



THIRTY-FOURTH ANNUAL REPORT

OF THE

FRUIT GROWERS' ASSOCIATION

OF

NOVA SCOTIA,

1898.

S. C. PARKER, SECRETARY, BERWICK, N. S.

Published by Order of the Government of Nova Scotia.

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1898.

THE HISTORY OF THE

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FRUIT GROWERS' ASSOCIATION

OF

NOVA SCOTIA.

Patron.

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R. W. STARR.

Delegates to Farmers' Association.

M. G. DEWOLFE,

R. S. EATON.

FINANCIAL STATEMENT.

N. S. FRUIT GROWERS' ASSOCIATION IN ACCOUNT WITH G. W. MUNRO, TREASURER.

1896.			
Dec. 31.	Balance on hand	324	49
1897.			
Jan. 22.	Received from P. Innes for Wm. Young	1	00
9.	Provincial Grant for 1896	300	00
May 14.	Transfer from Horticultural School	900	00
30.	Six Annual Subscriptions	6	00
	Two Life Members	10	00
	Advertising	14	00
Dec. 30.	Provincial Grant for 1897	300	00
		\$1,755	49
1897.			
Jan. 22.	Paid S. C. Parker, salary	\$ 100	00
	" Woodworth, printing	16	00
Mar. 3.	" Horticultural School	300	00
4.	" Huggins, Reporting	30	03
30.	" Eaton, Printing	5	00
Apl. 8.	" Rent College Hall	25	00
13.	" Horticultural School	150	00
May 14.	" N. S. Printing Co.	112	10
30.	" Parker, Account	59	06
	" Porter, Salary	25	00
Dec. 18.	" Horticultural School	300	00
	Balance	633	30
		\$1,755	49
1897.			
Dec. 31.	Balance on hand	\$ 633	30
	Balance Horticultural School Account	139	71
	Total Funds	\$ 773	01

HORTICULTURAL SCHOOL IN ACCOUNT WITH G. W. MUNRO, TREASURER.

1896.			
Dec. 31.	Balance on hand	\$ 228	92
Mar. 3.	Received from F.G.A.	300	00
Apl. 13.	Received from F.G.A.	150	00
May 13.	Received from Government Grant	2,000	00
31.	Received from N.B. Government Grant	200	00
June 17.	Received from Greenhouse	100	56
Sept. 2.	Received from Greenhouse for August	7	75
Dec. 18.	Received from F.G.A.	300	00
		\$3,287	23

1897.			
Jan. 2.	Paid Faville, Microscopes, etc.....	80	26
"	" Faville, Davis account	3	50
"	" Faville, Prizes	20	00
"	" Faville, Meehan account	4	08
"	" Faville, Account	144	09
"	" Faville, Salary.....	1,400	00
"	" J. K. Martin, Salary	180	00
"	" S. Porter, Salary	93	00
"	" Sears, Salary	100	00
23.	" Duties and Expenses, Instruments	4	00
"	" Murphy, Labor.....	7	50
"	" Simson Bros., Chemicals	9	93
25.	" Rockwell, Stationery	7	78
"	" Simmers, Seeds.....	4	80
26.	" C. E. Starr & Son, Account	17	27
"	" Christie, Painting	1	50
Mar. 5.	" Subscriptions to Periodicals	22	00
May 14.	" Fruit Growers' Account	800	00
June 9.	" Dawson Bros., Printing	9	00
"	" A. Conoon, Tuition	11	50
"	" Chase, Trucking.....	3	99
"	" Rand, Seeds	7	98
"	" Caldwell, Account	3	64
10.	" G. H. Wallace, Account	93	
"	" Rockwell & Co., Stationery	3	76
12.	" Illsley & Harvey	9	76
"	" C. E. Starr & Son	3	83
"	" R. E. Harris	7	55
14.	" Balcom, Trucking	1	75
17.	" Eaton, Printing.....	4	00
"	" A. Athenaeum, Advertising	9	00
18.	" P. Herbin, Printing	1	00
"	" Porter, Seeds	1	10
"	" W. Coal Co., Fuel	45	94
July 10.	" Cohoon ground rent	25	00
"	" Wolfville School Board	50	00
"	" F. W. Woodman.....	7	87
Aug. 23.	" J. W. Bigelow, Insurance	15	25
Sept. 2.	" Water Rate	5	00
"	" Porter, per Archibald	8	55
Dec. 18.	" Herald Printing Co.	11	50
	Balance	129	71
			\$3,287 23

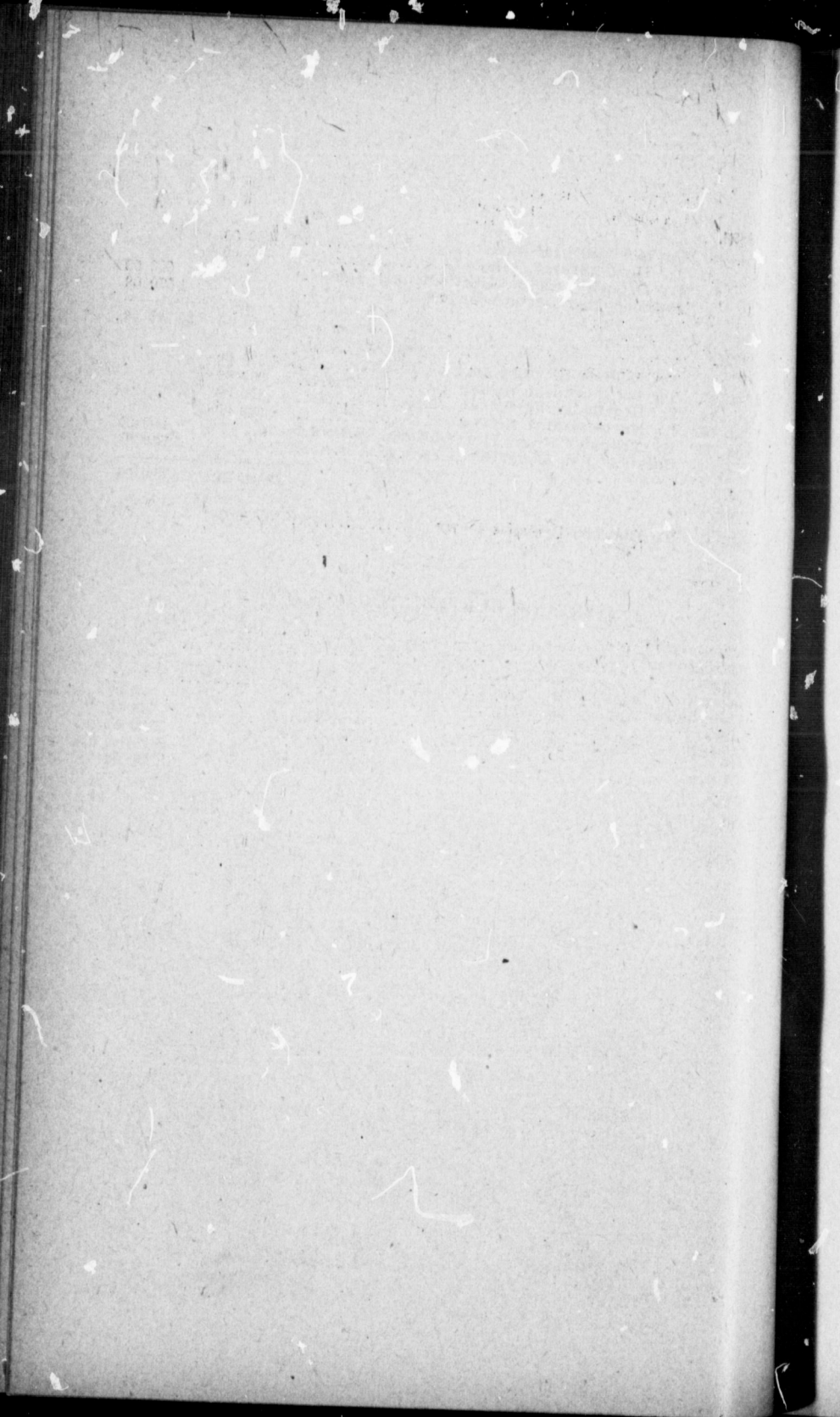
HORTICULTURAL SCHOOL IN ACCOUNT WITH N. S. FRUIT GROWERS' ASSOCIATION.

1894.			
	To paid Professor's Salary	\$1,400	00
	To paid Professor's Travelling Expenses.....	131	30
	To paid for Books, Apparatus, etc.....	538	78
	By Provincial Government Grant		\$1,650 00
	Balance to New Account		420 08
		\$2,070 08	\$2,070 03
1895.			
	To Balance Brought Down	420	08
Feb. 8.	To Horticultural School	500	00
Mar. 30.	To Horticultural School	250	00

1896.		
Apl. 8.	To Horticultural School	500 00
Dec. 9.	To Horticultural School	500 00
	By Deposit Receipt, Horticultural School.	600 00
	Balance 31st December, 1896	1,570 08
		<hr/>
		\$2,170 08
1897.		
	To Balance Brought Down	1,570 08
Mar. 3.	To Horticultural School	300 00
Apl. 13.	To Horticultural School	150 00
Dec. 18.	To Horticultural School	300 00
May 14.	By Transfer From Horticultural School..	800 00
	Balance 31st December, 1897	1,520 08
		<hr/>
		\$2,320 08
1898.		
Jan.	To Balance Brought D wn	\$1,520 08

ASSETS OF HORTICULTURAL SCHOOL.

Greenhouses, etc.....	\$ 500 00
Microscopes	300 00
Furniture	115 00
Laboratory Apparatus	30 00
Greenhouse Apparatus	80 00
Library	175 00
Greenhouse Plants, etc.....	100 00
	<hr/>
	\$1,300 00



THIRTY-FOURTH ANNUAL MEETING.

(Stenographic Report by W. H. Huggins.)

Heid in College Hall, Wolfville, January 26th, 27th and 28th, 1898.

The meeting opened at 7 o'clock, p. m., with President Bigelow in the chair.

Rev. E. M. Keirstead, D. D., invoked the divine blessing.

The Secretary read the minutes of the preceding meeting, and, on motion, the same were approved.

President Bigelow presented his Annual Address as follows:—

Ladies and gentlemen:

On the thirty-fourth anniversary of this ancient and honorable association I have the honor of presenting my sixth report as president.

In reviewing the past year from a fruit grower's standpoint we have an object lesson on the uncertainty of our product. While 1896 will be recorded as the most productive fruit year of our history, 1897 will be the least productive for the past ten years, our export in 1896 being about 500,000 barrels, and 1897, about 85,000 barrels. While a number of causes may be noted for this year's failure, I think the principal ones are, first, the extreme wet, cold weather in June preventing the perfect polonisation of all fruits, and the exhausted condition of the trees from the abundant crop of the previous year. Those conditions existed and had the same disastrous effect in all the eastern and northern portions of the continent.

For future reference it is worth recording here our annual export to London since 1890, and we may estimate that these figures represent two-thirds of our apple crop,—1890, shipped 53,627 barrels; 1891, 89,199; 1892, 116,725; 1893, 35,058; 1894, 254,410;

1895, 155,955; 1896, 409,733; *1897, 85,000. With the exception of Missouri (which yielded this year ten million barrels of apples) and the Western States, the crop on the rest of the continent is as short as in N. S. proportionately. The U. S. government reports the crop of 1897 thirty-seven million barrels; 1896, seventy million barrels; 1895, sixty-one million barrels.

With light crops comes the compensation of high prices. While most growers considered it advisable to accept \$2.50 to \$4 at home, those who shipped are receiving \$3 to \$5 net, and 40s. sterling is reasonably expected for the balance of this year's crop in London. Any growers who had one-fourth of last year's crop will by these prices net nearly as much as was obtained from last year's crop, but the loss to the country of labor and expenses is very heavy, and the present scarcity of money among growers emphasizes that fact, and the loss to the people generally of this most healthful and important article of food is most serious.

As a whole the usual insect pests have not been very destructive this year, owing largely to the fact that the system of intelligent and thorough spraying has been adopted, and fruit growers are realizing the necessity of adopting the most approved methods of treating their orchards to insure success.

A cheap and effectual means for destroying the cankerworm is being extensively used in California by surrounding the trunk of the tree with a wire netting instead of tarred paper, and I would recommend its use.

