim the attention of us all. The fruit grower should become an original investigator, ever alert to bring about some new improvement of fruits, both large and small. When we think of the vast improvement that has been made in many plants during the past sixty-five years, we can readily see before us a broad field in which to labor. Let us discuss first in this connection, cross fertilization as related to orchard fruits as conducted by man ; second, the work of nature in the fertilization of blossoms of fruit, and its very important place in orcharding. Many of the fruit trees of your Province are imports bred under different conditions of soil and climate, consequently not as well adapted to climatic conditions as are native sorts, with native features of hardiness. It often takes several generations to adapt certain varieties to localities. It seems then that it is the duty of the fruit raiser to give this subject more attention, endeavoring to originate new varieties, introducing features of hardiness, improved productiveness, flavor, size, color, etc., to meet the desire of home or foreign consumption. In cross fertilization marked advancement has been made among flowers and vegetables, and grand results observed in the strawberry, grape and raspberry. Comparatively little has been done among orchard fruits until within the last few years, simply because the returns are not as speedy as in other fruits, and we are too apt to become impatient, trusting more to the returns from chance seedlings or sports, uncertainties in every sense of the word, relying on the wind and insects to do the work for us, regardless of proper selection. We will then turn to the

method of procedure in this cross fertilization, The process is easily understood and quite simple. We must deviate a little and explain the parts of the flowers and be able to recognize them. A complete flower consists on the outside, first of a circle of modified or transformed leaves on the end of the flower stock, and is called the calyx, the leaves are the sepals. Inside of the calyx may be found another circle of leaves which are variously colored, that constitute the corolla of the flowers, and its separate leaves are the petals. Next to this appears a circle, usually more numerous, called the stamens, each of which consists of a slender filament; at the end is the anther, in which are located the pollen grains of the flower, usually yellow in color and of different shapes and sizes,—under the microscope may be seen to consist of all structures, which are separate, containing living matter,—this constitutes the male part of the flower. In the center of the flowers is another circle, or sometimes single organ, called the pistil; this usually has a moist surface at tip called stigma. The stigma is connected by a slender stem or tube called style, with the ovary in which are small bodies or ovules. So when the pollen grains fall upon the moist surface of the stigma it soon develops into a small tube, which passes down the style, reaching the ovules, the union forming the embryo plant, and the ovule becomes a seed; this last process is called *fertilization*. When the pollen is applied from same plant it is said to be self-fertilized. When the pollen is applied to the ovules of another variety of flower of the same species the process is cross fertilization, and the result is a *cross*. When the cross is made between two varieties of flowers of different species the result is a hybrid, as in crossing plum with pear, apple with pear, etc. Having become thoroughly acquainted with the parts of flowers entering into the operation, our first step in the work is the collecting of the pollen that is to be used in fertilizing the variety desired. This should be done as soon as the flower opens, collecting the anthers before they have had time to burst. Often times it is quite necessary to collect pollen and develop it artificially, before the flower to be impregnated is to be treated, owing to difference in time of blooming. In this instance the blossoms or buds should be placed in a warm room and heat applied, and anthers permitted to shrivel up, when the pollen is ready for use. In taking the anthers from the flowers they should be placed in a cup, envelope or vial, and kept dry until ready for use. This is the method

