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Published

TRANSACTIONS

AND

REPORTS

OF THE

FRUIT GROWERS' ASSOCIATION

AND

INTERNATIONAL SHOW SOCIETY

OF

NOVA SCOTIA,

1893.

Published by Order of the Government of Nova Scotia.

HALIFAX:
NOVA SCOTIA PRINTING COMPANY.
1893.

BERWICK, *March 1st, 1893.*

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.

Yours faithfully,

S. C. PARKER, *Secretary.*

FRUIT GROWERS' ASSOCIATION

AND

INTERNATIONAL SHOW SOCIETY

OF

NOVA SCOTIA.

Patron.

HIS HONOR THE HON. M. B. DALY, LIEUTENANT-GOVERNOR.

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

Senior Vice-President.

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

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Hants "	HON. M. H. GOUDGE	Windsor.
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Lunenburg "	JUDGE DESBRISAY	Bridgewater.
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Assistant-Secretary.

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

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

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SENIOR VICE-PRESIDENT,
SECRETARY,
TREASURER, } ..... *Ex officio.*
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A. McN. PATTERSON.

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	Date of Election.
ROBERT GRANT HALIBURTON, M.A., F.S.A.	Jan. 30, 1873.
JOSEPH R. HEA, D.C.L., Toronto	" 6, 1874.
GENERAL SIR HASTINGS DOYLE, K.C.M.G. (deceased)	April 6, 1875.
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D. W. BEADLE, ESQ., St. Catherine's, Ont.	" "
ROBERT MANNING, ESQ., Boston, Mass.	" "
RICHARD STARR, ESQ., Cornwallis, N. S., (deceased)	" "
F. C. SUMICHRAST, ESQ, Harvard University, Boston	Jan. 10, 1886.
JOHN LOWE, ESQ., London, G. B.	" 15, 1884.
THE HON. SIR CHARLES TUPPER, G.C.M.G., C.B., London, G. B.	" 20, 1887.
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PROF. JAMES FLETCHER, F.R.S.C., F.C.S., Ottawa	" "
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CHAS. EIBB, ESQ., Montreal, (deceased)	" "
PROF. H. W. SMITH, B.Sc., Truro, N. S.	" "
PROF. JOHN CRAIG, Ottawa	" 27, 1893.

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			Date of Election.
J. V. BIGELOW, ESQ., Wolfville			April 9, 1875.
HENRY B. WITTER, ESQ., Wolfville			" "
CHAS. E. BROWN, ESQ, Yarmouth			Oct. 1, "
EDWIN CHASE, ESQ., Cornwallis			Nov. 1, "
R. W. STARR, ESQ., Wolfville			" "
CHAS. R. H. STARR, ESQ., Wolfville			Jan. 3, 1886.
W. C. SILVER, ESQ.,	Halifax		Dec. "
JAMES SCOTT, ESQ.,	"		" "
GEORGE LAWSON, PH.D.	"		" "
JOHN STAIRS, ESQ.,	"	(deceased)	" "
THOS. A. BROWN, ESQ.,	"	(deceased)	" "
THOS. A. RITCHIE, ESQ.,	"		" "
A. K. MACKINLAY, ESQ.,	"		" "
J. F. KENNY, ESQ.,	"		" "
M. P. BLACK, ESQ.,	"	(deceased)	" "
HON. P. C. HILL,	"		" "
EDWARD BINNEY, ESQ.,	"	(deceased)	" "
JAMES FARQUHAR, ESQ.,	"		" 1883.
T. H. PARKER, ESQ., Berwick			Jan. 1892.
DR. A. P. REID, Halifax			Jan. 1893.

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AXFORD, Rev. F. J. H.....Port Williams.

BOLIVER, G. S.....Conquerall.
BROWN, C. C.....Wolfville.
BARNSTEAD, W. L.....Halifax.
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DIXON, F. A.....Wolfville.
DIMOCK, STEWART.....Windsor.
DAVIDSON, J. B.....Wolfville.
DODD, J. S..... "
DEWITT, DR..... "
DUNCANSON, WATSON ..... "
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DUNCAN, R. R.....Grand Pre.
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ELDERKIN, C. F..... "
EATON, F. H.....Kentville.

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GRIFFIN, A. N.....New Minas.
GRANT, JAMES.....Halifax.
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HEBB, W. A..... "
HULTON, HARLAN.....Halifax.
HARDWICK, W. H.....Canard.

HIGGINS, PROF, D. F.....Wolfville.
HIGGINS, J. M.....Halifax.
HATTIE, J. B..... "
HALIDAY, JAMES..... "
HILL, JAMES S..... "

INNES, P.....Cold Brook.

JOHNSON, GEO. C.....Wolfville.
" E. C..... "
" A. H ..... "
" MRS. A. H..... "
" JOHN A..... ...Grand Pre.
" C. Y.....Wolfville.
" THOS. C.....Halifax.
" F. C.....Wolfville.

KING, E. D.....Halifax.

MCLATCHY, R.. .....Windsor.
MORSE, J. S..... .Wolfville.
MARTEL, REV. A..... ... "
MILLER, J. A.....Bridgewater.
MACK, HON. J. N.....Liverpool.
MCMANUS, A. E.....Halifax.
MORRISON, A. G..... "
MOIR, ALEX..... "
MAHON BROS..... "
MACKINLAY, ANDREW..... "
" C. H..... "

NEWCOMB, W. E.....Canard.
NEILY, L. O.....Aylesford.

OUTHIT, C. W.....Halifax.
OAKES, J. B.....Wolfville.

PARKER, A. B.....Wilmot.
" S. C.....Berwick.
PATRIQUIN, C. A.....Wolfville.
PINEO, A. A ..... "
PATTERSON, A. MCN.....Horton Landg.
PAYZANT, L. S.....Halifax.

ROSS, JAMES .....Halifax.
REYNOLDS, F. H..... .... "

STARR, J. E.....Port Williams
" A. C..... ..... "

SMITH, E. D.....Halifax.
SUTHERLAND, J. H..... "
SMITH, G. M. & Co..... "
SCHAFNER, J. E.....Williamston.

TAYLOR, ROBERT.....Halifax.
TUZO, THOS.....Horton Landg.
THOMSON, GEORGE.....Wolfville.

VAUGHN, C. M.....Wolfville.

WENTZELL, SIMEON.....New Germany.
WHITMAN, ALFRED.....Waterville.
WATERMAN, JAMES M.....Block House.

YOUNG, DR.....Windsor.

FINANCIAL STATEMENT.

NOVA SCOTIA FRUIT GROWERS' ASSOCIATION in acct. with G. THOMSON, Treasurer.

	DR.		CR.	
	To Secretary Parker, per receipt	$ 20 00	By balance from last account	$ 217 00
	" N. S. Printing Company	110 20	" T. H. Parker, Life Membership subscription	5 00
	" Secretary Parker, per receipt	45 50	" 60 annual subscribers	60 00
Dec. 31st.	" Dep. Rec. No. 1907, Peoples' Bank	873 00	" One lady subscriber	50
	" Balance as per bank book	436 22	" Government Grant	300 00
			" Dep. Rec. P. Bank, No, 1454,	868 00
			" Interest on dep. receipt	34 42
		$1484 92		$1484 92

FUNDS ON HAND.

Dep. Rec. No. 1907	$ 873 00
Balance at bank	436 22
	$1309 22

Wolfville, 31st Dec., 1892. E. & O. E.

We have examined the foregoing Treasurer's account, and compared the entries with the vouchers therefore, and find the same to be correct. The pass book of the bank shows the balance of $436.22 at the credit of the Association. We have also seen the dep. rec. for $873.00.

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

Wolfville, 5th January, 1893.

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

Wolfville, 5th January, 1893.

also seen the dep. rec. for $873.00.

SPRING MEETING.

MIDDLETON, ANNAPOLIS CO., *April 28th, 1892.*

Pursuant to announcement the spring meeting of the Association met in Gullivan's Hall, Middleton, at 2 p. m. The day being exceptionally fine and spring well advanced, seeding had begun and many farmers were busy, causing a small attendance. The President called the meeting to order at 2.30 o'clock, and announced as the first topic for discussion, The proposed Exhibit of Nova Scotia Fruit at the World's Fair, Chicago, in 1893.

The PRESIDENT said he had received a communication from Prof. Saunders, the Dominion Commissioner, and was in communication with the Dominion and Local Governments, and was expecting assistance from both. Mr. R. W. STARR introduced the following resolution :—

"That this Association prepare to make a worthy Exhibition of Nova Scotia fruit at the Chicago Exposition in 1893, and that we petition the Dominion and Local Governments for grants sufficient to make it a success."

MR. STARR said he had talked with some members of the Local Government, but they did not seem ready to decide so he thought this resolution in order.

DR. REID thought the proposed exhibit would be a grand advertisement as it would show to the people of the world what we were doing, and show our fruit to American and Continental buyers.

MR. DIXON.—As an Englishman thought we should be represented at the World's Fair. As the Englishmen generally thought Nova Scotia and Newfoundland about on an equality for climate and resources, thought the more thoroughly N. S. was advertised the better it would be for us, and thought it only right we should show up our own resources.

B. STARRAT.—Said we were all of one opinion. The Exhibition would be a big affair. All countries would be represented and there

could be no better advertisement than to place our fruit there. Englishmen would be there and they were our largest buyers. Both English and American buyers would be there, and he thought we would not be improving our opportunities if we did not exhibit our fruit.

The PRESIDENT—thought we should make a good exhibit of long keepers in May.

MR. R. W. STARR said we made an exhibit of fruit in the Centennial Exhibition, they kept an exhibit of Nonpariels all summer by keeping from the air. His idea would be to select carefully, and place the fruit in barrels as picked from the trees, pack them in tight barrels and place in cold storage till they are wanted, and thought in this way an exhibit could be kept all summer. He had a few Gravensteins in glass jars and was trying to see how long they would keep. Did not expect we would find a market in Chicago for fruit, but all other countries would show largely and Canada should not be unrepresented. We should commence with our early fruits and continue in relays, as long as the Exposition lasted.

DR. A. P. REID said carbolic acid was a good preservative, but it destroyed the fruit. Salsilic acid was a good preservative and not a bleacher, and was probably the best preservative for the purpose Resolution put to the meeting and carried unanimously.

The following resolution was at this stage of the meeting introduced by DR. REID, seconded by F. A. DIXON :

Resolved,—That this Association offer a prize of $20.00 for the most approved paper setting forth the advantages of N. S. as a fruit growing country—giving provincial statistics of the average quantity of fruit raised and marketed, also detailed report of ten orchards for several years past, showing average production of shipping fruit and of fruit suitable for evaporation and cider, showing acres of producing orchard, age of trees, cost of labor and fertilizer, and gross and net sales of orchard—The paper to contain about 4000 words, or equal to ten pages of ordinary report of F. G. A. Said paper to be forwarded to the Secretary before Nov. 15, 1892, with a sealed letter signed with same motto as its accompaning paper. The sealed letter to contain name and address of writer, and not to be used except to determine the prize taker.

MR. A. B. PARKER thought this was a big advertising scheme, and any large grower should pay well for his advertisement. He thought it would do a lot of good to the country generally, but ten

men should not be advertised. It would be hard to get at the cost of production.

MR. F. CHIPMAN said we should not go back ten years for statistics. Did not think there was any reasonable objection on account of advertising individuals. It was our country not individuals we wished to advertise, and we should make as good a showing as possible.

MR. MILLER thought perhaps three years would be long enough to consider, and we should have some large and some small orchards on the list.

Resolution carried.

A communication from Mr. J. S. DODD was read asking for an extension of time for the committee appointed to take into consideration the sale of fruit in the local markets.

PRESIDENT BIGELOW thought this was a very important matter, too many of our apples were consigned to Halifax and sent to the auction room.

MR. MCNIEL said one trouble arose from the fact that but few of the grocers understood the nature of the fruit.

MR. WHITMAN had tried commission men for twenty years, and found but little difference among them.

R. W. STARR had a long experience with Halifax grocers, and had dealt with some who gave satisfaction and others who had not. He always advised his consignees of the quality of the fruit, and usually found them pay attention to his instructions.

MR. WHITMAN thought we should hasten along, and thought a more important matter was how to retain our standing in the London market, and referred to the complaints which were urged against our small barrels.

PRESIDENT BIGELOW.—The barrel question came up at our Annual Meeting, and should be looked into. It was operating injuriously on the sale of our fruit. The Canadian barrel held a full peck more than ours, and buyers of course preferred the larger barrel.

MR. PEAKE (of London) said the difference in the barrels made a vast difference in price. The Ontario fruit was very fine last year,

and Nova Scotia fruit poorer than usual, and of course that made the disparity greater. Had heard complaints of Nova Scotia fruit not being packed tightly. Apples needed careful packing to make them firm.

PRESIDENT BIGELOW said the principal objection to our fruit in Liverpool was on account of the small barrel, they called them Nova Scotia "kegs" in the Liverpool markets.

MR. DIXON said they were retailing Newton Pippins in London at 3 shillings per dozen.

MR. WHITMAN here read a letter from Nothard & Lowe, of London, in which they called attention to the fact of losses to Nova Scotia shippers were often owing to the small barrels.

MR. B. STARRATT said the size of the barrel interests us all, and is a practical question. He had seen our apples in Covent Garden Market. They stand the barrels on end, three tiers high. He had seen N. S. and Ontario barrels side by side in three tiers, and there certainly was a wide difference, about one foot in height in the three tiers. It was an important question, and should receive careful consideration. Was glad to say the most of our farmers are honest in their packing, as much, or more so, than any other class of people. There was a great improvement in methods of packing, but some men still went to their cooper and wanted small barrels. We cannot legislate for Ontario; we must raise our standard to conform to theirs. Apples in Ontario were exceptionally fine this year, and that was the reason they outsold ours.

MR JONES said we should consider this matter carefully. Our coopers were prepared to make barrels of the present size, and to change would entail much expense. Let the Ontario people alone, our time will come by and by.

MR. WHITMAN was afraid matters would go from bad to worse. Had found from measurement that barrels in many cases were not up to the standard the statute requires.

MR. STARRATT said no doubt we lost more in the price than there was difference in quantity. There was also the freight, which would be the same in either case.

MR. JOHN SHAFFNER said there was something besides shipping, barreling and marketing. We must in the first place grow the fruit.

First learn how to grow good fruit, then to pack, then market. He came here to learn. He was ashamed of our barrels; did not believe there were fifty barrels in the county up to full legal size. We could grow as fine an apple as any part of the world, and we should get the top price.

MR. STARR said his experience in hardwood barrels was first with imported staves; he did not like them. Then tried birch and beech, found these unsatisfactory and costly to make. The quality of our apples was poor last year owing to the frosts. The Baldwin particularly was almost universally injured, and also the Nonpareil, and this would account in some measure for the low price.

MR. WHITMAN had found frost to injure the Baldwin the most of any fruit, both in appearance and flavor, and they should be picked early.

MR. PEAKE said the London retailers could sell the hardwood barrel, and that might make a slight difference in price over soft wood.

MR. DIXON thought Nothard & Lowe must be mistaken when they said there was only 126 lbs. of apples in our Nova Scotia barrels.

MR. WHITMAN thought there was no mistake, as he had weighed barrels of apples and only found 145 to 148 lbs., barrel included.

Meeting adjourned till 7.30.

The Association met again at about 7.30 o'clock, and a large attendance of farmers from the surrounding country were present. Question: Has the use of fertilizers any effect on the black scab? This question was discussed at length by Messrs. MILLER, STARR, SHAFNER, PARKER, and others.

A letter from Vice-President STARR was next read and discussed

MR. J. E. SHAFNER then read the following practical paper on—

FRUIT PRESERVATION.

Mr. President, Ladies and Gentlemen,—

When requested by your Secretary to prepare a short paper on the foregoing subject my first inclination was to decline; feeling I must come before you laboring under two disadvantages, *i. e*, 1st. I

have never been enrolled as a member of your valuable organization. 2nd. I know full well you possess talent far better equipped to grapple with so broad and important a subject. However, being assured by the Secretary that he would interest different members on the subject, and desirous of hearing their views in connection with the same, I have collected a few ideas, partly from experience and partly from observation, which I submit to your careful consideration.

No doubt you are all conversant with the general analysis of fruit preservation, particularly those who were so fortunate as to listen to the able address delivered at your January session by Dr. A. P. Reid, consequently I will not weary you with a repetition, but proceed at once with the subject in hand under which heading I propose to combine Canning and Evaporating; an industry which I shall endeavor to prove is required by the fruit growers of this valley to make fruit culture a success.

The present age of improvement and invention may be compared to a vast tidal wave sweeping over the land. The mind is filled with wonder in view of the great inventions of the past and present decade; many, however, from want of practicability are soon buried for ever from sight, only those that have been weighed and are not found wanting keep abreast of the waves. Improvement is a thing of growth, and the inventor must ever be on the alert if he would be foremost in the sharp competition.

Fruit culture in its different forms is daily increasing in popularity, bringing to its aid the best intellect of our land. What revelation future has in store for this wonderful product remains yet to be seen, but judging the future by the past we may look for grand results. It is not necessary to quote statistics to prove that the fruit industry is yearly increasing, all that is necessary is to look carefully around, up and down this valley, and on every hand may be seen proofs to verify this statemeht.

Fruit culture is unquestionably profitable. It is a fact not to be disputed that more money can be made from one acre set to choice fruit than can be made from ten acres put to wheat.

Experience has proven this, and fruit growers realizing the fact are yearly increasing the acreage. Capitalists confident of good percentage on their money are investing liberally. But this fruit when grown must find a market or else all of this labor will be for naught;

and as the acreage doubles year by year, the question naturally suggests itself to the fruit grower, How can we dispose of this fruit to the best advantage? Is it not high time this question was settled? Will our local markets demand all the plums and other small fruits of perishable nature that are so fast increasing? Will we not experience gluts and seasons of over production? Is it not time that fruit growers were awake to the fact that the time has passed for flooding our markets with inferior fruit? We must expect seasons of overprodnction; then as intelligent and faithful tillers of Old Mother Earth should we not make calculations for the same; we should be looking carefully around us, so as to leave no stone unturned that will further the interests of our profession. A profession which brings us in daily contact with all the beauties of nature, and the marvellous works of the great Architect of all.

I am confident that this, one of the greatest drawbacks to the increased acreage of fruit, can be overcome by a properly conducted Canning and Evaporating establishment, owned, and operated entirely in the interest of the fruit grower. If the fruit growers of this valley would only co-operate there would be no difficulty in establishing such an industry. Can not more be done by this valuable Association to induce a greater number to join your ranks, for in no better way than this could the co-operative spirit be cultivated. I like the signification of the word co-operation, for it means a united effort on the part of those concerned to effect some commercial and industrial transaction or working together to produce some desired result. Co-operation is in direct opposition to monopoly. Monopoly is instituted to effect selfish ends, whilst co-operation is public spirited.

With the spirit of unity among the fruit growers a joint stock company can be formed for the purpose just mentioned; every fruit grower to be a share holder, this would awaken an interest and lead to better results. Here we would always find a market for surplus fruits as it could be carried over to seasons of scarcity, or shipped to foreign markets at such seasons as would be most advantageous, and right here I would suggest that in my idea of a canning and evaporating factory the long used tin can should be dispensed with, and make room for the more attractive and far superior hermetically sealed glass jar which is destined soon to take its place.

As this paper is prepared partly from experience I trust you will bear with me while I make mention of a little of my experience in connection with canning fruit in glass jars. Spending the winter of '91 in one of the best fruit regions of Ontario, and having opportunity for observation as well as mental reflection, my mind would wander back to this valley, and the favorable opportunities we possessed in comparison to other portions of the Dominion for fruit growing I felt confident then if the fruit growers had a factory such as I have alluded to it would be a great boon to them. So sanguine was I in the belief, that after a careful study of the subject together with some practical and well tested information, (which I was so fortunate to obtain) I decided upon arriving home to try the experiment on a small scale. I put up about one thousand jars. The results I am pleased to say far exceed my fondest hopes. My stock is disposed of and orders turned away. Frequently I am asked will your goods keep in glass jars? I think they have been well tested on that point, as they have stood a journey to India, and at last accounts were keeping perfectly. It takes time as well as skill to reach perfection. I see where I can make improvements next season, when I know I can put on the market an article equal to any and superior to many. I mention this simply to shew that I am not building air castles, but that they are all possibilities. People are daily becoming more particular with regard to this line of fruit, and are willing to pay the price if the article suits. It is only a matter of time when all lines of fruit to find a ready sale will have to be prepared in glass jars.

From the following prepared table I shall endeavor to substantiate my statement made at the beginning with reference to combining canning and evaporating, shewing one is incomplete without the other. 1st, we will take the apple. I have already stated that the time has passed for flooding our markets with inferior fruits. I also emphatically state that they should not find a market at the canning factories. How can a factory place upon the market a first class article from refuse fruit? I contend it cannot be done.

The line of thought I take with reference to this is, place nothing but No. 1 fruit on the market in its natural state; send the No. 2, which by the way should equal the No. 1 in every respect but size, to the canning factory, and the balance to the evaporator. If this uniform system was carefully followed I feel confident we would

realize greater prices for good fruit and dispose of our inferior to better satisfaction than filling our markets with a general mixture. Here the canning and evaporating department each have their own work to perform, with the apple the "King of Fruits."

2nd, we will take the different kinds of small fruits that are extensively cultivated within the Province. In the following table I have taken as my standard 100 quarts, with the evaporator as my first illustration :

Kind of fruit.	No. of quarts.	Average fresh value.	Yield in lbs. evaporated.	Cost to prepare.	Market value.	Net Profit.
Raspberry	100	$8 00	35	40c.	30c. lb.	$2 10
Blackberry.. ..	100	3 00	30	15	15	1 35
Cherry..... ..	100	5 00	23 pitted.	50	30	2 00
Strawberry....	.. ....	same	proportion	.....	....	....
Gooseberry.. ..	.....	"	"	....	.... ..	....

We will now take 100 quarts of the same fruit canned.

Canned Raspberry.....	100	8 00	No. qt. jars when cann'd 66	10 00	34c. per jar.	4 44

A single glance will be sufficient to see that the canning is far more profitable than evaporation of small fruits, as other lines run in about the same proportion as the Raspberry. Plums, which by the way are receiving a great deal of attention at the present time, are undoubtedly more profitable canned, and when we see orchards all the way from one hundred to three thousand of this choice fruit being planted, does it not stand us in hand to make due preparation for seasons of overproduction? They are sure to come, then why not as intelligent men make preparations for the same.

The above tables have been carefully prepared, experience proving the results. Then follows the evaporator with sweet corn, peas, beans, and all kinds of vegetables ; these combined with fruit would give employment to both departments of my ideal factory. In conclusion I would just say that our fruit is not shown up to the world as it should be. Did you ever realize that it had to do its own advertising? It is quite true it can stand on its own merits, but could not the demand be made far greater if its good qualities were brought more frequently before the consumer. I welcome with no

small degree of satisfaction the fact that our fruit through the efforts of this Association will occupy a prominent position at the World's Exposition to be held at Chicago, and fruit growers should give you their hearty support in your great undertaking. Thousands look upon fruit to-day simply as a luxury. Thorough advertising would bring forth its medicinal value, and teach consumers to look upon it not only as a luxury, but as a necessity.

The medical profession are recommending fruit as a healthy diet. This should be constantly before the consumer, and it can only be accomplished by extensive advertisement. Then let us ever honestly agitate and educate the masses in the line of greater consumption, thus increasing the sale of our fruit ten fold. This will encourage increase of acreage until our valley will bloom with one mass of foliage, and every man will sit as it were under his own vine and fig tree. Then a factory engaged in fruit preservation along the lines laid out would be indispensible. I am satisfied there are fruit growers within the sound of my voice who will live to see the same, which will grow as our markets develop to such proportions as to surprise the most sanguine enthusiast on the subject.

R. W. STARR asked as to the comparative cost of tin and glass jars.

MR. SHAFFNER said the cost of tin was much less, but he found consumers willing to pay the extra cost and preferred glass, as the jars could be returned, and in any case were useful.

MR. STARR said although this was a fruit county, one could not find a grocery store in the valley but that had imported canned fruit on their shelves. He had seen $300 of canned fruit in one order of a Wolfville grocer from Montreal. Some of this order was preserved plums, perhaps some of the same as were shipped from this valley ast year to that city.

DR. REID.—The difficulty in using glass is cost of carriage and packing, with loss in breakage. The point now at issue is to obtain a flexible glass.

MR. PEAKE.—In England there is a large consumption of canned goods, but a great prejudice against the use of tin. Glass and stone jars are almost universally used.

MR. DIXON.—In England they pack glass jars in barrels, and find them to carry more safely than in boxes.

MR. SHAFFNER said he packed his jars in sawdust, and found no loss in breakage. Canned goods from Montreal were to-day in this valley in large quantities. Thought we should make an effort to at least retain our home market.

Resolved, that MR. SHAFFNER have the thanks of the Association for his valuable paper, and it be published in our proceedings.

At this stage of the meeting MR. A. WHITMAN introduced the following resolution:

That the Secretary be instructed to convey to the Executive Government of the Dominion the following resolution of this Association:

Whereas, the N. S. F. G. Association now convened at Middleton, considers it desirable that a change be made in the statute relative to the size of apple barrels; trouble and loss having come to Nova Scotia shippers, owing to the fact that the Upper Provinces use a much larger barrel than the law provide;

And whereas, The shippers of Nova Scotia comply with the provisions of law and use the sized barrel therein provided;

Therefore resolved, That the Government be requested to legislate in the matter, and compel shippers to use a barrel of the exact dimensions, no larger and no smaller, so that the size of barrel shall be uniform throughout the Dominion. Every barrel to be branded by a sworn inspector under penalty. Also the cubic contents be given as well as length between head, diameter of head and diameter of bilge, instead of measurements as at present.

Seconded by R. W. STARR.

R. W. STARR thought we should adopt the large measure, and in the mean time keep our barrel fully up to the standard.

PRESIDENT BIGELOW said the Ontario shipper could be proceeded against just as readily for using a barrel larger than the law prescribed as for using a smaller.

Resolution carried.

MR. STARR asked what the observation of orchardists had been in regard to the action of the extremely warm weather of last November and December on the fruit buds. He had noticed the buds had swelled in some instances.

It was the concensus of opinion that there had been no appreciable loss on that account.

Some discussion on various topics followed here.

The PRESIDENT announced the summer meeting would be held in Bridgewater on July 7th.

Meeting adjourned at a late hour.

SUMMER MEETING.

BRIDGEWATER, JULY 7TH, 1892.

By special invitation of the manager of the N. S. C. Railway and the Bridgewater Agricultural Society, the Association arranged for a meeting at Bridgewater on Thursday, July 7th. A number of fruit growers and members of the Association from Kings and Annapolis Counties availed themselves of the opportunity to spend a day in that thriving town and assist in making the meeting a success. Among those present we noticed President Bigelow, Senior Vice-President C. R. H. Starr, Secretary Parker, Prof. Lawson, R. W. Starr, W. W. Pineo, John Shaffner, F. M. Chipman, R. E. Harris, D. Masters; also a number of ladies from the valley. The meeting was not as generally advertised throughout the country as was expected, consequently the attendance of Lunenburg farmers was not as large as could have been desired—the special train from New Germany not being as well patronized as it should have been. However, at 2 p. m. there assembled in the unique "Music Hall" (which had been placed at the disposal of the Association free of charge) a goodly number of persons interested in fruit culture, including Rev's. W. E. Gelling and John March, and other clergymen whose names we failed to obtain; Messrs. Craig of the *Bulletin;* Oxner of the *Enterprise;* Dr. March, J. A. Curll, Secretary of the Bridgewater Agricultural Society; W. A. Hebb, Emanuel Hebb, G. S. Boliver, James Waterman, Simeon Hebb, T. R. Pattilo, Simon Wentzell, J. A. Mills, and a number of others.

PRESIDENT BIGELOW, in his opening address, referred among other thing to the World's Fair at Chicago next year, and said that the Association had undertaken to make a collection of fruits for exhibition during the whole season, and the necessity of trying to make such collection as complete and perfect as possible. In this work the Association urged and expected the assistance of fruit growers in every section of the Province, as the collection should be essentially provincial

in character and comprise every description of fruit and berries, both wild and cultivated. The Dominion Government had offered to supply the glass jars in which the fruits would be preserved in fluids that were expected would present the different varieties in their natural colors and appearances. One thousand square feet of floor space has been assigned for the Nova Scotia fruit exhibition, and he trusted all would do their utmost to make this show a grand success. The Association would provide glasses and chemicals to any person who would undertake to fill them with extra fine fruits. President Bigelow also spoke of the profit of fruit growing and the prospects for Lunenburg yet rivalling Kings or Annapolis Counties in the production of fruit for the English market.

R. W. STARR was then called upon and spoke at some length of the necessity for, and the best methods of, care and cultivation of orchards, giving many sound and practical hints in regard thereto, which no doubt will prove profitable to our Lunenburg farmers, most of whom do not seem to realize the importance of properly caring for what trees they have, much less the advantage to be derived from an enlarged system of fruit culture.