The San Jose scale has invaded fruit trees in all parts of this continent and is the most destructive and most difficult to destroy of any pest. It is not yet known to be in Nova Scotia, and you will be called upon to recommend strong legislation to prevent its appearance here. In Ontario, where it has been found to an alarming extent, that government has passed an act which is very expensive and difficult to enforce, and it is for you to consider whether it would not be cheaper and more effective for us to ask for legislation prohibiting the importation of all nursery stock in N. S. for one year at least. Hon. John Dryden, minister of agriculture for Ontario, in a letter enclosing copy of their act, writes:

*Estimated.

"The only possible chance to wipe out the pest entirely is to proceed promptly and energetically."

The man who plants an imported nursery tree in Nova Scotia this year is his own worst enemy, and should be dreaded and despised by fruit growers generally.

The inauguration of a permanent provincial exhibition at Halifax this year, should be regarded as an important forward movement by fruit growers, especially as we have now for the first time a large convenient building in which to exhibit fruits, plants and flowers, and every facility offered for exhibiting them to the best advantage. Notwithstanding the scarcity and lack of color of all our fruits this year, our association made a very creditable artistic exhibit of fruits, plants and flowers without drawing upon our scanty funds, and under the management of our leading lady horticulturist, Mrs. A. Johnson, Secretary Parker and Mr. Harris, of Nova Scotia Nursery, it proved an attractive feature of the exhibit. The new feature of giving large prizes to each county proves a valuable incentive for the cultivation of fruits and berries of some kind in every county of the province. Mr. D. H. Knowlton, Secretary of Maine State Pomological Society, who acted as judge this year, in his report makes the following statement: "It is very gratifying to the judge, and must be to the fruit growers of the province, that your commission fully recognizes the great importance of fruit growing, and the most cordial relations that seem to exist between your commission and the Nova Scotia Fruit Growers' Association, to whom you are indebted for much of the excellence of the horticultural exhibit." A most pleasing feature of this exhibit was the attendance of the Hon. Minister of Agriculture, and his practical and exhaustive address to us farmers. For the first time since confederation the Nova Scotia farmer has had the opportunity of seeing a minister of agriculture, and it is a hopeful sign when he visits us and becomes familiar with our wants, and wishes to become our advocate to obtain a just share of the revenues of the Dominion to be expended in the best interests of the farmers and fruit growers. While millions are freely voted for all the other departments of the public service, the most important industry of

agriculture, which is, and ever must be the only means of support for over sixty per cent. of the population of Canada, receives a meagre grant of one or two hundred thousand, while millions could and should be annually expended in promoting the agricultural interests of Canada.

It is most gratifying to report that under the able management of Professor Sears our School of Horticulture is doing excellent work, with an enrolment of fifty-six students, and while we are unable from the lack of funds, to make this department as efficient as it should be, we are enabling the young men and women of this fair land to obtain free a thorough and practical knowledge of fruit culture, and we hope that not only the Dominion government but private individuals will recognize the advisability of their endowing this school with a substantial grant. We received from the Nova Scotia government \$2,000, and from New Brunswick government \$200, and as the annual expenses are about \$3,000, there are financial difficulties in store for us.

Owing to the apathy and indifference of those most deeply interested the Fruit Shipping Co. and Cold Storage Co. have not yet materialized, and it would seem that stern necessity alone must compel the fruit growers to avail themselves of these improvements. While cold storage may not be indispensably necessary in marketing our hard winter fruit, perfect ventilation in transit and a reasonable rate of freight are indispensable, and I am pleased to report that we have made some progress in securing these advantages, as explained by the President of Kings County Board of Trade in his report. These, and many other subjects which will come before you, will, I hope, receive your careful consideration and prompt attention.

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 six years.

George Thompson moved, and R. W. Starr seconded, that the address of the President be received and printed in the transactions of the Association; and the Association express their appreciation of the President's efforts to advance the fruit growing interests of the Province.

The motion, on being put, was passed unanimously.

President Bigelow.—Words cannot express my feelings. This is the sixth time I have received this marked sentiment of your kindness toward me, and I feel that it is very ill deserved. I feel that I have about played my last card in this business, and you require a younger and abler man in this position. This will be for you to decide. I am very sorry indeed that we have this year to inform you that we may have in the near future to take steps to prevent the attack of another insect. To meet such difficulties is what the Association is for. I feel that this Association is composed of men who will meet these difficulties, and hence our success.

Notes of the Year.

RALPH S. EATON, KENTVILLE.

On being asked to prepare a paper for the Fruit Growers' Association, I felt like again refusing, as there seemed to be no new subject of special interest which I could present, unless I should give what is interesting to myself as a fruit grower, namely, a review of some of the important points discussed in the reports and bulletins of the United States and Canada (which give results of experiments at the various stations), together with some other points which I have observed during the past year.

Perhaps the most important subject before the minds of fruit growers is the rapid spread, from one section of country to another, of the San Jose scale, and I am very glad to observe by our programme that the subject of legislation regarding its coming into our province will be taken into consideration at our meetings. I trust that such action will be taken by our government as to cause a very thorough inspection of all nursery stock imported into our province this spring, and the complete extermination of the pernicious insect, if it should be found to be already in our midst. It has been discovered in about fifteen places in Ontario, and a law is being passed relative to it. The Michigan law went into force last autumn, and it is claimed that already the nursery stock has been cleaned of this pest. The fruit growers of New York, in their meeting to-day, are discussing the advisability of taking action regarding it. Although the great alarm of a year ago has consid-

ably subsided, and though the men at the Experimental Stations who have had most to do with this insect during the past year, seem to feel confident about its easy control, yet in some respects, it is a much more dangerous insect than we have at present, and the expense of the treatment is quite too much to be added, unnecessarily to our present tax in caring for our trees. We have heard of it for years as starting from the San Jose Valley in California, where it was first noticed in 1870. It soon became pretty generally distributed over that state, but did not reach the Atlantic coast till '93, when it was first discovered in Virginia, and afterwards in the nurseries of New Jersey in '94. Professor Smith, of the New Jersey Experimental Station, was sent to California to make investigations regarding it. He found it in every fruit section he visited, but nowhere a very injurious insect or greatly feared by the fruit growers. In the southern part it had been kept in check by natural enemies, parasites and predacious insects, and in the north by persistent and well directed efforts of the fruit growers themselves. The distribution in the eastern States seems to have been largely from the New Jersey nurseries, though in a few instances it is traced to Maryland and Alabama. From these points it has spread south and north. There is very little in Western New York or in Michigan, but Long Island is full of it from one end to the other; and Georgia is fairly alive with it. In a second bulletin published last October, from the Georgia Experimental Station, Professor Starnes says: "Two years ago few orchardists had ever heard of the San Jose scale. Fewer still could have recognized it or distinguished it from other species. To-day, however, things are vastly different, and our fruit growers are decidedly aghast at the prospect for the bitter inveteracy of the Scale and its power to devastate are now better understood. It is at last realized that not only is our orchard industry in danger, but that the existence of all deciduous vegetation is threatened should the pest once become distributed generally throughout our forests, for in that case all hope of its final extinction would be lost, and it would remain a standing menace forever. The time for concealment and reticence is therefore past. The subject must be fully ventilated and the issue squarely met and

boldly confronted. The people, too, are clamoring for detailed information, for remedies, and for immediate and stringent legislation, and it is in response to this call that the present bulletin is issued."

The entomologist at Ohio speaks as strongly, and declares it worse than all the insect pests put together. On the other hand, Professor Smith, of the New Jersey Experimental Station, whom I have mentioned, writes the following, though he is criticised very strongly for thus minimizing the danger.

"I will make the very radical assertion that the San Jose scale is a very easy species to deal with, and that its practical extermination in an infested orchard is not particularly difficult. I will admit, however, that the treatment to accomplish this result is heroic and somewhat expensive; but if the trees are not worth the labor and expense involved, they might as well be taken out altogether, because the scales will sooner or later kill them, and will at once reduce the value of the fruit, if they do not make it actually unsalable. To accomplish the result above indicated will require treatment both in winter and in summer, because winter treatment alone, whatever the medium, will, I am convinced by experience, prove ineffective, and repeated summer treatment alone might prove injurious to the trees."

It was discussed at Cornell last spring, and it was at first thought that every shrub infested with it would have to be burned. Some of the worst plants were, and others were left for experiment. In May, before the scale began to grow, a thorough application was made of the whale oil soap mixture—two pounds of soap to a gallon of water. On June 25th they were sprayed with pure kerosene and water, in the proportion of one to five, and again with the same July 2nd. An examination was made by Professor Slingerland, who could not find a single living scale among the dead ones. He now thinks that it is not as dangerous as was at first painted, and can easily be kept in check as the pear psylla or many of our other insect pests. In his estimation the kerosene mixture is equally as effective as the whale oil soap, but he emphasizes most strongly the necessity of thoroughness in the spraying. The Leggitt brand of whale oil soap seems to be the only reliable one.

The special danger from this scale arises from the fact that it is very hard to detect when in small numbers, and that it multiplies so rapidly, taking only thirty days for the young to mature and be able to reproduce, so that it is estimated that one pair can, in a single season, be the progenitors of three thousand millions of scales. Further, it will attack all deciduous trees and shrubs. When in large numbers on a tree or branch it is said to have the appearance of grey ashes stuck to a wet surface.

It is rather remarkable, that where ever the San Jose has been found in large quantities, that some parasite or fungus has also appeared, which lives on the scales, and in some instances, as in California, has almost controlled it. In Ontario the pest has been observed but a very short time, and already a little insect, smaller than the scale, called the pentilia missela, or pilifue lady bird, has been found preying on it. In Florida a fungus ally is expected soon to have the mastery of it.

Thus it seems, that though we are compelled to assist Nature in her work if we are to enjoy the fruits of the earth, yet she has not designed that the earth is soon to become a treeless plane.

Just a few words about spraying. Another year's experience has emphasized more than ever the necessity and benefits arising from it. The Ontario government did a splendid thing last spring in giving practical instruction in this matter in some twenty orchards located in different fruit districts of the province. The results of this work, as testified to by men owning the orchards, are published by the government, can be had for the asking, and prove beyond question that spraying pays and pays well. Never has such strong testimony come from fruit growers. In one orchard reported there was from 75 to 90 per cent. of clean fruit on sprayed trees, and 10 to 15 per cent. clean on adjoining unsprayed trees. More benefits seem to have been observed this year than ever before among our own orchardists too. Fortunately for us the bordeaux mixture will keep in check fungus growths other than the black spot. The bare branches of our Lombard plum trees and some other varieties appearing in the middle of the summer, and the immense loss by plum rot, will surely waken us to action in this matter. A very interesting bulletin which all should have, is No. 98 from Geneva,

by Professor Beach. At the Virginia Experimental Station the early and thorough spraying with the bordeaux has almost entirely kept in check the pear blight, while trees in the immediate vicinity have suffered very much from this disease. At another station a careful observation and record was made of the effect of this fungicide on black knot and very marked benefits resulted. Again, from information coming to hand this summer, and from my own experience, I have strong hopes that we can control the leaf curl of the peach, which has become so common, and which must impair the vitality of the trees very appreciably by causing, as it does, to put out each year a second growth of leaves. Referring to the peach, there has been a rather novel and successful experiment at the Missouri Station to protect peach buds from the effects of extremely low and changeable temperature. The spraying of the trees, during the winter, with a thick white wash made with lime and one part of skimmed milk to every four of water. The skimmed milk causes the white wash to adhere very much better to the twigs. Three to four sprayings served to keep the buds well coated until spring, and because of the white surface absorbing so much less heat than the natural color of the wood, the buds remained dormant till April, and 80 p. c. passed through the winter unharmed, while on unsprayed trees but 10 p. c. of the buds were alive. We have not grown peaches long enough to know whether our climate will necessitate care of this kind, but if it does, the treatment is not very expensive.

The Japan plums are each year receiving more attention in all fruit districts. The Burbank, which ripens about the same time as our Lombard, still stands at the head, and is the only one, I think, which has been fruited in our province. It must be cut back severely each year in order to obtain a compact, symmetrical tree. The Abundance ripen some ten days earlier, and is the next in beauty, quality and productiveness. These two have stood the thermometer at 28 degrees below zero in Iowa, and borne a beautiful crop of plums the second year from planting. The Red June is still earlier than the Abundance and has maintained the good opinion which pomologists had of it two years ago.