used in the collecting of pollen in apples, pears, plums, etc. We next remove the anthers from the flowers to be fertilized, so as to prevent self fertilization. This can best be done before any pollen escapes or stigma is ready to be fertilized. About twenty-four hours before the flower opens the bud is broken into and the anthers removed by means of sharp-pointed pincers or forceps. It is not always necessary to open the flower and remove the anthers one by one, for in the apple, plum, and fruits of this nature, a part, if not all of the petals may be removed and the anthers removed carefully to prevent distribution of the pollen. Generally two flowers in a cluster are treated in this way to insure greater possibilities of success, the rest being removed. Blossoms growing upon strong spurs are preferred to those growing near or at the end of limbs. This being done, a one pound paper manilla sack is placed over the flower to protect the pistils from visits of insects and foreign pollen; these sacks are fastened at the bottom by pins or wire. As soon as a shining appearance is observed on the stigma, pollination should be performed, usually the following day. The best possible time is on a warm damp morning. Bees among the blossoms is a good indication. The sack is removed and pollen is applied liberally and quickly to the stigma with a camel's hair brush—better still, a small pen-knife. The sack is then replaced and fastened at the bottom with a fine wire, to protect from insects. The sacks should remain on until the stigma has dried up and there is no further danger of pollination. It should then be removed and covered with a netting—thin muslin is best—to prevent the attacks of insects and birds, giving free admission of air. Care should be observed not to get pollen mixed. Label the fruit, giving date, parents, etc. In the fall the fruit is gathered, selecting only those fruits that appear to be the most promising, discarding those that are inferior. The seed is planted and seedling developed, and when of proper size may be grafted, and results closely noted, the process covering a period from seven to eight years with apples, less of course with plums, cherries, etc. The chief consideration in the cross fertilization is the selection of varieties. The mechanical part is easily understood. The operator should be treated as the stock-breeder treats his stock in the selection of breeds. It is necessary that the highest judgment should be exercised in the selection of parents for the cross. The mother should be a variety that is permanent and has a fixed type, and the purest

bred. Choose as far as possible trees of young and vigorous growth. This work will require but a little time, and when we think of the possibilities in store for us, we should not be loath to try this very important experiment. Working persistently along this line, selecting carefully the parents from which the cross is to come, also select the best from among the crosses in order to sustain a high degree of perfection. This selection is much more important to the fruit raiser than the crossing. Next to consider in this connection is nature's plan and man's aid in the fertilization of blossoms in the orchard. This is of great importance to the fruit raiser, inasmuch as it concerns him in the planting of apples, pears, plums, etc., in orchard. Many experiments and observations of practical importance have been made during the past decade, and a careful study of our orchards goes to show very often why it is that vigorous trees of bearing age fail to produce satisfactory crops. Many trees of apple, pear and plum are infertile with their own pollen, and bear only when grown near other varieties blossoming at the same period of time. Large orchards often fail to bear anything like a crop for this very reason, and many valuable crops are lost before the real cause is determined. This is especially of note among plums. A large number of our common pears and apples are nearly sterile when fertilized by their own pollen of the same variety. In the West, where top working of the apple is not as universal as in your Province, decided results have been observed. It has been found that among the self-sterile apples may be found Northern Spy, Spitzenberg, Tallman's Sweet, Bellefleur,—require other pollen besides their own to do the work. Baldwin and Maiden's Blush are among the self-fertile varieties. Jonathan and Wine Sap are found to be self-sterile. I have seen Ben Davis and Oldenburg bear well when isolated in blocks. Mr. Matthews of Iowa, has a block of 125 Jonathan apple trees twenty years old that have not borne except during two seasons, and that on those trees in the outside rows adjacent to other varieties, while another block of Jonathan is top-worked with fertile varieties and the orchard gives him a good crop. I cite this to illustrate the great mistake in grouping of varieties in orchard planting. Prof. M. B. Waite, of Washington, D. C., who is the best authority on this subject, having conducted a number of extended experiments along this line, claims that in an orchard of twenty thousand Bartlett pear trees of bearing age, they did not produce

fruit except in a few cases where it was thought that the blossoms were fertilized by bees (which are the friends of all orchards). Many plums are infertile. Such sorts as Moer's Arctic and Wolf may be said to be self-fertile, but most sorts are not. Cherries are similar to the plum, there being but few varieties that are self-fertile. I am of the opinion that it is quite probable that a large proportion of our most highly developed varieties are more or less self-sterile, and that mixed planting in all orchards should be the rule, observing time of blooming. Some varieties bloom several days later than others,—care should here be exercised. There is a large field in this Province for the improvement of varieties by cross fertilization. New orchards are being planted every year, and the amateur should be alive to the importance of the necessity of having his fruit blossoms properly fertilized, remembering the necessity of the careful selection of varieties.