C. R. H. STARR was next called, and spoke of the best methods of packing and marketing apples. One farmer near Bridgewater had told him that morning it was little use to grow apples, as they had no market. With the N. S. C. Railway, and their splendid harbors, all the markets of the world were available. Lunenburg County had all the advantages that Annapolis and Kings enjoyed, no man in those counties would say to-day they had no markets. Such an expression might have been heard from our forefathers when the Valley orchards were about like those in Lunenburg to-day, but that day has long since passed. There was no question as to what could be done in fruit growing in this section of the province if only the people would give the matter proper attention, that was practically demonstrated by a visit to Mr. W. A. Hebb's place this morning, whose orchard would rival most orchards of its age in the Annapolis Valley. This orchard has produced 700 barrels in one season. Mr. Hebb did not complain that he had no market. Quantity and quality would find a market every time. In reply to a question as to prices realized, Mr. Starr said a number of growers who had been shipping the whole of their apples to London for several years, could show a net average of $2.50 to $3.50 per barrel returns.

MR. WATERMAN, of Blockhouse, asked for information *re* black knot on plum trees, and claimed to have discovered an insect that caused the trouble, and agreed to furnish Prof. Lawson with specimens for examination.

Meeting adjourned for tea at six o'clock.

EVENING SESSION.

The evening session was more largely attended than that of the afternoon, a number of ladies being in attendance. A very general interest was manifest. Questions and answers were in order for a time, and much information was elicited.

PROF. LAWSON addressed the audience, and as usual gave valuable hints and suggestions. He remembered twenty years ago seeing a collection of apples exhibited in Halifax by Mr. Hebb, then a member of the House of Assembly, as fine fruit as he had ever seen. There was no doubt about the capabilities of Lunenburg County as a fruit growing district. Bridgewater should be the centre of a vast orchard.

REV. MR. GELLING said there were great possibilities for the future of Lunenburg if her people would wake up and devote their energies to developing the fruit industry instead of emigrating to foreign countries.

REV. MR. MARCH said he had known the country for thirty years, during which time many fine orchards had been grown, and there was prospect of a great improvement in the near future. He felt sure great good would follow the discussion and information gained at the meeting, and he hoped the F. G. A. would again arrange for similar meetings.

The SENIOR VICE-PRESIDENT, who presided during the evening owing to the indisposition of the President, said the Association wished it to be distinctly understood that each jar of fruit contributed for the World's Fair is to have the name of the variety and the grower's name and address attached thereto, then uniform labels will be printed containing these names and secured to each glass jar. Already a number of jars of strawberries have been filled with magnificent specimens, Mr. Simeon Hebb presenting a jar of very fine berries at the meeting.

Mr. T. R. Pattillo, of Bridgewater, was appointed to look after any contributions that may be offered in that section of the country, and it is the intention of the Association to send glass jars to different parts of the Province in order to secure as large and representative a collection of fruit as possible. The exhibition opening in May and closing in October, it will be necessary to preserve this season's fruits to make the collection complete.

The officers and members of the F. G. A. will be pleased to give any information and receive assistance from any person willing to contribute in any way to the success of this exhibition. The Association are taking the matter in hand, with the expectation of placing Nova Scotia in the front rank among the exhibitors of the world, and in this work they solicit the co-operation of every person.

After the usual votes of thanks the meeting adjourned, after a very pleasant and profitable session.

JANUARY MEETING.

(Stenographic Report by W. H. Huggins.)

HELD AT WITTER'S HALL, WOLFVILLE, JANUARY 26TH AND 27TH, 1893.

29TH 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.

Among those present were J. W. Bigelow, (president), R. W. Starr, S. C. Parker, (sec't'y) C. R. H. Starr, Geo. Thomson, (treasurer), Dr. A. P. Reid, A. McN. Patterson, B. O. Davison, F. A. Dixon, T. H. Parker, S. Dimock, E. C. Elderkin, Rev. A. Martell, C. E. Brown, E. C. Banks, W. P. Churchill, A. C. Johnson, A. H. Johnson, Chas. Johnson, Ralph Eaton, Ross Chipman, J. S. Dodd, J. R. Starr, A. B. Parker, Dr. DeWitt, Guy Goodacre, Charles Fitch, E. C. Johnson, Peter Innes, Walter Brown, J. E. Starr, A. Whitman, W. C. Archibald, Rev. F. H. Axford, J. S. Morse, John Donaldson, Fred Johnson, L. O. Neily, Lewis Donaldson, R. Harris, Capt. Tuzo, Dr. H. Chipman, W. H. Chase, and about 50 others.

The association had on their tables a large display of apples from the world's fair collection which were greatly admired by those present.

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 SECRETARY also read his report for the past year, which was as follows:—

SECRETARY'S REPORT.

Mr. President and Members:

At this the 29th annual session of the N. S. F. G. Association, it becomes my duty for the first time to present to you the Secretary's Annual Report. In appearing before you for the first time in this

capacity I hardly know to what part of our work to direct your attention. We have a Fruit Committee, of which Mr. R. W. Starr is the accomplished and experienced chairman, and will at a later stage of the meeting present to you an exhaustive report of the state of business during the past year.

The Chicago Fruit Exhibit has also occupied much of our attention, and our energetic President has thrown much enthusiasm and hard work into the arrangement, and it has given him abundant opportunity to exercise his well known business ability. Of this you will hear in the President's address. The financial affairs have been relegated into the hands of a new official, the Treasurer, and your Secretary is relieved from the responsibility of guarding the family purse, so there seems nothing left for me but to give you a short statement of the routine business of the Association.

About my first official duty was the publication of the Annual Report. It was placed in the publishers hands a few days after the meeting closed, but from delay in the printers hands it did not reach me till about the first of April. At this stage a further delay occurred. I was informed by our late Secretary that our report as an official Government publication had free transmission through the mails. The first lot I sent out were stopped at Halifax and enquiry at once made of the P. M. at Berwick, as to whence they came and reason for free mailing. Quite a lengthy correspondence with the P. O. Department ensued, and after some weeks of delay and considerable correspondence the matter was satisfactorily settled and we now have official authority to use the mails for the free transmission of our report. We are indebted to Dr. F. W. Borden, M. P., for representations made to the department at Ottawa in connection with this matter.

The Spring Meeting of the Association was held at Middleton on the 26th of April. Notwithstanding the early date the weather was remarkably fine and farmers were busy seeding, causing a smaller attendance than probably would have been the case under other circumstances. Nevertheless a fair gathering of fruit growers was assembled and a profitable meeting was enjoyed. The question of an exhibit for the Columbian Exhibition was fully discussed, and preliminary arrangements made for collecting and preserving a full collection for this important Exhibition.

For the summer meeting it was thought best to enlarge our field of operations and try green fields and pastures new, so upon solicita-

tion of several representative men, Bridgewater was fixed upon as the place of meeting. Every effort was made by people in that vicinity to make a successful meeting. Mr. F. B. Wade, manager of the N. S. C. Railway, made a one fare excursion over his line, and ran a special train for the accommodation of the people. Quite a number of members went through from the valley including several ladies, and it made a very pleasant and profitable excursion. Your representatives spent a day among the orchards in the vicinity of Bridgewater, and were surprised at the place orcharding is already assuming among the industries of the county. The valley of the La Have, in our opinion is eminently adapted to fruit growing, and with the same care and enterprise as is evident in this valley they would prove no mean competitors for excellence in fruit growing. The largest orchard in Lunenburg Co. is owned by Mr. W. A. Hebb, near Bridgewater. This orchard, though standing in grass and not ploughed for ten years, was in a high state of fertility, as evidenced by the healthy condition of the trees and the enormous growth of grass upon the ground. The trees showed care, were fairly well pruned, and laden with a show of fruit which even at this early date (July 6th) gave evidence of an abundant harvest, and I have since learned that Mr. Hebb had about 600 barrels of apples this season. The fruit growers in Lunenburg Co. evinced an intelligent interest in the proceedings and seemed anxious to learn, and we predict a great future for fruit growing in this fine county. I visited the Yarmouth Co. exhibition in the interests of the World's Fair exhibit. This county is rapidly becoming alive to the possibilities for them in fruit growing. A fair display of fruit was shown, several large exhibits coming from Annapolis county. Plums were conspicuous by their absence. Pears, etc., few and poor. A remarkable feature of the show was the display of grapes grown under glass. Several gentlemen in Yarmouth town are the possessors of cold graperies, and certainly they must be a constant source of pleasure to the owners. I had the pleasure of inspecting some of these graperies under the guidance of Mr. C. E. Brown, and certainly this example might be followed with pleasure and perhaps profit by many of our fruit growers. Mr. C. E Brown, our Vice President for Yarmouth Co., is an enthusiast in fruit culture and is thoroughly posted, carrying Downing literally at his fingers ends. Yarmouth Co. certainly conducts a model exhibition, and it would be worth the while of our Exhibition

Committees to take lessons from their management. By the way, it certainly is a matter for regret that no Exhibition was held in the valley during the year. It certainly is not a matter for commendation that the three banner agricultural counties of the Province had no responsible body willing to undertake the management of an Exhibition and allowed the government grant to revert to the treasury. Although this Association during its later years has chosen to devote its energies to the education of our fruit growers in propagating rather than in growing fruit, yet we think it would be wise to take up the second clause of our name the, *International Show Society*, rather than let such an omission occur again. In closing I must thank all members of the Association for uniform kindness and courtesy. President Bigelow is certainly a tower of strength, enthusiastic, indefatigable, and thoroughly business like, and is prepared to overcome every obstacle. Of our senior Vice President's experience I have had many times to avail myself. From an intimate association with the Assistant Secretary in our work during the past summer, I am more and more amazed at his exact historical, technical and scientific knowledge of all departments of fruit growing, and certainly living under those classic walls yonder there would be nothing out of place in creating a new title and dubbing Mr. R. W. Starr, Doctor of Pomology.

Resolved, The above report be adopted by the Association.

The PRESIDENT then read his Annual Report as follows :

PRESIDENT S REPORT.

Ladies and Gentlemen : Having honored me with the Presidency of this worthy institution for a second year, it becomes my duty to report its progress during the past year, and I am pleased to be able to hand over to my successor the Association improved financially and in numbers, yet regretting that so few of our fruit growers give us the benefit of their names and experience.

From a fruit growers standpoint the past year has been a fairly successful one. The fruit crop has been below the average in quantity owing to a disastrous tornado and hail storm of unusual violence occurring the 21st of June, doing much damage to trees and fruit The quality of all the fruit has been very good and the year's receipts of cash for fruits will far exceed the revenue derived from all other farm products in the counties of Kings and Annapolis. It is difficult

to ascertain the exact quantity of fruit marketed, but as near as can be estimated it is about as follows: bbls. Apples 200,000 ; Pears 1,000 ; Plums, bushels 4,000 ; Strawberries, quarts, 75,000 ; Cranberries, bbls. 1,200. Other small fruits, quarts 50,000.

Owing to the world's abundant crop prices have ruled low for Apples during the first of the season, but recent shipments have averaged $2.50 per bbl. clear, and from present outlook the year's crop will average $2.00 per bbl. The prices of small fruits have been remunerative and the demand quite equal to the supply.

The injury by insect pests and black spot has not been very seriously felt, and we feel assured that by applying the remedies in use no serious injury to fruit or trees need be dreaded in the future.

This Association has held two quarterly meetings, one in Middleton in April and one in Bridgewater in July, and we believe they have been mutually beneficial. It is most desirable that the Vice Presidents in each county should interest fruit growers in the work of this Association.

I met Mr. Saunders, Executive Commissioner for Canada for the World's Columbian Exposition, at Halifax, by appointment, in April last, and he urged upon this Association the necessity of making an extensive exhibit of fruits at that Exposition. While we were fully aware of the importance of placing our superior fruits before the world on that occasion we were not in a position financially to assume the work, and on referring the whole question to the Nova Scotia Government, they seeing the importance of the work guaranteed a small amount towards defraying the cash outlay, and entrusted to this Association the care of collecting, packing and forwarding said exhibit, and the Dominion Government guaranteed to pay all transportation charges. There is now in cold storage at Chicago 101 boxes and 15 bbls. of Apples and Pears, and on hand about 200 glass cans of fruit preserved in chemicals, and 15 bbls. of long keeping Apples. By this means we have arranged to show our fruits of 1892 to best advantage all through the exhibit of 1893. I take this opportunity of thanking the fruit growers of this county for their valuable assistance in furnishing and collecting fruits for this exhibit, and I now feel assured that they will be amply rewarded by bringing the fruits of Nova Scotia prominently before the assembled world at Chicago.

During this session your attention will be called to the urgent necessity of improving the present inefficient and too expensive transportation facilities for fruit to England. The desirability of establishing an experimental fruit farm in this valley. The necessity of increasing the membership and influence of this Association, and making it more useful to fruit growers—and many other questions of the deepest interest to fruit growers, all of which I hope will receive your careful consideration, and result in permanent benefit to this important and increasing industry.

In view of the enormous undeveloped wealth of the fruit growing industry in Nova Scotia, I have collected the following statistics and general information for publication.

When we consider that the fruit belt of the three counties, Annapolis, Kings, and Hants contains over 400 square miles of the best orchard land in the world, and that of this area not 20 per cent. has been cultivated, and not 5 per cent. has been set in orchard, and as shewn by the following statistics that no other investment will yield such profits, when reckoned over a term of one hundred years, it is to be wondered at that labor and capital have not long since secured this rich inheritance, and it will be a greater wonder if in this age of gigantic combines and enquiry for profitable investments this vast territory is not immediately acquired, and with business methods be made to yield, as it can, an income of from twenty to thirty millions of dollars a year. No other country in the world can offer more favorable inducements to the settler with moderate means. With lands at from five to one hundred dollars per acre, intersected with railways and navigable rivers affording the cheapest outlet to the markets of the world, the healthiest and most invigorating climate, the soil best adapted to fruit culture with an inexhaustible supply of fertilizer brought to our very doors by every rise of the Bay of Fundy tides, and the most desirable social and religious conditions, the seeker for a home finds the most desirable conditions for a happy and prosperous development of human life.

To prove the profitable results of apple culture alone in this belt, I have secured the actual results from the following named orchards for the last ten years, the truth of which I am prepared to prove, and they are known to be a fair sample of all the orchards in the valley :

Owner of Orchard.	No. of Acres.	No. of Trees.	When planted.	First cost of land.	No. of barrels of Apples last 10 years.	Nett amount of Sales of Apples.	Total cost of cultivation, 10 years.	Value of other crops beside apples.	Net profit last 10 years.	Present Value of Orchard.	Remarks.
A. D. DeWolf.	8	350	1870	$400	3200	$5750	$960	$840	$5630	$8000	*Sold* at that price.
Lewis Johnson.	2½	100	1837	250	1800	3600	400	100	3500	1500	Old neglected orchard.
Charles Fitch .	5	200	1869	1000	1500	2800	800	1000	3000	3000	
J. S. Dodd....	5½	240	1870	200	4200	9000	2500	1500	8000	5000	*Sold* at that price. Well cultivated.
R. Harris	18	900	1857	1800	5500	12875	4000	4200	12675	9000	*Sold* at that price.
J. W. Bigelow.	4	160	1871	400	1500	2800	1100	850	2650	3000	Orchard neglected.
Leander Eaton	11	440	1868	1000	4000	6000	1500	4000	8000	5500	Orchard well cultivated.
S Sheffield....	4	200	1871	470	2300	4075	715	1200	4560	4000	Well cultivated.
R. W. Starr ..	11	500	1871	1000	3498	6120	2610	3300	6810	6600	Well cultivated. Kept in potatos.
Fred. Johnson.	8	300	1870	1200	1685	3370	1200	700	2870	4800	Well cultivated.
	77	3390	.....	$7820	26183	$56390	$15785	$17690	$52065	$42400	

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As a result of these facts we have a profit of $52,065 from 77 acres of orchard in ten years, from an investment of $7,820, and permanent value remaining in orchard worth $42,400. Any man of small means or moderate income can produce the same results, while to the promoter and investor it proves that with a capital of say one million dollars one hundred thousand acres of new land can be acquired capable of giving an income of $5,200,000 per year for one hundred years after the first ten years, and one million dollars of additional outlay.

To prove the cost of producing a young orchard, I have obtained the following facts from the owners of four young orchards planted five years, and have selected those who paid the *highest* and *lowest* prices for land.

From this table it is proved that from an outlay of $5,285 in five years the orchard is made worth $15,915, and the whole cost of raising an orchard can not exceed three dollars per tree average, which tree will give an average income of two dollars a year for one hundred years.

A very important factor in estimating the profit of apple orcharding in Nova Scotia is the proved longevity of the apple tree here, as good crops are now being raised on apple trees planted by the French one hundred and fifty years ago.

Cost of Land, Trees, and all expenses on an Apple Orchard first five years.

Owner of Orchard.	No. of Acres.	No. of Trees.	When planted.	Cost of land.	Cost of Trees and all other expenses, 5 years.	Value of all other crops.	Present value of Orchard.	Remarks.
Johnson Brothers, Grand Pre.....	26	1086	1887	$1560	$1250	$1100	$4000	Good cultivated land.
F.W. Borden, M.P., Canning	25	1000	1888	75	700	None.	2200	Wild land.
Ralph Eaton, Cornwallis	50	2000	1888	500	1000	300	10000	New land.
J.W. Bigelow, Wolfville.....	35	1400	1888	700	900	None.	5000	New land.
	136	5486	..	$2835	$3850	$1400	$21200	

With these facts before us is it not remarkable that according to our last census returns there is no great increase of population in this fruit belt within the last ten years. Among other causes I attribute this largely to the fact that this country is comparatively unknown outside the Dominion of Canada. While vast sums are being expended to advertise the rest of this continent, Nova Scotia is unknown in Europe, and no effort of a practical form has been made to bring to the notice of the world the advantages and great resources of Nova Scotia as a home.

With this object in view this Association offered a small prize for a paper shewing the advantages of Nova Scotia as a fruit producing country, to be published and distributed at the World's Fair in connection with our fruit exhibit, but the same apathy which keeps Nova Scotia unknown is manifested here, as no paper has been offered, and this opportunity of placing in the hands of desirable settlers this important information will be lost unless some member of this Association volunteers to furnish such a paper for publication at once, and as the Nova Scotia Government has offered a small sum to defray the expense of publication, I sincerely hope this opportunity will not be lost.

In conclusion I take this opportunity of thanking the officers and members of this Association for their cordial co-operation and support in conducting its business for the past two years, and hope a much more capable man may be elected for the ensuing year.

J. W. BIGELOW.

Wolfville, January 16th, 1893.

DR. A. P. REID referred to the work done by the President during the past year, and said the Association was better on account of it. He had visited Queens County and noted the great advance in fruit growing in that County. There were a large number of orchards being planted and in time the Annapolis Valley would have a rival section, which goes to show the wonderful adaptation of a large part of Nova Scotia for fruit growing, and that the apple tree can flourish in other parts of the Province as well as in the Annapolis Valley. He also referred to the large number of fruit growers who were not members of the Association, and who if they were on the roll could assist the Association very much by their presence and also by their subscriptions, and also that a life membership certificate could be had in

the Association by each person desiring to become a life member paying $5.00. He said that the exhibit to the World's Fair was undoubtedly one that any country should be proud of. He moved that the report be adopted.

J. E. STARR, in seconding the resolution, said he wished to offer his congratulations to the President for his exhaustive report. He said that it showed that the President had taken a deep interest in his work and was certainly the right man in the right place.

C. R. H. STARR said that before putting the question he would like to make a remark in reference to a statement which might be misleading with reference to the crop of this season not being an average one. The estimate of 200,000 barrels is a full average crop, and according to our shipping statistics at the present date, the crop this year will prove to have been larger than any crop since that very large crop of 1886. At the present date we have shipped more apples to England than any season since 1886, the amount being 76,000 up to the present date, and it bids fair to extend to 100,000 for the same season, which we have not reached any season since 1886.

The report was unanimously approved of and ordered to be printed in the Minutes.

The PRESIDENT then called upon Prof. JOHN CRAIG of the Experimental Farm at Ottawa, to address the meeting.

Mr. President, Ladies and Gentlemen,—Your President has been kind enough to give me rather a flattering introduction; now I did not come here with the expectation of giving you a treat, but I came down here rather to meet the fruit growers of Nova Scotia, to learn all I could, to carry away all the information possible, and to give you something in return, in fact make our work co-operative in every sense. It is a special pleasure to me to meet the fruit growers of Nova Scotia to-day. I may say for the past three years I have been hoping to get down here, but difficulties have cropped up on each occasion which have prevented me from coming. Then your invitations have been so generous as to be almost embarassing, on each occasion our whole staff has been invited—and we being individually modest could not decide who should accept, and for that reason we all stayed at home. However, on this occasion I felt particularly honored when I was authorized by Prof. Saunders to accept the invitation of your Secretary.

My knowledge of Nova Scotia fruit growing has up to the present been derived from literature, but since coming here yesterday I have learned something from observations about fruit culture in the Annapolis Valley, and its possibilities, and I have been very strongly impressed by many things ; the extent of your apple orchards, and the apparent vigor and longevity of your trees I do not think, however, that you have reached the acme of perfection yet, and possibly one of the reasons that this valley has not developed more rapidly in other fruit growing lines besides the apple is on account of it standing quite alone. I am of the opinion that if you had a live competitor in some of the outlying counties and a friendly rivalry existed between you, it would give a new impetus to this industry ; Peach, Pear and Plum growing would be developed to a greater extent to the benefit of all sections of the country. Thus far the Annapolis Valley has been too much by herself in this regard. With respect to the progress of horticulture during the past few years I would refer you as a standard to judge by, the marked advances which have been made in regard to methods of treating the fungous diseases which attack our fruit trees, and this progress is also well marked by the great advance made in treating the fungous diseases and insect pests attacking the larger and smaller fruits ; and in looking over some of the back reports of your Association on my way down here, I was exceedingly pleased to see it placed on record in these volumes that the Nova Scotia Fruit Growers Association was among the first organizations of this character to take into account the serious inroads made by the various fungus pests which attack our fruit trees, and almost the first of Canadian and among the first of American societies to investigate the disease, the method of treating of which I wish to bring before you this afternoon. Some years ago I was pleased to notice the progressive spirit manifested by this Society in that direction, and without saying anything flattering I think this progressive spirit is only a general index of the character of your work. Now, although we talk a great deal about the disease commonly called "Black Spot," I do not think any of us realize the vast amount of damage which is justly chargeable to it. During the year 1890 the estimated damage resulting from "Black Spot" in the United States, and as close an estimate as possible was formed, amounted to sixteen million dollars to the apple industry alone—and from this estimate we can very readily judge what is our own relative position in regard to it. In considering this disease there

are a few foundation principles which we should take up first, and study, before we can get a clear understanding of the methods and reasons for treating it certain ways. In a broad way it is well to consider what most of you know, that fungi belong to a flowerless class of plants and exist on dead or living plants—they are unable to take up the crude material from the soil as flowering plants do, but they maintain their existence by living on other plants which prepare food for them and give it to them in an assimilated form. They have no flowers or seeds, but their reproduction is effected by special organs which are called spores. There are two classes, one feeding upon dead organic matter; the other living plants. These latter twine around and take hold of the plant and draw the nourishment out of it—and this class which derive their nourishment from living plants are called Parasites. Another class which feed on dead organic matter are called Saprophytes—of this latter class we have familiar examples in the Toad Stools and Mushrooms; Smuts, Mildews and Rusts belong to the parasitic class, so that we see that they have no power of assimilating food for themselves. It must be prepared and in an assimilated form. Another great difference between them and our ordinary plants is that they have no visible flowers—they are entirely flowerless. Their vegetative portion, or that which corresponds in flowering plants to leaves and buds, consist of slender thread like tubes, collectively called mycelium. These portions which correspond to seeds of the flowering plants are called spores. These spores are exceedingly minute and multiply with great rapidity, and by means of these the disease is carried over from one season to another. The parts of a fungus are microscopic objects not discernable by the naked eye, and can only be distinguished by means of a high power microscope. The number of injurious fungi probably surpasses that of the flowering plants.

We of course are all familiar with the well known "Black Spot" of the apple, also the disease which causes the blighting of the pear and apple, a familiar example is also found in the disease which causes the potato rot. These are all specific microscopic plants, and depend upon spores or seeds for reproduction in the same manner as flowering plants. Now of course one plant living upon another—storing up nourishment which is filched by the other must be injured to a serious extent. There are several ways in which these parasites are injurious. They first deprive the host plant of its nourishment and its food

supply—being weakened and reduced its vitality is naturally lowered and it is unable to properly perform its functions, it does not ripen up the wood made during the season, and it is unable to perfect its fruit; again, the growth by this unnatural state of affairs may be accelerated or retarded in an abnormal manner, and the general health of the tree much affected. In connection with "Black Spot", one of the principal features we observe at the north is that the plant is so much weakened that the growth of the season is not well ripenened and the plants go into winter in bad condition and are injured by the cold, even although we may not have noticed the presence of the fungus on the foliage. We thus find that owing to the attacks of the parasite that the tree does not ripen up its wood in the autumn, if then a severe winter follows, we have what is commonly called winter killing, caused as I have said by insufficient nutrition due to supporting parasites. Among other effects noticeable in summer when the attack is severe are that the leaves and fruit fall and decay prematurely.

The disease to which I wish to direct your attention more particularly at this time is the "Apple Spot". I find some of the results of experiments which I have carried out in the treatment of this disease have already been incorporated in your report of last year and those who have read it be able to listen to the present imperfect explanations at least with some degree of satisfaction. The "Apple Spot" is a product of the cool climates although it extends it attacks from Maine to California. It does not exist to any injurious extent in the extreme south. It depends more or less upon climatic conditions for a greater or less development—a cool and moist atmosphere being particularly favourable to the germination of the spores, and spread of the malady, while a dry, hot condition has the opposite effect. At first it was not understood that the disease attacks both the leaves and the fruit. The presence of the enemy is first brought to our notice by small black spots on the fruit, which are now looked upon as only one form of the trouble. When investigators began to examine it closely they found another form on the leaves, causing peculiar blotches or smoky colored spots—this was proved to be the same thing. It thus occurs that sometimes we may find the fungus affecting the leaf very badly, and on the same tree the fruit might be comparatively free, and right here is a point of considerable importance; in such cases, when the fruit is not affected much, fruit growers frequently do not think it necessary to spray their

orchards, but it is important to treat the tree whether the fruit is attacked or not. I have already shown that the growth is greatly retarded and the health of the tree much impaired by the fungus growing on the leaves. The spores, or reproductive organs, are carried over winter by living on fruit in the barrels, also on dead leaves and on the young shoots, so that we have many ways and means for it to be carried through from one season to another. Now, you will then see the ill effect of putting in barrels fruit which is affected with the scab, as the closed and damp atmosphere of the barrel will certainly favour the growth of the fungus. Now in regard to the treatment of this disease. I would first emphasize the wisdom of choosing varieties—as far as possible—which show relative freedom from the "spot" because we have no such thing as fungus proof varieties. This, then, s our first consideration, select varieties that have not in the past been and are not liable to be affected by the spot. If we must grow a variety liable to be affected by the spot, then we must spray, and here the fungicidal properties of the copper salts give us invaluable aid. On the charts before you may be seen in a graphic way the results of my experiments in treating this disease with copper salts in varying proportions. These results have been verified by growers in Quebec and Ontario who have tried experiments with dilute Bordeaux Mixture, in a number of localities, the average result has been very encouraging. The Bordeaux Mixture is a spraying compound which was discovered by fruit growers in France some years ago. Its efficacy as a fungicide was demonstrated by certain vine growers in Bordeaux, France, who found that the boys of the town showed a too marked preference for their grapes, and wishing to put a mixture on their grapes which would prevent the inroads of the boys, they made a mixture of blue stone, copper sulphate, and lime, and sprayed it over the grapes early in the season, which made the grapes unattractive and distasteful at the time. Outside rows treated in this way were found to be much freer from grape rot and mildew and rot than others not sprayed, so the mixture soon came into general use, taking the name of the town. The original mixture was composed of six pounds of copper sulphate dissolved in four gallons of water and four pounds of lime slaked in two gallons of water, the two then poured together and diluted to 22 gallons. In this proportion it was used for two or three years—it is in this proportion, however, a very sticky mixture and frequently clogs the nozzle. The results shown on the chart are from the use of this mixture about

half strength, that is three pounds of blue stone and $2\frac{1}{2}$ lbs lime to 25 gallons of water; this gave me 39% first class, 45% second class, 16% third class. I should say here that the treated trees were of the Fameuse variety. In using mixture No. 2, the results were even better. This No. two mixture is the modified eau celeste—that is a modification of the ammoniacal copper carbonate which I mentioned in my report of 1890. It is a simpler way of preparing the same materials. It contains copper sulphate and ordinary washing soda. I think in your report of last year you will find directions for preparing this fungicide and you will there find it called "Unwashed Solution." By looking at the chart it may be seen that the lowest results obtained with any of the spraying mixtures were far ahead of those results obtained from untreated trees. In no case did the untreated trees yield more than 18% of apples of first quality. Summing it up briefly then it is readily seen that whether you use the copper carbonate in suspension or any of the first four you will obtain paying results. But those which gave the best results were the Bordeaux Mixture and modified Eau Celeste. To each of these mixtures I add Paris Green (for the benefit of the Codling Moth) after it had been diluted to the fullest extent. And a single application added about 9% to the amount of sound fruit. With these results before us I therefore feel justified in recommending the following :—

1. *Solution.*

Carbonate of Copper	$1\frac{1}{2}$ oz.
Ammonia	$1\frac{1}{2}$ pints.
Water	25 gals.
Paris Green, (added in second application)	$1\frac{1}{2}$ oz.