Mr. S. D. Willard thinks we cannot plant too many of them. A new plum coming in after the Burbank and completing the list of a good succession of the Japan varieties, is the Wickson. It is the largest of all the hardy Japan plums, is of fine quality and appearance, and is considered a valuable acquisition.

Among the newer peaches, the Elberta is claiming the most attention, and seems particularly able to adapt itself to a great variety of climates.

Mr. J. H. Hale, the great peach grower in Connecticut, says that the thermometer dropped to 20 below zero there in December last, and the fruit buds of the Elberta were unharmed.

More attention is given each year to this point of hardiness in the buds of the peaches.

This spring the interchangeableness of fruit buds and leaf buds was very noticeable, a subject of interest to which Mr. Archibald called the attention of the Association a year or two ago. Those who looked for blossoms to appear on the blossom buds of the cherry and plum last spring, saw only leaves putting forth.

Experiments are being tried at Geneva to show the productive power of the soil without additional fertilizers, and the results show the great advantage of thorough cultivation, a subject that is constantly being rung through the horticultural press.

The analysis of 49 different samples of soil at Cornell University showed that in the eight inches of surface soil there was, per acre, on an average, 3,053 pounds of nitrogen, 4,219 pounds of phosphoric acid, and 16,317 pounds of potash. Experiments are being conducted there to get at the reason, why it is necessary, in order to obtain even a fair crop, to add so much more fertilizer to the soil. So far, Professor Roberts has been most impressed with the fact that plants languish more from want of moisture than from lack of plant food. Potatoes planted in 1895 and 1896 without fertilizers either year, but cultivated nine to thirteen times, gave 337 1-2 and 363 1-2 bushels per acre. This is certainly a pointer for the higher cultivation of our orchards. In the growing of potatoes it seems to me that the cheapest way for such intense cultivation is with an implement known as a "weeder." Level culture

is fast becoming popular with scientists and experimentalists in potato growing. Those who saw, last autumn, S. B. Chute's ten acre field of potatoes near Berwick, must have been impressed with the value of frequent tillage and the great economy in the method of applying it. This field had been gone over one afternoon of each week from the time of planting till the potatoes were too large to hill up by a boy with a horse attached to a "weeder." When I was there a part of the field had been dug and the yield was about 200 bushels per acre. The crop, generally, has been phenomenally small this year as you know. In this field neither a hoe nor cultivator had been used, yet there was not a weed to be seen. The soil was very mellow, as level as a floor, yet not a sun-burnt potato was visible. The field had been considered "no good" in previous years; had had no stable dressing, but an application of commercial fertilizer when the potatoes were planted.

A visit to this farm suggests another very important subject. I have heard quite frequently during the past year from farmers that "it did not pay to plant any more fruit trees than they had manure for." It seems late in the day to advance arguments of this kind, when the most extensive fruit growing everywhere is conducted without stable dressing. About a dozen years ago Mr. Chute bought this "run out" farm for \$1,600. He has kept three horses, three cows and two or three pigs during the last five years. By request, he gave me the following amounts of income and expenditures for '97:

Income	\$2,574 00
Expenses	1,031 00

This gives a net profit of \$1443 00, to which he thinks should be added:

Fertilizer still in soil	\$ 150 00
One year's growth of five acres raspberries....	125 00
Growth of 3,000 fruit trees at 25c.....	750 00
	<hr/>
	\$2,468 00

These figures will speak for themselves and show what can be done in fruit culture by the right stamp of man without stable dressing or dykelands. It must be borne in mind too that the plum crop was a failure the past year, and apple crop not much better.

Some progressive fruit growers of Ontario have shipped during the past season sixteen carloads, consisting of pears, peaches, plums, grapes and tomatoes to Glasgow and London in cold storage. Through defects in refrigeration some of the stock was landed in poor condition and there was heavy loss on this, but whenever sound fruit was put on the market most satisfactory prices were obtained. Cases of Quackenbos plums containing from 50 to 60 pounds, were sold for 15 shillings. Great confidence is felt for the future, when the cold storage system has been perfected, and the fruit men of Ontario are arranging for much more expensive shipments next season. Five years ago it was prophesied by one of our far-sighted plum growers that we should be shipping plums and peaches to England before 1900. It was not credited then. Already it is understood that the Furness line are making arrangements to have cold storage steamers for this season's fruit, and no doubt many trial shipments will be made.

The first of the permanent annual exhibitions at Halifax, as an event of the year, gives us another evidence that we, as an association, have further cause to congratulate ourselves upon having such a representative as our President to look after our interests as he has again so ably done. Since Mr. Bigelow has filled the chair, he has been closely identified with the exhibit at the "World's Fair;" has been largely instrumental in bringing about the establishment of the "School of Horticulture," and has been untiring in advancing the interests of the association along every line. All this requires much time, tact, ability, and good judgment—his only reward, our appreciation. This he assuredly has, and we can only hope that he may be able indefinitely to continue the helpful work of the past and to fill the very honorable position of President of the Nova Scotia Fruit Growers' Association.

Spraying---Its Past, Present and Future.

F. C. SFARE, M. S., DIRECTOR SCHOOL OF HORTICULTURE.

The history of spraying is a most remarkable one, considered from almost any point of view. Fifteen years ago we knew scarcely anything in regard to it, but to-day, the progressive fruit raiser can obtain reliable information upon almost any phase of the subject. The first remedies proposed were most unique, and seem to have been suggested by the same train of reasoning which actuated our grandmothers, when they selected remedies for their ailing grandchildren; namely, that the more horrible the odor of a substance and the more fearful its taste, the more certain it was to prove efficacious. Yet occasionally, in some mixture of a half dozen or more such substances, one would be introduced which was really effective, and in this way, these early, spasmodic efforts to prevent the inroads of our insects enemies, resulted in some discoveries of actual value. Tobacco was among the first substances to give satisfactory results, its use having been suggested, doubtless, by the experience of some one who had made an unsuccessful attempt to learn to smoke—and thus, one substance after another, was added to the list. But these accidental discoveries were made slowly, and their actions were but little understood, so that improvements in methods of application resulted only after years of experience. And if the prevention of the attacks of insects was shrouded in darkness, what can we say to describe the state of affairs with reference to fungous diseases, those mysterious visitations which often came so suddenly and always left ruin and consternation behind. What wonder that the poor fruit raiser felt himself under the ban of Providence and abandoned the field to his enemies. One can imagine that he announced to his fellow sufferers, with even more assurance than does the representation of his type to-day—"Gentlemen, fruit-raising doesn't pay!"

But in time men began to study these matters scientifically, which is only another name for carefully. The structure and life of the insect were studied with a view to attacking it at its weakest point, and as a result we have our present system. Every new pest that has come into prominence has been subjected to the same care-

ful study, and in every case, in the past, some method of treatment has been devised which has proved effective. The difficulty now is, not that we do not know what ought to be done, but that we do not do it.

It is a curious study to look back over the past and to notice the career and final downfall of the different pests that have appeared, each heralded, as is the San Jose scale to-day, as the last straw which was to "break the camel's back," and to wipe the fruit industry from the earth. Yet each, after a longer or shorter time, has been subjugated by the use of some new remedy, or the modification of an old one, or by the increase of its natural enemies; and each one, after the reign of terror caused by its first appearance, has taken its place along with other pests, not, indeed, to be forgotten, but to be provided for as we provide for the destruction of weeds in our fields or as we ought to provide. And I am willing to go on record as saying, that in my opinion, the San Jose scale will be no exception to this rule, but that a remedy will be discovered which will be effectual and yet cheap. I do not wish to be understood as trying to detract from the reputation which Mr. San Jose scale has been able to make for himself, but I do wish to give a little hope to those poor mortals who think that the fruit industry of our own province is at an end because, forsooth, the San Jose scale has appeared in Ontario. I believe that whatever we can do to delay the time when we shall have this new pest to fight ought to be done, for the methods of fighting it are continually improving. And I believe that all plantations set within the last few years should be inspected, to make sure that the scale is not already within the province. Aside from this I believe we can only watch and wait.

The universal adoption of spraying seems to be delayed principally by three classes of fruit raisers. First, there is the man who hasn't time to spray. Poor, over-worked mortal! I very much fear that there is nothing at present that can be done for him. His case has been well summed up by some one who said that "the man who hasn't time to spray hasn't time to make money."

And secondly, there is the man who firmly believes in spraying and often makes some attempt in that direction, but without any

especial result, either in the amount of spraying he really does or in the good which this little is able to accomplish.

And lastly, there is the man who thinks that "spraying doesn't do no good no how." Whenever I see him, or hear him, I always imagine that his knowledge of spraying is about equal to that of the Irish gardener, who came to his employer in great distress of both mind and body. On being asked what was the difficulty, he replied, "Bedad Sorr, I accidentally swallowed a petater bug, and although widin two minutes, I took a taysponful of Paris green, he's shtill a kickin up a divil of a fuss insoid of me, I'm thinkin' your Paris green is no goo, Sorr." Of course there may be men in other countries, however, who still honestly doubt the beneficial effects of spraying; and I, for one, though I am somewhat of an enthusiast on the subject of spraying, am willing to concede that there may be times, yes that there undoubtedly are times, when spraying does no good; times when it may even do harm. But these adverse results can almost always be explained after a careful investigation, and we will usually find that they are due to our lack of knowledge on the subject. And if, in some cases, they cannot be explained, is that a sufficient reason for abandoning the practice altogether? For every instance in which spraying has proved a failure there are numberless cases where it has been an entire success; yet some men persist in looking for the failures and utterly ignoring the successes. It is singular how much evidence some people require to convince them of the utility of such a practice as spraying, and yet these same people will pay 75 cents apiece for peach trees, which are warranted to withstand any degree of cold because the sap in them "goes down" in winter, or does not "go down," (either warrant is equally effective in securing their orders), and they will not hesitate a moment to pay \$1.00 apiece for pear trees that are warranted to be "blight proof," though this warrant consists only in the word of a "fruit-tree agent," that class of individuals, which, with certain notable exceptions, has perpetrated more frauds on a long-suffering public than has any other with the possible exception of the lightning rod dispersers. It certainly is true that "people like to be humbugged."

But admitting, for the sake of argument, that the practice of spraying still occupies debatable ground, let us see what has been done to show that it is effective in preventing the ravages of our insect and fungous enemies. If we look for evidence among our own neighbors I think it will not be lacking. I have talked with a number of men in this province who have told me that during last season, when so few apples were raised, the men who did succeed in producing a fairly good crop, were those who persistently sprayed their trees; and not only did they produce more fruit than their neighbors who did not spray, but it was better fruit, free from the black spot, which so injures the appearance and keeping qualities of our apples, and free from worms. If we go farther from home there is hardly an experimental station in Canada or the United States which has not experimented upon this subject and issued bulletins on the results, showing in almost every case a large increase in the percentage of sound fruit from sprayed trees as compared with that from unsprayed trees. In this connection let me quote from an article in the last number of the *Canadian Horticulturist*. Speaking of the benefits of spraying it says:—"As an illustration of this where spraying was done, from 75 to 90 per cent. of the fruit was clean, while from the trees in some orchards, not sprayed, only 10 to 15 per cent. of the fruit was fit to pack. Spys and other red fruit from sprayed trees commanded \$3.50 per barrel. The best fruit from unsprayed trees would bring but \$2 per barrel." Continuing it says:—"For fear the farmer with a small orchard may think this spraying business does not concern him, one man's experience is given." Mr. George Adams, of Smithville, Ontario, writes: "I have eleven Spy trees. Eight of them were sprayed, and the result was 24 barrels of the finest fruit I ever picked from them. I sold them at \$2.50 per barrel, and four barrels of culls at \$1.00 per barrel, \$64.00 in all. These calls were not spotted but were undersized and wormy. The three Spy trees not sprayed gave three barrels of badly spotted fruit, which sold for \$2.00 per barrel, and about ten barrels of culls which I sold for \$1.25 for the lot." That is to say the sprayed trees brought \$8.00 each, and the unsprayed trees less than \$3.00, a difference of more than \$5.00 per tree." Such instances might be multiplied, but it is not necessary.