Mr. W. C. ARCHIBALD, for the Committee on the establishment of a Horticultural School, submitted the following report :

Your Committee appointed at the annual meeting in Jany. '93 to provide "Ways and Means" for the establishment of a Horticultural School and Experimental Fruit Station on the line of the W. & A. R. R. beg leave to report :

Your committee carried petitions to the Local Government for a grant of not less than \$2000 per year, for the purpose of forming a School of Horticulture. This sum was granted at the following Session of Parliament, conditioned on the basis of a School term of 6 months duration and \$50 per student. Your committee were able to make favorable arrangements with the Governors of Acadia University for Class-rooms, etc. They were also able to secure the services of Prof. E. E. Faville, graduate of the Horticultural State College of Ames, Iowa, to inaugurate the department. This gentleman submitted a course of study for the School, which was referred to the Government and adopted. The School term opened Jany. 8, '94. Your committee asked the Government to amend the Act and shorten the School term of this year to 5 months, which amendment is now in force. The School has enrolled 60 students, and the average attendance to date numbers 41. Two hours per day are devoted to instruction in theory and practise. Class certificates will be granted at the close of the term to those students passing the examinations on work done during the year closing June 1st. An increasing interest is manifested by the students. A library of leading books on Horticultural subjects is being founded, a number of these being

donations. Your committee believing that in connection with the Horticultural College an Experimental Fruit Station is an imperative necessity—have by various letters, applied to the Federal Government for a sufficient annual grant to carry on the Station work. The beginning of so important an enterprise is beset with difficulties and requires your careful attention. Your committee recommend that a Council Board for the Horticultural School be appointed consisting of one member for each County of the Province with an Executive Board chosen from the vicinity in which the Institution is located. The President of the Association with the Professor of the Horticultural College, to be *ex officio* members of the Executive Committee.

Committee "Ways and Means,"

W. C. ARCHIBALD,
J. W. BIGELOW,
RALPH EATON,
T. HARDING PARKER,
HON. M. H. GOUDGE,
C. R. H. STARR.

In moving the adoption of the above, MR. ARCHIBALD spoke as follows :—

Nineteen years ago the first regularly organized agricultural experimental station was established in Connecticut. Other stations soon followed by state or college authority in various parts of the union. In 1887 congress passed a law providing and organizing a station in every state and territory, except two, with a yearly grant of \$15,000 to each. In different states branches or sub-stations have been established. Local climates and soils seem to demand them, and judging from the value already placed upon them will be rapidly multiplied. In 1890 congress further granted an increase of \$1,000 per year for the period of 10 years, or until \$25,000 becomes an annual grant to each state. The number of officers engaged in the different lines of work in 1892 are as follows : Directors, 68 ; chemists, 115 ; agriculturalists, 59 ; horticulturalists, 59 ; botanists, 36 ; entomologists, 36 ; veterinarians, 23 ; meteorologists, 14 ; biologists, 9 ; phycists, 3 ; geologists, 4 ; in charge of sub-stations, 27 ; together with a large staff of assistants. The monthly bulletins give a valuable synopsis of work done at the experimantal stations. There were 250 of these issued in 1892, besides 55 annual reports. A central office for collating experiment station work is now attached to the department of agriculture at Washington.

The agricultural and horticultural schools and colleges may be classified as follows: Institutions in which the sciences relating to these are taught; also colleges in which the sciences are taught along with the theory and practical work, and schools in which the elementary part of these subjects are taught with the practical work. These courses of study run from two to four years. The Pennsylvania state college has recently undertaken to supervise a course of home readings for farmers and fruit growers. There are now 66 of these various colleges and schools in all the states, employing about 1,200 professors and other teachers, with a student enrollment of 12,000, of which one-third take special studies in soil culture and its varied products. This immense work has been brought about in 19 years.