2. *Suspension.*

Carbonate of Copper	$1\frac{1}{2}$ oz.
Water	25 gals.
Paris Green (added in second application)	$1\frac{3}{4}$ oz.

In mixture No. 1, dilute Bordeaux Mixture, you have a remedy inexpensive, easily applied, and effective for the Canker Worm and Codling Moth as well as the "Black Spot." When the attacks of the Canker Worm are very severe, however, it will be advisable to use Paris Green alone at the rate of 1 lb to 160 gallons.

Q. What time would you use it ?

A.—With us the Canker Worm is most injurious during the first 15 days in June, but it is important to apply the remedy as soon as

the young larvæ begin to feed—the exact date must be determined by observation. The cost of this diluted Bordeaux Mixture which will prevent in a paying manner the inroads of Apple Spot, Grape Mildew, Raspberry Anthraceuse, Codling Moth, and Canker Worm—in quantities of 100 gallons, will be about 93 cents, not counting the time consumed in its preparation. In buying large quantities you can reduce that figure—in buying small quantities at retail it will cost you more as a general rule. You would have no difficulty in making 100 gallons for one dollar. I have made it for seventy-five cents. Large trees will take about two gallons, if you have the right sort of nozzle.

Q. What kind of nozzle is best?

A. The Nixon—this is provided with a central, piston which is operated with a spring for the purpose of clearing the nozzle if it clogs.

In regard to mixture No. 2, you will see that 100 gallons of this will cost $1.65—the ammonia used to dissolve the copper carbonate is the principal item of cost in this. This last season, which was very rainy, we had to spray very often, and later than usual, and this modified mixture Eau Celeste can be applied late in the season and does not render the trees unsightly. It can be applied later than Bordeaux Mixture in treating grapes for mildew—in fact just a few days before picking them if necessary. As a general rule I do not think it is safe to add Paris Green to the mixture, as some varieties of apples are liable to be injured. I have used it safely, but I would not feel justified in recommending it to fruit growers generally. You will notice on the chart another substance,—potassium sulphide—this is particularly useful in treating gooseberry mildew. I know you grow gooseberries in this vicinity to some extent, and I trust you are not affected very much by injury from mildew, for which the above is a specific when used at the rate of one ounce to three gallons of water, and sprayed over the gooseberries several times during the season, beginning early. You must be on hand with the mixture before the mildew appears.

Q. Will it kill the Currant Worm?

A. It is simply a remedy against the mildew of the Gooseberry.

Apart from treating the trees with fungicides I would again emphasize the necessity of first selecting varieties which are not liable to spot, and after you get the varieties cultivate and treat them well in the

orchard. The health of a tree has much more to do with its immunity from disease than is generally taken into consideration. A tree half starved and half cared for will be more likely to fall a prey to some fungous diseases than one in good growing condition. That is one of the secrets of getting good quality and a good color, trees which have only sufficient vitality to keep them alive cannot be expected to mature and perfect fruit high in appearance and of good quality.

RALPH EATON—Those that used the Bordeaux Mixture injured the apples by causing a rust to appear on them?

A. I have seen some indication of this effect where the trees have been sprayed with the full strength Bordeaux Mixture. Half strength as recommended above will not produce this result.

MR. DAVISON—How early in the season do you use the Bordeaux Mixture?

A. Just as soon as the blossoms have fallen. One treatment with 1 lb. copper sulphate to 50 gallons of water before the blossom is open is advisable, in fact before the leaves appear on the trees. Last year my first treatment was made in this way, simply bluestone dissolved in water. The trees were sprayed with one pound to 50 gallons of water before the blossoms or leaves appeared. The next two treatments were with the Bordeaux Mixture before the blossoms opened and again after they had fallen, this was followed with the Eau Celeste, one application.

RALPH EATON—If one pound of Paris Green to 50 gall's of water injured the fruit, would the addition of lime with the Bordeaux Mixture allay the harm done to the blossoms if applied when the tree was in blossom? one pound of Paris Green to 50 gallons is altogether too strong.

A. I do not think that spraying with the proper mixtures at the time the tree was in blossom would prevent it from setting. I do not think that Paris Green would affect the parts of the blossom any more than a shower of rain—the leaf seems as sensitive as any part of the tree, even as sensitive as the flower. But it is not necessary to spray at this time; again, injury to bees may result from the application of poisonous liquids at this time.

Q. Injury has been noticed by the fruit growers when spraying was done by Paris Green when the fruit trees were in blossom, not so much to the setting of the fruit as to the foliage?

A. There is no doubt about it that the foliage can and is frequently injured if the Paris Green is too strong, but this is entirely unnecessary; the mixture should be constantly agitated. Paris Green does not dissolve, and if allowed to stand it will settle to the bottom again —you should be careful to clean out each barrel as you refill it, on account of this settling to the bottom of the Paris Green.

Q. Do you think that one pound of Paris Green to 160 or 200 gallons of water added to Bordeaux Mixture will make the solution strong enough to kill the Canker Worm? A. Yes.

Q. Is it effectual when the Canker Worm is grown?

A. In treating apple trees one pound of Paris Green to 160 gallons of water does not injure the leaves, and we know that it will kill the Canker Worm if the trees are thoroughly sprayed. It may not kill them all at one application. It is better to apply the mixture twice, than to apply it too strong and run the risk of killing the leaves.

C. R. H. STARR—Have you found much variation in the strength of the Paris Green?

A. Mr. Fletcher took the trouble to get a number of samples of Paris Green from different manufacturers and had it analysed. He did not find a greater variation than six to ten per cent among them. It is quite possible that the limit of variation may be wider than that London Purple I believe is more variable in its composition than Paris Green, though it contains practically the same poisonous ingredients.

A. H. JOHNSON—In reference to the amount of liquid applied to the tree—have you any rule for that?

A. You must wet the entire foliage. In all these spraying liquids it is not necessary to drench a tree—it should be applied in a fine misty form. With the nozzle I speak of the liquid is thrown out in the form of a cone and with great force, it is broken up into small particles and is deposited on the tree in a fine misty spray which serves the purpose exactly, so that the tree is not drenched, and your tree does not get an over deposition of Paris Green in parts. A fine spray is particularly desirable in the case of these fungicides applied to fungus growths, because the spores are prevented from germinating.

The main points to be remembered in connection with this malady are that it is caused by a minute parasitic fungus, a low form of plant life, which, by living on the leaves and fruit of the apple, prevents

assimilation in the former, and the development of the latter. It is not so generally known that the same fungus attacks both the leaves and the fruit. A few facts to be remembered in connection with successful treatment are: 1. That it is perpetuated by spores, which take the place of seeds. 2. That these spores, formed in the autumn, live over winter upon the old leaves, fruit and young branches. 3. That these germinate in the spring as soon as conditions are favorable, which is usually about the time the young foliage is developing. The efficacy of the copper salt remedies have now come to be generally recognized, and the fruit grower who does not use these remedies is neglecting a simple precaution in direct opposition to his best interests. Ammoniacal copper carbonate and dilute Bordeaux Mixture (half strength) are now the leading fungicides for apple and pear scab and grape mildew.

I would like very much to get the co-operation of fruit growers in this Valley next year to carry on this work and I would furnish information, and possibly a certain amount of some of these mixtures prepared, if fruit growers would take it up and give it a fair trial, because, after all, the results obtained by the practical orchadist carry more weight than those worked out under my own direction.

REV. F. J. H. AXFORD—In mixing the Copper Carbonate, when I poured the Sal Soda and Copper Carbonate, it granulated after a while and did not dissolve readily when the ammonia was added. I poured off the water immediately—as much as usual?

A. There must have been some impurity in the constituents used.

Q. It acted like that more than once.

REV. F. J. H. AXFORD—I used well water, rather hard?

A. I cannot say what effect the excess of carbonate of lime would have on the carbonate of soda. It might possibly produce the effect you describe.

Q. Will you tell us what quantity of the Paris Green mixture will saturate an average sized apple tree, using the pumps you suggested?

A. In those experiments—which I have quoted where Fameuse planted 20 years ago were sprayed—they took about a gallon and a half a tree, doing it thoroughly. Of course you cannot spray a tree thoroughly from one side only—it is necessary to go down one side and come up the other.

Q. What sort of hose would you use on a pump. Would you find it convenient to use 10 or 12 feet?

A. When necessary to reach the top of tall trees either use a long hose, or you could use a gas-pipe, with nozzle attached, connected with your pump by 6 or 7 feet of hose. When a long hose is used it is convenient to tie your hose to a pole, and direct the spray in this way.

REV. F. J. H. AXFORD—Would it do to spray the trees with the Copper Carbonate in solution without pouring off the water?

A. Yes. That is essentially the second mixture; modified Eau Celeste.

Q. Would that do without the ammonia?

A. By referring to the chart (which is embodied in your report of last year) you will see. I obtained good results the first year, but the comparative results with rainy seasons like last year were not so promising.

Q. What is the best strainer?

A. A piece of sacking placed over a barrel and held in position with a hoop. Always prepare the liquid a day or so before it is needed because in the case of the Bordeaux it forms a better mixture, that is the ingredients unite better and do not clog the nozzle.

A. MCN. PATTERSON—What is the reason the fungus attacks one tree more than another—one kind of apple tree more than another kind?

A. The disease undoubtedly develops most rapidly wherever it finds the most favourable conditions—just why one tree should offer more favourable conditions it is not always easy to determine.

A. MCN. PATTERSON—Can you do anything with the treatment of the soil which surrounds it?

A. You cannot treat the tree through the soil in such a way as to prevent disease from attacking it; but you can, by keeping the tree in a healthy condition materially aid it in warding off disease.

REV. F. J. H. AXFORD—Would you recommend a liberal treatment of barnyard manure?

A. This might in some instances be beneficial. Barnyard manure alone gives you too much nitrogenous food, and favours the formation of wood rather than fruit buds.

Q. In old trees which require building up?

A. Yes, in such cases it would be beneficial.

The treatment we give our orchard at the Experimental Farm is an alternate dressing of wood ashes and barnyard manure—the barnyard manure supplies the nitrogen and some phosphoric acid, and the ashes a large amount of potash, which element goes to ripen up the wood.

C. W. ARCHIBALD—Do you use leached or unleached ashes?

A. Unleached ashes. Leached ashes have not very much value except as a mulch or to improve certain soils.

REV. F. J. H. AXFORD—Would you recommend bone-dust?

A. Bone-dust is an excellent fertilizer, and may be considered as a soil tonic. I may say that it is impossible to tell what a soil needs unless its component parts are known to you. That is part of the work of the Experimental Farm at Ottawa. In the chemical department soils are analyzed from different parts of the province; after obtaining the analyses the chemist gives his report to the party who sends the samples, together with hints as to the kind of fertilizer needed. You are then in a measure able to determine what your soil needs. In this district of Nova Scotia where your soils are peculiar this class of work is very valuable. Where you have such great deposits of natural fertilizers, in the shape of marsh mud, it is particularly desirable to know what element of plant food they supply so that they may be utilized to fertilize your orchards—although an analysis of marsh mud may not always show its actual fertilizing value as applied to the orchard, because the constituents may be more valuable in their natural proportions and arrangement in the muds than chemical analysis would lead us to believe, so that practice and trial should back up science in these matters.

GEORGE THOMSON—There is another substance from which potash is got, called kainit? A. Yes.

Q. Is it cheaper or dearer than potash got from ashes at a dollar a barrel?

A. That would depend on how much the kainit costs laid down. It is one of the German Potash Salts and contains about 12 or 13 per cent of potash. A bushel of good, unleached, hardwood ashes is worth fourteen cents for its fertilizing value in comparison with barnyard manure. Wood ashes contain from 6 to 8 % of potash and from 1 to 2 % of phosphoric acid. Lime is indispensible to the healthy growth of crops, in itself it is not a strong fertilizer, it simply n

conjunction with other constituents of the soil. It renders available other materials which may have existed in a form in the soil which the plant could not get hold of. It assists in setting up a process of fermentation, or nitrification in the soil by which means nitric acid is formed, and is valuable for nitrogenous soils, as mucks.

Rev. F. J. H. Axford—Would you recommend gypsum for an orchard?

A. It is not valuable in itself. It is useful on account of its absorbent properties, apart from this it is not very valuable.

Q. Have you found in your spraying experiments any difference in the injury to the trees when applied as the leaves were young or when old. Does it make any difference?

A. We have noticed that invariably the later applications did more injury than the earlier. This effect sometime ago was attributed to the supposed fact that the older leaves were more susceptible to injury than the younger. I think, however, that the injury is simply due to the greater deposition of paris green on the leaf. On the third application you have a heavier deposit of paris green on the leaf than at the time of the first. This matter was brought up two or three years ago and it was generally thought that the young leaves withstood the paris green better than the older, but on looking into the matter more closely I am of the opinion that it was simply the greater amount of Paris Green on the leaf. The young leaves have a sort of waxy covering which throws the mixture into little dew spots and probably prevents it being absorbed.

One point I omitted was the cost per acre of applying the mixture. Number one Bordeaux Mixture, with me last year, did not exceed more than fifty cents an acre for each application. The trees were about twenty years old—planted forty to the acre. I gave them four applications.

Q. Did you find that eight ounces of paris green in the mixture would kill the canker worm if they were half grown?

A. We are not troubled to the same extent with the Canker Worm, at Ottawa, that you are, but I have no doubt of the efficacy of this remedy.

Rev. F. J. H. Axford—I found three ounces to a parafine cask, forty gallon cask, sufficient.

J. E. Starr—We must begin as soon as the worm begins.

GEORGE THOMSON—I think it is a great pity that orchardists have canker worms destroying their trees and injuring the leaves. The canker worms are very easy destroyed by care in the proper season. I read an article here before on this subject and I have tried the remedy, and can recommend it myself; it is tarred paper and printers ink. You then prevent them from going up in the tree—by this means you can stamp them all out.

Q. It takes too much time?

A. In answer to that question I may say that it is done at a season when there is very little work on hand. You commence on the last of October or the first of November. There is very little doing then, and then again you can attend to it in the spring, and you will find it a cheap process.

PROF. CRAIG—There are two things which strike me humourously in this discussion, and these are the strong constitution of your canker worms and your method of fighting them. The paris green, in the proportions named, will kill an ordinary constituted canker worm.

A. McN. PATTERSON—I know the printers ink to be exceedingly effectual. I attended a fruit growers meeting a few years ago and several farmers gave their experience, and I said I would go home and try the printers ink. I did so and I rubbed them all out.

J. E. STARR—If this remedy is applied in the autumn, and again in the spring, it is effectual, although it does involve a great deal of labour; still it can be carried out effectually no matter how large a man's orchard is.

A. McN. PATTERSON—I papered 200 trees at a cost of one dollar. A friend of mine had his own orchard done up very nicely and I got him to fix mine. He took a common blacking brush and went around those 200 trees in two hours, leaving about as large a space of uninked paper above and below as was inked. In the fall of the year we undid one side of the paper and there it hung, and in the spring we clapped it around and renewed the ink.

PROF. CRAIG—I was asking more particularly with regard to young trees?

A. I tried tarred paper and it caught more in the spring than in the fall.

GEORGE THOMSON—There are two kinds of canker worms, fall and spring; the difference is apparent on the end—one is concave and the other is convex.

Rev. F. J. H. Axford—Is not one green and another dark?

George Thomson—I have not noticed that. We have noticed a difference of appearance in the egg. Each moth produces from 70 to 100 eggs.

Mr. Archibald here submitted the names of the following gentlemen who had paid one dollar each, and who wished to become members of the Association. He said that he wanted to show the deep interest the merchants in Halifax had taken in the Society, and he casually called upon them, and that this was the result.

The following gentlemen have contributed $1 each: Alex. Gunn, E. G. Smith, Halifax; Hon. M. H. Goudge, Windsor; Hon. J. N. Mack, Liverpool; A. E. McManus, F. H. Reynolds, John H. Sutherland, W. L. Barnstead, A. G. Morrison, barrister; J. M. Higgins, J. B. Hattie, Alex. Moir, James S. Hill, Mahon Bros., E. D. King, barrister; James Halliday, E. S. Carter, Progress; Andrew Mackinlay, C. H. Mackinlay, Coleman & Co., Robt. Taylor, C. W. Outhit, James Ross, Thos. C. Johnson, John Duffus, Lewis S. Payzant, Halifax; F. E. Cox, Avonport; Prof. Frank H. Eaton, Kentville; W. L. Foster, Norton Fulton, James Grant, G. M. Smith & Co., Halifax.

Dr. A. P. Reid—If a meeting of this Association were held in Halifax I think there would be a larger attendance.

The next on the programme was the following paper:

OUR PRESENT AND FUTURE AS FRUIT GROWERS.

BY W. C. ARCHIBALD.

In the early coming days the fruit growers, health and pleasure seekers from Niagara of our own beloved Canada; from the states of New York, Michigan and California; by way of Halifax to visit one of the gardens of the world, will cross the Avon, name suggestive of drama and song. A few minutes more the sombre mouth of the Gaspereaux, with the lowering brow of Blomidon, witness of the past, is in view. The brighter picture of Grand Pre, enshrined in poets song, with the homes of the happy on its highlands and the cattle grazing in the meadows, is a pleasing picture to the reviewer.

"Here Nova Scotia's golden vale begins, a land of fruit, blessed is the man who wins a home within its borders rich and fair; for peace and plenty ever nestle there. But when at length to Wolfville's

heights we go, and mark the smiling vale of Gaspereaux : the Eden haunted beauty of that scene lends to our spirits of its joys serene."

The observation of his Lordship Judge Weatherbe, now current, that we have in this golden vale some 400 square miles capable of producing an annual revenue of $30,000,000. This of course is largely included in the warm fruit belt, from this point to the beautiful Basin of Annapolis. I have no means at hand to accurately determine the present annual value of our fruit product, but will estimate it to be worth about $500,000. The difference here between our present product and its estimated future, show fruit growing along the lines of our possibilities.

In horticulture there never were so many difficulties to meet as at the present time. The fact of our case is mainly this : the enemies of the fruits of the earth are multiplying at a prodigious rate. It is reported a gentleman who inspected a diseased vineyard in his state, on returning home, looked into his vineyard to see if the disease had appeared there. On careful inspection he cut out all the diseased vines and leaves, which he held in one hand. Two days later, he reports, a hay rake would not have held all the diseased vines : so rapid had been the progress of the disease.

Fruit growing in Nova Scotia enlarges most of all known products, the earning power of the land per acre. To unfold this future to an average capacity the highest intelligence, power and skill must be sought. There has long been a felt need of a fruit experiment station, with a professor's chair, for the purpose of promoting horticulture, in its various branches by scientific investigation and experiment, located in our midst. The individual fruit grower cannot afford the experiments for himself—time and expense are too great. It is clearly evident that scientific experience exemplified in the correct planting of fruit groves will be commensurate, the enlarged success and profits to the individual and the province we live in. Even in this garden of the world the abandoning of farms already obtaining in many districts on our Atlantic slope, depopulating and depreciating the country of its richest blood and certain agency of wealth, will be mournfully felt by us here ; unless we bring to our aid more economic methods than our present practice.

I quote, "It is obvious that such a station, if it is to accomplish that for which it will be established, must gradually reach out into

new fields of enquiry--extend its researches into new branches of horticulture and be prepared to meet new problems which are constantly presenting its needs for the means of such development."

Our experiment station at Ottawa is doubtless doing good work for its two provinces. In the fruit growing states there are many such chairs established, with experiment stations doing most valuable work. They touch us in Nova Scotia in a general sense only. After their experiments are made there is still a wide gulf to be bridged over, by a further testing on our valley grounds, before we can with confidence assuredly recommend them for general planting. I think I may safely assert this is the experience of nearly every fruit grower in this Association. The advantages of the proposed station as we see in it, are the testing of new fruits before they are offered for sale by the nurserymen, and in this way save a large amount of money to the individual fruit growers. There is here a modification of soils, latitude and climate which must be carefully considered ; oftentimes with very different results. Why is the average acreage yield of New York State greater than any of the New England or Middle States? but that she has more successfully dotted her extensive areas with experiment stations, which observe soil and climatic influences more closely and carefully, comparing notes with each other : thus fulfilling more accurate conditions with greater and higher possibilities. I believe experience has proved that substantial advantages obtain from wholly separate horticultural and agricultural departments. Now, as to our opportunities in taking on this new work proposed and aiding in developing our province as well as the Dominion's resources. We have already existing among us three flourishing colleges and universities within the fruit belt. Kings College at Windsor, Acacia Villa Seminary at Horton, and Acadia University at Wolfville. An experiment station of some 20 or more acres might suit the present purpose of this Association for a fruit station. These lands, doubtless, could be obtained by lease for a term of years rent free, or tendered by some enthusiastic fruit grower contiguous. This station *with botanical gardens near the College*, which is really necessary, should be under the control of one competent person, who may be styled the "Director," and be responsible to a board of management. This director and professor in botany, entomology, etc., would also be qualified to give lessons in orcharding and the diseases of fruit trees. The

second professor being an analytical chemist of soils and fruits, etc., and if possible bacterialogy and its relation to horticulture. A meteorological station with observations has long been imperatively needed, these two professors having combined salaries within $2500. Now, as to the economical advantages in locating the chair and grounds contiguous to an Arts College, it may be observed :—Many who are merely taking an arts course would be induced, through the presence of the station, to take a course with the ultimate result that they might become fruit growers, and of the very best class, because they in addition to their knowledge of fruit growing would possess a first-class general education. This would stimulate them to greater efforts after leaving College—and therefore give rise to a better and more intelligent class of fruit growers. What is wrong with the educational system of to-day? I would a hundred times rather my boys, if they graduate from a university, take up the health-giving, ennobling, and dignifying work of fruit culture; than to be seeking for governorship of this province, highly honorable as it is. The work of fruit growing is the creation of new capital from nature's resources, adding wealth to the individual and the nation. The advantage to fruit growers of a properly conducted fruit station in this valley would be very great. It is of primal importance to the orchardist to know the correct tree and fruit to plant for it increases in value about ten times before it commences to bear. Before men will proceed in this work they must have full information what they may successfully plant. They could have an analysis made of their soils and fertilizers; the suitability of soil for fruit growing with best fertilizer to obtain best results; experiments in regard to new kinds of fruits trees and their yield; investigations into causes of diseases of fruit trees at present unknown; the best means of preventing the different diseases; testing value of insecticides and fungicides; the general advantage given by having an opportunity of consulting competent authorities and to grow higher class fruit more economically. Here the education of our children as competent fruit growers may be obtained and still be at home. From such a central bureau in our midst for circulating information throughout the Maritime Provinces, publishing results of experimental station; the large and small fruit interests would soon feel new pulsations of life, resulting in increased wealth. As the acreage value of fruits advanced the marketable value of fruit lands would rise in value. Nowhere on the American continent, I believe, is fruit growing more

profitable than in the Annapolis Valley. This will attract people, and population gives value to property. For a score of years our markets for best fruits have been steadily improving with our greater production. With the water-ways of the world into the very heart of our orchards, with trans-atlantic and cold storage fruit steamers at Annapolis, Kingsport, and the new wharf to be built in Cornwallis River, opposite this growing town, for the convenience and economy in shipping of 5000 fruit growers in Gaspereaux, Horton, Wolfville and East Cornwallis, what country with ours can compare in the quality of our fruits and profits of the orchard.

With $2500 for salaries and $1500 for running expenses of the fruit station—making a total of $4000 *now* required, I submit the following method: This Association through its members and friends vote and raise $1000. Five hundred dollars of this to be raised outside the present funds of the Association, of which I believe 20 persons will contribute this amount. It will be a pleasure for me to subscribe $50 of this, and believe that the $500 can readily be assured. With $1000 from this Association the Nova Scotia Government could not do less than double the amount. The Dominion Government could not be less generous. The people and Government of New Brunswick with similar interests will be interested in this work also, and if the case is properly laid before them would probably advise a grant.

With a Directorate appointed by this Association and the Governments endowing the chair through the Association, your aim, scope and enlarged usefulness will be greatly augmented. Let this banner province, unsurpassed in intelligence, wealth, and natural resources to the square mile, in the march of 3000 miles towards the setting sun, move serenely on. We are told the first Garden of Eden was in the land of the east. Providence smiles upon us still, this eastern Eden is ours. In closing, Mr. President, allow me to move the following resolution:

Resolved—That a committee of five be appointed to take into consideration ways and means for the establishment of a fruit experimental station in the Annapolis Valley, and that such committe report at the next quarterly meeting.

Resolution duly seconded and carried unanimously.

A vote of thanks was tendered MR. ARCHIBALD by the Association, for thus ably introducing this important subject.

MR. RALPH S. EATON was then called on and read the following paper:

POINTS IN FRUIT GROWING WORTHY OF ATTENTION.

This Society has heretofore given the greater part of its attention to apple culture, and rightly so, because the apple not only possesses more qualities suited to our circumstances than any other fruit, but as an eminent writer has said, "of all the productions of the earth given to man through the agency of tree or shrub the apple stands pre-eminent." In desert, in pastry, in marmalades, jellies, confections, and medicine it has become indispensible. There are a few other fruits, however, that for *variety* and because of their maturing *earlier* in the season than the apple are very desirable for home use, and time *may* show that they may also be profitable for disposal in our provincial towns and in the neighbouring republic. I refer to the plum, pear, peach, cherry, apricot, and quince. Of these delicious fruits the plum, pear and cherry are about the only ones which have been tried to any extent, and *few*, if any, of us derive the pleasure or profit we might from the cultivation, in our gardens or orchards, of a properly selected list of varieties of even the fruits which we have. I invite your attention for a few minutes to some points relative to the above mentioned fruits which many of us have not thought about, or knowing do not put into practice. These meetings, we think, should be the place where the stores of information which accumulate during the year among the members, through reading and through personal daily observation, should be *sifted* and the valuable material used by us in further developing our undoubtedly great fruit resources. We earnestly desire our friends who are old in experience and practical knowledge not only to point out our errors, but also to give us whatever they consider guides to success.

There are quite a number of young fruit growers in our province who are worthily trying to grow their own nursery stock. The indiscriminate use of seeds from the third and fourth grade of apples which go to the cider mill, is strongly disapproved of by the best authorities. No potato grower would attempt to produce fine stock by propagating year after year from his small potatoes. Unfortunately the damage in the reproduction of the apple is longer in showing itself. Seeds from the *best* apples of the native, or ungrafted trees, are hardier and much to be preferred. Care should be exercised in procuring these seeds to

see that they are fresh and have not been heated, for pomace will heat very quickly and the seeds be spoiled for sprouting. Seeds should always be planted in the autumn and covered but an inch or two deep. In digging the seedlings of one summer's growth, all the weaker stalks and those which have poor roots should be thrown away at once.

In *root* grafting we should not attempt to multiply the stocks by cutting roots into small pieces, but give each scion four or five inches of the *best* part of the *best* roots. In any kind of grafting use for scions only that part of the last year's growth on bearing trees which has full, plump buds. Suckers and any rank growth of wood with small, shrunken buds should be discarded. In the propagation of all fruits we should believe *thoroughly* in and *act* on the idea of the survival of the *fittest*.

It is claimed by some nurserymen that the wounds made in pruning young trees would heal over much more quickly if, instead of severing the branch *very* close to the main stock, the cut was made just outside the little rings on the bark which are visible at the junction of the side branches and stock. Experience proves that the more short side branches left on young trees the more the stock or trunk will develop. These branches may be kept short to a few buds or leaves. Too often we see slender or withy trees in nursery or orchards pointing to the nine o'clock sun.

Do we appreciate as much as we should the use of the subsoil plough in our orchards? This plough could be used to great advantage in the dead furrows which are often made where the rows of young trees are to be planted. Afterwards a few furrows could be plowed each year, keeping in advance of the roots. There are many parts of Nova Scotia where the soil is naturally too shallow for fruit trees and the use of this plough would deepen the soil, thus giving the tree surer anchorage, a larger food supply, and a far greater and more even quantity of moisture. In the marking out of a young orchard, either large or small, our experience is greatly in favour of making the rows around the outside of the field first by measuring and using tall stakes. When this work is exact, the interior can be quickly and accurately filled in by three persons, two sighting across the blocks and the third with a white lath, holding it so that it will be in range for both persons sighting. A small piece of shingle may be put in the place of the lath, by the third person, before he moves on in forming his row. If the field is too large for the stakes to be seen plainly from opposite

sides, it can be intersected with one or more rows of stakes by measurement. A small straight wire of any kind makes a good measuring chain. The popular way with us in setting trees is to have them 33 feet apart and at right angles. If one intends to derive all possible profit from their orchard in root or grain crops, this is perhaps the best way; but if the largest possible return of fruit is desired, two other modes are recommended by many of the largest and best English and American fruit growers. The one known as the hexagonal form, where each tree will be exactly the same distance from every other, will allow of more trees to the acre and permit of cultivation as well as the square form. The other mode I think of putting into execution myself this spring, and have no doubt that it will meet at first thought with the disapproval of most present. It is the setting out of a row of trees between the rows already set or to be set in the square form, and let these come alternate with the regular ones. Every third span or row will be omitted to allow of better cart way when the trees are large. The spraying can be easily done with the use of a longer hose. If the regular trees set in the square form are 33 feet apart, these extra alternate ones will be a little over 23½ feet from the other trees, and would allow of about 67 trees instead of 40 to the acre. This, we think, would give plenty of room for our apple trees for twenty five years, allowing them to spread naturally, and if the lateral growth is slightly shortened, every year or two after the 15th year, the interference of the branches can be prevented almost indefinitely, and this shortening or heading in, if done in June and July, will be conducive to the formation of fruit buds. I submitted this plan to Mr. S. D. Willard of Geneva, New York, and perhaps no authority would be regarded as better by all who have the pleasure of his acquaintance—and it met with his strong approval. Some would argue that the ground would be shaded. Why then grow the potato, the grain or the grass crop in the orchard. Others would fear that there would not be room for the roots. We would reply that the theory of root pruning is not settled yet. We have gone into many of our best young orchards of 15 to 25 years planting, and stood in the middle between some four of the largest trees that have been allowed to spread naturally, and we have thought that there was plenty of room in this space for an extra tree as large as any of the other four. We can easily figure on the increased profits that would accrue from having in a ten acre orchard 670 trees averaging a barrel each instead of 400 in the

usual form. The cultivation would be the same. A little more tree food would be needed. Further, in this connection, which can be handled more easily, two trees having four barrels of apples each, or one tree having the same superficial area of top as the two, with eight barrels of fruit? One of the largest orchards in the United States, from which 70,000 bushels were shipped a year ago, has the rows of trees 30 feet apart and the trees 12 feet apart in the row. These trees branch very low, are trimmed in the shape of a pyramid, and can be almost entirely picked by men standing on the ground. I speak of this to show th at trees can be pruned to any shape desired, and heading in, if done in July, will invariably cause heavier fruiting.