And now just a word as to the effect of spraying upon the fruit. There are still some people who feel that substances which are so effective in destroying insects and fungi ought to have some injurious effect on the consumer of the fruit, and who, therefore, feel that they are tempting Providence every time they eat an apple or a bunch of grapes that has been sprayed. For the benefit of such people let me quote from the late Mr. Lodeman, of Cornell University, a recognized authority on spraying. He says:—"Fears have been entertained that some substances are dangerous, even when not visible, on account of their effect upon the crop, which was supposed to be poisoned. This subject was well agitated when Paris green and London purple began to be commonly used in the destruction of the potatoe beetle. My analyses were made, but no arsenic could be found either in the tubers or in the parts above ground, and soon all fears of arsenical poisoning disappeared and potatoes treated with the arsenites were used without question. Another equally groundless objection was raised in regard to apples which had been sprayed for the canker worm or codlin moth. It was said that the bloom found on such apples consisted largely of the arsenic which had been applied to the trees to destroy insects, and that such apples were unfit for use. These reports have led to many analyses of sprayed fruit, and only in rare cases has even a trace of arsenic been found. It is only when very late applications are made, such as are utterly useless, that any of the poison is found upon the fruit, and then the quantity is so minute that it could in no way cause injury to the consumer. But even though all the poison sprayed upon the apples in making necessary treatment would remain there undisturbed, a person would be obliged to eat at one meal eight or ten barrels of fruit in order to consume enough arsenic to cause any injury. As a matter of fact, however, the poison all disappears during the growth of the apple, and these are as wholesome as though no treatment had been given and even more so."

Similar objections have been raised against grapes sprayed with Bordeaux mixture and the following paragraph is a clear and concise statement of the facts bearing upon the case: An adult may use about 8 grains of copper per day without fear of the results,

and grapes properly sprayed would contain not more than eight hundredths of a grain in four or five pounds of fruit. "On this basis an adult may eat from 300 to 500 pounds of sprayed grapes per day without fear of ill effects from the copper."

Equally conclusive figures have been given by the Experimental Station of Michigan to show that there is not the slightest danger from pasturing stock in orchards which have been sprayed with Paris green. I shall not give these figures, because I believe that if anything could be done to convince fruit raisers that it is bad practice to pasture their orchards, a long step in the right direction could be taken and it is possible that fear of evil effects of Paris green may help on the cause. It is probable, however, that if this fear has any effect it will be to prevent spraying and not the pasturing of orchards.

In order to understand more fully what we ought to do to make our spraying most effective, let us consider a few points in regard to the life history and structure of fungi and insects. First, with respect to fungous diseases—what is it which causes the black spot of apples, leaf blight of various trees and other similar diseases? In each case, it is simply an exceedingly small plant, very different from our conception of what a plant is, and this little plant grows within the leaf or fruit for a certain length of time, and then produces its own fruit. These plants are produced from what is called a spore, corresponding to the seed of higher plants, and exceedingly minute, so that, in most cases, it can be seen only with the aid of a microscope. In the spring these little spores, which are very abundant, are blown about by the wind and finally lodge upon the leaf or fruit to be attacked. Here, under favorable conditions of warmth and moisture, the spore germinates, just as a seed would do in the ground, and sends out a little sprout. This sprout grows on the surface of the leaf or fruit for a time and then enters into the tissues of the plant, either through one of the minute openings, called breathing pores, which are quite abundant on the surface of many parts of plants, especially the leaves, or else it bores directly into the plant. Once inside, it branches and grows about through the tissues of the plant, just as roots grow in the ground. It takes up the juices of the host plant and appropriates

them to its own use, and finally, when it has completed its growth, it bears its fruit, producing spores like that from which it started. These spores are usually dark in color and are produced at or near the surface of the host plant. They are so abundant as to give to that particular spot a dark color. It is these spores which give the characteristic appearance to the disease known as "black spot," of the apple. This, in brief, is the history of a typical fungous plant. Many of them vary in some particular, but this is sufficiently accurate to serve our purpose. Now, let us see what points we can observe, which may aid us in applying our sprays so as to accomplish the most good. In the first place it is quite evident that in dealing with these pests all our applications must be preventive, and not remedial. For when once the fungous plant gains access to the leaf or fruit, it is beyond the reach of sprays, and can be destroyed only by destroying also the part affected. We must therefore, begin to spray early, or the enemy will get ahead of us, and gain access to the plant before we are aware of it. Secondly, we must keep the plant protected with our sprays so long as there is any danger from the attacks of the fungous. And, lastly, since these spores are so very small, we must use every precaution to see that all parts of the plant are reached by the spray, and not only upon the spore alighting upon the particular spot where we have prepared for its reception.

I would suggest the following treatment for the "black spot" of the apple, or leaf blights, which are a fair sample of this class of disease: 1st—Spray the trees, before the buds begin to swell in the spring, with a solution of copper sulphate or blue-stone, 1 pound to 15 gallons of water. Let me emphasize the fact that this must be done before the buds swell in the least, or they may be injured by the treatment. Next, as soon as the leaves are well "out," spray with Bordeaux mixture, and continue to spray with this latter whenever an application is needed. As to the number of times to spray, that depends greatly on the weather. If there is no rain, a single application may last for two or three weeks, but with heavy rains a second application may be needed in as many hours. From two to six will usually be sufficient, according to season and variety.

The labor of preparing Bordeaux mixture can be very materially lessened by the use of what is called a stock solution of the copper-sulphate. That is, instead of weighing out six pounds of blue-stone and dissolving it, each time that you wish to prepare a barrel of the mixture for use, instead of this, dissolve, at the beginning of the season, a quantity of the blue-stone in water, say at the rate of 1 pound of blue-stone to 1 gallon of water. Then all that is necessary, when you are ready to spray, is to measure out six gallons of this solution, and you have six pounds of copper-sulphate. The lime cannot be treated in quite the same way, but enough should be bought in the spring to last through the season—and be sure that it is fresh. Then slake the lime, and keep it in what is known as the “putty.” If it can be kept under water so much the better. Of course, when wanted for use it cannot be weighed out, or measured out, and, consequently, we must test the solution to see when enough has been added. This is done as follows:—Put the six gallons of copper-sulphate solution in the barrel, and add ten or fifteen gallons of water to make the solution more dilute. Now take some of the lime putty and mix with water as though you were preparing some whitewash. Add this to the solution in the barrel, and stir thoroughly. And now apply the test to see if enough lime has been added. Take a pen-knife with a bright blade and place the tip of the blade in the mixture, moving it backward and forward for a minute, and then examine it. If you have not added enough lime you will find bright, metallic, copper deposited on the blade, and you must add a little more lime, stir well as before, and test again. After a few trials one can tell very nearly how much lime is required.

By simply adding 1-4 to 1-3 of a pound of Paris green to each barrel of Bordeaux mixture, we may be able to deal with both our insect and fungous enemies at the same time, thus reducing both cost and labor. Use only the best materials in spraying, pure Paris green, fresh lime and copper-sulphate in crystals. They may cost you a little more, but the better results will very much more than pay the difference. But whatever else you may do that is not strictly rational, don't spend any money for patent exterminators, either of insects or fungous diseases. Buy the materials and mix them for yourself, and then you will be sure what you are apply-

ing. Some of those patent concoctions may be all right, but too many of them are like the remedy for which the hotel keeper's wife paid an exorbitant price, and which was warranted to clear the house of bed bugs. She received a small package of Paris green, with these instructions:—"Capture the bug, squeeze the back of his neck till he sticks out his tongue, and then apply a few grains of Paris green."

I had intended to give a short discussion on the structure and food habits of insects, but the length which this paper has already reached, will prevent my taking up that subject at the present time.

In closing let us glance briefly at a few lines which offer an opportunity for improvement in the future. First, nozzles must be devised which shall deliver a fine spray, and yet not clog badly. The "Vermorel" is good in this respect, but can be improved. The importance of a fine spray cannot be over-estimated since by its means all parts of the plant may be reached and protected from insects and fungi.

Secondly, materials for sprays must be cheapened, either by the discovery of new substances, which are effectual, or by cheapening the production of those already in use.

Thirdly, some power must be introduced which shall be cheap and efficient, and which shall relieve the fruit grower from so much back-aching work at the end of the pump handle. Add to all this the fact that a small army of investigators will continue to study the insect and the fungous plant from every point of view, and to suggest, year by year, new methods by which we may hope to make our attacks more and more successful.

One other improvement we must hope for in the future, and that is that every fruit grower, whether he has two gooseberry bushes or two thousand acres of orchard, shall spray his plantations thoroughly and intelligently. Then we can offer our fruit to our English cousins with confidence, sure that it will be satisfactory and sure that we can find a market for all that we can produce.

DISCUSSION.

S. C. Parker.—I notice that Professor Sears said he used 6 lbs. of copper sulphate in the mixture. We have been instructed to use only 4 lbs.

Professor Sears.—That is the standard with us. But it is a point you can tell by testing better. The object of adding lime is to change the blue vitriol, so it will not injure the tissues of the plant. You must add enough lime to make that change.

Q.—Do I understand one pound of blue vitriol to 15 gallons of water?

Professor Sears.—Yes, that is the solution for spraying trees or plants in a dormant condition. If the leaves are out they will be injured.

Ralph Eaton.—Can a stronger solution be used without injury to the trees?

Professor Sears.—That would depend on the tree. That is the strength recommended, and is usually used for applications at that time of the year. But it is probable a stronger solution could be used without injury to the plant. The spraying solution would be more effectual, perhaps, but this quantity has proved satisfactory, and does not injure plants in a dormant condition. Whether you could apply a stronger solution can only be learned by experiment.

Ralph Eaton.—It has been observed by those who have used the copper-sulphate and Bordeaux mixture for a number of years that the applications have had a marked effect in cleansing the old trees from the mosses and other fungous coatings that are certainly very prejudicial to the best health, and therefore productiveness of fruit trees. As it is the caustic propensities of the copper-sulphate that have this effect, it would be very desirable to know what would be maximum strength, which could be used, before the trees have leaved out, to obtain the best and quickest cleansing results.

As the subject of spraying is not likely to come up before the Association again during these meetings, and as it is such an important one, I will add a few more words.

The paper just presented by Prof. Sears gives evidence of very careful preparation, and is a valuable one for this Association at this time. His method of testing the quantity of lime necessary to be added to the copper-sulphate to make the Bordeaux mixture the proper strength is a new one, and would have the advantage of exactness, and therefore economy in material used in the preparation.

There are one or two points in the work of spraying, which I put into use last spring, which I consider marked improvement in my work of former years. These were suggested by the necessity of economy in labor and time, and the decidedly untidy and uncomfortable manner in which spraying has always been done, as I have seen it with others, or practised it myself. We usually see the 40 or 50 gallon oil cask for spraying carried about by one or two horses or a pair of oxen, the water splashing around promiscuously, and much delay and personal inconvenience in preparing the Bordeaux mixture, and straining it through an old bag. I obtained a one hundred gallon molasses cask, cut a square hole in the centre of bilge for a box-shaped funnel, about eighteen inches long, and large enough at the top to allow a bucket of water or Bordeaux mixture to be inverted or emptied into it without the liquid running over the side. Tacked two thicknesses of wire fly screening across the bottom of the funnel for a strainer, and fitted it tightly in the square hole, letting bottom of funnel drop about eight inches below staves. This funnel should be easily removed to allow sediment to be thrown away. The cask, of course, was intended to be placed on its bilge. In this position the length of pipe connected with an ordinary pump will reach sufficiently near the bottom of the cask, and the pump can be easily bolted on the top of the bilge between the funnel and either end of cask. To those having the old style of "perfection pump," or any style depending upon the force of water through a return hose to keep the mixture stirred, I would suggest the following very cheap, much more satisfactory and advantageous change:

Following the idea of the pumps which stir the liquid with a paddle moved up and down by a rod connected with the pump handle, by supervising the work of a black-smith—any of them

could for fifty cents fasten a light piece of iron to the top of pump handle with axle clips, allowing the iron to extend three or four inches beyond the handle. From an eye in the end of this iron a rod may run to the paddle (about 5 x 8 inches in size) made of sheet iron, and hinged by bolt to a clasp, which hugs the pipe at the bottom. By this arrangement there is no uncertainty about the liquid being stirred whenever the pump is in motion. By the addition of a coupling, a few feet of hose and another nozzle, the "return hose," for which there will now be no need, can be changed into a second spraying outfit, so that two trees can be easily sprayed at once, or both nozzles can be turned on the same tree. Of course, if a person is purchasing a new pump this stirring apparatus is attached, and though of many different styles, most all seem to keep the liquid well mixed. I found that the "perfection" pump worked easily when both hose were used, and only required a twelve year old boy at the handle.