The school of horticulture founded at Wolfville in January of this year has an enrollment of 60 students with an average attendance of 41 at this date, as reported by the professor in charge. Few schools of this class on the continent have started under more favorable auspices. I think this may be satisfactorily accounted for by: 1st, the great advance in simplifying scientific study of soil culture; 2nd, the felt need of a school in this garden land by the fruit growers' association; 3rd, a professor in earnest love with his work and ability to popularize it in the youthful mind in the person of Professor Faville. In attendance may be named such gentlemen as Mr. Robert Starr, a prince of pomology in this province, and President Bigelow, who bear testimony to the valuable work being done there. Two hours per day are devoted to instruction in theory and practice. Class certificates will be granted at the close of the term to those passing the examinations on work done during the term.

A council board, consisting of one member respectively from each county of the province, with an executive appointed in the vicinity of the school to meet once a month has been formed. It is proposed to hold a horticultural tournament at the closing exercises in June next. The beginning of so important an enterprise is beset with many difficulties, but none are insurmountable. Agriculture is rapidly breaking itself up into specialties. Besides the sons of our farmers and our merchants who will study the captivating subject of orcharding, young men who have the ministry in view would not only find a fascination in the science, but in the trees, the flowers and the fruits would find an unending supply of charming companionship and

abundant in suggestive thought to refine and instruct the people of their charges. It would also be consonant with the profession to indicate the architectural beauty of laying out grounds and the arrangement of trees for landscape effect, to help their parishioners to comfort and contentment in the home land. The time may also be near when the cities will need to replenish their strength, by sending their sons to technical schools to learn the theory and practice of soil culture. The provincial parliament endowed the school with \$2,000 a year, and the fruit growers have given a practical recognition of the interest shown them. It is of vital importance to our school at this stage that we have an experimental fruit station, endowed by the federal government with not less than \$3,000 to \$5,000 this very session to give us courage, confidence and ability to effectively carry on our growing work. The above facts and figures show that governments by the people are at last recognizing the farmers' claims upon the country for financial aid to their enterprises on an equitable basis with manufacturing industries. We should quicken our thought and hasten our step and ask without delay for our rightful due. We should give our hearts as well as our heads with our hands to this broadly beneficent work.

The resolution was duly seconded, and after a full discussion the Report was formally adopted by the Association.

The Council Board of the Horticultural School for 1894 was appointed as follows: Executive.—J. W. Bigelow, Prof. E. E. Faville, W. C. Archibald, Ralph S. Eaton, S. C. Parker, C. W. Roscoe, Dr. H. Chipman. County Members.—J. W. Ross, Pictou; G. B. McGill, Annapolis; James D. Sperry, M. P. P., Lunenburg; Col. Blair, Cumberland; G. R. Archibald, Colchester; John Donaldson, Kings; Chas. E. Brown, Yarmouth; Chas. E. Burrill, Digby; Dr. Lawson, Halifax; C. B. Whidden, Antigonish; J. H. Sinclair, Guysborough; Dr. Kendall, Cape Breton; C. E. Starr, Boston. Members of Board for Hants, Queens, Inverness, Victoria, and Richmond to be appointed.

It was also resolved: That this Association recommend that the Executive Committee meet once a month for the transaction of business required, and a general meeting of the Council Board be held annually during the week of the closing exercises of the School. That it will be the duty of the Council Board to report the doings of

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the year at the regular annual meeting of the Association. That the Chairman of the Council Board be a permanent member of the Executive of the Association.

At this stage of the meeting S. C. PARKER asked leave to introduce the following resolution, which was seconded by Dr. REID, and passed unanimously :

Whereas : At the Chicago World's Fair, Mr. L. Woolverton, Canadian Commissioner of Horticulture, did excellent service in aiding the F. G. Association Horticultural Exhibit, and assisting our representatives by every means in his power ;

Resolved, that the thanks of the Association be tendered to Prof. Woolverton,

And that he be made an honorary member of the Association.

The meeting was then favoured with the following address by Mr. G. B. MCGILL :—

FERTILIZERS.

The farmer is brought into direct contact with the soil, with the plant, and with fertilizers. While the proper mechanical condition of the soil brought about by thorough cultivation and drainage is of importance, perhaps there is no problem of greater interest to the farmer than the fertilizer question. There is no one thing for which farmers pay, year by year, more cash. Then if any true economy can be practised in this direction it is of vast importance. By true economy we mean use without waste or loss. This can be practised only under a knowledge of that in which we propose to economize.