The subject of intermixing in an orchard different varieties of the same fruit, and intermixing different fruits in order to secure the better fertilization of the pollen, is one which will receive the attention of pomologists during the coming ten years. These facts at present are known—That apple trees with several varieties of apples on them seem to bear better annual crops than trees that are surrounded with those of the same variety. That orchards near where bees are kept in large numbers bear better than those distant from the apiary. That large florists will buy swarms of bees and allow them the use of their conservatories for the sole purpose of carrying the pollen of one flower to another. We often notice that in some seasons our fruit trees blossom well, but we get a poor setting of fruit. Scientists seem to think that this is due to climatic influences that happen to be unfavorable to the transition of the pollen from one tree or blossom to another, resulting in a lack of proper fecundation. In a private letter of reply from Mr. Willard to questions I had asked regarding the interspersion of the plum, cherry and peach among the apple trees, he says: "Better results have been found when cherry trees have been planted between plums in orchards, and science has recently demonstrated the fact that the pollen or bloom of the one will fertilize the bloom of the other. This is a matter of great interest and significance to the fruit grower of intelligence who *is disposed to call science to his aid.*"

Are not all of us who have young orchards a little neglectful in keeping the trees properly straightened up and symmetrical. In my own experience I have found that the most satisfactory way of bringing trees of four to seven years planting to their proper place is by using a small galvanized wire, circling a suitable branch near the crotch of the tree, and the other end attached close at the ground to a stake.

This stake should be about four feet long, driven firmly in the ground in a slanting direction, and at a distance of about eight feet from the butt of the tree on the west side. In older trees where more power is needed, a large stone, first circled by a suitable wire, can be sunk in the ground in the place of the stake, and of a sufficient depth not to interfere with the plough. The wire from the tree can be attached to the wire around the stone. In the case of cross ploughing north and south this wire can be removed temporarily. Great care should be taken in the use of proper bandages of straw to prevent the wire from injuring the tree.

The damage done to our trees by omitting to cover the wounds made in pruning with paint or cement is seldom realized by us until branch after branch is broken down and perhaps our tree completely ruined. For small wounds probably nothing is better than liquid grafting wax. For large wounds, which are hollowed out by years of decay, a piece of canvas, oilcloth or similar material can be tacked over the wound carefully so as to prevent the entrance of rain or insects, then painted thoroughly till impervious to water.

Is it not a little strange that many will consider that it is decidedly against the health of an *animal* to have it covered with filth and vermin, and yet maintain that a similar covering on the bark of the *tree* is necessary as a protection, and that nature would not allow it to be there if it were not good for the tree. We ask first if this coating of loose bark, moss and lice is necessary for the tender bark of a young tree. If so, we never see it on a healthy specimen. Why then should the thicker bark of a tree in the strength of middle age want such a protection. Second, do we see this surplus loose bark, moss, etc., mostly in orchards that have had the care conducive to good health, or in orchards that have been badly cultivated and fertilized. Third, does not carelessness of the laws of hygiene in animal life bring about a condition where nature has to be assisted before a normal state can be regained? Why expect nature to assert itself any stronger in vegetable than in animal life? I noticed with a great deal of interest and satisfaction last spring the effect of potash dissolved in water to the strength of one pound to two gallons, and applied as a wash to trees in the orchards of Mr. Thompson, Mr. Archibald and Mr Chipman of this village. I afterwards used a milder solution in a young orchard of my own and, although the trees were previously in an average healthy condition, yet the effects of the application were noticeable at quite a

distance, for it had given the bark a particularly clean, dark brown appearance. I would strongly recommend the cleaning off of all the loose bark and moss—the dwelling places of the bark lice and the winter quarters of the codling moth—with a hoe during April and an application of the potash about the middle of June. This potash can be obtained at Mr. Morse's in this village at about 12c per pound, or in Halifax in large quantities at a much cheaper rate. Experiments have been made with most astounding results as to crops where the diluted potash has been applied as a fertilizer to the roots.

The idea of *thinning our fruit* in the early summer is one which has scarcely been thought of by us in this province, but in a few of the best orchards of apples, plums, peaches, and pears in the United States it has become a regular part of the work during the first of July. Certainly those of us who have had many apples to sort this season have realized the necessity of trying to reduce the quantity of apples in our second and third grades. We must regard the force pump on our farms to be as essential as the mowing machine and the hay rake. We must combat the canker worm, the codling moth, the plum curculio, and the apple scab, but we must go further than this or we will be left behind in this age of competition to produce the best fruit. Are there not many of us this year who have found as many barrels of No. 3's among our Gravensteins and Baldwins as there were No. 1's? And have we not realized the waste of time in picking and sorting? Who would say that if all the apples which go to the autumn were picked from the trees the first of July that we would have any No. 2's at all for shipping. The following very forcible extract on this subject I take from an editorial in *Green's Fruit Grower*:—

"It requires some courage to thin out the superfluous specimens of pear, plum, peach and apple. The man who hesitates, however, is lost. This has been proved by our best cultivators. The hesitating man who goes into the orchard after the blossoms have fallen, sees the fruit setting upon the trees says to himself, "This surplus of fruit will fall of itself;" (a certain portion of it does fall); later, the fruit grower goes to the orchard and sees upon his trees a large quantity of fruit, and yet, as the fruit has not attained its full size, the tree does not appear to be crowded; now the questions arises, "Shall this fruit be thinned?"

The hesitating man says to himself, perhaps if I spend time and money in cutting out this superfluous fruit some disease or insect may take away the remainder and thus I may have no crop left. This is

true. In this world there is no such thing as certainty with any enterprise. The fruit grower at this time must have the courage and thin his fruit and take his chances. It is something of an expense to employ extra men at the busy season to go through the orchards with sharp shears clipping out every specimen that shows signs of imperfection, and signs of imperfection are noteable at a very early age, and yet all this expense is many times more than made up as results will prove in most cases. It has been claimed that the time saved in picking and assorting fruits at harvesting that have been thinned and have not been allowed to grow in the natural way, the trees overcropped, so as to admit of but few fine specimens, more than pays for the cost of thinning at the proper season in July. Where the fruit has been properly thinned it can be gathered in less than half the time, and there is very little assorting necessary; but the main gain in thinning is in securing the finest specimens, such as are in demand in the markets at nearly double the price of the fruit as ordinarily grown. It should be borne in mind that when the tree is overloaded, bearing perhaps ten times as much fruit as it can mature, the tree cannot produce fruit of the largest size, of the finest excellence of flavor, or the greatest beauty and appearance. In other words, the tree is in the condition of those people who are unwisely attempting to do many times more than they can do well; struggling under these trying circumstances, many people over-tax themselves and do not attain the excellence they desire. * * * * * * *

But further than this, our orchards are benefitted by judicious thinning, for the reason they are thereby induced to bear more regularly every year. Have you not noticed that trees in your orchard which bear moderate crops of fruit, bear more regularly than those that bear enormous crops? I think such is the case. The thinning of fruit may not bring about this annual bearing in one or two years, but such will be the tendencies of the trees, owing to the fact that the seed produced in the large number of culled fruits is more exhausting to the tree than any other part of the product. Therefore, the small crab apple has nearly as great a strain upon a tree as a large and fine specimen of the Swar or Spy. If a large portion of inferior specimens are removed the vitality of the tree is preserved, as the fruit of the tree which is properly thinned may not need the amount of fertility required by such trees as are overburdened with fruit."

Yearly interest is increasing in some of the other varieties of fruit, and more peaches have been ordered for planting the coming spring in this county than the most enthusiastic fruit grower would have prophesied a year ago. The success of Mr. Patriquin and Mr. Archibald of this village, and Capt. Cox of Canard, has proved that even some of the more tender varieties can be grown with us. The following lines from Mr. Willard are well worth attention; "Peaches are

worth a good trial *provided* you plant sorts hardy in the fruit bud. Many peaches are hardy in wood but the fruit buds fail to stand the changes incident to our northern region. This is an opinion based on observation through all the northern and middle States and Canada. Peaches can be raised over a large extent of territory every year, providing the right sorts are selected, but the Crawfords, and those closely allied to them, are quite uncertain over a very wide area of the good peach growing country. For Nova Scotia I think you will find the Crawfords unreliable, now and then only a crop. The Alexander is very different in its type and makes up and belongs to the hardy class, but there are *better* sorts of same type or family." He recommends the Alexander, Hynes Surprise, Hortosis River, Elberta, Brigdon, Early Barnard, Hill's Chili, Jacques Rare Ripe, Red Cheek Melocatoon and Snow's Orange.

Plum culture too, is beginning to receive more attention, and a few venturesome ones are going to try them on quite a large scale. For plums, as well as for peaches, I cannot quote a higher authority than Mr. Willard, who from a young plum orchard of sixty acres shipped 16,000 boxes the last season. He says, "I have found that successful plum growing demands a succession through the season, beginning with the first that ripen in July or August through to October, by this means holding the market and doing the business with ease without a glut on hand at any one time. The Czar or English plum is the earliest, then follows the Fiell, Bradshaw, Genii, Prince of Wales, Peters Yellow Gage, Hudson River Purple Egg, Union Purple, and last to ripen Grand Duke. These all tried and tested sorts." The Lombard also, is widely known and well liked. In addition to these the following are highly recommended by large and practical fruit growers, Niagara, Shippers' Pride, Burbank, German Prune, Wild Goose, McLaughlin, and Coe's Golden Drop.

Those who go in for Cherries recommend the Morello class first, as being the most prolific bearers and less liable to rot—The Early Richmond, Montmorency, and English Morello. Of the Heart and Bigarreau, the Governor Wood, Yellow Spanish, Olivet, and Windsor are mostly recommended.

In Pear culture Mr. Wm. C. Barry, President of the U. S. Horticultural Society and one of the highest authorities in fruit, recommends both standards and dwarfs, and varieties ripening in succession for autumn and for winter use. He gives the Gifford, Brandywine, Petitte

Margaret, Bartlett, Clapp's Favorite, Sheldon, Flemish Beauty, Bousock, Superfine, Lawrence, Anjou, Winter Nellis and Josephine. Downing recommends the Apricot for the garden as coming in between the Cherry and Plum. The Harris is considered the best, followed by Oulin's Early Peach and Early Moorepark.

It is a mistaken idea that the Quince is not as much improved by cultivation as any other fruit. For distance apart 10 feet is considered sufficient. It is deemed a great acquisition in the garden for its use in preserves and jellies. As to variety nothing excels the orange.

Now nothing has been said about the many diseases to which these fruits are subject, and of course this is a very important subject; too important and too lengthy to go into in detail. Columns of fruit papers and pages of bulletins are devoted to these diseases, and we all have access to them. All these columns and pages can, we think, be condensed into a very few lines. Secure the most perfect health of the tree by giving it liberal cultivation and plenty of food, thus enabling it the better to withstand the enemy. Cut away and burn immediately any diseased portions as faithfully as a physician would sever every particle of proud flesh from a wound on the human body. We have reason often to be discouraged at the formidable array of enemies that seem to be yearly increasing, but when we consider the allies which we have in the form of experimental stations, which have been established in every province of the Dominion and every state in the Union, and that at some of these stations the whole time of one man is given to the study of one single disease, we should not be disheartened from this source, but rather aim to extend our markets and improve our fruits to meet the ever increasing fastidiousness of the epicurean taste. Let us remember that in the beginning the fruits of the earth, as well as the beasts of the field, were made for man, and surely he shall have dominion over them.

W. C. Archibald—I was particularly impressed with one point that Mr. Eaton emphasises, that is the destruction of insects upon the trunks and branches of our trees. Last year I sprayed my trees with Carbonate of copper and lime which produced a caustic, and I sprayed also in the autumn and my fruit was larger than ever before. By careful observation my fruit was one eighth larger than ever before. Mr. Archibald advocated fertilizing the soil well.

DR. A. P. REID—With regard to the setting out of trees, I do not think it has been at all proved that the orchard is injured by cultivation—hence, if it be not injured there is no reason why you should not have more than 40 trees to an acre, if you can work your ground to better advantage. In the second place if you are cultivating your soil and your fertilizer is prepared as it should be, the tree is going to receive its share the same as any other plant. Is it not desirable that we should crowd as many trees as possible on an acre as a commercial or business principle. I had the pleasure last year, or the year before, of presenting this Association with a paper which dealt with, first, the increase of our fruit; and secondly, how to improve the general appearance of our farms and villages. All the trees on a farm for practical cultivation could be planted outside of the farm and along the roads, and thus allow your trees plenty of air and light, and you could have just as large number of well cultivated trees.

In respect to the nutrition of a tree—at the last meeting of this Association, held in Middleton, Mr. Miller spoke very pointedly of Nitrate of Soda as a stimulant for the apple tree. I felt that he knew what he was talking about and I thought that it would be well worth while to try it. I have an orchard which was not thriving as well as I would like. I tried it and I can assure you the difference was well marked. Nitrate of Soda was scattered along the land. The fruit was not subject to scab, but the whole tree was healthy. We are making all the efforts we can to develop an interest in fruit growing, and we should interest the youth in the work just at the time he is able to see the parasites better than at any other time, and just at the time that the knowledge would be far better to him than at any other time. Now is the time that this Association should take the young boys in hand and train them up as they should go. The information derived from meetings such as this would be invaluable to them, and fit them for their life work.

A. MCN. PATTERSON—Is it not possible to make your land so rich that you will grow too much wood and not enough fruit?

PROF. CRAIG—I think you could by using certain manure deficient in potash. If you use strongly nitrogenous manure it goes largely to wood forming and leafy tissue. I think it would be a stronger growth than necessary and to the depreciation of the supply of fruit. On the other hand a tree can be kept in good growing condition and supplied

with the food materials for the formation of fruit in such a way as to promote a vigorous growth of all parts. I think the principal danger would arise from an ill balanced ration; and while I am up I may say that I have listened to the paper just delivered with a great deal of pleasure; it is one of the most excellent and suggestive papers that it has been my good fortune to hear for some time, and I have had an opportunity of attending a number of Conventions during the last year. It touches the latest and newest matter out on this subject in a masterly manner. There are one or two points which might be expanded, one in connection with the fertilization. I did not quite catch whether the essayist intended to convey the idea that the cherry and the plum would likely fertilize each other in orchards.

RALPH EATON—Yes.

PROF. CRAIG—I do not think that our facts will bear out this belief. I have for the past few years been doing a good deal in the way of artificial fertilization of varieties of fruits, conducted on practical lines with a view of obtaining practical results—also, to see the possibilities and limits in this kind of work. I have frequently tried to cross the plum and the cherry, but I have never succeeded in getting the fruit to set, so that I think setting them in orchard for the purpose of favouring cross fertilization would be useless. There are no doubt crosses between the plum and the peach—one in Virginia is called the "Blackman's Plum." I have never had any facts before me to convince me that the plum and the cherry could be crossed. However, they are both in the same genus, and it is possible. If on the other hand they cannot be crossed, I do not see the necessity of intermingling the varieties. Point number two relates to thinning. The primary object of all plants is the reproduction of their kind—this is in the case of apples—as with other flowering plants it is accomplished by means of the seed. The pulp or surroundings of the seed is formed after the materials which go for the development of that seed are provided. The waste goes to form the pulp and it is large or small as the excess of nutrition makes it. Therefore lessen by thinning the number of seeds to be developed and thereby increase the size and amount of pulp. In connection with the varieties of plums given, I am surprised that Mr. Willard, whom I have the pleasure of knowing quite well, and who is thoroughly practical in every way—he has a large plum orchard; I am surprised that he did not mention Burbank and

Botan—both Japanese plums. He sent me last year a basket of Burbanks; large, handsome, dark red plums, very attractive and of fair quality. I would suggest their being tried in this vicinity in an experimental way. Mr. Chairman, I have had much pleasure in listening to this excellent paper.

DR. REID—One question that suggests itself to me is that when Mr. Eaton was reading his paper I noted particularly the remarks he made in regard to the planting of different species together, and the modifying influence on each other. Fertilization is carried on by the wind and by insects, and having flowering plants of different kinds near each other their influence would demand careful observation.

W. C. ARCHIBALD—Possibly a wrong impression was obtained in reference to over fertilization, if it is possible in an orchard. I think possibly that from year to year the potash is being exhausted from our soils, and it would perhaps be as well to put a double dose on.

RALPH EATON—In reference to Prof. Craig's remarks about the variety of plum, I am quite sure Mr. Willard did recommend these variety, although I cannot account for not naming them. And he also said that he expected great results from these Japanese varieties. He classified his varieties and there were a great many species. I would like to ask this question,—Suppose an orchard is making too much wood by the use of nitrogenous manures, could not fruitfulness be obtained by checking this growth?

PROF. CRAIG—It is difficult to say whether you can force a plant to do a thing or not do a thing. I think by a system of pruning you could retard the plant and this could be done by pruning.

Q. Would the same list of trees which are used in Ontario be suitable in this locality?

Ans. No, they would not. Where the thermometer drops down to 35 degrees below zero it is necessary to get trees that will *live out of doors.*

Q. Would you object to give a list applicable to Nova Scotia?

A. I think so. Practical farmers here could give a list better than I could.

We are going to grow peaches in Ottawa. I had a consultation with Mr. Willard, and it is simply a matter of hardiness of the fruit, "Excelsior" I think is a good variety; it originated in New Hamp-

shire, and is being pushed to the front by Messrs Hale Bros. I saw it exhibited at the Pomological Society at Washington. It is quite hardy.

MR. THOMPSON—The question was asked whether you could give trees too much nitrogenous manure. Some years ago I paid particular attention to that subject and I fertilized my trees very highly indeed, and the result has been that three years ago I had 85 barrels from my orchard. The following year I had 105. And this year I had 150 barrels. But age should be considered. It is possible that young trees under 10 years of age might be made to throw out too much wood. When trees arrive at the age of 25 years, which is the age of the trees in my orchard, I do not think they will make too much wood. I put the manure on the surface—and I doubt whether it is a good plan to put the manure under each ploughing, because in that way you are liable to injure the feeding roots. I have avoided ploughing in my orchard and have applied manure as top dressing, and the result is as I have told you.

Session closed.

EVENING SESSION.

WOLFVILLE, *January 26th, 1893.*

Vice President STARR in the chair.

A large attendance of members and visitors present.

The first paper on the evening programme was read by DR. REID, Superintendent of the Victoria General Hospital, Halifax, subject:

THE FRUIT GROWER'S ASSOCIATION AND THE PUBLIC SCHOOL.

Mr. President, Ladies and Gentlemen:—I again impose on your courtesy and must thank you for the undeserved welcome with which you have always favored me. In thinking over my inability to say anything worth your time and attention in reference to fruit growing, and sympathizing with your valued secretary who has to arrange a programme for your acceptance, it appeared to me that we might consider the relationship between the public schools and this association, which is, I take it the active representative of one of Nova Scotia's most valuable industries and the one which has most favorably impressed the

outside world with her fertile soil and a climate, which, taken all in all, has no peer on this continent—a fact which is not sufficiently appreciated by her own people who forsake their birthright for the more probable chances of hard fare and blighted prospects of a western emigrant. The members of this association fill two positions: the citizen and the fruit grower, and we may devote a little time to the consideration of each.

As a citizen: We should expect that not the least function of the public school would be to train up good citizens, and this is so closely associated with morality (I use the term in its widest sense), that I need merely mention it. At the last session of the legislature it was made compulsory on the managers of the public school system that instruction (oral or by graded text books) be given on the following subjects: "Alcohol" and its compounds, tobacco and narcotics generally—giving the reason for avoiding their use and coguate information to the end that an accurate and healthy future public opinion may be developed. Also, the ordinary laws of physiology, with the hope that disease and accident may be minimized throughout the community. I have the honor to be one of the committee to develop this subject, and my confreres have not been parsimonious in the expenditure of the time, energy and intelligence that will make this subject a practical success. But as citizens we must look much further ahead. A well-educated, thoroughly temperate and perfectly healthy organization is, we know to our sorrow, quite compatible with expert forgery and every variety of scoundrelism—with murder, robbery, and all the offences of the criminal calendar down to the parasitic tramp.

The advantages offered by our public schools proportionately increase the ability of the criminal to carry out his nefarious projects, and society should adopt a means to checkmate undesirable qualities in its members. We have very high authority for the belief that these may be diminished if not eradicated. "Train up a child in the way he should go, and when he is old he will not depart therefrom," and again, "As the twig is bent so the tree is inclined." The best practical code of morality is the christian religion. Is it not the duty of every citizen to direct every effort to the end that every child be trained in its tenets? In the educational atmosphere of this locality no argument is needed on this subject, for Wolfville is famed for its efforts in this direction; but they are confined to adolescents and those seeking a higher education. My plea is for the young and those

whose circumstances do not permit such advantages. You may tell me the Sunday school and home teaching supply the want; but from the very best information I can obtain about 75 per cent. of those who attend the public schools are from various circumstances debarred the above privileges.

You may ask me what are you going to do about it? And I can only answer that this is neither the time nor the opportunity to discuss details, but I do not hesitate to say that with a properly directed public opinion there are no insuperable difficulties, and my only object in thus imposing on your time and forbearance is to elicit thought, discussion, and in the near future, action in carrying out a more nearly perfect system of public education which is yearly approaching, as one improvement after another becomes developed.

As a fruit grower: Amongst the varied duties of the public school these two loom up most prominently and are as well most intimately allied: (1), to make the individual not only self-supporting but to enable him to use the powers bestowed on him by nature to the best advantage; (2), to develop the capabilities of our common country in general and Nova Scotia in particular. And with your permission we will think over the subject together. Special attention should be given to a systematic training of the faculties of self-reliance and careful and accurate observation, for experience goes to show that these forms of ability, no matter how obtained, stamp the successful man in every walk of life, and in no case do we see it more prominently than in those who can neither read nor write. The illiterate man elicits our sympathy, and justly so, and we say—what might he not have been? But again, we need not be too profuse in our regrets for him, for very often circumstances may have given a better practical education and developed his abilities to an extent which the school and college can but approach. I do not bring this forward as an argument against the public school, but it is an index of an educational programme which does not receive so far the study and attention it merits. If there is one fault in our system needing correction it is that every facility is furnished, and every obstruction removed from the easy acquirements of knowledge. We overlook an ingrained propensity in human nature that we value an acquisition exactly in proportion to the labor we have to give to acquire it and another similar one. That overcoming one obstacle the better prepares us to overcome other and more difficult ones.

In presenting these truisms to you it is with the object of eliciting not more thought but a different variety of thought and practice in our public schools. I will give an illustration that you will appreciate: The successful orchardist is not unfrequently a man of (so called) limited education, but he is a self-reliant man of accurate observation, and in so far has the best education. Hence you will permit me to ask the question, should not our public schools be so managed as to bring out the latent ability of the individual rather than to load him with unappreciated information too frequently forgotten in after life. There is no insuperable difficulty to the attaining of this object, and I trust we are approaching it, though our progress is very slow. As fruit growers our most absorbing interest is in developing our unparalleled natural resources, and we must use the public school as the key which can unlock treasures of knowledge and observation in the future that are at present debarred. The successful orchardist must be an educated and practical entomologist, and equally as well posted in economic botany.

These subjects are of surpassing interest to the young and growing intelligence, and should take the precedence of some of the "ologies"; they should receive not less attention than grammar and the lower grades of mathematics, which are now sufficiently inculcated for the ordinary every-day affairs of life. Before this can be obtained the council of public instruction must modify the curriculum of the normal school and the requirements of the different grades in the examinations for school teachers, and I feel assured that a committee of this Association, which is best able to indicate the lines of work required, would have no difficulty in obtaining the assistance and co-operation of the superintendent of education and the council of public instruction to this end. This subject opens up a very wide prospect in the view of our public schools, as every industry can claim similar recognition. I can see no reason why they should not receive it. Our business only refers to fruit-growing and sufficient for us is the duty of representing our specialty, and as it is quite within our province I trust we will claim a position as one of the pioneers in developing such a system of practical education in our public schools that the capabilities of Nova Scotia can be utilized, that her energetic and enterprising growing citizens will be able to have exercise for their best ability in furthering their interests while building up our province, and that our treasure lavished on public schools shall not be for the building up of another

country. Voluntary expatriation now robs us of much of the intelligence and energy of our people, and the fruit grower should step forward and point out the way to utilize and absorb this mis-directed treasure.

JOHN DONALDSON said he was very much pleased and gratified with Dr. Reid's paper, but he would like to go a step further than Dr Reid, and he would say that the farmer needs more intelligent and practical education than is given in the public schools. He said he spent seven years at Acadia College and one year at McGill, yet he had never received a single lesson in book-keeping in his life. That education did not unfit a man for common work but that an educated man could dig a ditch better than an uneducated man. He thought that there was a lack of practicality—that of course all the higher branches, political economy, logic, and the natural sciences a farmer is not in so much need of as the professional man, and did not think the farmer is as well fitted as the business man who takes these courses for his work in life. It seems that there is some element lacking. The agricultural colleges have a course which we all need. He moved a hearty vote of thanks to Dr. Reid.

A. McN. PATTERSON—Mr. President you referred to me as an educator. I am pleased to have you do so. I am pleased to know that after spending my life in educating the youth I really have been educated. I was sorry Dr. Higgins was not present sooner to hear this excellent paper of Dr. Reid's, as we would have had some extended remarks from him bearing upon this question, and indeed I would have listened with a great deal of pleasure to what he might say about it. I am sorry that in just touching upon this matter that we have not time to go into it and so I will only touch upon a few ideas. After spending my life thus far in training the youth, I am more than ever possessed of the idea that if we do not make a moral man we had better leave it alone—and that a moral man can only be made by example. You may say to your son or to your people, go and do so and so, but if you do not live it before him or them they will not do it. If we train up our youth in the proper way they will be a benefit to our country. I believe a great deal of money has been wasted in educational purposes in this country. It is mostly our youth who leave our country to people a foreign land rather than live in our own. And more than that they leave our shores seeking wealth

instead of hewing it out of the resources and development of our country. In educating the human mind we should work to bring out the ideas, and power to deal with knowledge. You speak of man receiving no education? Is he a thinker? Is he an observer? When he does these things he is educating himself. If you consider teaching as stuffing or anything of that kind, you have only got stuffed turkey at last. You can stuff turkeys, but you cannot develop the human mind in that way. Teaching and training are two different things. Train up your child every day both mentally and physically and you will make a man of him. Teach him to live, to be good, noble and true. He cannot be otherwise. Teach him to think and deal with knowledge. If we are to succeed in having men to develop this country, we will have to begin with the young child—and let us think more of our children than dollars and cents, and let us instil education into them and their development will be worth more than our farms. Let them feel that we are their teachers and their helpers. But if we say that we have not time to look after our families, but we must go and look after the farm or orchard and neglect the children, you may be satisfied that you have your farm but you will not have your children. You have exchanged your children for your dollars—what is the good of your dollars. You will leave your dollars behind you when you go hence, and your children to come to ruin. If our ambition in the past has been to give a child a college degree, rather than to teach that child to love liberty, to love being useful, to take pride in developing our country, then a college edueation is a failure. Every man is self-educated—if he cannot think he is not educated. You place a proposition before me. If I am able to think out that problem I am an educated man—but if my mind has no innate powers of itself to work out a task I am uneducated.

I have much pleasure in seconding the motion that has been made with respect to the doctor's paper, and I would say I consider it one of the finest papers that I have heard in our Association, because it looks to the man as well as to the material.