A good ten hundred horse can easily handle the hundred gallons of liquid, even on newly ploughed ground, and if the pump and funnel are well fitted to cask, a person can sit on it and ride without getting the least wet.

In placing the cask in proper position in the horse cart support it properly on bottom, secure it firmly in front and back, by pieces of 2 x 3 studding, or something similar, running across cask and bolted to the staves, and on sides by boards, ten to twelve inches wide, hollowed out on one side to suit curving of staves, and then nailed to top of cross studs. A person can then stand on floor of cart in back and front, or on boards at side of cask, which will elevate them some two feet. The cask when thus fixed will be solid.

I made the preparation of the Bordeaux mixture very simply in the following way: If I wanted to spray, say four hundred gallons in the morning, I would weigh out the evening before thirty-two pounds of copper-sulphate in a basket, and suspend the basket at the top of the water in a barrel containing sixteen gallons, or eight buckets. Slack thirty-two lbs. of lime in same quantity of water in another barrel. Then for each 100 gallon cask I would take two pails of the sulphate mixture and two of the lime mixture (after they were well stirred), pour them into a third barrel, stir and empty into cask.

Some Things I Have Observed in Fruit Farming.

BY HENRY SHAW, WATERVILLE.

I believe in short introductory remarks. I also believe in short addresses, especially on an occasion like the present. I do not expect to tell you anything new or anything you do not know, but perhaps I can remind you of some things you have forgotten or neglected. I have observed apple trees that have a bunch of sprouts growing around the trunk never die from bark bursting. I suppose the reason is that the sprouts catch and hold the leaves that fall from the tree in the autumn, and the leaves and grass hold the frost later in the spring, preventing the sudden thawing and freezing. The sprouts also in some measure prevent the rays of the sun from shining on the trunk in April. I have observed that trees manured in the fall of the year produce far larger crops and a much better quality than trees manured in the spring. I suppose the reason is that manure applied in the autumn goes into the ground, and is there locked up all winter, and when the spring time comes, and the trees put on a pretty mantle of pink, white and green, they have an ample supply of plant food to last them all summer, and in return for this good care they will present the owner with a golden harvest.

I have observed that trees growing in sod, if properly manured in autumn with well rotted manure, and the grass cut before, or when it is in blossom, produce evener crops annually, the fruit is better colored, freer from scab and other defects, will keep much longer than apples grown on cultivated soils. One tree properly manured, trimmed and well cared for, is worth a dozen neglected trees. It never pays to grow inferior fruit; it always pays to grow good fruit. I have noticed that it always pays to use unleached hardwood ashes. Ashes never fail, especially on sandy land; ashes will last in the land five times as long as the best fertilisers we can buy. I have also observed that it is a very bad plan to manure an orchard heavily one year, and then let it go 3 or 4 years without. It is like trying to rear an animal by giving it a big feed one day, and then letting it go hungry three or four days. You may keep the breath of life in the "critter" but it will not amount to much.

There are many beautiful things in this world, one is a well kept orchard in full bloom. A still prettier sight is the same orchard in the fall of the year loaded with rosy cheeked apples. Talk about the tropics and tropical fruit; compare the orange with our Gravenstein, and see what a difference. The rind of the orange is thick enough to make moccasins, and what little remains of it is nothing but sour water. Then take the preserved fruits of the tropics, the tamarind and dates, and compare them with our preserved plums, strawberries or cranberries, and see what a difference. A man never knows the value of good health until he is deprived of it. We will never know the value of our country for fruit growing till we leave it. I know, and I dare say many of you know of men who have left fine farms with good orchards, or fine lands for orchards, and gone west in hopes of bettering their condition. A few may succeed, but the most of them fail. I know of one man in particular who planted a large orchard and sold his farm; now it is one of the best in the country. Last year it produced fifteen hundred barrels of apples. To-day that man is in southern California having a hard struggle to make a living growing tropical fruits.

Mr. President, I think I will change the subject a little. I always maintain that no man's belief constitutes a fact, unless he has positive proof to back it up. I will tell you what I believe, and will give you the proof. I believe that apple and plum trees will bear full crops every year if they are amply supplied with manure and water. Two years ago I put up a windmill pump for irrigation that raises 120 barrels of water an hour in a good breeze of wind. My orchard land is nothing but sand piled on top of sand, and to finish it up there was some more sand put on. In dry seasons it suffers very much from drought, the plums and apples are very small, and drop off badly. Two summers ago I put ten thousand barrels of water on a half acre of plum orchard, and about the same amount on the apple orchard. I had a large crop of apples and plums that year just as you all had. This last season where I irrigated most the previous, I had a full crop of plums, where I irrigated least I had very few, where I did not irrigate I had nothing; it was the same way with the apples. I had a full crop both years, and now plum and apple trees, to all appearance, are budded

for a full crop next season. Now, gentlemen, you will observe that I have not departed from my early training. In my Sunday school days I was taught to believe in much water.

I have also noticed that our most successful fruit growers are not lazy, ignorant, nor idle, but they are active, energetic, great thinkers and readers, using their brain as well as their muscles, willing and anxious to compete in the markets of the world with the fruit growers of all other countries. If one tree dies they will dig it up and set another. If one variety proves worthless they will cut it out and graft in a better kind. They never allow their own, nor employ their neighbors' cows to do their pruning, they prefer to do it themselves. And the man that starts early and starts right in any business, especially in any new branch of fruit growing if he sticks to it and perseveres, he is sure to succeed, and will be amply rewarded for his labor, while the man who starts late and starts wrong, does his work wrong and carries on the way, if he ever does get there, will find little or nothing for him. Last, but not least, I have observed that the proper way to set fruit trees is to set them as upright as possible, and be sure and place the root end in the ground. (Applause.)

DISCUSSION.

George Thompson said, in reference to trees bearing every year, he would like to know if it were not necessary to thin out the fruit every year—that unless you thin out the fruit they will not bear a good crop the following year.

Henry Shaw.—The year before last we had a full crop of Astrachan. We irrigated heavily that year, last year we had another full crop, and now they are budded to all appearance for a full crop for next year.

R. W. Starr.—How long did you keep up the irrigation?

Henry Shaw.—From the middle of June to the last of August.

Rev. Mr. Axford.—Did you irrigate the leaves or roots?

Henry Shaw.—The roots, by running it in furrows between the rows of trees.

R. W. Starr.—How far did you have to bring the water?

Henry Shaw.—Twenty-two feet in height.

President Bigelow.—Give us the whole cost of construction and maintenance of your pumping plant?

Henry Shaw.—Cost of plant, about \$150. It is a twelve foot Aermotor steel wheel.

President Bigelow.—Then the cost afterwards?

Henry Shaw.—Just the ordinary wear and tear.

President Bigelow.—And what is its duration?

Henry Shaw.—A steel wheel should last 40 years. The tower painted once in five years.

Q.—Is that the ordinary cost of them?

Henry Shaw.—You can get them for less than \$150.

Dr. DeWitt.—How deep is the well?

Henry Shaw.—The water is brought from a brook to the pump, which raises it 22 feet in height, and then carries it all over the field. The wind-mill is on the highest part of eight acres of ground—and I can run the water over the eight acres. I have not completed the plant yet, for I intend to build a reservoir to hold three or four thousand barrels of water, and have it in running order all the time.

George Thompson.—I am very much interested in this question of annual bearing. I fertilize my trees very well. I have had Graensteins bearing five years in succession. Last year they bore an enormous crop, and this year very few. Now, about mulching. Have you ever tried mulching the trees. The couch grass under the trees is injurious to them. Have you ever tried mulching under trees?

Henry Shaw.—No, sir. Mulching prevents evaporation. A thick coat of grass would answer the same purpose.

John Donaldson.—We find on heavy land that orchards require underdraining—would that agree with the system of irrigation advocated by you?

Henry Shaw.—Yes, if you have too much water you will kill vegetation, then underdrain. Too much water will prevent a good growth of any vegetation; and if you do not have enough water the vegetation will languish, and there is where irrigation is useful.

President Bigelow.—This is applicable to sandy land?

Henry Shaw.—Yes.

Dr. DeWitt.—Following up Mr. Thompson's question with regard to mulching—I would like to ask Mr. Shaw whether if his land were seeded down with red clover, as that is a crop which produces the most nitrogen, and when that clover was in blossom, if it were cut and the trees mulched with it, whether it would not prevent the escape of moisture, and keep these roots all irrigated as well as his water from the wind-mill.

Henry Shaw.—It would prevent evaporation, but it would not add any water like a wind-mill pump.

I have two acres seeded down to clover; next year when it is in bloom I will mow it and mulch the ground, put on a sufficient amount of manure, and then fire on all the water I can get on to it for the soil is nothing but sand.

J. M. Parker said it was useless to manure a tree close up to the butt. It would be better to spread manure as far as the branches extended at least, for the roots extend still further. The whole ground should be as well manured and mulched as around the tree.

Dr. DeWitt.—In advocating mulching, I would not give the opinion that we should do away with manuring or composting. We must use that as much as ever. Every agriculturist knows that it should be distributed all over the ground.

Mr. Pineo.—I would ask Dr. DeWitt, if he would mulch the whole area?

Dr. DeWitt.—I had in mind Mr. Shaw's eight acres; and I had other orchards in mind in this vicinity where mulching could be used. And having in mind those eight acres, I would advocate the mulching of the whole surface. There are orchards in this vicinity of plum trees only eight or ten feet apart—in that case the whole surface should be mulched.

Mr. Pineo.—If we fertilize close to the tree, it causes the fibres and roots to increase more largely than it does away from the tree. I think it is just as necessary away from the tree as close to it.

Ralph Eaton.—Another point in favor of mulching with straw or such like material is its manurial value. A ton of oat straw,

for instance, will contain 62 per cent of nitrogen, 20 per cent phos. acid, and 1.24 per cent potash, which of itself is worth nearly \$4 as a fertilizer. This is an important consideration in the growing of trees along fences or side hills, where cultivation is not practical. My own experience during the last ten years has led me to believe that as good growth can be obtained by trees planted in these positions as when well cultivated, provided they are well fertilized when set, and mulched sufficiently to prevent any grass or weeds from growing as far as the roots extend. During the past season I used a half ton of coarse grass around 150 trees, 3 years old, in a line fence, and consider it a sufficient mulch for at least two years. Of course, it will be necessary to use some birch bark, tarred paper or wire screening around the trees at the butt to prevent the ravages of mice, but the cost of the tarred paper, including the application on a few hundred trees is a mere bagatelle. In this mulching is a point in the economy of fertilization and cultivation which is worthy of practical consideration in the matter of orchard planting, especially in new or unbroken ground. Mr. S. B. Chute, of Berwick, one of our most progressive men, who is always finding out the most economical principles in fruit culture, is adopting this system with his blackberries and raspberries.

T. H. Parker—Said he was much pleased with Mr. Shaw's remarks. There was one observation which Mr. Shaw made that should be emphasized, and that was "to start early, start right, and stick to it." He said he knew a man who owned a tract of land, on which he planted a young orchard, and then sold out. This farm has since been sold for \$6,000. He then purchased another farm near the North Mountain, planted a large orchard, and sold out, and went to California. This farm has since produced 1,500 barrels of apples a year. Thus the second farm was started for other men to gather the fruit. He went to California and engaged in speculation, and lost all he had. He then came back to New Glasgow, and was so reduced in circumstances that he had to rent a piece of land. He went into the fruit business, and regained his position, then went to California again. He sold his farm in New Glasgow for \$3,000. A young man will have no difficulty in getting along in this country if he starts early, starts right, and

sticks to it. A good business can be done in small fruits especially. There is money in it.

M. G. DeWolfe.—I understood Mr. Shaw said he would value wood ashes at one dollar a barrel. What is the manurial value of ashes per ton?

Henry Shaw.—I do not know, but unleached hardwood ashes, which never have been wet, will last 5 or 10 years in the soil. A good many years ago my old orchards were very scabby; I went to the lumber camps in the woods and got 30 or 40 barrels of ashes and put them on a few acres, and had a fine crop—that is 20 years ago—and the value can be seen to-day. I have used ashes around my trees every year—they always pay me. This bone meal and phosphates in a year or so is all gone. Of course the wood ashes are difficult to get.