A knowledge of the general valuation of fertilizers is necessary at the outset. The three essential elements of plant food for which the agriculturist has to pay are phosphoric acid, potash and nitrogen. Every commercial fertilizer should contain one or more of these elements. A *complete* fertilizer will contain them all. These elements have a commercial value given them like other articles of commerce. At the present time phosphoric acid ($P_2 O_5$) is quoted at 8c per lb. potash ($K_2 O$) at 5c per lb., and nitrogen at 15c per lb. Then if we find the guaranteed analysis marked as follows,—

$P_2 O_5$ (phosphoric acid).....	8%
$K_2 O$ (potash)	7%
N or NH_3 (nitrogen or ammonia)...	4%

We reason thus in calculating the value per ton :—

8%	of 2000 lbs.	=160 lbs.	@ 8c.	= \$12 80
7%	of "	=140 lbs.	@ 5c.	= 7 00
4%	of "	=80 lbs.	@ 15c.	= 12 00
				<hr/>
				\$31 80

It must be remembered the foregoing prices are for the raw material in the wholesale market. Add to these prices the cost of mixing, bagging, transporting and retailing; and such a fertilizer probably could not be sold for less than \$45 per ton. The fertilizer here mentioned is a very high grade of complete fertilizer, and a representative one for a good crop of potatoes.

A word as to nitrogen and ammonia. Nitrogen is an element; ammonia is a compound of nitrogen and another element called hydrogen. Ammonia is valuable for the nitrogen it contains, and when nitrogen is quoted at 15c. per lb., ammonia is worth about $12\frac{1}{3}$ c. per lb.

Remember in buying fertilizers (so called superphosphates) nothing is of any value except available phosphoric acid, potash and nitrogen. The nitrogen may be in the form of a nitrate or ammonia. The cheapest way for the farmer to procure his fertilizer is to go into the nearest market of large cities such as New York or Boston, and purchase his nitrate of soda, dissolved bone, and sulphate or muriate of potash, and mix his own fertilizers. By a little study the average farmer can mix a special fertilizer for any crop. But it is often more convenient for him to purchase it already mixed and in smaller quantities than car-load lots. His only resource then is to buy from a reliable dealer, whose guaranteed analysis will give the purchaser an idea of the value he is getting. And most dealers have become educated in the fertilizer problem to the extent that they can give a manure adapted to the crop to which it is to be applied.

The composition of the crop, the special character of the crop, the character of the soil to be cultivated, and the particular function of each element of plant food, must all contribute to form the basis of one's judgment in procuring fertilizers. To illustrate, all crops require some potash to grow the stem, nitrogen to grow the leaf, and phosphoric acid to ripen the seed or perfect the fruit. Turnips require a fertilizer rich in soluble phosphoric acid, since it appears they have a

singular inability for appropriating this from the soil. Mangels, on the contrary, require a fertilizer rich in nitrogen. Economy may be practised here by studying the character of the crop. Then, too, the fertilizer for sandy soils should be more soluble than clayey soils require. It seems, also, that potash in the form of sulphate is best suited to potato growth, while the muriate is better suited for salt loving plants like the mangel, turnip, etc.

Heretofore most of our orchards have been kept up with barn-yard manure. But it has become a grave question if this method cannot be improved by supplementing it with a commercial fertilizer particularly suited to fruit culture. Notice the composition of barn-yard manure :—nitrogen from 0.4% to 0.8%, phosphoric acid from 0.2% to 0.4%, potash from 0.3% to 0.6%. It will be observed by these figures that the per cent of nitrogen is twice as great as that of phosphoric acid, and also leads the potash largely. Now the stem and fruit, which agree in composition chemically, depend to a great extent on potash for their growth. Hence the importance of supplementing barn-yard manure by a fertilizer rich in potash. And the fruit grower who depends wholly upon commercial manures for his use should purchase complete manures rich in potash.