Prof. Higgins.—I do not know whether I am in order in supporting that paper because I did not hear the paper. I am sorry I could not get here earlier as I have sustained I suppose an irreparable loss. I think I have some little idea of the line of thought. Dr. Reid is disposed to follow and I suppose he did follow. I assume I would have agreed with him in most he said, but I do not care about

some remarks he made when I came in as to the necessity of directing our education to things that would be useful on the farm. I think that is a mistake. If a man wants to be a lawyer he thinks it a good thing to go to college and study and graduate, and then he goes into a lawyers office, and goes to a law school and studies several years longer. He does not complain because while he is in college he is not taught anything in the line of his profession as a lawyer. He expects to get that after. Just so it is in the case of a doctor, he thinks it is a good thing to have a college education to enable him to go to work. It is the formation, it is the training. It is not the pouring into a man. It is the development of the powers and faculties of the mind so that when he gets through college he is able to take hold of his studies in his profession of Medicine, Law, or Theology, or on the farm or anything else. Go into our Legislature and you will find the dominant body there are lawyers—and the doctors are sent there but the farmers are not. The idea has got abroad among farmers that an education is not necessary for a farmer. It is necessary for the doctor, it is necessary for the minister, it is necessary for the lawyer; but it is not necessary for the farmer. If a farmer is to have an education it must teach him to plough, mow, reap and dig, but not as in the practice of the other professions. Farmers, agriculturists and horticulturists will never take the position that is due to them in society, will never exercise any influence in the country until they have got through with that heresy and come to the belief that an education is just as desirable, and just as necessary for the man that is going to cultivate the soil as the man that is going to heal diseases or the man that pleads at the bar.

Now, gentlemen, if your son is to be a farmer send him to college. You should educate your son not to hold on to your dollars as Mr. Patterson has said. When our farmers are educated they will not be the beasts of burden for other members of society, but will be the leaders and influence the society in which they belong. Now, I have some sympathy with the farmers because I am a farmer myself. Farmers do not hold the position and exert the influence that they ought, and I believe that this is the main reason for it. Somehow, they have got the idea into their mind that an education is no use to farmers. Gentlemen, give that belief up, and the sooner you give it up it will be the better for yourselves, better for your families, and better for the people of your country.

REV. A. MARTELL.—I taught school for twelve years, and I had to stuff a boy with the multiplication table—when he was not stuffed he could not apply it to practice. By stuffing a boy somethimes you give him ability to use his senses.

A. MCN. PATTERSON.—When you find a minister who finds a sermon written by some other minister and he gets up and delivers it, that is a stuffed minister (laughter).

REV. A. MARTELL.—When a man reads another man's sermon on a better subject, and a better sermon than he can write himself, he has done a good thing.

PROF. CALDWELL.—We understand by stuffing, the taking in of just the material that persons needs for food—and there is a difference between the goose that is stuffed and the person who eats it.

DR. H. CHIPMAN was here called on, and read a paper as follows:

THE ORCHARD AND DAIRY.

Mr. President and Gentlemen:—

The wise man has said "there is no new thing under the sun," and the subject of this paper, "The Orchard and Dairy in N. S." is no exception to the rule. There were French orchards in N. S. two centuries ago, and English apples were growing here a hundred years ago. We were shipping apples to London eighteen years ago in '75, and the shipments for '92 will aggregate 100,000 barrels. Three counties only, Kings, Annapolis and Hants, were engaged in the exportation of these apples. There is nothing new in all this, but there is every prospect that, in the not distant future, the majority of the remaining fifteen counties of N. S. will be able to increase the quantity of apples already grown to such an extent as to become exporters in their turn, and the annual shipment will not be 100,000 barrels, but 1,000,000. The orchard is here to stay. With regard to the dairy, the farmer's wife has for years been making butter and cheese for home consumption and the local market, but some years ago cheese factories were successfully established, and within a year a movement has been made for the establishment of creameries in several of our counties. It is just here the reason for my paper appears—to call attention to the movement that is on foot to unite the orchard and dairy, and conduct them on scientific and commercial principles. The one is admirably adapted to supplement

the other. The orchard demands fertilizers, and if denied the soil becomes impoverished and the fruit fails. Dairy products take nothing from the farm, and the animals provide a fertilizer for the orchard. As the conditions of a country change, the farmer is obliged to change his methods and crops or fall behind. With flour so cheap there is no longer a profit in raising wheat, and the price of beef has fallen so low that there is very little margin in fattening cattle. Our farmers have felt this, and have recently been giving more attention to dairying. The little Jersey has been introduced quite generally, improving the quality of the butter very much, and adding to the profits. But the business at best has been done on a very small scale, and the work for the most part falls on the women, and women are the busiest part of creation, and a busy women who makes good butter every churning is as rare as a white blackbird. The servant girl is out of the question. If creameries are established and butter made wholesale of uniform good quality and exported to England with our apples, it will be equivalent to the creation of a new industry in N. S., and be a great benefit to the country. After all, the success of any country largely depends on the success of its agriculturists. The farmer is essentially a creator of wealth. Mankind must eat to live, and the object of all farming is to supply the demand of the hungry millions for food and convert the products of the soil into wealth. The farmer's calling is a most honorable and beneficent one. His work calls for the very highest type of manhood. Strength of body, intellectual training and scientific attainments are all as valuable on the farm as in any other department of life. As a rule that farmer is most successful who has business ability and tact; who knows when and how to buy and sell; who is a good planner, can direct and lead his men, is in touch with what is going on in the world, and quick to see the bearing of passing events on his business. There is more than this. Nature demands from all those who deal with her the strictest honesty. She never cheats the farmer nor can she be cheated by him. "As he sows so shall he reap." Nature is a great moral teacher, and the farmer more than any other man has the opportunity from daily contact with her to learn her laws, and observe the beauty and harmony in every growing plant and opening flower. He

> "Finds tongues in trees, books in the running brooks,
> Sermons in stones, and good in everything."

And through it all he learns to see the hand of a great Designer, and is led from Nature up to Nature's God. But I have wandered from the question and in this practical age one is required to stick to his text and make points if he can. I think, Mr. President, it will be in order just here to consider briefly the causes which led to the change in our farming twenty years ago, and the subsequent rapid development of our orchards, and also why the dairy is now coming to the front as a companion branch of farming.

In view of the decline in prices of farm products in the markets of the world and the subsequent wide spread agricultural depression, the question, how far and in what direction is this depression felt in N. S., is a pertinent one at the present time in this Provincial association of farmer-fruit growers, and one that bears directly on our subject. The question was discussed at the Annual Dinner of the Kings Co. Agricultural Society in December, and one gentleman in summing up the speeches said he thought the question of depression had been settled as the historian of Irish snakes had settled the snake question: "There are no snakes in Ireland;" so it is evident there is "no depression in Kings Co." Some of us will agree with this statement, and I think we might broaden and lengthen it to include the whole of the Annapolis Valley, and indeed, every county in the province. The Provincial "crop report" for '92 and the market reports will bear me out in saying that N. S. has scarcely felt the "agricultural depression" which is pressing so heavily on the various nations of the world irrespective of their form of government or fiscal policy. As a class our farmers are comfortable, crops are abundant, and their surplus products for the most part find a ready market at profitable prices. There are others who take a different view of the situation, who find the country depressed, "its products shut out of the markets of the world," and hard times for the farmers generally; and, we must admit, there is a grain of truth in this pessimism. The optimistic view is nearer right, but the other side is not wholly wrong. It is the old story of the shield with two sides. On the one side we see our apples selling at a fair profit in the London market, small fruits, hay, oats, dairy-products, eggs, poultry, etc., as abundant and selling for as good prices at home and abroad as ever they did. On the other side they see potatoes difficult to raise and shut out of the neighboring market by the "McKinley Bill," while beef has gone done in price in competition with beef from Ontario and the great

ranches of the North West. Here is the lesson for us to learn. N. S. has moved along with the rest of the world during the last quarter of a century. Circumstances have changed, and the wise man will change his methods and crops to suit the times. There was a time in the history of the country when Halifax merchants imported all the goods and did all the business with the West Indies. Country traders went to town and bought of these great merchants, and they grew rich and died happy as bank Presidents and directors. Now this is all changed and Halifax has learned to do business on different lines, and yet there is wealth and prosperity and growth in Halifax. So it is with our farmers. Years ago the potato crop was the special money-producing crop and the whole farm was a potato field. Every farmer filled his cellar with potatoes. The large ones were marketed and the small ones made beef. Potatoes and beef brought in the money, and very little attention was paid to orchard, dairy, or any other branch of farming. But as the years rolled round the condition of the country changed. The U. S. government abrogated the reciprocity treaty. The war drums were stilled and the soldier-citizens returned to the farm and workshop and supplied their own markets. The Colorado Beetle extended its travels across the border and the "McKinley Bill" finished the business. The last few years a market has been found in the West Indies; but it is uncertain, the price is low and the labor and expense of destroying the Beetle considerable, so that potatoes as the special crop have had their day, and the farmer asks, what next? Nova Scotians are hard to beat. They come from that grand old Anglo-Saxon stock that acknowledges no superior in the world, brains or brawn, and who never know when they are beaten. Our farmers solved the knottiest point of the problem some years ago, largely by the help of this Fruit Growers' Association, by planting orchards, and learning how to ship the fruit across the Atlantic. The history of the shipment of N. S. apples to Britain dates back only twenty years. Previous to 1870 it was considered almost an impossibility, and in '75 "it excited no little thought and concern," but nowadays it is as easy and simple to market our apples in London as Halifax, and for this plain sailing to London markets we owe much to the F. G. A.; to Mr. C. R. H. Starr, for so many years its painstaking Secretary, and to the firm of Nothard & Lowe which he represents. The shipments for '92, as stated before, will amount to $100,000, and though prices were low

and two steamers, early in the season, landed their cargoes in bad conditions, the net proceeds will not be less than $150,000. Add to this the large sum received for small fruits, and it is apparent these western counties have found *the* special paying crop. But N. S. is essentially a fruit country, and other counties are following our example, and there is every reason to believe that in the future every county in the Province with the same care and attention given to the orchard will raise fruit for export. The orchard in N. S. has come to stay. It has every element of permanency. An orchard of two or three hundred trees in full bearing with ordinary care will give an annual income of $400 to $800 to its fortunate owner, and the market in Britain is a permanent market. N. S. fruit well and honestly packed is as sure as any thing to go across in good order and command a good price. But it may be asked, when the exports increase to $1,000,000 barrels, what then? Well, there will still be room for more. The President of the Board of Agriculture in Colchester, England, in a public speech stated that there was paid to foreigners in 1890 for fruit and vegetables £4,804,750; for butter £10,398,843; for cheese £4,975,134. That affords N. S. a pretty large margin for fruit and dairy products. If there is no longer profit in raising beef, wheat and potatoes, there remain fruit, butter, cheese, eggs and poultry.

The food which the farmer produces from the soil has a money value, but it cannot all be turned into cash, and while he creates food and wealth for the nation he must live himself by the profit on his labors. To do this he must grow some special money producing crop to meet current expenses, and in the western counties to-day that crop is fruit—large and small, but chiefly the apple. But the one-crop system, all the eggs in one basket, is a risky business, invariably ending in failure in the long run in all countries. The farm cannot, therefore, be safely made all orchard. An untoward accident might be disastrous, and some means of fertilizing the orchard must be provided. "Orchards will continue profitable only so long as they are compatible with a judicious system of farming that will maintain the permanent fertility of the soil." Again in those counties where the orchard is not a commercial enterprise, some other paying crop must be raised and the dairy meets both cases. Prof. Robertson, than whom there is no better authority, has pronounced the condition for successful and profitable dairying in N. S. to be most favorable.

There are broad acres of "Dyke" with rich alluvial soil that have yielded abundant crops of hay and autumn pasturage for a century without any fertilizer; there are acres of upland pasture, capable of great improvement; there are other acres which can be made to yield immense crops of green fodder either for soiling or ensilage purposes. A small outlay for bran, meal and oil-cake would make a good butter ration at a very reasonable expense. Some change in our cows would be necessary. For cheese Shorthorns, Holsteins and Ayrshires would be profitable, but for gilt-edge butter the Jersey and Guernsey blood are absolutely necessary, and Ayrshires come next. The government has established experimental creamery stations, and from them valuable information is disseminated in every province, and the Professors visit the people and establish dairy-schools and give every instruction in the art of making butter and shipping it. Prof. Robertson is now in England delivering lectures on "The food-producing resources of Canada, and how they can be developed to the mutual advantage of the English merchants and the Canadian producers." Every effort is being put forth to advance the interests of Canadian agriculturists in Great Britain. There are none of the Provinces in Canada so admirably adapted to the growth and perfect maturity of fruit and the production of pure delicious butter ("materialized sunshine" Prof. Robertson calls it,) as our little province down here by the sea. Neither do any of them possess the same advantages for shipment to England. Situate between 43° and 47° north lat. and 60° and 70° west lon. with the Gulf stream sweeping along within a few miles of its southern shore, and protected from the chilly north winds by an almost continuous belt of mountains along its northern side, the climate of N. S. is more equable than in any other part of the Dominion. The summers are delightfully cool and bright, and the winters mild, the mercury rarely rising about 86° in the shade or going below zero.

The autumn months are perfect in the valley, including of late years the month of December. If winter sometimes lingers in the lap of spring, our "Indian Summer" is summer in the lap of autumn. It is the ideal climate for the orchard and dairy. To quote Prof. Robertson again, "Canada is the natural home of cattle. With its fertile soil and bracing climate it gives vigorous health to domestic animals, and freedom from all serious diseases of an infectious or contagious nature. The dreaded disease pleuro-pneumonia, is wholly

unknown in Canadian herds." While this refers to the whole Dominion it is particularly applicable to Nova Scotia. I have tried at some length to show that the conditions in this province, and especially in this valley, are exceptionably favorable to the combined industry of fruit growing and dairying, and a few words about transportation and markets. The whole coast of Nova Scotia is thickly indented with numerous excellent harbors, easy of access, safe and commodious. Halifax harbor, widely known as one of the finest harbors in the world, is open the year round, capable of floating the largest steamship; with a dry dock equally as capacious, with railroads from all parts of the province centering in the city, and lines of steamships running direct to London and Liverpool, and the nearest port in America to the Old Country, the facilities for marketing are of the best. There is only one drawback—freights are too high compared with other ports, and the arrangements in the steamers for ventilation of the fruit and providing for its delivery on the other side in good condition are wholly inadequate. This is a subject of vital importance to this Association, and it is absolutely necessary that some means of remedying this source of great loss should be found. It is really the most pressing before us at the present time, but I shall leave it for my friend, Mr. Patterson, to deal with it in his paper which is to come later on. There is ample room for the expansion of the orchard and dairy in Nova Scotia. There is plenty of first-rate pasturage in every county. The province contains about 13,000,000 acres, including lakes and streams. The last census gives 6,080,693 acres of land occupied; 1,993,694 improved; 969,545 under crop; 994,112 in pasture; 30,037 in garden and orchard, and 4,086,999 in forest. Number of cows in the province, 139,570, and butter produced 15,579,577 lbs. During the last decade, while the number of cows has increased only about 2,000, the pounds of butter made have increased by over 8,000,000. The average per cow in 1881 was 54 lbs. against nearly 112 lbs. in 1891, a marked improvement which indicates a better understanding of the art of butter making, and a great improvement in the breed of cows. No doubt there will be still more improvement in the next ten years. A fair standard for a good dairy cow is 300 lbs. of butter in the year. There are 1,758 silos of average capacity of 60 tons in the province. There are seven silos in King's County. Mr. A. G. Goodacre's has an average capacity of 70 tons, cost $100, is filled with corn, the variety

most approved being Pierce's Prolific, London, Ontario. He covers with cut straw and tarred paper, and weights with salt hay. During four months of the season, in addition to the pasturage, vetches and oats are fed. Raises oats, peas, and barley for winter feeding; keeps 12 grade cows, largely shorthorn; made 518 lbs. butter from September 1 to date; can improve on this very much; markets in Halifax, and receives 25 cents from October 1st to June 1st. Attends to dairy himself. Puts butter up in 2 lb. prints marked off into ¼ lb. sections, and wrapped in parchment paper, and packed in butter cases. Pays freight on empties. Mr. Goodacre's farm is in Wallbrook, Gasperaux. He has imported a thoroughbred Guernsey bull of the finest strain in Canada, and will improve his cows with this blood. Mr. Goodacre and his brother, who owns a neighboring farm, and is going into sheep raising, are young Englishmen who have come to Nova Scotia and chosen a home among us, and are respected and made heartily welcome by all who know them; we wish all Englishmen like them every success in their adopted country.

To return to fruit, apples produced throughout the province in 1890, 1,057,592 bushels, allowing 2½ bushels to the barrel, we have 420,436 barrels. In '92 a safe estimate will be 425,000, of which 100,000 were shipped to Britain, leaving 325,000 for home consumption and home markets, including a small quantity shipped to United States. Other fruits—plums, cherries, pears, quinces, etc.—were 55,938 bushels, with 68,449 lbs. of grapes. These latter fruits are claiming more and more attention, and there will be very largely increased production during the next ten years. There is no question about the successful growing of these throughout the whole province, and in several localities peaches will thrive and ripen fully in the open air, as was proved last season by the delicious peaches from trees in Kentville, and in Messrs. Patriquin's and Archibald's orchards in Wolfville.

As a practical illustration of what can be done in Nova Scotia by an honest, industrious, contented Bluenose without capital, and only such education as the common school afforded fifty years ago, I will take the liberty of referring to the farm of Mr. John Byrne, a member of this Association, and both he and his farm are well known in King's County. Mr. Bryne was born at Town Plot, King's County. At 14 years of age he was so fortunate as to secure a situation at Acacia Grove, the residence of the Hon. Charles R. Prescott, who did

more to advance the interests of horticulture in Nova Scotia than any other man living or dead. He remained in Mr. Prescott's employ fourteen years, and acquired a thorough knowledge of the various branches of horticulture. When 28 years of age, with a capital of $1,200, he purchased the farm which he now occupies, situated about a mile from Kentville on the south side of Belcher Street, sloping south down to the river—no better and no worse than dozens of other farms in Cornwallis at that time. There was no orchard on it except a number of old French trees near the line. These trees were "old settlers," but were grafted over, and it is worthy of remark that they had been standing in the greensward, when they came into his possession, and have stood there ever since 1855, thirty-eight years, without cultivation or manure, and have been, and are still, bearing a good crop of Golden Russets every year. They were grafted in 1858. The first year of ownership, 1856, an acre of apple seeds was sown. The little trees were root-grafted and formed his nursery, which was planted in ordinary land, and received ordinary culture. He sold these trees, allowing purchasers to select the best, and planting from year to year some of those that were left. The orchard grew slowly, as he was obliged to carry on the ordinary farm work and raise some crop to bring in cash to pay interest and meet current expenses. He pursued this course, steadily enlarging his orchard year by year, and keeping down expenses until now he has an orchard of 30 acres, bearing 2,000 trees, all home-grown root and branch. Seventeen hundred are in bearing, which yielded 800 barrels last year. His gross sales in 1886 were $3,000, other years $2,000, while the average net income is about $1,200. The old house has been replaced by a large comfortable new house, there are new barns and out-buildings, and Mr. Byrne's home is now as convenient and comfortable as any farmer need want. It is all paid for—not a dollar owing—a neat, comfortable home, a certain income of about $1,200 all from a farm in Nova Scotia in 38 years, and the happy owner, now 66 years old, is hale and hearty, able to work, and enjoy the fruits of his labor. What is the value of such a property to-day? You can judge for yourselves, when I state that some acres of orchard in full bearing near Wolfville are valued at $1,000. All honor to John Byrne and such men as he who are content to live in their own country, and by honesty, sobriety, and industry win a home and a competency for themselves and their families. Such an example is worth millions to

the young men of Nova Scotia. How much more worthy of honor is such a life than that of the hundred millionaire, who won his millions by gambling in stocks, wrecking others' fortunes, and ruining others' lives, and for all his eighty thousand dollar monument execrated, the world over when he died. The curse of the age is this greedy, intense passion to become rich suddenly, without labor, by some stroke of luck, or brilliant speculation, or smart trick in stock gambling! The great desire seems to be to get riches, honestly, if possible, but get them. It is all wrong. The fortune that is won by honest labor, be it large or small, is the one most enjoyed in life, and causes fewest regrets when the end comes. What one has done in Nova Scotia others can do. Young men, there is no need to go West or to go to Boston. There is a better chance to build a home and win an income in Nova Scotia to-day than there was in 1856. Honest labor, with industry, sobriety, and economy will do it.

J. R. STARR thanked Dr. Chipman for this valuable paper. The potato on which we have been depending so long is out of the question entirely. We *may* get good returns for our potato crop, but we cannot depend on it. The Dairy takes nothing from our farms, and will enable us to build up our orchards with its aid. People who plant young orchards are not able to get returns from them immediately, and must look for something else to get returns from while their orchards are growing, and the dairy will fill the bill. I therefore move a vote of thanks to Dr. Chipman.

PROF. CRAIG.—I just wish to say a word in connection with this matter, which will be of interest to the fruit growers and dairymen. I heard the name of Prof. Robinson mentioned as being in England; he has since returned, and has charged me with a special message to the fruit growers of Nova Scotia. While he was in England to bring before the people of that country the resources of Canada, he was not forgetful of the fruit growers interests. He made special mention of this place. I have a clipping from a newspaper which gives his remarks almost verbatim in connection with the fruit industry of Nova Scotia, and he gives a very glowing description of the Annapolis Valley. He has made arrangements for the transhipment of all his dairy products at the experimental station in Ontario, and eastward, via Halifax to the English markets, of course, picking up the dairy products of Nova Scotia in transit. He also took some little

trouble to look into the fruit question there, and he found that the reasons for the comparatively low prices, and possibly unsatisfactory results of the shipments of this year, was due to two causes—First, the universal depression in agricultural circles; second, large shipments of oranges from Spain, which were sold at low prices, and consequently had a depressing effect on the fruit market. Prof. Robinson had the pleasure of meeting you here two years ago, and has had very pleasant recollections of his visit, and has charged me with this message to you.

PROF. CALDWELL.—What would probably be the net return from butter sent to England?

PROF. CRAIG.—I can only give it from memory. The returns from trial shipments manufactured in Ontario netted the producers over 24 cents per pound. This was manufactured at Ingersoll and Elgin. I think that is a fair estimate.

The discussion on Mr. ARCHIBALD'S paper, read at an earlier stage of the Session, (*See Pages 47-51*) was taken up here.

THE SECRETARY.—When it fell to my lot to prepare a programme for this meeting, the subject of an experimental fruit farm in connection with Acadia College was in my mind, and I asked the President if he could not get a member of the faculty to take up the subject, but he replied that they did not care to do it, as any move should come from some outside source. It evidently fell into good hands when it was placed in Mr. Archibald's charge. He has got hold of the right strings, and is pulling them the right way. This is a point on which I have been thinking for several years, and goes right back to the theory propounded by Mr. Patterson. Education is a fine thing, but education at a college will not make farmers or fruit growers. I speak from experience. I put in half a course at college, two years, and was nearly spoiled for a farmer, and had I taken the full course it would certainly have changed my entire life, whether for better or for worse, I cannot say. You will find that the men from the colleges are not working the soil. That of the large number that leave Acadia College every year, very few become farmers, although they are in many instances farmers sons. It is very apt to turn them from any inclination to follow agricultural pursuits. If we establish an institution to teach fruit culture and fruit growing,

and employ the proper methods of teaching and training, we may induce the young men to take up this neglected work instead of devoting themselves to the learned professions, and I am convinced if we work this matter up, it will be ultimately brought to a successful issue.

DR. CHIPMAN said that this association, and every other agricultural society of this county, are receiving from doctors, lawyers, and ministers very liberal support, and a good deal of help; and education has had no ill effect upon that at least.

PROF. HIGGINS.—It is not the college that spoils the boy if he has in him the making of a farmer, if he takes a college course and is educated, he will make a farmer when he gets through. He will make a better farmer. And there are exceptions. Some of our graduates are likely to distinguish themselves as farmers, and if they do so, it will be largely because of the fact that they have got an education. The doctor gets his college education, and the lawyer gets his college education, but you would put a farmer half way through a common school, and put him on the farm, and expect him to be as able as a man who has had better opportunities. I really hope that this proposition of Mr. Archibald's will be carried out. I kept a sort of Meteorological Observatory here for a number of years. I kept a record of the direction of the wind, state of the barometer and thermometer three times a day. That was done under the auspices of the Smithsonian Institute, and it would have been continued up to the present time but the Dominion Government established stations, and, when they did so, the Washington authorities felt that they would be rather interfering with us, and so they did not request me to continue it any longer.

THE SECRETARY.—I do not mean for a moment that a farmer should lack education; educate him thoroughly, but also educate him in the line of his profession. If a young man spends five years at college and has no training in agriculture, he will not have much desire for farming the same when he gets through.

PROF. CRAIG.—I am exceedingly pleased with the idea of the establishment of an experimental fruit station here, and it shows that the Fruit Growers' Association are keeping well up in the front, and are keeping pace with a like movement in other parts of the Dominion. I quite agree with the Secretary, that the farmer should

be educated in the line of his profession, and, as Dr. Reid has so excellently pointed out, this should be done through object lessons. An experimental farm would not conflict with any line of university work, but would give an excellent opportunity for any whose inclinations were in that direction to take a special course in this line, and perhaps it would lead them to further thought and study, even if they took a full course in a university. We see a great many cases of lawyers and doctors in after life turning back to the thoughts of their youth, and taking an interest in horticulture, etc., and it is very easy to see that they are advanced and progressive in the whole line. And it is exceedingly gratifying to me to see this movement, and though I am a servant of the Government, apart from that, I have a great and deep personal interest in the fruit industry in every part of the Dominion, and anything I can do towards establishing the experimental station here, I will be pleased to do.

THE PRESIDENT.—What has been done in Ontario in this line in respect to experimental fruit stations?

PROF. CRAIG.—This matter has been agitating the minds of the Ontario people for three years. Our experimental station at Ottawa does not cover the conditions of the whole province of Ontario. There was a committee appointed to memorialize the Provincial and Federal Governments, and they have made much progress, and the matter will materialize before very long. This committee has been appointed as a standing committee, and the matter comes up every year; and I have no doubt their efforts will bear fruit.

T. H. PARKER said he was in full sympathy with Mr. Archibald's movement for the establishing of an experimental fruit farm, and he (Mr. Parker) would also subscribe $50.

C. H. R. STARR said he was much pleased with Mr. Archibald's paper, and the views expressed in the paper were quite in line with his own.

THE PRESIDENT.—This is a live issue, and one we have got to meet, and a committee of five will doubtless effect something. I asked the president of Acadia College to give us his views on it at the Social to-morrow evening, but he excused himself and said he thought the thing should come from outsiders. The faculty are in full sympathy with the work.

A. B. PARKER.—When the team is harnessed you will not be long before you find a driver.

MR. ARCHIBALD.—This association may be asked to vote $500 from the funds of the association. It is proposed to ask another $500 from the fruit growers, to be paid into this association for a specific purpose. The Fruit Growers' Association will control this station by a directorate of 5 or 7. The Fruit Growers' Association would have a majority of directors; then with a vote of $1,000 from this association, we would approach the various governments for subsidies. There never was so much money in the world before, the only question is how to get it. We are not going to ask the patronage of Acadia College—it may go to King's College or Lower Horton. When these grants from the governments are obtained this work can be begun in a small way.

C. R. H. STARR.—I think our friend, Mr. Archibald, in asking the fruit growers for $1,000 must be prepared to do a little more machinery work. We only get $300 from the Government, and we have only had about 100 members for the last five years.

GEORGE THOMPSON said he did not see how they could pledge themselves to raise $1,000, or even $500.

C. R. H. STARR.—It is an important step in the association, and perhaps it would be better to think over it and defer the appointment of this committee until to-morrow.

DR. CHIPMAN said he was very glad to have Professor Craig present. At one meeting they had three professors—Macoun, Saunders, and Fletcher from the Experimental Farm. He proposed that Prof. Craig be made an honorary member of the association, which was duly seconded by Mr. Bigelow, and passed unanimously.

C. R. H. STARR suggested that it would be well to get a list of persons who were interested in the work in different counties, and, if it was advisable, to appoint one in each county, in addition to the Vice-President for that county.

A. WHITMAN said he would like to know why we were retrograding in our export trade, and why the Upper Provinces were advancing in their foreign trade. He said this question could be discussed with profit to all concerned.

C. R. H. STARR said as far as our fruit was concerned we still lead Ontario, although the returns were not so bright as were hoped for.

Meeting closed at a late hour.

SECOND DAY.

Wolfville, January 27, 1893.

The Morning Session was called to order by President BIGELOW at 10.30, a good representation of members being present.

The financial report of GEORGE THOMSON, ESQ., Treasurer, was read and adoped by the Association. (*See Page 7.*)

The election of officers was then proceeded with, and the result can be seen on page 3.

The report of the Fruit Committee was then read by R. W. STARR, chairman of committee, as follows:

Mr. President,—In preparing for this report, I took it upon myself, as chairman of the Fruit Committee, to issue a circular letter to each member of the Fruit Committee, and also to the vice-presidents of the different counties, soliciting answers to a number of questions or subjects on which we desired information.

In response to this appeal I have received quite full answers from C. E. Brown, Yarmouth; R. W. Freeman, Shelburne; W. A. Hebb, Bridgewater; W. O. Creighton, Pictou; Alfred Whitman and Isaac Shaw, of King's; and short letters from Prof. Smith, Truro; Hon. Isadore LeBlanc, Arichat; C. C. Gregory, Antigonish; and W. F. McCurdy, Victoria. Just nine of the eighteen counties heard from, as yet.