M. G. DeWolfe.—In your use of wood ashes, have you found your trees are less liable to insects?

Henry Shaw.—The trees throw off the old bark, and have better foliage, and the fruit is freer from scab. The ashes supply the potash necessary to make the fruit perfect. With respect to irrigation, I should be pleased if any of you would pay me a visit and see my pump for yourselves. In the meantime you can get Wilcox's work on irrigation, which is published by Orange, Judd & Co., New York. It is the latest and best work on irrigation.

Dr. DeWitt.—This paper is very important and I might say here there was not enough discussion, especially with respect to spraying. I think it would be better to have a fewer number of papers and more discussion. Mr. Shaw in his observations has told us how to set the tree upright, which statement has been challenged by Mr. Eaton, who thinks that the trees ought to be set out inclined to the west, where our stronger gales come from. I do not know but that I question him. Is not the leaning of the trees the fault of the pruner? I have seen a few thousand trees planted—although it is not my profession—and I know that those trees are not leaning at all; but have been set out with a view to this by having the trees pruned so the trees will not tip—so the larger roots are being fixed in the ground from the direction in which the

gales come. The trees can be set upright, and can be pruned, root and top, to keep them upright ever afterwards.

Henry Shaw.—This tendency of trees to lean can be remedied by halter breaking, that will keep them up. (Laughter.)

A. A. Pineo.—I have set out trees leaning to the west and found out some two or three years afterwards that I made a mistake, and should have set them to the east instead of the west. You may see many orchards with the trees inclining towards the east—and it takes a good deal of care to bring a tree up. I would rather have a tree upright so that I could form the top and have it equally spread from the centre, and keep it that way.

Mr. A. Parker.—If you put a tree upright the prevailing wind will take it the other way. That is my actual experience. I have some trees, and if I had to put them out again I would put them at 45 degrees to the west. When the wind blows every little twig goes over from the east to the west. So that instead of putting them upright I would set them out at an angle of 45 degrees to the west.

A. Whitman.—In reference to the sprouts that Mr. Shaw spoke of—I understood him to say that there was some difficulty arising from it. The first thing I do is to cut off all the suckers, when I am trimming, and follow it up during the year. I remember being in his orchard, and I found he left the sprouts 2 or 3 feet around the tree. Perhaps I misunderstood him. I think he said there was some advantage.

Henry Shaw.—There are a great many trees, like Gravensteins, die by having the bark slip off the butt. I never knew of one in my orchard that had the bark slip off that had a bunch of suckers, or sprouts and grass to catch and hold the leaves—the leaves hold the frost later in the spring and prevent the sudden thawing and freezing which causes the bark to slip off.

Ralph Eaton.—How many years would you allow these suckers to grow?

Henry Shaw.—They do not do any damage. I would cut them down in the spring, and let them grow until the next spring.

George Thompson.—A short time ago I read an article in the report of the Fruit Growers of Ontario, and though it seemed an

unsightly thing to see these sprouts around the tree, they advocated leaving the sprouts because it protected the trees from the sun before the leaves came out; and it preserved them from bark sun scalding. They advocate that—and that is a pretty high authority. It does look unsightly

Saxby Blair.—I have been very much interested in the meeting to-night, especially in the points which have been discussed by the various speakers. One thing that interested me more particularly was the setting the tree out, or setting it at an angle. It is a question which has occupied my attention in Nappan to get the tree to grow straight. Our prevailing winds are not from the east, but are more from the south-east; and consequently in that district we would have to set them out differently.

Rev. J. W. Manning said this was the first opportunity he had ever had of attending a meeting of the Fruit Growers' Association in Kings County. He thought the meeting was exceedingly interesting, and he was very glad indeed to be present to hear the different speakers, and the papers which had been read.

THURSDAY.

Association met at 10 o'clock.

President Bigelow in the chair.

DISCUSSION.

Is the Work of Black Knot Inspectors Profitable?

INTRODUCED BY C. A. PATRIQUIN.

Mr. Patriquin said—Immediately after the passing of the act the town council of Wolfville appointed an Inspector. He was paid twenty cents per hour and ten cents for each notice delivered. He visited 160 orchards in two days. In 94 places Black Knot was found to exist. The same orchards were visited again, in fourteen days the knot had been cut off; and between 300 and 400 trees destroyed. The people having infected trees seemed desirous of complying with the act. During the month of November the

same orchards were revisited, and in 74 places it was found to exist. The owners were asked to have the knot destroyed, which was at once attended to. In the spring of 1897 the town was practically free from this disease. No inspector was appointed in 1897; there was quite a growth of black knot during the year, but in most cases it has been cut off this fall. I think the last two seasons have been very conducive to its growth. I think in the orchards sprayed with the bordeaux mixture there is not nearly as much black knot. The town of Wolfville could be kept clear of black knot at an expense of five dollars per year for inspection. The Kings County Municipal Council thinks it is not worth while to pay much money for it, as I understand that all the bills put in were cut down. They prefer to pay more money for the snouts of wild cats and skunks.

Q.—Can you tell us how many plum trees there are in the town of Wolfville?

Mr. Patriquin—Between 20,000 and 30,000 trees.

J. M. Parker—It is not only the plum trees which are infested, but if you go into the South Mountain in the western part of this county you will find the second growth of wild cherry completely black with it. It would take a good many five dollars to exterminate it within the limits of Western Cornwallis. Wherever you find a wild cherry tree throughout the Valley you will find the black knot more or less.

I. Shaw—If you go into the woods fifty rods you will easily discern it. I have seen bunches of wild cherry infested with it right in the forest. I would not oppose a law to have proper inspection—that is cut off the bad trees.

Mr. Stevens—I was appointed by Kings County Municipal Council to look after the black knot in ward two. I called at 300 places—both farms and gardens—and examined them for the black knot. I found the black knot in about 125 places. I served 116 notices. I called again at these places about ten or fifteen days after my first visit. In almost every case I found the owners had cleaned the trees and destroyed the knot thoroughly. In the month of November I found the black knot was on the trees as bad as in April. Whether it would be wise or not to spend money

to keep it down I cannot tell. My bill was \$43.60 to the council. I am informed that they cut it down about half. It is necessary this matter should be looked after, and the inspector must be paid.

R. S. Eaton—Was it expected that you should visit the orchards again in the autumn, after the leaves had fallen?

A.—I was not so instructed. If I had been, I would certainly have done so.

R. S. Eaton—I can testify to the keenness of Mr. Steven's eye in detecting the black knot. He discovered it on two trees in my orchard. After the leaves have fallen would be the most important time to visit. I hope the work will be kept up. The winter spores will soon be spreading.

Mr. Patriquin—It is just as necessary to visit in the fall as in the spring.

J. Donaldson—Did you have any refusal on the part of the owners to cut out the black knot?

Mr. Stevens—No. I found that the people were pleased that a person had been appointed to keep the trees clean. In one case, a man said it took him a whole week to clean his orchard.

President Bigelow said that individual growers could do more to keep it down than all the corporations on earth. It is a vital question for this county, and the municipality should not neglect it. It is not the man who makes money out of his orchard, but it is the neglected orchards which produce no fruit and are not looked after. I would like to ask Professor Sears to give the latest information on the subject.

Professor Sears—The spread of the black knot is principally in the early spring. The spores, which correspond to the seeds of other plants, are blown away, and lodge on the limbs of trees, and they are thus infected with disease. The plant grows on the tissue of the tree; and when you remove it—if you see the black knot on a limb the roots are much more extensive—you should take more off than the part affected. Another point we ought to remember is, that spraying is very effective, and at the same time you are spraying for this you may be spraying for other things as well.

If you are troubled with any insects, you may combine it and fight against this fungus. You may fight it in two ways, by cutting out and burning the parts affected, and by spraying. If there are affected trees in any district the inspector ought to have these removed, as they are a public nuisance, and ought not to be tolerated.

President Bigelow—What is the special time or season for attacking this pest?

Professor Sears—The special time is in the spring, and for that reason the first application should be before the plant comes out. The trees should be sprayed with the plain solution of blue vitriol.

Q.—What is the cause of the plum leaves falling, as they did this season, and is there any cure?

Professor Sears—I am not familiar with the particular case. It is usually some form of leaf blight, and it can be controlled by timely spraying.

Secretary Parker—Regarding this latter question that has arisen, I have a letter from Professor Craig, bearing directly on it:

“Ottawa, Sept. 27th, 1897.

“Dear Mr. Parker:

“The plum leaves which you sent me are affected by a disease known as shot hole fungus *Cylindrisporium padi*. There is no need to dilate on the damage that this disease causes to your trees. You have had an opportunity of learning something of its nature this summer. It is one of the easiest of all the fungous diseases to prevent by spraying. Three applications of bordeaux mixture, made at intervals beginning with the time the fruit is about the size of peas will effectively and satisfactorily prevent it.

“Yours very truly,

“JOHN CRAIG,
“Horticulturist.”

R. Starr said that where spraying is not done and resort is had to cutting, it is absolutely necessary that it should be done before the spores are circulated—before they ripen and pass off, and it

must be done in the early fall. If they can be cut before they turn black in the summer it would be better.

Mr. Patriquin—There are two crops of spores. One that ripens in summer, and another in the early spring. You can see it swelling and growing. It is a kind of yellowish color. If it is cut off and destroyed, then there will be no spores from it which will spread. If the knot is cut off after it is ripened and left on the ground, it will spread. It is absolutely necessary to destroy it in some way when it is cut off. In some cases, after you cut it off, the roots are still left, and I have seen spirits of turpentine recommended. Another way is to paint it over with shellac.

T. H. Parker—How far will the spores go?

Professor Sears—As far as they can be blown. If you take it off when it is green it will do no harm to leave it in the orchard—the same as in the case of weeds.

Ralph Eaton—Might it not mature after it is cut off?

Professor Sears—I believe in burning it. The safest way would be to destroy it in all cases.

J. E. Smith—With respect to the use of turpentine—I went through my orchard on the 2nd of May, and cut off all the black knot I could find. I came to a crotch where there was quite a large piece, and I applied turpentine and sulphur, and I found no spreading from it. It seemed to kill it dead. In other places, where we did not apply it, it was as thick as weeds.

T. H. Parker said he had grafted plum trees in a remote place, at least one-quarter of a mile from any plum tree. He grafted two feet from ground. He had put in scions from Bradshaw. Since then he found plenty of black knot, and he had come to the conclusion that there was something inherent in every plum branch, put it where you will—that there was something inherent in a tree that under certain conditions it would develop black knot, and if this was the case, all the pruning you could possibly do would be of little use.

Professor Sears—Under certain conditions it will develop the black knot; but you must have spores to develop it.

When you get clover to grow without seed, you will get the black knot to grow without any spores. (Laughter.)

Mr. Miller said he cut the black knot off three times a year. In the fall he cleans everything up he might have missed when the tree was in foliage. He generally made from three to four trips in the orchard during each year. His first visit was when the fruit is setting; then again, after the fruit had been gathered in; and later on, he would finish the job up. He found that certain varieties were affected more than others. The Lombard species seems to have an affection for black knot, while other varieties seem to show very little of it. What the outcome was going to be he could not say. When plums are at a pretty fair price the farmers were inclined to look after their orchards, and when plums go down in price they get careless. He knew of a number of orchards which had been abandoned from the ravages of the black knot. He thought their greatest hope was along the line of spraying to check it in its conception. He intended to make an attempt in that direction during the coming season. He said if the bordeaux mixture, used for three successive seasons, will annihilate it, it would be a very valuable discovery.

S. C. Parker—It was remarked a moment ago that the county council were using their efforts to exterminate the evil. I do not think so. My own opinion is that when they accepted the act and appointed inspectors they did not expect they would inspect. They did not expect to have any bills rendered; and when bills were rendered it astonished them, and they immediately proceeded to cut the bills of the inspectors down to one half. I think it quite important that the matter should be again urged on their attention.

John Donaldson—I would like to see this inspection carried on in my own ward. I would move that Mr. R. S. Eaton and the secretary be a committee to urge the matter upon them. Seconded and passed.

THE SAN JOSE SCALE.

Mr. Patriquin then read the following proposed act:

An Act to Prevent the Spread of the San Jose Scale.