In connection with barn-yard manure a good supplement would be 200 lbs. of sulphate or muriate of potash and 300 lbs. of dissolved bone to the acre. One ton of good hard-wood ashes, (unleached) would contribute about the same fertility and be equally as good, perhaps, as the amount of potash and dissolved bone here mentioned.

It is to be understood that these quantities apply to orchards of apples and plums in full bearing. For young trees a smaller quantity, sown around the trees, may be used. The quantity used and surface covered should vary in proportion to the size of the tree.

The following is a very well balanced fertilizer to be used exclusive of barn-yard manure for orchards in bearing :

Phosphoric acid, (available).....	7%
Nitrogen.....	4%
Potash.....	8%

If in connection with this fertilizer, applied at the rate of one half ton per acre yearly, a green crop is turned under every third year, a person ought to raise good apples or plums.

The above address was heard with close attention, and was followed by a general discussion, taken part in by a large number of those present, and much information was elicited.

THURSDAY MORNING.

A session was held at 10 o'clock, and resolved itself into a general discussion, bearing on a dozen practical topics. A very interesting meeting was the result and the Association adjourned at 12.30 o'clock.

APPENDIX.

HOUSE OF ASSEMBLY, BILL 273.

AN ACT TO ENCOURAGE THE ESTABLISHMENT OF A SCHOOL OF HORTICULTURE.

[*Passed April 22nd, 1893.*]

WHEREAS, The Nova Scotia Fruit Growers' Association propose to establish and conduct a School of Horticulture, and it is believed that the successful carrying out of the undertaking would promote the important interest of fruit growing in our Province, and it is expedient that reasonable aid be granted from the Provincial Treasury to the undertaking ;

Be it therefore enacted by the Governor, Council, and Assembly, as follows :

1. If the Nova Scotia Fruit Growers' Association, or any other body, shall establish and conduct an efficient School of Horticulture, and shall make satisfactory arrangements for the diffusion throughout the Province of useful knowledge of fruit growing by means of lectures and otherwise, the governing body of such school shall, subject to the provisions of this Act, be entitled to receive annually from the Provincial Treasury towards the support of such school the sum of fifty dollars for each pupil who shall have been regularly in attendance at the school for at least six months in the year, and shall have pursued such course of study as may be prescribed ; provided, however, that the total sum payable to such school in any year shall not exceed two thousand dollars.

2. The location of such school, the course of study, and all rules and regulations for the management of the school, shall be subject to the approval of the Governor-in-Council.

3. This Act shall cease and terminate if such School of Horticulture be not established within two years from the passing of this Act.

COURSE OF STUDY, N. S. SCHOOL OF HORTICULTURE.

E. E. FAVILLE, B.S.C.A., *Prof. of Horticulture.*

The full course, as outlined, consists of a two years course, divided into periods of three months each. Certificates to be issued for work done the first year, and diploma granted on the completion of full course of two years. The course as laid down in formation of school is as follows:—

FIRST PERIOD.—(*Three months.*)*Botany.*—(See Note A.)*Physical Geography.*—(See Note B.)*Horticulture.*—(See Note C.)

A.—BOTANY.—Since botany treats of plants existing in nature, and horticulture of their improvement, this science readily becomes the basis of all work in horticulture, and a knowledge of this branch is necessary to the frame-work of the subject, treating of the formation of root, stem, leaf, pollenation of flowers, dissemination of seeds, etc.

B.—PHYSICAL GEOGRAPHY.—This study treats of the elevation of land, its adaptability for fruit culture, effect of ocean currents, climate, winds, storms, etc., on vegetation; causes of rain, snow, dew, etc.

C.—HORTICULTURE.—Lectures on fruit culture, methods of pruning, training, planting; discussion of varieties of plants; preparation and care of seeds during winter; methods of planting; shipping of trees and plants, and treatment of same when received from nursery. Practical work in identifying varieties of trees and fruit, with practical classification. Work in winter care of fruit trees and small fruit, covering the work of mulching, cutting scions, and treatment of them in root cellar, noting carefully the difference in care of apple, pear, plum, and cherry scions. Indoor or winter grafting in grafting rooms, etc.