Some of those letters I have taken the liberty to condense for the purpose of bringing them within the limit of this report, but have preserved the originals for the publishing committee's revision for the transactions. The rest, with a copy of the circular issued, are hereto annexed.

I have the honor to be, yours obediently,

R. W. STARR,

Chairman Fruit Committee.

CIRCULAR LETTER.

Wolfville, N. S., January, 1893.

Dear Sir,—Will you kindly send me a short report of the state of fruit culture in your county. I would suggest the following subjects on which information is particularly requested:

1st. Increase of orchard planting during past three years.
2nd. Improvement in care and culture of orchards.
3rd. Average per cent. of crop of 1892 compared with other years.

4th. Varieties best suited and most profitable for your locality.

5th. Give instance of large crop from any tree or trees, stating, (*a*) Age and size of tree; (*b*) Name of variety; (*c*) No. of bushels; (*d*) Condition of soil and culture; (*e*) Year of production of crop; (*f*) Name and address of grower.

6th. Progress of culture in pears, plums, cherries, peaches, quinces, grapes and small fruits, and varieties of each best suited to your district.

7th. What insect pests, and diseases have you to contend with, and what remedies do you use.

Any information on these or other subjects in connection with horticulture will be gladly received for the report of Fruit Committee of the F. G. A.

An early answer will greatly oblige.

Yours truly,

R. W. STARR,

Chairman Fruit Committee.

In answer to above circular, A. WHITMAN, of Waterville, King's, writes as follows :

1st. I have no accurate data to go by, but should estimate that the number of trees planted during the past five years would equal the total number growing previous to that time.

2nd. I can report a decided improvement in the care and cultivation of orchards. Live fruit growers have learned that it pays to feed and care for the trees every year, and all the time, and that it will not do to depend solely on ploughing in green crops to sustain the fertility of the soil and maintain the quality and quantity of the fruit. Yet there are many cases of shameful neglect; orchards that are allowed to stand for years without the least care, not even the necessary pruning, and yet some of those men are planting more acres instead of taking care of what they now have.

3rd. Would estimate the crop for King's County at about two-thirds an average crop.

4th. Would name Gravenstein and Blenheim as most profitable for this locality. Approaching nearest to perfection of any next in order, Kings, Ribstons, and Golden Russets. These latter are not so good bearers, but bring high prices, which tends to make up the deficiency in quantity.

5th. No report to make.

6th. There is rapid progress in plum culture during past three years, large numbers of trees having been planted; varieties principally "Moer's Arctic" and "Lombard." The crop for this year was not large, but sold at good prices, $1.25 per peck basket, making growers jubilant over future prospects. The planting of pears is increasing, and this year's crop sold at good paying prices. There is not much attention paid to the culture of cherries, but there is always an active demand for them in their season, and what few find their way into the markets, sell high in proportion to other fruits. Very little is done with grapes, peaches, or quince's in Western King's, simply from neglect. Strawberries take the lead in small fruits. The crop for 1892 beat all previous records for quantity and quality, but prices ruled low, partly owing to large consignments from Ontario. Raspberries come next in importance, and have paid well. Of the many varieties tested, Cuthbert is considered the best, and is placed at the head of the list for market purposes. The cultivation of cranberries has assumed large proportions already, and great progress is being made, many acres of bog land being prepared and planted each year, and so far the work has proved remunerative and successful. The crop for 1892 has been good, and sold in local markets at from $5 to $7.50 per barrel, and many have been shipped to foreign markets at a profit.

Mr. Isaac Shaw, of Weston, says:

1st. Not quite as many trees planted during the past three years as during the three preceding years, still the area planted is large.

2nd. The improvement is quite marked. Cleaner culture, better manuring, and more careful pruning is becoming the rule.

3rd. No answer.

4th. Gravensteins and Baldwin's best for this locality.

5th. No answer.

6th. Very little being done in the cultivation of peaches, quinces, or grapes, and not enough of pears, plums, or cherries for home use. Small fruits generally neglected, except by a few persons, who have grown some strawberries for market. So far as tried, all fruits that have been grown in other parts of the province, can be as successfully grown here, the soil and location being everything that can be desired.

7th. We have much the same insect pests to fight as in other parts of the county, and, when anything is done, we use the same

remedies, with much the same results, good, bad, or indifferent, just according to the thoroughness of the work. The cultivation of the cranberry is still increasing, and receiving more attention. The yield per acre in 1892 was not equal to that of 1891, but the prices have been better, making the crop still profitable. Experiments in planting this fruit on portions of the Caribou bog have given very satisfactory resnlts, and there are hundreds of acres of this bog, now absolutely worthless, that can be made very valuable by planting with cranberries. The coarse peaty top that must be removed can be used as a mulch for fruit trees on the sandy soils surrounding, or burned to use the ash as manure for the same purpose, and there is abundance of sand near by for covering the surface, and, if it should be found necessary to flood the plants at any time, there are two lakes in the centre which can be utilised for the purpose by means of pumps driven by wind.

William A. Hebb, Esq., of Indian Garden, near Bridgewater, Lunenburg County, writes :—Referring to your circular of the 2nd inst., I have to state :

1st. A few years ago a large number of grafted stocks were imported and planted in various parts of this county. These nurseries, supplemented by a great number of seedlings grown by other farmers, have nearly all been sold, and planted, in addition to great numbers of trees imported and sold by agents. Altogether, I think I am safe in estimating that there are twice the number of fruit trees growing in the County of Lunenburg to-day that there were three years ago.

2nd. Improvement in orcharding is quite visible in the grafting of better sorts on bearing trees, more careful pruning, and some attention being given to the cultivation of the soil.

3rd. The crop of 1892 will rate at about a full average.

4th. Best varieties are Baldwin, Spy, Nonpariel or Rox Russet, Gravenstein, Bishop Pippin, and Kings.

5th. I grew this year, 1892, on four Baldwin trees, over 50 barrels of apples. Trees 38 years planted, 17 to 18 inches diameter of trunk, standing in grass for several years, and the crop mown for hay, but top-dressed with stable manure and a little wood ashes every year.

6th. Most farmers grow a few plums, pears, and cherries for home use, but not to any extent for market. Bartlett is about the

best pear, and Napoleon Bigarreau and Sweet Heart the best in cherries. Diana seems to be the best grape yet tried. Peaches, Quinces, and small fruits not grown to any extent.

7th. We have not many insect pests to trouble us as yet. A few borers, which we dig out with mallet and chisel, and a caterpillar, which covers a portion of the tree with a web; these we singe with a torch lamp on a pole. The Black Knot on the plum is a serious trouble, and I know of no remedy better than high cultivation and special manures. The birds take the cherries, and I don't know how to prevent them, but think we should plant half-a-dozen extra trees especially for them. I have observed that they like the soft-fleshed cherries best, and seldom take the large firm-fleshed Bigarreau when they can find any other.

From R. W. FREEMAN, ESQ., Jordan River, Shelburne County:

1st. Shelburne County is adapted to the growing of apples, equal in quality to any raised in the province, proved by the annual exhibitions. The increase of planting during the last three years has quadrupled, and of the best varieties of winter fruit, and, if properly cared for, will be an article of export, it has only been few years since vessels used to call at Shelburne with apples, but the county produces enough for its own consumption.

2nd. Orchards are receiving more attention and care; grass removed from around the trees, and land manured and cultivated, and better care in planting more regularly as to distance apart, and protecting in winter the roots from frost, as we are more accustomed to quick changes than the counties inland, and the farmers have been well repaid.

3rd. Crop was about the same as 1891, but look for large increase as old orchards are being renovated.

4th. Greenings, Baldwins, and Bishop Pippins do well, and the most profitable Gravenstein, as an early apple, some very fine are raised.

5th. From 4 to 5 barrels of apples have been taken from trees 12 years from planting. Varieties, Russets and Baldwins above the average.

6th. Not much attention has been paid to culture of plums and cherries, but this locality is well adapted. The last year large quantities of plums was raised in vicinity of the town. Pears are not a

success owing to sudden changes. Varieties are not hardy enough to withstand wind. But little attention paid to small fruits, as an article for shipment only in sections, but well adapted for same.

7th. The only pest we have is the *Borer*, and the best remedy to cut them out. Now, you will know by our situation we are a fishing and lumbering people, no farmers, so that attention is not paid as in farming counties, but our people are getting interested and buying more trees annually and look carefully to varieties. This is proved by the exhibits each year. Old orchards that have been wholly neglected for years are being pruned and grafted.

From W. O. CREIGHTON, ESQ., West River, Pictou County :

R. W. STARR, ESQ.

Dear Sir,—Yours of 31st December just to hand, and, in reply, will endeavour to answer your questions in order as nearly as possible.

1st. While there are very few who are actually setting out new orchards, the large majority of farmers are adding a few trees each year, so that I feel perfectly safe in saying that the area under trees has more than doubled in five years.

2nd. It is still the exception to see an orchard that receives proper cultivation—most being left in grass, which is cut for hay ; but, on the whole, there is an undoubted improvement on ten years ago, and many farmers are waking up to see the benefit of care and cultivation, and knowledge of selection of varieties is more widely diffused than formerly.

3rd. The crop of 1892 was fully an average one ; quality better than 1891.

4th. For early varieties Red Astrachan, Duchess, and Emperor are largely grown, are very productive, and find ready sale in local markets. Gravenstein, Ribston Pippin, King of Tompkins, and Golden Russet, although not largely planted until within recent years, have proved very successful and profitable varieties. Bishop Pippin was formerly the most popular winter variety.

5th. Cannot give any instance of remarkable productiveness.

6th. Very little progress is being made in the cultivation of other fruits, except the plum and strawberry. Of the former the Moer's Arctic seems to be the plum for Pictou County, but Lombard, Bradshaw, Yellow Egg, Gages, and other varieties are productive and profitable. Of strawberries, the prevailing varieties are Wilson,

Sharpless, and Crescent Seedling. Not enough are raised to supply local market, and no doubt the strawberry industry would prove very profitable to an enterprising grower.

7th. The insect pests we have to contend with are bark louse, borer, codling moth, and occasionally the fall web-worm and tent caterpillar. The canker worm has scarcely made its appearance. Generally these pests have been allowed full swing, but some of the foremost growers have been using the usual remedies, viz.: Alkaline washes for bark pests, and arsenical poisons for codling moth and leaf-eating insects. The black spot seems to be spreading rapidly and attacking new varieties each season, but I have not heard of a single man who has tried any remedy.

All of which is respectfully submitted.

R. W. STARR,
For Fruit Committee.

MR. C. E. BROWN, of the Fruit Committee, then read the following elaborate report from Yarmouth County:

Yarmouth, 21st January, 1893.

ROBERT W. STARR, ESQ.,
Chairman Fruit Committee,
N. S. F. G. Association.

Dear Sir,—In answer to your circular of 31st December, I give you below the result of my correspondence with several of the parties therein named, in connection with notes of my own on fruit growing, taking up your questions as given:

1st. Increase of orchard planting during last three years.

From the number of agents employed in tree selling, local and transient, and from the large importations of trees every spring, one may safely estimate this increase as fifty per cent., the chief extension being along the line of the Western Counties Railway, reaching into Digby County, by Yarmouth owners.

Messrs. Blackadar and Co., at Hectanooga and Meteghan, have twenty-five acres in apple trees, about fifty trees to the acre; C. C. Richards, at Mack's Mill, has ten acres, planted in the Spring of 1890, about 45 to the acre, with the following varieties:—Gravenstein, 100; Grimes' Golden, 150; Hubbardsbon, 40; Northern Spy, 100; Red Astrachan, 10; Wealthy, 10; Yellow Bellefleur, 20. Wm. A. Cann,

at Hectanooga, Hugh D. and Augustus Cann, at Mack's Mill, are among other owners of new orchards along the line, the most recent being Dr. C. A. Webster, who bought a number of lots in the vicinity of Mack's Mill this fall, with the beginnings of orchards on some of them, (300) three hundred acres in all, with the intention of planting apple trees. These lots, bought in the rough, cost from one dollar to ten dollars per acre. The land is chopped over, the trees are burned, and apple trees are planted among the stumps, the soil being prepared for a few feet about each tree, bone dust and ashes used as fertilizers. When the stumps are removable, the whole area is ploughed and thereafter cultivated as required. In 1890, Andrew Mack, of Mack's Mill, showed, at our exhibition, Baldwin, Ben Davis, and Haas, Twenty Ounce, and Yellow Bellefleur apples of fine quality, gathered from trees growing where only the forest stood five years before. In all these new orchards in fresh soil, the quality of the apples is surprisingly good, well grown, free from spots, and highly colored.

2nd. Improvement in care and culture of orchards.

Although by no means general, there is decided progress every year in this direction, indicated by the rapidly improving quality of the fruit shown at the Annual County Exhibition. Growers are learning that, to grow fine fruit, they must feed and prune their trees. Too many instances are still to be seen of trees planted in the sod in grass fields, left to themselves, but expected to grow, and, in time, to bear fruit. Neither growth of tree, nor fruit, even of the poorest, should follow such neglect.

3rd. Average per cent. of fruit crop for 1892 compared with other years.

The estimate of this for the county at large is fifty per cent. Here and there an orchard, favored by some peculiarity of protection, or care or cultivation, yielded a full average crop, but a half crop, as a whole, is thought a fair judgment. The cause of the general failure of fruit trees to set and mature their fruit is not known. The quantity of bloom on all kinds of fruit trees was unusually abundant, and early in the season it was thought the crop of fruit would be far beyond an average crop, but, as the season advanced, the trees were found to be bare of fruit. We had no severe storm such as devastated the trees in Annapolis and King's Counties.

4th. What varieties suit your locality best, and are most profitable ?

We have now the names of 146 varieties of apples grown in the county, in addition to which there are numerous seedlings and others of recent introduction, not known to the writer. The conditions of soil, temperature, shelter, and sunshine vary greatly in different parts of the county ; on the shore, within the influence of the cool and salt sea breezes and fogs, but few varieties do well. Of these, named in the order of usefulness, Keswick Codlin, Oldenburg, Gravenstein, Waganer, Ontario, Northern Spy, Winter Greening, Easter Pippin, Sweet Bough, Grimes' Golden, Golden Sweet, Acker, and Wealthy are best. Inland, most kinds succeed fairly, but Red Astrachan, Major or Andrew's Sweet, Gravenstein, Grimes' Golden, Ontario, Northern Spy, Fall Jennetting, Baldwin, Ben Davis, Gavel Pippin, King of Tompkins Co'y, Ribston Pippin, Yellow Bellefleur, and Wealthy are the most popular and profitable.

5th. Instance of largest crop, age and name of tree, soil, name of grower, &c.

Robert P. Kelly, Carlton, Yarmouth County, gathered eleven barrels of marketable apples in 1886 from a Fall Jennetting tree 20 years old ; soil, clay and gravel, underdrained with stone, top-dressed with stable manure, poultry manure, bone dust, ashes, &c., pastured with sheep and pigs. Mr. Kelly has 12 acres in apple trees, average crop 250 to 300 barrels ; not more than one quarter of the trees yet in bearing ; sells in Yarmouth at $3.00 to $3.50 per barrel ; sold Swayzie Pomme Grisi this winter at $5.00 per barrel.

Nelson Corning, Jr., Chegoggin, gathered 25 bushels No. 1 apples from two Fall Jennetting trees (supposed 25 years old) in 1890 ; from one Baldwin tree, 10 years planted, 3 large barrels and one half bushel, large, highly colored, fine apples ; from one Major Sweet tree, in 1890, four and one half barrels. Mr. Corning's orchard is on the western slope of a side hill, in grass, not much looked after ; owner too busy with other work ; average crop in 1892, 125 barrels.

T. M. Ryerson, Carlton, gathered, in 1888, seven barrels from a Golden Sweet tree, top grafted in 1868, and in 1892 five barrels from a Gravenstein tree, top grafted in 1872. Soil, a gravelly loam, crop in 1892, 50 barrels ; average crop, 250. Keswick Codlin and Oldenburg bear enormous crops, seemingly larger in the cooler, coast regions, than inland. The Oldenburg, in especial, is unable to carry the heavy

crop of fruit it bears, and the trees never get large, in consequence of the annual breaking off. The fruit is of fine flavor for cooking purposes, and always saleable in the nearest market. Ontario is an annual bearer of large, even-sized, sound, clear apples, that keep until May or June, as grown here, do not rank highly as a dessert apple, but in Ontario are rated among the best, even for dessert.

There is no average in growth and productiveness of apple trees, and calculations of probable crop, for 10, or 15, or 20 years, based on occasional yields, are misleading. The writer has Gravenstein and other kinds, twenty years planted, large enough to bear barrels of apples, that, owing to unfavorable position, and too much wind, are absolutely barren. The same varieties, within a stone's throw, but sheltered, are productive. So in growth, among a hundred varieties, a few take the lead, and there will be some as remarkable for slow as others for strong growth. In a few kinds received from Wisconsin in 1884, as root grafts, Acker, a seedling of Oldenburg, is wonderfully thrifty and productive, began to bear in 1890, and has borne each year an annually increasing crop, fruit fine looking and keeps rich, sound yet, but drops badly in October. Salome, greatly extolled when planted, an Illinois seedling, fruited in 1892 ; fruit the size of a small crab, and no better. Shiawassee Beauty, after seven years growth, is not over five feet in height, and has not borne fruit. Princess Louise from Ontario, and a beautiful, highly colored apple, of fine quality there, is a good grower, and comes early into bearing, So far the fruit is not of any merit grown here.

6th. What progress is being made in the cultivation of pears, plums, cherries, grapes, peaches, quinces, and small fruit, and what sorts of each prove most reliable ?

Pears have not been grown with success anywhere in the county, but a few varieties are still planted every year, and some may yet be found to be of value. Now and then a warm, sunny summer gives a crop of pears that mature, but, as a rule, pear trees are worthless. The same of plums and cherries. Against an eastern wall, properly trained and cared for, they do well, especially the Bradshaw plum, but, in the open ground, both usually fail. Black Knot of late years has proved a serious evil, and, with the caterpillars, has nearly vanquished the wall fruit trees. Grapes cannot be grown in the open air in any part of the county to be edible. Large crops of the finest foreign grapes, chiefly Black Hamburg, are grown in cold graperies, of

which the number is increasing every year. There is no market for the product at a price to pay cost, and as the market, at home and abroad, is supplied with California and native grapes, at so low a price that there is no demand for foreign grapes, except in small lots in mid-winter. The Schumacher peach grows well at Carlton, bearing large crops of fine peaches, ripe the last of August. This is the only variety so far known to mature edible peaches in this county. Quinces are grown by a few, and succeed fairly.

In small fruits, there is a rapid increase in area under cultivation, chiefly of strawberries, stimulated by the facility of reaching the Boston market in good condition four times weekly. On the 12th July, just after the beginning of the season, (17,000) seventeen thousand quarts were shipped to Boston by steamer. One grower expected that his crop from two acres would realise one thousand dollars. Charles DeWolf, Yarmouth, advises me that his crop netted him over 19 cents per quart box the season through ; from one half acre he shipped 1,568 quarts, and received net return ($300.00) three hundred dollars, variety chiefly Charles Downing ; a few Sharpless. Mr. DeWolf ships only perfect fruit in full sized quart boxes, in cases that are returned. Each picker is required to use two boxes, and to throw all small, soft, and imperfect fruit into No. 2 box, putting only the best fruit in the shipping boxes. One or two hands are kept in the receiving house, constantly at work, during the picking season, inspecting, removing any inferior berries that escaped the notice of the pickers, and tastefully facing the top layers, hull down, at the same time aiming to have only first class fruit all through ; the second class fruit is sold at home to fill orders for preserving, &c. Mr. DeWolf sometimes gets ten cents (10) *more* per box for his strawberries than other shippers by the same boat, who have not learned the need of care. In this, as in all fruits, large and small, the profit is thrown away at the very gate of success, through want of honest, careful packing.

Mr. DeWolf's half acre plot is in matted rows, mulched with rushes, swamp grass, &c., the plants are set in the spring, 3 feet × 2 feet, the runners allowed to root along the rows, plants not permitted to bear fruit the first season, yield fair crops for four or five years in succession, the plants gradually filling a 1½ foot space, an equal space, 1½ feet, left for the pickers.

Gooseberries, currants, and raspberries are grown in nearly all the gardens of the town successfully, and some few grown for the market. A large number of English varieties have been tried, of which Yellow Amber is an easy first. Other kinds are Whitesmith, White Champagne, Old Rough Red, Warrington, Crown Bob, Sulphur, Keen's Seedling, and Industry. Two year old plants of these and other kinds are imported in hundreds, at a cost, including all charges and commission, of $9.00 per 100. Several American varieties are also grown, and are quite as good for preserving. Fay's Currant has proved of little value in my garden, and, of several kinds of red currants, the Old Red Dutch is best. No black currant, Lee's included, yields a crop. Of red raspberries, the Red Antwerp alone has proved of value, hardy, productive, and of fine quality. Yellow all too tender; fail to bear crop.

7th. What insect pests diseases and remedies.

With the increase of orchards comes increase of insects and disease. In my early reports on fruit growing, I could say we had not ever seen the Black Knot or the Currant Worm. These are now prevalent throughout the county, but are kept in check by cutting off the former, and by the use of hellebore for the latter. I have never seen the Curculio, or its work on our plum trees; nor have I ever seen any wormy Yarmouth apples, from which I infer that the Codling Moth has not yet found its way here; nor do we often see the Tent Caterpillar. More frequently in alder growth than on apple trees; it does not seem to increase. Our cold, damp climate is not favorable to insect growth and propagation. Only last season the Potato Bug reached us, being reported in small numbers in several widely separated localities in the county. The Bark Louse is very prevalent, and, like "Pusley," is fearfully "propagatious." Scrape and wash with potash water, soft soap, &c. Canker is a serious disease with many varieties of apple trees, and is said to spread through spores like Black Knot. Cut off and burn, seems to be the only remedy.

CHARLES E. BROWN.

Yarmouth, 21st January, 1893.

Resolved, That the Report of Fruit Committee, as read, be received and published in the Annual Report.

The business of the session being completed, the Association adjourned till 2 o'clock.

AFTERNOON SESSION.

The Afternoon Session was called to order at 2 p. m., and Prin. H. W. SMITH, of the Nova Scotia School for Agriculture, addressed the Association as follows:

ADDRESS BY PROF. H. W. SMITH.

Mr. President, Ladies and Gentlemen:

Mr. Starr said he wished to hear from me in reference to fruit growing in some parts of the province, from which he was not able to get any material, so I will speak of the counties where fruit does not grow. During the past two years it has fallen to my lot to travel over nearly the whole province, giving lectures, or in connection with the School work, and I was struck with the enormous increase in the growth of small fruit in counties such as Cumberland, Colchester, Pictou, Antigonish, and throughout the Island of Cape Breton. In many of those counties, not only are the ordinary small fruits, strawberries, currants, and gooseberries, being cultivated more extensively than ever before, but there are numbers of plantations of cranberries of considerable size. In the vicinity of Truro, where the School of Agriculture is situated, a number of apple orchards have been set during the past few years; also some plum orchards and a number of small plantations of fruit, such as cherries, &c. Of course there is no attempt at raising the tender fruits. One thing has struck me quite forcibly, and that is that our summer fruits become, more or less, winter fruits in those localities. This suggests the kind of fruit that should be grown in those localities. It is difficult to reach those people and to convince them that fruit growing can be made profitable in these counties.

I wish to invite the Fruit Growers' Association to hold a meeting at the Provincial School of Agriculture, in Truro, during March. We have built a new school building, and we propose to have some meetings in connection with the opening of the building, and I would like to see the two Provincial Associations—the Fruit Growers' Association and Dairymen's Association—hold some special meeting in Truro in connection with the opening. The exact date has not been determined, but it will be sometime in the early part of March.

And at that meeting would be a good opportunity to bring up anything new in the way of legislation.

The School of Agriculture, as you will remember, was established something like eight years ago. It came into active operation some seven years ago, and for three years it had to work in one room in the basement of the Normal School in connection with that institution. It grew and survived, and I may say that it has grown under the patronage of the Fruit Growers' Association of Nova Scotia. Three years ago a farm was purchased for it; we have had possession of it for nearly four years, and since then we have been working on broader lines. A year ago it was decided that the institution should have a building of its own in which to impart information to the sons of farmers, and there has been erected during last summer a school building for the School of Agriculture on the farm. The farm is situated within eight minutes walk of the town of Truro; about fifteen minutes walk from the station. The farm is on a part of "Bible Hill" across Salmon River, from the town of Truro proper. This farm and building have been erected for the purpose of benefitting the farmers of this province, to teach the young men to farm more intelligently. This school has three stories devoted to school purposes. In the first story is a laboratory for the study of chemisty. The room is about 40 × 20 ft. It is fitted up with desks, where the student studies chemistry; not books in the ordinary acceptation of that word, but he can become acquainted with the chemicals themselves, and he can take the different chemicals and different fertilizing materials and become acquainted with their action. First, he learns their general character. On the same floor is a room about 20 feet square devoted to anatomy, particularly the domestic animals. In that room he dissects various domestic animals, and becomes acquainted with them in that way. On the next floor—the first floor of the building as you enter from the main entrance—is another chemical laboratory where the analysis of the different agricultural products is performed; where the student can analyse the different fertilizers, manures, fruit, etc.; besides that, there is a third laboratory room, fully equipped, and in good working order. On the next, third and top floor, is a room in which the student can devote himself to the study of insects, and of botany in its broadest sense, the various diseases of plants, and all the lower forms of plant life; also, some of the lower forms of animal life, as well as the study of insects, which

the room is particularly devoted to. Those rooms are 35 × 25. They can also be thrown into one large lecture hall for public meetings. In respect to the fittings, I do not think that any young man or farmer's son can find access to as well equipped laboratories for the study of agriculture and the sciences relating to it elsewhere in this country. He may find more extensive rooms, but not better equipped for the work, and, more than that, he has access to these absolutely free.

In reference to the work in which we have been engaged, suppose we take a walk on the farm to see what experiments we are engaged in. Starting from the school building, on the east, we would come to some plot experiments. Those experiments were undertaken first with a view to find out what chemical fertilizers our soil particularly needs. When we say our soil, I am speaking of the soils of a good part of Nova Scotia. The farm has a sub-soil of red sand stone, with which you are all familiar, and apparently the soil is very much of the character of the soil which composes a good part of our dyke lands. It is a very fine impalpable powder, and in this location very similar to the marsh lands at the head of Cobequid Bay, but quite different from some of your marsh lands here. By careful analysis of that soil, and of a sample of the dyked soils which have been made up in King's County, it is a fair typical sample of the essential character of the soil of Truro. They are similar in this respect, that they both contain a certain mineral which is known as zeolites. If you go along the top of Blomidon you will see in any of the crevices some very beautiful crystals, usually of a yellowish or greenish tint, which compose a considerable part of the rocks there. Some of the finest specimens I have ever seen came from Blomidon. This is one of the most valuable constituents of all agricultural soils. In this respect your marsh lands are so valuable on that account particularly. This substance is found in the soils at Truro, and offers to us a very interesting source of study. Now, these plot cultivations were undertaken to find out what fertilizers we should apply, and how they were going to operate. I duplicated experiments in other locations on the farm. The soil is of the same formation throughout the farm. The result of the experiments you can find detailed in the different reports which I have made to the Secretary of Agriculture. Suffice it to say that we found that certain crops flourished with phosphoric acid, which is an essential fertilizer

to use. That with other crops, potash gave particularly good results. We also found that nitrogen gave particularly good results. And those three constituents gave marked results with different crops, and sometimes a third compound gave three times the result of any of the three.

We left some of these plots without applying any fertilizer, and gave them certain kinds of treatment, and certain kinds of ploughing, and we got other results. In one particular place it gave something like twice the yield, and this last year, or third year, it gave 40 bushels of wheat to the acre. It had no fertilizer of any kind whatever in those three years, and yet it increased steadily in the yield. Usually when a crop is taken off it gets poorer. The history of the soil simply is that it had been in sod eight or ten years. We ploughed that in the spring the first year, and sowed spring wheat, two bushels to the acre—it came up thick, and we had a fine growth of wheat when it was growing at different stages, but it resulted in a lot of straw, and very poor grain. The second year we cultivated barley. You will remember the misfortunes our barley crop was suffering from. You will also remember the red rusty appearance, on account of the sudden change from the cold weather to hot weather in July. The barley came up about as thick as wheat, and began to grow thin, and some of the plants disappear. You could go along and see the little leaves, but not so many as usual, and, considering the season, we had a fair crop of barley. We took from that piece last year wheat—the same kind of crop I had on it the first year; on that plot I had 30 bushels in round numbers. It came up thick, and it stayed thick, and very few of the young plants died.