Be it enacted by the governor, council and assembly as follows:

1. This act may be cited as the "San Jose Scale Act."
2. In this act the word Minister shall mean the minister of agriculture or secretary of agriculture for the province of Nova Scotia. The word plant shall mean any tree, vine, shrub or plant, or the fruit of any tree or plant, or any part of a tree, vine, shrub or plant.
3. No person shall import or bring or cause to be imported or brought into the province of Nova Scotia, for any purpose whatsoever, any plant infested with scale, under penalty provided by section eleven of this act.
4. No person shall keep, or have, or offer for exchange or sale, any plant infested with scale, under penalty set out in section eleven.
5. For the purpose of scientific investigation the Minister may, from time to time, by writing, given under his hand, except such persons as he may deem proper, from the operation of the two preceding sections, and while acting under such permission, such persons shall not be subject to the penalties imposed by this act.
6. In any city, town or municipality of the province in which scale exists, or in which there is good reason to believe it exists, or danger may be justly apprehended of its introduction, it shall be the duty of the city, town or municipal council, as soon as it becomes known to either such council or members thereof, to appoint one or more inspectors to enforce the provisions of this act in the city, town or municipality, and fix the amount of remuneration, fees or charges he is to receive for the performance of these duties, and in case a vacancy should occur in the office of inspector, it shall be the duty of the council to fill the same forthwith. Said inspector or inspectors, within ten days after appointment, as aforesaid, shall file his or their acceptance of the same with the clerk of said city, town, or municipality, the expense of inspection to be borne equally by the city, town or municipality and the provincial government.
7. It shall be the duty of each inspector on or without complaint, whenever it comes to his notice that the scale exists, or is supposed to exist within the city, town or municipality, to examine without delay the tree or trees supposed to be infested, and

if the scale is found to exist a distinguishing mark shall be placed upon the tree or trees where the scale is found, and he shall forthwith give notice, in writing, to the owner or occupier of such land whereon the scale is found. If such owner be a non-resident, the notice may be left with the person in charge of the said land or trees. Such notice shall contain a simple statement of facts as found to exist, with an order that within ten days they shall immediately destroy, by burning, or take such measures as have been proven to be effectual in the destruction of the scale, and continue them until its extermination has been effected; and in case of the tree being known as nursery stock, shall require the person in whose possession or control they are found, to have the same effectually destroyed.

8. Any person appointed by the Minister, city, town, or municipality, under this act, to inspect or to destroy any plant for the purpose of enforcing the provisions of this act, shall, upon producing his authority, in writing, have free access to any nursery, orchard, store or store-house, or other place, where it is known or suspected that any plant is kept.

9. It shall be the duty of each inspector appointed under this act, to make himself fully acquainted with the life, habits, history, and best methods of destruction of the scale, the literature to be furnished him by the provincial government.

10. Under the recommendation of the Minister, there may be paid out of the consolidation fund of the province of Nova Scotia, to the owner of any plant that has been set two years or more (not including fruit) so destroyed, a sum not exceeding one-fourth of the value thereof, as reported upon by such officer or other competent person appointed as aforesaid.

11. Any persons neglecting to carry out the provisions of this act, or any persons offering any hindrance to the carrying out of the provisions of this act, shall, upon summary conviction, be liable to a fine of not less than twenty dollars nor more than one hundred dollars, together with costs, and in default of payment thereof shall be subject to imprisonment in the common jail for a period of not less than ten days and not more than thirty days.

12. The governor-in-council may, by order, direct that other scale insects, other than the San Jose Scale, may be included in the provisions of this act, and thereafter and during the continuance of such order-in-council the word scale in this act shall include all such other scale insects. Public notice of such order-in-council shall be given by publication in two successive issues of the Royal Gazette.

Professor Sears—It would be very hard to say when stock is infested with the San Jose Scale, and when it is not. The most satisfactory way would be to have the stock treated in some way, so that if there is anything there it would be destroyed. By mere inspection it is not possible to insure freedom from the scale.

Secretary Parker—I do not think any system of inspection can be absolutely successful in dealing with this matter. The United States have made a compulsory inspection system; but their entomologists say that a compulsory system is not effective. I have read a number of letters from inspectors. As Professor Sears has said, they can tell when they find it, but they can not be sure it is not there if they do not find it. It is almost impossible to go through their large nurseries and guarantee freedom from the scale.

Dr. DeWitt—I think it would be a God-send to this province, a providential blessing, if we could keep foreign trees out of this country—in other words, stop importing from Ontario and the United States for a few years. We would then be able to keep out the San Jose Scale.

R. R. Duncan said this matter was too important to settle in a hurry. He would move that it be referred to a committee, to report in the evening or to-morrow morning.

C. A. Patriquin, R. S. Eaton, P. Innes, J. E. Starr and S. C. Parker were appointed a committee to report upon this question before the meeting adjourned.

Unanimously carried.

THURSDAY AFTERNOON.

2.30 p.m. Dr. H. Chipman in the chair.

The Marketing and Shipping of Apples in Great Britain.

By G. E. DEWITT, M. D.

For the past twenty-five years or more the fruit growers of this valley, have, as the seasons approached, been in the habit of shipping apples to London and Liverpool, and, now and then, direct to Glasgow.

At the annual gathering of Fruiterers and Market Gardeners of England, I heard the president, Mr. Garcia, of the firm of Garcia & Jacobs, say that their firm were the pioneers in this country in the apple trade; but, since then, numerous other competitors had disputed the field, and the trade was now divided among many.

Those present, who addressed the meeting, and alluded to Nova Scotia apples, spoke favorably of their quality, but advocated a better and more uniform package, better packing and better transportation facilities. They were unanimous in the expression of their opinions, that, in the interests of the Nova Scotia shippers, only the best fruit should be sent to the London market.

Nova Scotia shippers have found much fault at times with the reports of consignees in Great Britain, when they have reported the apples arriving in a bad condition, and prices were low in consequence, the shippers sometimes intimating that the reports could not be correct, and that the consignees made them to suit their own purposes. I may say, however, that those who have been in London and observed the condition of the fruit when it arrived, have had good reason to believe that those reports, were, in many cases reliable.

I must say, as I have said many times before, since my visit to Great Britain, where I observed some forty thousand barrels of Nova Scotia apples landed and sold, and the deplorable condition that great quantities of them arrived in, that I have good reason to give credence to the reports.

Most of the apples arriving in London, in February and March last, were slack in the barrels, and many were rotting. A great

many of them were shipped out of season, notably among them were Ribstons, Kings and Greenings. These apples sold from six to fourteen shillings, according to their condition, while Golden Russetts were bringing from nineteen to twenty-one shillings. The English know enough of Nova Scotia apples to look for them in their season, and when they arrive out of season and rotting, they are simply not in the market to compete with seasonable fruit.

I believe that the season for our Kings and Ribston apples, which when in good condition, bring high prices in England, might, by proper storage, be prolonged. Under the present helter-skelter condition of storage, they are too often kept at variable temperatures, in house cellars, and when on transatlantic voyages they are subject to close quarters, they soften and decay. It may, to some, seem to be not in accord with the subject of my paper to speak of the dangers of storing fruits and vegetables in cellars under dwellings, and yet, a shot at random may sometimes be of service,

The apple, cabbage or potato, when decayed, may be the nidus to propagate the germs of disease. There may be no danger in storing small quantities of fruits and vegetables in cellars needed for family use, providing they are frequently overhauled, and those showing the least symptoms of decay removed, and the cellar thoroughly ventilated; but experience has taught us that when the reverse has been the case, that numerous and fatal diseases have been traced to the farmers' cellars.

Irrespective of cheap freight rates, or rates that will allow us to compete favorably with Ontario and United States, there are three things we sadly lack. These are: Careful and systematic packing of the fruit, proper storage facilities on this side, and properly equipped and ventilated ships. Shippers need have no fear but that their apples will be provided with proper storage on the other side. The warehouses I saw in London and Glasgow, especially those of Northard & Lowe, are spacious and sanitary, and in every way well adapted to the preservation of the apples after they arrive. The custom of this firm to sell the fruit coming to them at private sale when stored in their warehouses, makes a safe provision for it, providing the consignees deem it advisable to hold it a short or longer period for better prices.

It has been said that by the means of cold storage earlier fruits will be preserved all through the winter and find a ready sale. I venture to say that, should our Gravensteins be preserved until the first of the year, that in seasons of plenty, they would drive out, or very much depreciate the seasonable varieties, such kinds as Rib-stons and Kings. With the proper storage facilities and properly equipped steamships, our Gravensteins can cross the ocean all right in their season, as can all the varieties, from the earliest to the latest.

I do not wish to discount or under-rate the advantages of cold storage. This process will have its place for pears and plums and other products. Before we can successfully compete with other countries, our apples must have proper storage subject to a proper temperature. Being exported otherwise, we will fail whether ships are well ventilated or not. I believe that the Furness people have done what they could to make their ships coming into this port safe carriers for our apples, and I know that their captains try to see that the freight is carefully handled, but with all this care, and with all they have done, we need differently constructed ships. While in London I heard one firm say, who dealt largely in fruits from the Canary Islands, that but seldom did a bunch of bananas soften in transit from October until February. The best ships coming into these ports were constructed for the carrying of passengers and perishable freight. These are the boats with superior ventilation and sanitary arrangements that the farmers need to export their apples across the Atlantic. If the farmers choose, they can have them, but, until they unite to conserve their interests, things will be much the same as they are now.

I know it has been said that I went to London for the purpose of seeing how our apples were generally handled and marketed. Men were informed on the other side that I went there to see how they handled and sold our apples. I went to London for two purposes, one, in the interests of my profession, and the other in the cause of the apple shippers. Apple sales usually commenced in the great public markets at eleven a. m., and lasted about two hours. When there was a great flux of apples in the market, buyers usually had it their own way. There is no doubt about that.

When in the markets apples are so plentiful that there are enough and to spare, the buyers do, to a great extent, regulate the prices. I have made the statement public, since I came home, that I saw in auction sales several samples of this, and since then I have been taken to task by some of the friends I met over there because I stated facts as I found them, they, having been posted by their friends on this side. My reply to them was that what I stated actually occurred, nor did I know that it reflected discreditably on the sellers. The salesmen at public auction cannot help or prevent buyers' rings. They exist all over the globe.

There is no fruit handled so severely as the apple. If the London firms saw their oranges, pines, bananas and other fruits handled as our apples, they would go for the stevedores in such a way as to bring about a speedy change. Contractors unload steamships with alacrity. From every hatch the apples are hoisted out at the same time. From one may be seen the rope netting emerging holding from twenty to thirty barrels, sometimes softly and at other times in such a way as to test the strength of the barrels and the texture of the fruit. From another hatch are seen several cant hooks, with barrels in their grip, depositing them on wharves, gently or otherwise, as the man at the lever happens to guide them, and from another hatch may be seen the single barrel constantly coming to the surface and dumped on a protected gang plank, when a few moments precipitate coasting brings the chime of the barrel in contact with the wharf, often making a somersault before it stops in its wild career, all of which is trying to the skill of the cooper and the contents of the barrel. Clear-skinned apples, such as Kings, Gravensteins, Greenings, Fallawaters and Blenheim are more or less bruised by the process. A barrel may become dislodged from its lofty perch on the rope netting and fall from twenty or thirty feet into the hold of the vessel, and, although the barrel may not be shattered, as one might suppose, it would, like Stevenson's engine, when the Scotch inventor was pleading for its place on the track, some one asked him how it would affect the engine if a cow got on the track? The inventor replied: "It would, no doubt, be bad for the cow." From personal observation I know the fall was bad for the apples.

A barrel well nailed will stand a great deal of thumping, but the thumping is bad for the fruit.

What will insure to the fruit growers of this valley a better package, more honest, careful and systematic packing, cheaper freight and better carrying facilities? Not the present isolated and dependent condition of the farmers, surely! I have not written this paper for the purpose of making a plea for the N. S. Apple Shipping Co., Ltd., nor is that company dead, as some would fain believe, but more especially for bringing and keeping alive before the association some of the main facts existing in the apple trade and the necessity for a change that will materially improve them.

Without a united effort on the part of the fruit growers, it will, in my opinion, be a long time before we will have a uniform package, well ventilated steamers and cheaper rates. Why? Because cheaper rates have been advocated before this association for the past ten years, to my personal knowledge, and I know not how much longer, and plans made, and efforts put forth to reduce them but all efforts and plans seem to have been in vain, as the freight across the Atlantic to-day, including railway charges, is ninety cents, or about double the price charged from American ports.