SECOND PERIOD.—(*Three Months.*)*Botany.*—(See Note E.)*Chemistry.*—(See Note F.)*Horticulture.*—(See Note G.)

E.—BOTANY, continued, with more practical application. Sap circulation, nomenclature, fixature of names. Origin of plants, their history, development, etc. Parts of flowers distinguished and discussed.

F.—CHEMISTRY.— Student becomes acquainted with scientific experiments, and of such a nature as to afford a knowledge of this science as applied to plant and animal economy. A study of oxygen, nitrogen, hydrogen, etc, and their combinations and uses for plants and animals. Discussion of reagents used in the detection of certain substances in the materials of plants, soil, etc. A complete knowledge of formation of acids, bases, salts, gases, etc. Preparation of fungicides and insecticides—constituents entering into these combinations.

HORTICULTURE.— Treating of methods of cultivating of soils ; seed sowing—when and how ; transplanting and planting of trees and small fruits ; out-door grafting, budding, cross fertilization of flowers. Best methods of spraying fungi and insects. Practical work in the field, pruning, grafting, application of commercial fertilizers at time of planting, preparation of ground for plants. In fact, putting into practical use knowledge obtained during fruit year.

SECOND YEAR.

The student is now prepared to take up a more advanced treatise of the subject having fully mastered the fundamental principles in the first year's work, the course is as follows :—

FIRST PERIOD.—(*Three Months*).

Botany, Physiology of Plants.—(See Note A).

Economic Entomology.—(See Note B).

Horticulture.—(See Note C).

A.—BOTANY.—Text-Book in this year, with work in laboratory, with specimens of plants, fungous growths, etc., acquiring use of microscope studying cell structure and contents such as starch nucleus, etc. Examination of different fungous growths, observing spores and their formation, assimilation, transpiration, and absorption of plants, and many other interesting studies that come under this head.

B.—ECONOMIC ENTOMOLOGY of insects and their economic treatment. The life history of insects injurious to fruits and vegetation, and their economic treatment explained. The best methods of destruction of such insects as potato bug, codling moth, canker worm, wire worm, currant worm, etc.

C.—HORTICULTURE.—Treating of drainage, principles of vital force in germination of plants, winter, summer, spring and fall pruning, why we do this? Commercial handling of fruits and fruit trees, landscape gardening, floriculture, top working fruit trees, construction of green houses, heating, care, etc. Practical work in preparing plants for winter keeping, work in green house, proper storing of vegetables, celery, cabbage, etc.

SECOND PERIOD.—(*Three Months*).

Evolution of Horticulture.—(See Note E).

Chemistry of Soils.—(See Note F).

Horticulture.—(See Note G).

(Thesis).

E.—*Evolution of Horticulture*.—Students are given references for reading in Library, outlines submitted, and, synopsis of work done in reading on various methods of propagation and advancement of horticulture reported.

F.—*Chemistry of Soils*.—Lectures in this connection with laboratory work embracing the chemistry of air, soils and fertilizers, and their action on roots of plants, determining what the plant takes from the soil, and the cheapest and best way to replace that loss. Preparation of composts for different soils, discussion of nitrification and its very important work in the orchard, etc.

G.—HORTICULTURE.—In these closing lectures of the course, a general survey is taken of all the work done and principles covered. Forestry is here taken up, and its value pointed out and discussed. Work in caring for and selecting ornamental trees. Experiments made with plants in green house. Thesis work, taking up practical subjects and amount of time devoted to preparation of this thesis counted as laboratory work.

The explanatory notes on course of study are brief summaries. Owing to better facilities for next year's work, the above course will be subject to change and with such modifications as to strengthen the work.

REPORT ON NEW APPLE, "BANKS."

"Cleveland Banks, Waterville, Kings Co., Nova Scotia."—New apple, "Banks," is a sport of that old and popular apple, "Gravenstein. It is one of the most beautifully colored apples, superior as a dessert apple to its parent.