At Cornell University they have been experimenting lately with the wire worm. They are little straw-colored insects which you might call worms. They are yellow straw color; little hard budded affairs made up of lumps, and usually with more or less of a hard covering. They took some of these wire worms and placed them in cages—in a cage made of two pieces of glass, and filled in between the glass with earth and then scattered seeds on top of the soil, and covered it all over so that nothing could escape. They could see through the glass the worms crawling in the soil, and saw them eating grain and roots, kernels of wheat, &c. But they found out something more—that they had a better appetite in the Spring than in the Fall; that they eat more before July than after, and, like all larvæ, they shed their

skin and moulted—the skin would break off, and the worm crawl away, and by careful observation it was found that it took about three years before these insects transformed and became a complete insect. When these worms are transformed they become these little black click beetles, or snap beetles. Those beetles which, when you knock them on their back, they snap and come to their feet again. And these wire-worms eat all the ground and tender sprouts and seeds. But what bearing did these insects have on the soil? Why, the soil had been in grass for a number of years, which enabled these worms to thrive and grow. That soil cut the first summer at half a ton to the acre, and last year I divided some of these plots up, and there was a product of three tons to the acre. And the point I wish to make is this, that the soil was not poor in the sense that it was exhausted; it had hay on it for 8 or 10 years, but only half a ton to the acre. But that same soil, without adding any fertilizer, had been getting into a condition that it yielded 30 bushels of wheat, and three tons of hay. That does not look like exhausted soil. Why was it? It must be because those wire-worms had been eating at these roots, and for some reason or other there could not have been so many wire worms the second year, or as many in the third year as there was in the second year. That land was ploughed in the fall, and in fact every fall from the time we purchased the land. What has that to do with it? Those little clock beetles hatched their eggs, and the larvæ was lying in the soil three years, and along about July this larvæ passes through what is called the pupal stage—it is the condition in which the butterflys become before they are butterflys,—when they pass through the pupal stage they make a cell; make a round, smooth place when they transform, and when they transform they are very tender, soft, white affairs in this little cell, and if the ground is broken up then they are very easily destroyed—if the cell is crushed,—and more than that, if the cell is not crushed the frost kills.

Our greatest crop is hay, and why is it that our hay lands run out usually in a few years? I am speaking of upland. It strikes me as the reason, because of the abundance of these wire-worms in the soil, and if fall ploughing is persisted in it will destroy them. I have no doubt that fall ploughing destroys other insects as well. We have the experiment still in operation. We have pieces of land which have not been disturbed for 15 years. Next Spring we will take a cubic

foot of that soil, or more, if necessary, and we will carefully sieve it, and count every wire-worm and insect in it. We will also do the same with land three years, two years, and one year old respectively, and compare results, and I hope we will get something interesting from it. I may say that other parts we are treating in other ways, and analyzing the soils from year to year to see the effect of the different treatment of commercial fertilizers and manure on the soil, and so on. I try to grow as many varieties of crop as possible. The crops that we have grown this year was beans, peas, maize, barley, oats, rye, and all the various roots that we can raise here to any profitable extent. I would urge upon you to call and examine the school, and see if it is not worth while to send a young man there who intends to be a farmer. I would be pleased at any time to show any gentleman over the farm, or my superintendent, Mr. Fuller, would also be happy to do likewise.

A. M. HEMEON.—I wish to speak of a worm which is very destructive in the State of Massachusetts. It has been very destructive in my garden—they will destroy potatoes if left in the ground too long.

MR. SMITH.—It is the mille pedes—they have a great many legs. The destruction by these worms has been seriously investigated, and I do not recollect now a single remedy. Further than that, they are found in land continually cultivated, as well as abundant in land that is not cultivated. I wish I could offer you some assistance in the matter, but cannot.

PROF. CRAIG.—I cannot corroborate your experience in the matter. We have never been troubled with the mille pedes in Ontario or Quebec. They furrow in the ground for the winter, and, for a general remedy, I would recommend fall ploughing, so that it would bring the insects to the surface, and lay them open to the action of the frost, which would kill them. Of course, they would stand a certain amount of frost.

MR. COLLINS.—I have had considerable experience, and have known crops to be entirely destroyed, and I would like to know why some soils were fitted for these worms more than others. I know it is the case.

PROF. SMITH.—I think I have noticed that they are more abundant in the lighter and brighter soils, and I think that our marsh

soils has suffered considerably from them. It may be the salt in the moisture. I am looking forward with a good deal of interest to the results of the examination of those soils, which I am engaged in.

A. McN. Patterson, Principal of Acacia Villa Seminary, at this point read the following paper :

FRUIT TRANSPORTATION.

This is the most important subject that can come before this Association at the present Session, and I wish a much abler and better informed person had its introduction in hand, but I shall simply hope to open up the matter, and draw out the discussion.

Some may say that this is not a proper subject for this Association to deal with, and does not belong to its duties. This, in one sense, may be correct, and, in another, far from the truth. Apple growing in Nova Scotia has become a very extensive and important employment along this valley, and the apple is now our most important staple product. The money brought in by the sale of our apples has a vast influence in all our other interests. When the returns are small there is a perceptible stagnation in our business, and, when sales are good, there is a decided impetus given to all our engagements.

Suitable and possible returns would give a new life to this Association, would exercise a depressing effect upon our insect pests, and the dreaded fungi, would underdrain our fields, increase our orchards, and make this valley a paradise. But such is not our fate under present conditions, this very autumn two of our largest shipments, comprising over 20,000 barrels of our best fruit, were almost thrown away, a loss to the fruit growers of not less than $40,000, and this owing chiefly to improper transportation. It may be said by some that this was an isolated instance, and not by any means a specimen of our shipments. I think the observing mind, and the man whose pocket is most effected by these events will not say so ; that which operated so disastrously in these two cargoes has been taking place in a modified form all along our shipments, and gradually undermining our reputation in England and our source of wealth at home.

The words "slack and rotten" have marred the face of our account sales for years, and there marks of Mr. Whitman last evening were alas ! too true ; our apples arriving on the market in such bad shape has reduced the profits of the business, and our fruit will

not obtain the price which it would have done under more favorable circumstances.

We ship to Britain annually from 80,000 to 100,000 barrels of apples, and we are safe in asserting that from our neglect we lose that many dollars each year in our present manner of shipment. Yes, a yearly loss to our valley of $100,000 is no exaggeration by this immense and continued folly; our present practice is most singularly unbusiness-like. The commission men who sell our apples in Britain have their agents here to look after their interests, the ships that carry them have their agents, actively looking after their interests, but where is the agent of the farmer? Who is looking after his interests? The armer has no representative in this business whatever. It is only a wonder that it has done as well as it has. We have left our fruit to be handled and managed by these merchants and ship agents, just as may suit their convenience and give profit to their own business. I do not complain because these men attend to their work. I simply say, that it should take two to make a bargain, the producer should have his say in the management of this matter, especially when he has to bear the whole of the expense. Why, fellow producers, just look at this matter. You have not one word to say as to how much freight you ought to pay, how your apples should be cared for on the passage, how they must be handled in loading and unloading, how they should be sold, or whether your returns are correct or not. Bills of lading have no meaning whatever as to our fruit being delivered in good order, they simply mean that we are compelled to pay the freight even if the apples are knocked about in the most destructive manner, and many half barrels eaten.

The simple truth of this whole subject is this, we are passing our apples over to other parties to do with them just as they please, pay themselves well for their trouble, and hand us what little balance may remain. Why this matter, when you really think of it, is superlatively ridiculous. The trouble is not, that there is a subsidized line of boats, but simply we are not looking after our own business.

Since this subject was delegated to me to bring before you, I have talked the matter over with some of our best thinking and practical men, and all without exception have supported the idea that we, as producers, need to combine our interests, have our own managing agent completely under our control, and fully separate from other agents in this business, and we can have just such a form of trans-

portation as we think best. $100,000 a year in freight for a few months of the year, and with prospects of enlargement, is sufficient to attract the attention of our ship owners and ship agents.

Gentlemen, whenever we show a well formed, determined, business-like front, then we shall be consulted as to what we require. But remember, we will never get it until this is done. What we should do at this very gathering is to resolve to form "A Fruit Growers' Shipping Association," and call meetings at Canning, Kentville, Berwick, Middleton, Bridgetown, and Annapolis, to bring this matter before our people, and urge them to action. Our people will not join such a combine unless they are instructed as to its necessity, and also they must feel assured that it is not to become the machine of some particular individual who has an axe to grind.

The producers must unite and make themselves felt as a strong body of men who are determined to have their apples placed on the market in proper form. Let them select three men, and give them authority to act for the Association. Let these advertise that they have 8,000 barrels of apples to send to Britain each week after a certain named date and on certain conditions, namely, that the fruit must be kept cool by a proper system of ventilation, and carefully handled and not affected by other cargo, and ask for tenders for this work, and it is quite certain that it will call the attention of ship owners, agents, and builders to this subject, so that we shall not only have our fruit placed properly upon the market, but the expense of freight, &c., very materially lessened. However, I do not think the great object to be attained is so much the lessening of our expenses as the placing our apples on the English market in their superior excellence and beauty. Yet this reduction of expenses must not be overlooked, for it very materially affects the returns. I found in my own shipments that the sales of my apples in Liverpool were about the same as my sales in London, and yet the returns were very much better from Liverpool, owing to less expenses. Now it may be thought that this employing three agents to act for us here would be a large increase in our expenses, but it would not, for five cents per barrel would be fully sufficient for all our expenses. We must remember that five cents per barrel on 50,000 barrels, which is about the half of our shipments, means $2,500. To object to an agency on the score of expense is to be penny wise and pound foolish. I say three men or three agents, because it is too much labor for one.

Every cargo should have an agent on board of it, at least, until we get the exceedingly loose business into form, and also the sales on the other side should be studied so that we may know something as to the best form in which to put up our fruit, and also as to the correctness of our account sales when we get them.

Business properly and profitably done is business that is carefully looked after by the proprietor. It is not the proper thing to say that men moving in these high circles are above suspicion. History does not prove that the high strata of life is either more virtuous or more honest than the humbler walks of life. You must remember that where temptation is very strong there is a great liability to err. An individual handling 50,000 barrels of apples might think that ten cents on the barrel was not much for each producer to lose, and it would give him $5,000. This would be a strong temptation to human nature in America. I am of the opinion it would be equally so on the other side of the Atlantic.

If I should say this is done, there is no person among us that can prove it is not done, and not ten cents alone, but even to fifty cents, the temptation for $5,000 is increased five fold and becomes $25,000. The fact I wish to reach is this, we know absolutely nothing about our business on the other side of the Atlantic. We do not know whether it would pay us to box our fruit and crate it. What size our packages should be to meet the best sales. In short, we not only know nothing, but we seem perfectly satisfied to sit down and nurse our ignorance. The Australian away in the South Temperate Zone on the other side of our earth, can send his fruit miles through the scorching heat of the Torrid Zone, and place it in better condition on the English market, than a Nova Scotian does who has only to send it 3,000 miles, and that along almost the same parallel of latitude in which it was raised. We want our agents to go to London and Liverpool, and study our business, and find out all about the Australian methods. We want also to know if, instead of running all our shipments into London and Liverpool, if a cargo into Bristol, Hull, Dublin, and other ports would not distribute our fruit much better. A gentleman told me the other day that one of his sailing ships was loaded for Bristol, and he had a few barrels of rough scrubby apples that he did not know what to do with, so he sent them in this ship to Bristol, and received $3 per barrel for them.

There is much I wish to say further about this very important subject, but I must not take time from others. Let me just say in closing, we have in our hand one of the most pleasing, interesting, and money-making employments that can be found in honest toil on the face of our earth. It needs development, it wants, on our part, some enthusiasm, push, and enterprise. The apples of the Cornwallis and Annapolis Valley should be as well known in every part of the world as the Nova Scotian himself, or as the Spanish orange. Their beautiful clear bright skin, their wonderfully agreeable odor and flavor, distinguish them as the much desired fruit. When we consider that each good apple tree is even now producing what is equivalent to $50 on interest, and every acre is capable of producing 40 such apple trees, therefore it is an easy matter for every young man to have $2,000 at interest for every acre of good land he can possess. Why this apple raising and orchard business is worth more than we can estimate if only properly looked after. There is plenty of land for all our young men, and there will be no difficulty in settling all our sons in our own country.

MR. CHASE.—I have listened with a great deal of pleasure to many of the remarks made by Mr. Patterson, which shows that he has had considerable experience in the matter of shipping fruit. There are some points in which I scarcely would agree with him, but, on the whole, the means of transportation of our apples to foreign markets is a matter that requires very serious consideration. When we can show that we have a sufficient quantity of apples to ship we will then have better facilities for transporting fruit, but at the present time we are somewhat hampered. I am not going to refer specially to any political point, but I do think that a subsidy granted to any one line of steamers is prejudicial, as other steamers cannot engage in the same business, and this has precluded other lines of steamers from calling at Halifax, which is our proper point of shipment. We never had better facilities for shipping fruit than when we had the Anchor Line with such steamers as the "British Crown," etc., which were in first class condition. It is difficult to offer a solution other than, as I said before, as our quantity increases, when the quantity of freight offering is sufficient to induce competing lines to call we will get better facilities. I am somewhat doubtful whether our gravensteins can be ever successfully carried in large quantities to

Great Britain, and there find a suitable market. They go on the market in competition with their own fruits, thus making a surplus of fruits, whereas, such a tender fruit should find a market nearer home, such as the neighbouring republic. Such hardy varieties as Kings and Ribstons would seldom suffer seriously from transportation. In case of any accident to the steamers, of course a few days delay to gravensteins means utter loss, as many can vouch for in the experience of this year. The question has been brought up, how our fruit is handled in selling on the other side. I hold that the people have been looking after their interest to a certain extent—things have not been allowed to run as almost would have been inferred from some expressions here this afternoon. Of course, if we had this competition which I have referred to we would then see our fruit handled in better form, as the old rule that competition is the life of trade holds good in this where we have but the one line, and they know that it is the only means of transportation, they are not as particular as they should be, while on the whole, they have given a great deal of care and interest, and have gone as far as they could. I refer to Pickford and Black, who endeavour to meet the requirements of shippers. Of course, from a business point of view, they get all they can in the way of freight. We also find different kinds of men engaged in the fruit business, men who will render every shilling that the fruit brings, and of course, there are men engaged in that business who should not be trusted. It is an essential thing in any line of business to know the man with whom you are dealing. If a stranger comes among you soliciting shipments of fruit, you say to him, "Yes, we will send you a trial lot," or, "Give you a few," without making the slightest enquiry in that respect. They give him a trial, and it may be that the first returns are first-class,—they invariably are—but it is in the later shipments that the complaint comes back. Reference was made to forming a combine in the shipment of fruit. This is an age of combines. Perhaps this might be the solution of having our fruit better transported, but I will not dare to trespass on this ground.

A. WHITMAN.—I am glad this subject has come up. I think the paper read by Mr. Patterson is good one. I think this is certainly a subject of great importance. I do not approve of shipping in the months of January and February. For instance, I would like to

know why it is now in the month of January, according to the cable reports, that the prices are lower for the winter fruit than they were in November and December. We should also look at the condition in which the fruit is shipped. We have been paying too high prices for freight. The subsidy has been against us. A great deal has been said about a warehouse in Halifax. This is a subject worthy of consideration.

MR. CHASE.—This matter of shipping apples is only for some two or three months during the year. You are apt to forget what these steamers are doing in the intervening time. If you could invite a real good line of steamers, and offer a sufficient inducement to call at Halifax, they would surely come. Pledge them a certain quantity of fruit, and you will bring good steamers into Halifax. I remember last year talking to a friend of mine from New York who was down here. This gentleman was connected with a large steamship line. I asked him if we could not induce one of his steamers to call at Halifax. He replied, "If we could not get a large quantity we would not waste our time." I said suppose you get 40,000 barrels, but he said that was not enough ; it is not the small quantity in which money is to be made, but in a large quantity. If the people in this valley will only redouble their efforts and grow more fruit, as time goes on, our markets will extend and increase, and I would say to Mr. Whitman, in regard to the lower prices, that that must be a mistake, and there is no reason why it should be. I think this matter of a a warehouse in Halifax is a very important one indeed. It has been tried as an experiment in Annapolis. The proper way is to have the apples in good condition going forward, and to have a man go forward himself to see that they are put on the steamer properly. It is attending to these details that will bring success in this fruit business.

MR. PATTERSON.—The ocean is full of steamers taking fruit, and they are ready to come if they can pay the wages to their men. If we say stop till we get more orchards, why, we want the proceeds of our orchards here now. Would you tell me that 100,000 barrels is not enough to commence business on. I like the spirit manifested by Mr. Archibald. The Americans come here and tell us "Why don't you put up your tomb-stones at your front doors."

MR. A. WHITMAN.—According to the cable reports apples are certainly lower than they were in December. I shipped part of my

winter fruit in December, and Baldwin's sold for 16s., and the report is now that it is 10s. to 12s., and I met another shipper the other day and he said his cable had put it at an average of 10s. I asked him if that held good for the whole lot, and he said he understood it so.

Resolved, that the thanks of the Association be extended to Mr. Patterson for his valuable paper, and that it be incorporated in the minutes.

At this point MR. A. J. PINEO was called on, and read the following paper :

COMMERCIAL ORCHARDING.

Forty years ago orcharding, as an important source of revenue, was scarcely dreamed of even by the more advanced agriculturalists of Nova Scotia. The farmer who was in possession of a few apple trees in bearing, and was able to shake off sufficient fruit for his own family use, considered that he had reached the natural and legitimate limit of the business. There were few apples raised, the quality was poor, and the markets did not make any large demand for that kind of a product. But time has wrought mighty changes in fruit growing. Some of the older members present will be able to make more vivid comparisons between those earlier days of orcharding and the present achievements in that line than I can do. But with all that has been accomplished in the advancement of this great industry, fruit growing in Nova Scotia generally, and even in the Annapolis valley specially considered, is yet in its infancy. True, the Annapolis valley has gained a reputation almost world-wide for the superior quality of its apples and the productiveness of its orchards, and so it may seem fanciful to some to say that the industry is here yet in its infancy. But with all that has been accomplished I firmly believe that there lies not before any other industry yet attempted in the province such stupendous possibilities as belong to the raising of apples and other fruits. We see much in our papers regarding the influx of some millions of dollars of American capital for the purpose of developing more fully certain coal areas in our province, and the matter is deemed of sufficient importance to warrant the calling of a special session of our Legislature. We are frequently reminded of the vast wealth that this province possesses in its coal mines, in its iron mines, and in its gold areas, but I am convinced that the grand possibilities that lie ahead of the fruit growing industry of this province

far outweigh those of all these other natural sources of wealth combined. Why just look for a moment at our geographical position. Hunt up this little peninsula on the map and you will see that even if nature had not endowed us with transcendently favorable conditions for fruit growing we can easily compete with all other apple raising districts in the world in our accessibility to the best markets. We are nearer London, with her teeming millions of consumers, than is New York, and much nearer than is either Ontario or Australia. The British Isles, the overcrowded continent of Europe, and the seaboard cities of New England are all within easy reach of our shipping ports. And these markets are practically unlimited. Multiply our present meagre output by 100 and you will only have made a beginning of satisfying the demand. But what of our capabilities in this direction? It is generally conceded that there is no more favorable district in the world for producing apples of finest flavor and appearance than the Annapolis Valley. But let any one drive through even the best agricultural sections of these two counties, or stand upon some commanding point on either of the ranges of hills that bound our valley, and observe how small by comparison is the area yet devoted to this great industry. He will see thousands of acres of the best orchard lands in the world still devoted to grazing purposes, or yet covered with the primeval forests. Then let him by simple computation reckon the production of the valley when all these unimproved lands shall be clothed with bearing apple trees, and one continuous orchard shall stretch from Windsor to Annapolis. Then let him keep in mind that there is throughout the other counties of the province perhaps ten times this area on which apple trees can be successfully grown, and he will gain some idea of the immense production that is possible to us. And this possibility will doubtless be in a large measure fulfilled. Great as has been progress made in fruit growing in this province during the past forty years, it will pale into insignificance when compared with the progress that will mark the next four decades. With all the disadvantages that have attended the fruit growing industry in the past, such as excessive freight charges on shipments, ignorance of the conditions of the markets, dishonest consignees, not to mention unsuitable varieties and defective methods of cultivation, there is no business on earth from which the element of risk is so largely absent, that will give an equal profit to the investor. There are hundreds of orchards in this valley that are giving their fortunate

possessors from 50 to 100 per cent. profit annually on their cost. There are hundreds of farmers throughout this valley having each from two to ten acres bearing apple orchard who are able to live in independence and even luxury with small source of income besides. These men, or their predecessors, were induced a few years ago by the irrepressible tree agent to invest in a few apples trees, with the above results, and their unanimous lament now is that they did not listen with more confidence to the seductive voice of that individual, and plant ten trees instead of one. Capital, like every other element of nature or society, is always seeking favorable conditions, and when our monied men come to investigate this industry a little more closely and convince themselves, as they can easily do, of the great profits to be derived from it, there can be no doubt as to the results.

But orcharding, as a commercial enterprise, is even now forcing itself upon the attention of our capitalists. These are beginning to multiply in their minds the actual results of the smaller experiences, and form their estimates of the larger results that follow a more extended prosecution of the business. They are coming to appreciate the fact that Providence has endowed us with vast capabilities along the line of this great industry, and that all that is required to achieve magnificent success is experience and capital. The latter they have, the former can be abundantly obtained from the membership of this Association.

Already a joint stock company, with its head-quarters in the very centre of this valley, has been organized, and will begin active operations next season. I refer to the Annapolis Valley Orchard Company, whose practical manager is the secretary of this Society. Associated with him in the management are some of the most largely experienced and thoroughly practical of our fruit growers, and, backed as they will be by substantial capital, there is no doubt that unqualified success will crown their undertaking.

And this is but the beginning. It is my prediction, the wisdom or unwisdom of which time will determine, that before a score of years shall have passed there could be dozens of such orchards throughout the valley and in other favorable sections of our province, owned by capitalists and managed on commercial principles.

What will be the effect upon the individval farmers and smaller orchardists? Certainly these will stimulate to larger efforts. The small orchards of four or five acres will broaden by yearly additions

to their areas, and the production, even outside of the commercial orchards, will increase many fold. The increased production will lead to a more careful study and better understanding of the markets, and to organization in the matter of shipping and marketing. The Nova Scotia Fruit Growers' Association will then be something more than a society for the interchange of practical ideas on fruit culture, of inestimable value though its work in that direction truly is. It will probably be the medium through which the much desired organization of fruit growers for the purpose of shipping and marketing will be made. With its special agents in all the principal cities of Europe it will practically direct and control the greater part of the orchard output of the province. Better facilities for ocean transportation will be secured, so that our fruit will reach its destination in better condition, and more favorable freight charges will be obtained, which will leave a larger margin of profit to the producer.

But what about prices? Will not the enlarged production greatly reduce these and the profits to the producer? It is not probable that the fabulous prices that have in some instances been realized in the past will then be obtained, but neither is it likely that under the better organization that will then exist will shipments ever prove a loss. There is reason to believe that present prices will be lowered for we have only as yet touched, so to speak, the outside of the market. We know by past experience in our own province at what a pace the demand can increase. Occasional years of low prices, though of little immediate satisfaction to the fruit growers, have proved to be disguised blessings, as they have led to more general consumption and permanent enlargement of the market. In the countries that I have named as constituting a part of our natural market there is a population of some 350,000,000 of inhabitants, and as it has been the experience of the past that enlargement of demand in the apple market, as far as Nova Scotia is concerned at least, has always kept pace with the supply, we need have no fear as to markets or prices let our production be what it may.

Mr. Pineo's paper was well received, and after a short discussion, it was received by the meeting, and ordered in the minutes.

Prof. Craig, Horticulturist of the Experimental Farm, Ottawa, then favored the meeting with the following paper:

PROMISING VARIETIES OF THE MORELLO CHERRY.

Mr. Chairman, Ladies and Gentlemen,—I wish very briefly to bring to your notice some fruits which, in my opinion, have not received in Nova Scotia, and especially in this most favored of the fruit growing portions, that attention at your hands which their adaptability to your fertile soil and equable climate demands.

If I might be allowed to offer a criticism in regard to your system of fruit growing in Nova Scotia, and the Annapolis Valley in particular, it would be this, that, owing to the fruitfulness and longevity of your apple trees you have, in a measure, allowed the law of natural selection to run its course in regard to fruits, which has resulted in the cultivation of certain fruits being restricted to certain areas, as apples in the Annapolis, and cherries in the Bear River Valley. However, I think the minds of people are now pretty well disabused of this idea, and look upon it as a truth only when considered relatively. This belief will exercise a salutary effect on the progress of fruit growing in the province.

But, Mr. President, allow me to point out that the possibilities of your soil and climate should not confine you merely to apples, cherries, and plums, the latter of which I am pleased to note are now beginning to receive well-merited attention at the hands of intelligent planters. With such soil and climate I see no reason why the fame of your peach and pear orchards should not rival that of your apple orchards, with such excellent facilities for shipping, the raising of winter pears should prove a most lucrative undertaking.

But I have digressed from my topic, which is cherries, or more definitely that division of this class of fruits known as Morello cherries.

Cherry growing in Nova Scotia having been extended to such slight extent outside of the Bear River Valley, is probably attributable to the particular variety of cherry which was first introduced into that somewhat favored section. Its power of adaptability to varying conditions seems to have been limited, consequently the area of its successful cultivation was naturally restricted. We have been testing at Ottawa a large number of cherries, and have recently issued a bulletin covering our experience up to date, with the varieties which have been on trial. In this bulletin I have said that our "aim is to draw

attention to a class of cherries containing a number of varieties which appear to possess much value for those sections of the Dominion, where, by reason of the severity of the climate, sweet cherries cannot be grown profitably." This was stating the case in a very conservative manner, as I believe there are few of any places in the Dominion where varieties of the Morello cannot be grown profitably, even in competition with the finer varieties of the dessert cherries.

The following notes and illustrations are drawn from fruiting, either at Ottawa or at Abbotsford, Quebec :

Considered from a commercial aspect, cultivated cherries belong to one of two groups, which are outlined more or less roughly. Group I. includes Heart and Bigarreau cherries ; rapid growing varieties attaining large size, having much larger leaves than the next group, and bearing fruit, sweet and tender, as well as firm fleshed. The varieties of this class, as a rule, are not reliable where the climate is so severe as to prohibit peach culture.

Group II. includes Duke and Morello cherries. Formerly the distinctive lines dividing the Duke from the Morello varieties were drawn with considerable accuracy, but the rapid multiplication of varieties from seed, the probable product of natural crosses, has complicated classification so much, that of late years these two families have been generally grouped under one heading. The Dukes, as a class, are upright growers, with rather stout branches and leaves of moderate size, while the typical Morellos are round topped, with smaller leaves and slender branches more or less drooping. Intermediate forms are numerous, and it is a matter of some difficulty at the present time to assign to each new variety its true position.

It is unsafe on the strength of the results of a trial of a few years, to unqualifiedly recommend any of our tree fruits, the actual value of which can only be correctly determined by the experience of many years. The opinions here advanced should be considered tentative until confirmed or modified by later experience. Further investigation may reduce the number of varieties by showing that some here noted are not sufficiently distinct to warrant a separation from others which they closely resemble. At this time it is thought best to note such doubtful individuals separately.

AMARELLE HATIVE. (*Early Amarelle.*)

Received from Prof. Budd in 1887. It has made fair growth and thus far has not been injured by the cold of winter. It began fruiting in 1890, bearing the present year a full crop. Fruit large, obtusely heart shaped, with suture fairly well defined. (See Fig. 1.) Skin dark red, stalk long, slender, set in a deep cavity. Flesh well tinged with red, quite rich and juicy. Pit, medium to large. Quality

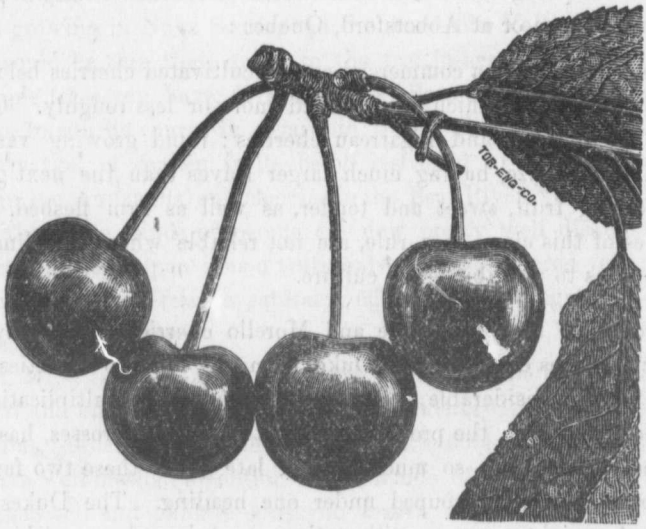

FIG. 1.—AMARELLE HATIVE.

good. Ripe this year July 10th. This variety would appear to be valuable on account of earliness and productiveness. The name would indicate French origin, but it does not appear in "Guide Pratique" of Frères Simon-Louis of Metz, Germany.

DOUBLE-GLASS (*Doppelte Glas*).—A very distinct type of tree of upright habit, with thick twigs and large prominent buds. Fruit of the largest size, heart shaped, with a deep suture. Stalk thick, 1 to 1½ inches long. Flesh yellow and firm, juice uncolored. Ripens towards the end of July. The above notes were made on fruit grown at Abbotsford, Quebec, where the tree was planted eight years ago. At Abbotsford it is not strictly hardy. Worthy of trial in Southern Ontario.

GRIOTTE d'OSTHEIM appears to be so closely allied to Ostheim as to render a description unnecessary. At Abbotsford it matures four or five days earlier, and is perhaps a little finer in quality.

FIG. 2.—GRIOTTE IMPERIALE.

GROS GOBET (*Montmorency à courte quene*). — Not hardy at Ottawa, but should be valuable as a canning cherry in Southern Ontario. Fruit large, borne in clusters; oblate, with a deep suture extending from apex to stem cavity. Skin bright red, stalk stout, $\frac{3}{4}$

to 1 inch in length with pit firmly attached. Flesh white, tender. For culinary purposes. Ripe the last week in July.

Minnesota Ostheim.

Speaking of the *Ostheim*, Mr. Gibb said, "I am told by Director Stoll, of Proskau, that this is a native of the Sierra Nevada Mountains, in Spain, where it was found at elevations of 5,000 and 6,000 feet, and that it was brought to Germany in 1687 by a German Professor, who grew it in the neighborhood of the town of Ostheim, whence its present name." That a number of varieties are represented by the family name Ostheim there is little doubt. Neither at Abbotsford, nor on these grounds, have Griotte d'Ostheim, Cerise d'Ostheim, nor the Ostheim, now found in trade catalogues, equalled in quality or productiveness the variety above mentioned. It seems to have been introduced from Germany by Mr. E. Myer, who settled at St. Peter, Minnesota, and brought with him sprouts of this cherry. (Iowa Hort. Soc. Report, 1881, p. 371.) Fruit much larger than Richmond, obtusely heart shaped; sature obscurely marked; skin dark red; when fully ripe a brownish black (see fig. 3); stalk two or more inches in length; flesh tender; deeply colored; quality good; pit medium to large; productive; maturing from July 15th to 25th. Tree of the round topped, half dwarf Morello type. This is recommended with a considerable amount of confidence in its future success.

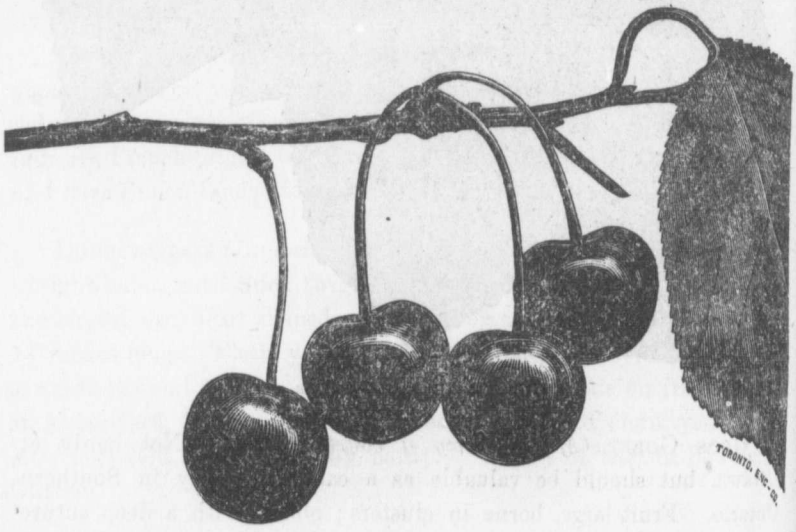

Fig. 3.—Minnesota Ostheim.

No. 18, RIGA.—This was introduced by Prof. Budd, from Riga, Russia. Fruit large, heart shaped, dark red; stalk long, slender; flesh firm, juice colored, pit small; quality good; ripening about July 12th; an attractive variety combining many good points. Tree resembles Ostheim, but is a slower grower.

WRAGG.

Mr. John Wragg, of Waukee, Iowa, informs me that this appeared as a sprout among a lot of Morello cherries purchased from Messrs. Ellwanger & Barry, Rochester, N. Y., twenty or more years ago. Its hardiness and productiveness attracted his attention. It has now become widely disseminated, and is doing well in many sections. Two of the three trees planted here have been injured by winter. In appearance and season the fruit resembles English Morello quite closely, ripening this year the first week in August. (See Fig. 8.)

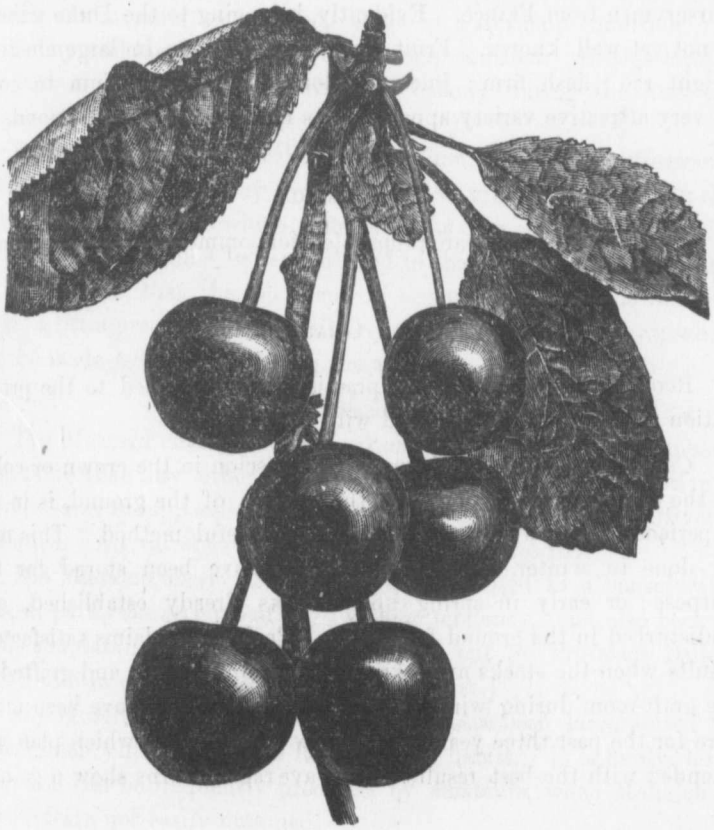

FIG. 8.—WRAGG.

Orel, No. 25.

Prof. Budd obtained from Orel, Russia, several varieties under number; these have been sent out in the same way. Varieties on trial include Nos. 23, 24, 25, 26, and 27. The following description applies to Orel No. 25, (see fig. 4) which appears to be the most valuable. Fruit borne singly or in clusters, large, heart-shaped; skin light red; juice uncolored; stalk an inch to an inch and a half long; flesh tender, very juicy, sub-acid; pit medium to small; ripe this year the first week in August, but fruit allowed to remain on the tree was in good condition August 15th. Tree is a vigorous, upright grower, hardy; an important addition to our late cherries.

Ostheim.—See *Minnesota Ostheim.*

Olivet.—This appears to have been introduced by American nurserymen from France. Evidently belonging to the Duke tribe, it is not yet well known. Fruit large, oblate, borne in large clusters; bright red; flesh firm; juice uncolored; quality medium to good. A very attractive variety apparently as hardy as Early Richmond.

Propagation.

Budding.—Cherries are propagated for commercial purposes almost entirely by budding.

Crown Grafting.

Root grafting, as ordinarily practised when applied to the propagation of the cherry, is attended with little success.

Crown grafting, which is inserting the scion in the crown or collar of the stock, at or a little below the surface of the ground, is in the experience of the writer a much more successful method. This may be done in winter, using stocks which have been stored for the purpose; or early in spring upon stocks already established, and undisturbed in the ground for a year. Prof. Budd claims satisfactory results when the stocks are taken up in the Autumn, and grafted in the graft-room during winter. Careful comparisons have been made here for the past three years with a view to determine which plan was attended with the best results. The average returns show a gain of

over fifty per cent., in favor of *crown grafting*, early in spring, upon stocks in the ground, which had been planted the year previous. A strong growth is obtained the first year, at the end of which the graft may be taken up, and part of the old root cut away. The yearling graft may then be replanted, setting it deeper than formerly, so that the scion is brought under ground, and offered conditions favorable to the emission of roots. The principal objection to the method is that at the time—early in spring—when this work should be performed, many other duties engage the attention of the fruit grower, making it difficult to accomplish, in a limited time, a large amount of this kind of grafting. The method is one, however, that can always be practised to some extent. It will prove of special service to amateurs for whose benefit the following instructions are given :

The stocks should be planted in nursery rows the year previous to the date of grafting. Cut well matured scions in autumn of the growth of the same season, keep these in a dormant condition over winter by packing in forest leaves, or damp sawdust. In this locality the best time for out-door grafting is usually during the first two weeks of April.

In out door work, instead of binding first, and waxing afterwards, a firmer joint is made by applying the wax first, and covering this with a cotton bandage which adheres to the wax, and holds the scion in position. It must be remembered in the case of stocks which are in the ground, that the top is cut off as soon as the scion is inserted, after a little practice this is easily removed by an upward cut, which can be made without disturbing the scion.

Stocks.

The Mazzard cherry (*Prunus avium*) is probably used by nurserymen more than any other as a propagating stock. It is a native of Europe, and is supposed to have given rise to many of our cultivated varieties. All varieties of cherries unite with it readily.

The Mahaleb cherry (*Prunus mahaleb*) is used to a considerable extent, partly on account of its dwarfing tendency, and also because of its adaptability to clay soils, as pointed out by Professor Bailey. (See Bulletin on Native Plums and Cherries.)

The Morello stock *Prunus cerasus*) has not been largely used by nurserymen, chiefly owing to its sprouting habits. It is hardy, however, and can be frequently procured by amateurs, when Mahaleb or Mazzard are not easily obtained.

WILD RED OR BIRD CHERRY (*Prunus Pennsylvanica*) has been successfully used as a budding stock for some years by several experimenters, but its ultimate value for this purpose has not been definitely determined. Most varieties seem to unite with it as readily as with Mazzard. Budded trees of many varieties on this stock in the trial grounds of the Central Farm are making a vigorous growth, apparently having made a perfect union. The ease with which seed of this species can be procured in nearly all parts of the Dominion, as well as its great hardiness, should render it a popular stock for cold climates.

As we have no nursery in a commercial sense at the Experimental Farm, arrangements have been made whereby buds and scions of the varieties mentioned can be obtained by intending growers and propagators on application to the Director of Horticulturist Central Experimental Farm, Ottawa. Our supply of available propagating wood is not large, but is entirely at the disposal of the fruit growers of the Dominion as far as it goes.

Resolved, that the thanks of the Association be extended to Prof. Craig for this very valuable paper, and that it be incorporated in the Association Report. Passed unanimously.

After the customary votes of thanks the session adjourned.

EVENING MEETING.

THE Evening Session was occupied by a conversazione in College Hall. A very large number were present, and an enjoyable evening was spent. Addresses were delivered by a number of prominent gentlemen, and the Wolfville Brass Band favored the audience with a select programme.

SPECIAL MEETINGS.

A SPECIAL MEETING of the Nova Scotia Fruit Growers' Association was held in Witter's Hall, Wolfville, on March 21st. The main business of this meeting was to receive and consider the report of the committee appointed at the annual meeting to consider the advisability of establishing a Horticultural School and Experimental Fruit Station under the auspices of the Society.

The committee reported as follows :

To the President and Members of the Nova Scotia Fruit Growers' Association :

Your committee appointed at the annual meeting of the N. S. F. G. A. to take into consideration "Ways and Means" of establishing and maintaining a Horticultural School and Experimental Fruit Station under the auspices of your Society, beg leave to submit the following report :—

1. They have given a fair share of labor and time to gathering data, and have consulted many farmers who would be likely to form a fair and reasonable opinion of such an enterprise, and have come to the conclusion that it is expedient and practicable to establish a Horticultural School and Experimental Fruit Station in the Annapolis Valley under the auspices and within the full control of the N. S. F. G. A.

2. That such locality offer the best inducements both on account of its favorable climatic conditions, and its convenient situation for the eastern and western counties of the province.

3. That, as a matter of economy, it is desirable to lease lands and lecture rooms for a term of years in the vicinity of some school or University.

4. That a qualified Professor and Director of Horticulture be given charge of the station.

5. That an Assistant Professor be employed to give instruction in other subjects relating to orcharding.

6. That the remaining studies of the course be taken in the regular classes of the University.

7. That either the Director or his Assistant visit in turn all the counties in the province, co-operating with the vice-presidents in their respective counties, and deliver practical lectures on modern fruit-growing and relative influences vital to its economic success, and to inform precisely and recommend the proper fruits worthy to be planted in the various counties—*these lectures* to be given at least once a year at some central point in each county.

8 The following is an estimate of the annual expenses :—

Professor's salary within	$1200
Assist. "	800
Travelling expenses	250
Fertilizers	250
Labor	200
Plant stock	200
	$2900

9. That a *strong effort* be made to increase the membership of the N. S. F. G. A. by means of a soliciting agent.

10. That the Local and Dominion Governments be applied to for reasonable grants to aid the enterprise.

11. That a membership pledge for five years of one dollar annually be secured at once. Also, a life membership of representative men in the different counties of the province.

12. That special donations be asked in sums of not less than fifty dollars.

13. That your committee recommend that an endeavor be made to secure interested co-operation from the Governments of New Brunswick and P. E. Island.

14. That your committee favor an honorable endeavor be begun by this Association, in conjunction with the government of this province, to secure the attendance of worthy young men from England and Scotland, having fruit growing in view as a life work; these students to be admitted to the school on reasonable tuition.

15. That tuition be free to natives of the Maritime Provinces.

16. Your committee would also recommend that a prospectus be prepared, together with petitions for signatures addressed to the

governments, and that copies be forwarded to the vice-presidents in each county, and that such vice-presidents be authorized to secure the best services of an energetic co-adjutor to solicit membership-pledges and signatures to such petitions.

17. That the Federal Government be also asked to establish a meteorological service in conjunction with the proposed Horticultural Station.

18. That your committee recommend this Association to vote sixty per cent. of the membership fees, hereafter collected this year, to the support of the proposed school.

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

After a lengthy discussion of the report as above, it was moved by J. E. STARR, seconded by DR. CHIPMAN, and carried unanimously, that, whereas this Society fully recognizes the necessity of a Horticultural School and Experimental Fruit Station in the Annapolis Valley: *Resolved*, that this Society recommend the establishment of such a station as soon as funds are available from any source. That the report of the committee be placed on the table for four weeks, to be discussed again at that time. That the furtherance of the scheme, and matters of detail, be left with the committee on "Ways and Means."

Also resolved, that if five hundred additional members can be added to the Association, that the Society donate five hundred dollars of its invested funds towards the furtherance of the scheme, provided we secure the required funds from any source to ensure the success of the measure. Carried unanimously.

The meeting then adjourned to meet in four weeks.

WOLFVILLE, *March 21st, 1893.*

Pursuant to adjournment the Association met in Witter's Hall to consider further the Experimental Fruit Station. A large and representative gathering were present.

MR. ARCHIBALD stated he had visited Yarmouth, Weymouth, Digby, Annapolis, Bridgewater, and Lunenburg in the interests of the Association, and found everybody ready for the inception of the scheme. He had received much assistance from representative men in these towns, and had secured a large list of members.

MR. F. E. COX.—Had visited Kentville, Windsor, and Bridgetown, and also presented a creditable list from these towns.

MR. T. H. PARKER reported he had secured 65 members in a radius of three miles from Berwick, and thought he could easily make his list in that vicinity to number one hundred names. He scarcely found a man who refused to identify himself with the Association, and thought it only needed systematic effort to secure similar results throughout the province.

THE PRESIDENT thought it was only a question of time and effort to enroll 1,000 life, and 2,000 annual members. We had achieved great results even at present. The day we reach 1,000 life members that day the scheme is secure. Had written J. B. Mills and Dr. Borden, Members of Parliament, and they assured him of their hearty sympathy and active co-operation. Although he was sceptical in the first inception, he was beginning to feel more assured of the success of the idea. Mrs. Johnson, our only lady member, had secured a paid-up subscription of twenty lady members in Wolfville.

MR. ARCHIBALD had been growing into a larger knowledge in the past ten weeks, and was convinced this was a timely move. We have the great body of the people with us almost as a unit. Let us rise above party and ask the Dominion Government for $2,000 and the Local for $1,000 per annum. We have put our hand to the plough, and are bound to put this Society on an elevated plane, and build a monument in fruit trees that will be long enduring.

MR. F. E. COX thought the matter should be brought before the Government at once, that step would aid in canvassing. If the people want it the Government must grant it, as they are simply to carry out the wishes of the people. What we have done is only enough to give an assurance of what can be done. The people are interested, and we should at once proceed to ask something definite.

DR. CHIPMAN was interested from a fruit growers standpoint, and also from the educational standpoint. Thought we should go straight

ahead, bring our influence to bear on the members, and they will handle the Government. He believed this scheme could be made a reality.

MR. THOMPSON said another lever we should use was the press. Men who have facile pens should write the matter up in the papers. We should also combine for improved shipping facilities.

R. W. STARR.—This question is of great importance, and we should press forward. We are not alone in this, Ontario is moving in the same line. The model farms are not serving the fruit interests, and we should join hands with Ontario, and enforce our demands.

Moved by F. E. COX, and resolved, That this meeting recognizes the good work already done by the committee, and they be requested to place our claim before the Governments immediately. Carried.

THE PRESIDENT read a letter from Mr. L. Wolverton stating he had been placed in charge of the Canadian Fruit Exhibit at the Columbian Exposition, and assured the Association he would do all in his power to aid in making the exhibit a success.

MR. C. R. H. STARR said he personally knew Mr. Wolverton, and could assure the Association he was the right man for the position.

After a short discussion, the meeting adjourned *sine die*.

APPENDIX.

REVIEW OF THE FRUIT SEASON,

By A. Whitman, Esq., Waterville, N. S.

The year 1892 which has just closed, has been an eventful year in many respects, in the growing and marketing of fruits both large and small. It has been a succession of disappointments right through. The commencement of the apple season gave every promise of a very large crop, and in judging from the trees when in full bloom, one of the largest crops on record was predicted, but owing to the sad results of that memorable storm which swept over the province in June, the continued dry weather during July and August combined with other causes, reduced the apple crop fully one half of what was anticipated in the early part of the season. Apple exporters learning that the crop in this Province would fall far below the average, and not exceeding an average crop in the Upper Provinces, together with the fact that the crop in the United States was unusually light, had every reason to expect as good prices at least, as were obtained in 1891, but in this they were sadly disappointed. The first two or three large shipments from Nova Scotia, principally of the early varieties, sold at ruinously low prices, resulting in heavy losses to buyers. It will be remembered that the receipts in 1891 were very large, both in London and Liverpool, exceeding any previous record, but notwithstanding the large quantities arriving, there was an active demand and good prices obtained with the most satisfactory results. From the most reliable information that could be obtained regarding the world's crop, the prospect looked even better than it did at the commencement of the season of 1891, these facts added to last year's successful experience, inspired speculators with the greatest confidence. Acting on this as large prices were paid, and in many cases larger than in 1891, consequently this has proved to be a hard year for speculators, as many who lost heavily on first shipments, kept on and bought large quantities of winter fruit, holding it to ship during the winter months, hoping to make up what they

had lost, expecting as usual an advance in prices after the commencement of the new year, but in this they are again disappointed, as cable reports just to hand announce January sales lower than November or December. The question has been repeatedly asked, "what is the cause of the low price ruling this season." Doubtless the depression in trade and manufactures existing in Great Britain has had something to do with it, but it is evident that the principal cause has been the poor quality of the fruit and bad packing, particularly the latter, many arriving slack, &c, which has materially affected prices. This season's experience in the apple trade, goes to prove and confirm what I have always contended, that the quality has more to do with prices than the quantity in any market, and this is especially true in the European markets.

NEW MEMBERS,

IN ENCOURAGEMENT OF THE PROPOSED EXPERIMENTAL FRUIT STATION AND HORTICULTURAL SCHOOL.

THE following names have been added to the membership since the annual meeting, and represents in some measure the interest of the people of Nova Scotia in the affairs of the Association. With a combined energetic effort the membership of the Association could be made to number thousands instead of a few dozens, as in the past. The list below has been compiled from various sources, and doubtless errors and omissions will occur. Any such will be gladly rectified on receipt of information by the secretary. With few exceptions, annual members are pledged to a term of five years:

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Life Members.—John W. Barss, C. R. Burgess, G. H. Wallace, J. W. Caldwell, C. W. Roscoe, I. B. Oakes, R. E. Harris, Wm. A. Payzant, C. H. Borden, J. F. Tufts, Geo. V. Rand, S. P. Benjamin, James S. Morse, A. E. Caldwell, J. W. Keddy, C. A. Patriquin, Walter Brown, J. L. Franklin, Geo. W. Borden, X. Z. Chipman, F. C. Johnson.

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Life Members.—Hon. L. E. Baker, Frank Killam, John H. Killam, C. C. Richards, Augustus Cann, E. J. Vickery, Amos B. Brown, S. H. Crowell, James Burrill (Mayor), Robert Caie, B. B. Law, C. A. Webster, M.D., J. Brignell.

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UGGESTIONS IN REGARD TO SPRAYING FOR THE PREVENTION OF FUNGOUS DISEASES DURING 1893.

By John Craig,

Horticulturist, Central Experiment Farm, Ottawa.

GENERAL CONSIDERATIONS.

Spraying with arsenites for the prevention of insect attacks has, by progressive fruit growers, become a recognized necessity and is now widely practised. Spraying with copper compounds for the prevention of fungous diseases is rapidly gaining favor and the value of the remedies recommended has been demonstrated by the orchardist, as well as the experimentalist.

Fungous diseases will in all probability increase in proportion as the food plants upon which they prey are multiplied, and as climatic and other conditions are favourable to their development. Spraying, therefore, must be resorted to, and in order to derive the greatest benefit, it should be generally practiced. The value of the efforts of one man who faithfully sprays his orchard is greatly lessened if his neighbour neglects preventive measures and so allows his orchard to serve the purpose of a breeding ground for the spores of fungous diseases such as pear and apple "scab."

In consideration of the importance of making a united and persevering effort with the object of keeping in subjection those parasites which prey upon our fruit trees and plants, thus diminishing their vitality and lowering the quantity and quality of products, this circular is addressed to the farmers and fruit growers of the Dominion with the hope that they will follow out as far as possible the suggestions contained therein.

HOW TO SPRAY.

As the treatment is entirely preventive, in order to make spraying effective it must be commenced early. All parts of trees or plants must be reached with the preventive agent. Drenching is not necessary and is expensive. A thin film or coating of the fungicide deposited upon the foliage will prevent the development of the spores as well as a complete soaking; but it is important that all the leafy surface should be wetted at least on the upper side. For orchard work a good force pump, which may be fitted into a barrel—side or end—will give

satisfaction. It must be of sufficient strength, and fitted with a nozzle which will project the spray in a fine state of division, yet with sufficient force to enter the deeper recesses of the foliage. The Vermorel nozzle is a very satisfactory instrument for distributing the liquid.

CO-OPERATIVE SPRAYING.

Some factors which act as deterrents to the progress of spraying may be enumerated as follows. This work, like the introduction of spraying for the prevention of insect enemies, on account of involving new lines of thought and action, is sometimes regarded by the farmer as impracticable on a large scale. It *must* be done at certain periods of the year—otherwise it is ineffectual. It involves the purchase of implements and materials which are sometimes difficult to obtain just when required. The success of the work depends also on intelligent adaptation of the treatment to the climatic conditions existing during the spraying period.

To obviate some of these difficulties I would suggect the adoption of a co-operative plan of spraying.

First, where orchards are not large, a few farmers might combine and purchase a spraying outfit which would serve the community, and if it were possible to have it continuously operated by the same individual, whom practice would lend superior facility in using it, an additional advantage would be gained. Another arrangement could be made as follows :—

A complete spraying outfit, including chemicals, might be purchased by a person who would be prepared to spray under contract, by the acre, or at a stated figure per tree. If this system of combating fungous and insect enemies was introduced, it would obviate much of the prejudice and inconvenience now connected with the work, and spraying would probably in a few years, to the great benefit of orchardists, become the general practice.

SPRAYING MIXTURES.

1. *Diluted Bordeaux Mixture.*

Copper Sulphate	4 lbs.
Lime	4 lbs.
Paris Green	4 oz.
Water	50 gallons.

This may be prepared by dissolving in a barrel, four pounds of powdered Copper Sulphate. In another vessel slake four pounds of

fresh lime with as many gallons of water. Spread a piece of coarse sacking, held in place by a hoop, over the top of the barrel in which the Copper Sulphate has been dissolved. Strain through this the creamy mixture of lime and water. Paris Green may then be added, after which the barrel should be filled with water. This forms an excellent insecticide as well as fungicide and therefore useful to destroy Codling worm, bud moth, and canker worm It should be used soon after being prepared.

2. *Ammoniacal Copper Carbonate.*

Copper Carbonate	5 oz.
Ammonia	2 qts.
Water	50 gallons.

This is more expensive than the former, is more easily applied and is used as a substitute, especially in the case of grapes, where the Bordeaux mixture might, by adhering to the fruit, injure its sale.

It is prepared by dissolving the Copper Carbonate in the ammonia and diluting with water to fifty gallons. The concentrated solution should be poured into the water. Care should be taken to keep the ammonia tightly corked in glass or stone jars.

HOME MANUFACTURE OF COPPER CARBONATE.

As the precipitated form of Carbonate of Copper is not always obtainable from druggists, and unless freshly precipitated may not be readily soluble, directions are herewith appended for the easy preparation of this material at less than the usual wholesale price.

In a vessel capable of holding two or three gallons, dissolve $1\frac{1}{2}$ pounds of copper sulphate (blue vitrol) in 2 quarts of hot water, using the crystalline form. This will be entirely dissolved in fifteen or twenty minutes. In another vessel dissolve $1\frac{3}{4}$ pounds of sal soda (washing soda), also in 2 quarts of hot water. When completely dissolved pour the second mixture into the first, stirring briskly. When effervescence has ceased fill the vessel with water and stir thoroughly; then allow it to stand five or six hours, when the sediment will have settled to the bottom. Pour off the clear liquid without disturbing the precipitate, fill with water again and stir as before; then allow it to stand until the sediment has settled again, which will take place in a few hours. Pour the liquid off carefully as before, and

the residue is *carbonate of copper*. Using the above quantities of Copper Sulphate and sal soda, there will be formed 12 ounces of copper carbonate.

Instead of drying this, which is a tedious operation, add four quarts of strong ammonia, stirring in well; then add sufficient water to bring the whole quantity up to six quarts. This can be kept in an ordinary two-gallon stone jar, which should be closely corked.

Each quart will contain 2 ounces of the carbonate of copper, which, when added to 20 gallons of water, will furnish a solution for spraying, of the same strength and character as that obtained by the use of the dried carbonate and one which can be prepared with little labour, and kept ready for use throughout the season.

3. *Potassium Sulphide.*

Potassium sulphide (Liver of sulphur).... 8 oz.
Water.....25 gallons.

Prepared by dissolving the former in the latter.

TREATMENT OF APPLE AND PEAR SPOT.

1. Before growth begins in spring, spray with a solution of copper sulphate 1 lb. to 50 gallons of water. On no account should this be applied after the foliage has appeared, as it will severely injure it.

2. Just before the blossoms open spray with diluted Bordeaux mixture (No. 1.). Repeat this after the blossoms have fallen, and make a third application two or three weeks afterwards. If the season is wet and rainy a later application may be advisable.

PLUM AND PEACH ROT—(*Monilia*).

Without being fully tested the following course of treatment is recommended for trial. Spray as soon as the fruit sets with Sulphate of Copper 3 ozs. to 45 gallons; follow this with Diluted Bordeaux mixture to which Paris Green has been added, for the purpose of checking attacks of the curculio. If rot develops late in the season, as is sometimes the case just before the ripening of the fruit, spray again with Sulphate of Copper solution, or Ammoniacal Copper Carbonate.

GOOSEBERRY MILDEW.

This disease can be effectually treated by using either Ammoniacal Copper Carbonate or Bordeaux mixture (No. 1), but as Potassium Sulphide (Liver of sulphur) serves the same purpose, is somewhat cheaper and more easily prepared, it is therefore recommended here.

Treatment should commence with the first signs of growth and continue at intervals of ten or twelve days till five or six applications are made.

SUPPLIES.

Chemicals for spraying can now be obtained from most druggists, and a few firms are making specialties of these materials.

Pumps of all sizes are offered for sale by the leading seedsmen, dealers and manufacturers, at prices ranging from $3.50 to $10 or $12. The barrel pump may be mounted on a stone-boat, cart or wagon as convenience or circumstances may suggest. Such a pump may be fitted to a barrel and made ready for use at a cost not exceeding twelve dollars. The copper Knapsack pump, so called because it is carried on the back of the operator, has a capacity of four or five gallons, and furnishes a convenient means of spraying low growing plants such as grapes, currants, gooseberries and potatoes.

Ottawa, March 15, 1893.

CALVIN CROCKER, of Lake George, Kings Co., N. S., says that his son James had Sciatica Rheumatism, for 18 months was under treatment of physicians, but got no better. Used eight bottles of **GATES' BITTERS** and **SYRUP,** and is a well man.

Sold everywhere at 50 cts. per Bottle.

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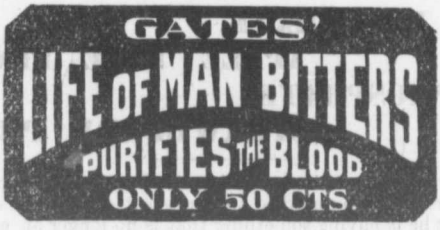
SAYS ABOUT



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