While I do not feel myself justified in awarding the medal, I can, in recommending it for further trial among amateurs, where the Gravenstein will grow, and venture the opinion that if it shall maintain its present excellence it will become one of the most popular market apples of its season.

E. F. BABCOCK, *Judge.*

Chicago, World's Fair, Oct. 25th, 1893.

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YOU WANT IT!



HARRIS M. FOSTER, Esq., of Hampton, Annapolis Co., writes that in the year 1875 his wife was sick with liver complaint and general debility, and three doctors pronounced her incurable, and after suffering for five or six years I heard of your Life of Man Bitters, and went to Bridgetown to get it. I saw one of the doctors and told him she wanted to try Gates' medicine, and he said, by all means, it will do no harm. I got the Bitters and Syrup, and in a comparatively short time she was well and able to attend to her household affairs. Since that time I have kept Gates' medicine in my house nearly all the time, but have tried some other medicine highly advertised but always go back to the old Gates' Life of Man Bitters. I do believe there is no better medicine in the market to-day, and am willing to answer any one that will write to me about it.

Address— HARRIS M. FOSTER, J. P.,
Hampton, Annapolis Co., N. S.

RHEUMATISM CURED.

PORT GREVILLE, Sept. 5th, 1889.

C. GATES, SONS & Co.—Gents: Last summer I had a bad attack of rheumatism in the hip, caused by cold and exposure. I used a bottle of your Syrup and one of your Acadian Liniment, and it cured me, so that I have not had a return of it since, though often exposed at sea. At another time I used your Vegetable Plaster for a bad kink in the back, with the best success.

Yours truly, CAPT. ISAIAH MORRIS.

WAS SICK OVER TWO YEARS. FRIENDS THOUGHT I COULD NOT LIVE. GAINED 30 POUNDS IN FLESH.

CANADA CREEK, Dec. 14th, 1892.

MESSRS. C. GATES & SON.

GENTLEMEN,—This is to certify that I was sick for over two years and was unable to work, having a fearful cough and no appetite, and friends thought I could not live long. In April last I took about six bottles of your Life of Man Bitters and Invigorating Syrup. My appetite soon returned, system worked well, and I am now over thirty pounds heavier than when I first commenced taking the medicine. I am also able to do my work, and feel altogether like another man. I intend taking some more of it now, and believe there is none as good in the market to-day.

CHARLES E. EATON, J. P.

Gates' Nerve Ointment. The Best Healing Medicine.

CANNING, Feb. 8th, 1894.

MESSRS. GATES, SON & CO.

GENTLEMEN,—Last July I was at work caulking on a ship at Kingsport, and fell through the staging and hurt the shin bone of my leg, which turned to a running sore. I tried a good many things prescribed by the medical profession, but did not succeed in getting anything to help it until I used your NERVE OINTMENT, which effected a cure in a very short time. I have used your other medicines with good effect.

Yours truly, JOHN HENDERSON.

WINDSOR AND ANNAPOLIS RAILWAY,

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The most charming SUMMER RESORTS in America are to be found clustered through the

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THE GARDEN OF THE MARITIME PROVINCES.

The "Land of Evangeline" Route is the Beau-ideal of the Tourists' Road, the best and most recent improvements, steel rails, air brakes, new rolling stock, and Buffet Parlor Car Service second to none, making travel through scenes over which Longfellow lavished the splendors of his imaginative genius.


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Change cars at Kentville for Kingsport, and board the S. S. "Evangeline" of the Evangeline Navigation Co., whose daily service between Kingsport and Parrsboro' takes the traveller under the very SHADOW of BLOMIDON, and from no other point can the magnitude of this giant sentinel be viewed to a greater advantage.

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**First Class Hotel Accommodation in every Town,
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Splendid steamships running in connection to and from Boston and St. John, N. B., while daily connections are made putting the passenger in touch with every Railway in Canada and the States.

 Buy a volume of Longfellow, or look up the nearest Tourist Agency, or, better still, take a trip through Western Nova Scotia, if you want to know more about

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