Last March, while in London, Mr. Stoker, the managing director of the Furness Company, gave me to understand that the ocean freight to be charged by their boats, this year, would be two shillings and sixpence. This, with railway freights added, would be seventy-five cents instead of ninety cents, as now charged. I believe and know that if there were a united effort on the part of the shippers of fruit, and the "Furness" people approached in the right way, they would obtain a uniform and reasonable rate, as well as improved carrying facilities. The company have done the best they could, under the circumstances, to preserve the apples in transit, and have no thought of allowing the traffic to go out of their hands, or into other channels, and I think I may further say, that the farmers of this valley wish to patronize, as they ought, the regular boats.

It has been said, and truly, that a great portion of Great Britain never see Nova Scotia apples. Why is this? Because the greater

bulk of our apples are shipped to London, Liverpool and Glasgow. By the time they have reached the consignees' hands, every barrel has carried with it a string of charges, commencing with the middleman, then an excessive freight rate, dock charges, cartage, market dues, portorage, etc., insurance, telegrams. By the time the retail dealer gets possession of the apples, they have doubled or trebled their price; in consequence the retail dealers in distant parts of England, who have to ship on railways, where the freights are high, and this railway tariff added to the charges already accrued, since the apples left the shipper's orchard, together with the profit sufficient for the last buyer to make a living out of his deal, puts them beyond the reach of the ordinary consumer.

Where, may we ask, is the remedy for this? Our apples cannot be exported without paying freight and agents' charges. They cannot be landed without paying dockage; they cannot be stored without paying truckage; nor can they be sold without paying a commission. What means, then, all this hue and cry about curtailing expenses? Last autumn, at a public meeting, I ventured to say that, in some cases, some of the expenses charged in London might be saved before the apples reached the consumer. After a knowledge of it got to the consignees, I was informed by some of them that I was unwise in suggesting any such thing. I said then, and I say now, that, making, as we must, London and Liverpool the great distributing centres to other large cities in Great Britain, that many of our apples could be re-shipped to these points, instead of having to pay cartage and portorage and salesmen's commission, before they reached these points. Water carriage is comparatively cheap in Great Britain, and the apples could reach these points, minus the charges for truckage, portorage and commissison on sales, and, in this way reach the consumer, who cannot and does not get them under the present conditions. The consignees, who handle our fruit over there, are not favorable to this change or departure from the way it has always been handled, and tell us we will rue it if we undertake anything of the kind. Our intentions may have been somewhat misconstrued in this connection. I do not and would not recommend sending our apples to every town and hamlet in England. Nor would I recommend, under the

present conditions of high railway tariff in England, the re-shipment of our fruit by rail, except by short hauls. But I do suggest, and believe it to be practical, that, in view of the increased apple product in this country, that it will not be inimical with the interests of fruit producers to seize the opportunity of re-shipment by water to certain large centres, where they do not now directly go, or do not reach there until they have had tacked on to them certain charges that might be avoided. When this is done, the consignees in London and other places need not be at all anxious. They, too, will receive large quantities. Their patronage will still be required and solicited and, certainly, I have no desire that it should be otherwise. The consignees in London, I am sure, have done their utmost, and often, under very trying circumstances, when the markets have been glutted and the apples arriving in bad condition, to get the most they could for them. I wondered, many a time, last winter, as I saw lot after lot sampled, how they got rid of them without a loss to the shippers.

The consignees in London have introduced our apples, and made for them as good a name as they deserve. I say this advisedly, after witnessing, as I did, so much bad and careless packing, and, together with the heating and roasting the apples sometimes get in transport, they have many times presented a sorry spectacle, and have not only annoyed but disheartened the consignees. The consignees in Great Britain say they cannot sell our fruit for less than five per cent. commission. Under the present regime we know very well they cannot, but if they can pay, as they do, one hundred pounds per year to their agents out here, and two cents per barrel beside, and take this out of their five per cent, surely they could, by dealing directly with an agent in London, do the business for a less commission, and if two per cent. could be saved in the sale of our apples in London and Liverpool, the additional two per cent. would support a man in London and Liverpool to look after the careful handling of our freight and its distribution to the salesmen and re-shipments to other ports. The proposal that the government subsidize steamers in view of cheaper rate, may reduce the rates, but unless there is an improvement in the sanitary conditions of boats we will be but little better off. The aim and object of the fruit growers is not only to

lessen expenses, but to have vessels that will insure the preservation of the fruit in transit.

The markets want a uniform package. At present our barrel is not uniform in shape and size. Some have bilges, and some are straight without bilge, some are made with stout hoops and staves and some with slim ones; some have good chimes, and others almost chimeless. The difference in price between an Ontario barrel of apples and ours, the apples being equal in quality, is from one to two shillings. Let the barrels be of soft wood, if need be, but let staves and hoops be of a stoutness to insure against severe handling and strain. In view of the great increase in apple orchards on this continent, and also in Australia, shall the fruit growers of this valley increase and improve theirs? I venture to say a thousand times, yes! Our apples are about gone when the Australian fruit arrives in the markets of Great Britain.

The comparatively new territory in Colorado, devoted to the production of winter apples, and which promises to be of great importance, will evidently swell the bulk of apples in the markets of the world, but Nova Scotia, possessing an apple superior in quality, and her fruit for export being so near the port of export, with freight on a basis with the United States, will always have an advantage and be able to compete with apples in the British markets with all comers.

The apple tree and its fruit is a product indigenous to this valley. It will flourish here, as it will flourish in no other section of this province. Nova Scotia is almost an island. The apple to do well, must be protected from fog and cold sea air and the mountain ranges skirting the Annapolis valley do this.

Much has been written of late in the daily papers concerning the farmers of Nova Scotia, and why they are not better off. In these communications it has been fully demonstrated that they cannot produce potatoes and oats with as little cost as the same products can be raised in P. E. Island. Nor can they produce wheat, corn, and pork as cheaply as in Ontario, but the product of apples can be raised as cheaply in this valley and marketed more cheaply, provided the freight charges are in the same proportion. There is a demand, and a growing demand the world over, for choice fruit,

and this demand should be catered for and met. Our apples are acknowledged to be of the best quality and of the most delicious flavor of any produced the world over, and it behooves the farmers of this magnificent fruit-growing belt to see to it, and take special care of their inheritance.

To the Mother Country and to the other parts of the European Continent must the fruit growers of this valley look for markets for the fruit. Day by day, the protective wall to the south of us is growing higher and broader and more impenetrable, completely barring our products, but as we turn our eyes towards the Mother Land we see new ground for hope, not in preferential trade, it may be, and to appreciate it we surely ought to give to her markets the best we have. I thoroughly believe there is a growing demand in the markets of Europe for Nova Scotia apples. Every year scientific improvements in navigation is bringing the continent nearer to us. There was a time, in the memory of many now living, when it took weeks to cross the Atlantic, but now it is done in as many days. India was a three-months' journey, but now only twenty-five or thirty days. Australia required six or seven months to complete the journey, now six or seven weeks.

"Now," says the English Reviewer, W. T. Stead: "steamships bridge every sea; cables link every continent, and by it news of importance is transmitted simultaneously all over the world, and commerce, despite the hindrance of protective tariffs, is weaving the nations of the earth into one vast web." Shall the farmers and fruit growers of this favored valley not be alert and alive to the exigencies of the times and seize the opportunities now at their thresholds, by promptly putting forth their energies and efforts in securing better rates, in improved sanitary arrangements for their fruit in ships crossing the Atlantic, in a more careful handling of the product, and a wider and more general distribution in the markets of the world; and last, but not least, ship the best fruit and pack it in the most scientific, attractive and honest way? I believe they will.

The Apple Trade with Great Britain.

BY J. E. STARR, PORT WILLIAMS.

Mr. Chairman, Ladies and Gentlemen:—I feel that I should apologize for attempting to speak to you. I have been travelling through the province of New Brunswick for the last ten days and have been snowed up for a considerable part of the time. I have travelled over two hundred miles through deep snow, with the thermometer below zero. I have been subjected to pretty rough treatment, so much so, that I feel hardly able to speak. Now, Mr. president, we farmers of the country certainly should feel encouraged, being advised from all quarters by the professional men of the country. Certainly if the farmers do not go right now they must be oblivious to this gratuitous advice. It has always been so, the farmers' interests are considered of such importance that every man, no matter what his profession or his occupation, has felt himself called upon to give us good advice. We appreciate it like all good things of life, but it is not always profitable.

I was sent across the Atlantic to examine into and report upon the possibilities of the apple trade with Great Britain. To smaller fruits I did not pay much attention. There was another man, an associate commissioner, and that was his special business—butter, cheese and cold storage. My efforts were chiefly directed to the apple trade, and the possibilities that might lie in the future was my chief study. To this end I took every opportunity I could of gaining information. It was very interesting. It was interesting to a Nova Scotian to go into Old England; to look into its historic places; to view the grand old cathedrals where lie the honored dead; and to go into the Imperial Institute and see how the present generation are honoring our Queen. And then to witness the high sentiment of loyalty and devotion to the country of the large masses of people was simply grand (applause.) Well, sir, after looking over these things, I came back to business, and I devoted myself to the possibilities of the apple trade. I found that our apples this year were carried across in good shape, and looked as well as when picked from the trees. Unfortunately when there is a large crop the ships have got into the habit of

packing them so closely that there is not the necessary ventilation, and they are consequently injured, if not ruined. These are the apples that kill the trade, and this state of affairs is more apt to come when the crop is large. This year the crop was small and they were not crowded in the ship, and came out all right, and when they did there was nothing left to be desired. By a good crop I mean good quality as well as large quantity. This year we were unfortunate in the quality—it was a bit off, and when the quality is off it is almost too much to ask that there should not be some apples in the barrel not first-class. If the supply had been abundant this year these apples would have resulted in loss to the shippers. When we get a good crop do not take this chance again. Grow good apples. We can grow good apples with the instructions which are given us, and they are so correct and abundant that “he who runs may read.” We can control the crop, and when we have done that we can control the market, and you may expect good prices to follow. When we find a market we should send good fruit to that market. There are many people in England and Scotland who never see an apple. We want to reach these people. The consumption might be quadrupled, if we could place a first-class article there in good condition. What is to hinder us? We must spray our orchards and kill this black spot. There is nothing that dealers over there dread so much as spotted apples. When the apples that are affected with it get over there they look worse than when they leave here.

Next to that comes honesty in packing, and perhaps of equal importance is careful handling. When I came back home I suggested to the government the appointment of an inspector to see to the shipments—to see that the cargoes were properly stowed and properly ventilated. The government said this was a very radical measure, and they were not prepared to go so far as this. At the present time all the skill of experienced stevedores is exercised in stowing every inch of space as close as they can pack it. It is wonderful how closely they can pack a cargo, so that a mouse could hardly crawl through. I saw a practical example of cold storage and ventilation in the trial shipments of soft fruit from Ontario. I went on board the Vancouver, which was taking a

large lot of perishable fruit—the fruit was cold, and the air of the room in which it was placed appeared to be cold, but the boxes were large and tight, and the fruit had been put into the boxes in a heated condition, and although placed in cold storage, the latent heat of the fruit was in the box, and before the cold air could permeate the package the fruit spoiled, and when it reached the other side the receipts would not pay for the fruit. This shipment was chiefly pears, plums and grapes, no apples. It was Ontario fruit, from the vicinity of Grimsby, shipped to Montreal in a refrigerator car. Mr. Crandall (who was there looking after this shipment) and I went to the auction rooms on the other side and we saw case after case opened, the contents of which were worthless. Yet right alongside of it was California fruit in cold storage. It had been cooled off before it was packed. The boxes were loose and open, giving the cold storage time to get in its work before the fruit spoiled. If you place from 5,000 to 10,000 barrels of apples in a steamer from the orchard in September, the latent heat may develop so that by the time they are landed they may be cooked. I detected this in every apple I tasted. Take a gravenstein, if it had good ventilation it was better there than here.

Perhaps I might say something to the fruit growers here with regard to the importance of packing the fruit honestly and establishing each man for himself a reputation. The buyers look after that over there. They look for the name of the packer on the head of the barrel, and want to see it there in full. Their memory is good about last year and the year before that. When they find a reliable brand they are going to have it if they pay more for it. When you establish a reputation it is worth gold. It is expected that you should put your handsomest apples on the top of the barrel, but let the others be good. They expect them to look well in the head. They should look well. You cannot make extras of all apples you grow. It is useless to try. Our credit is improving all the time. We are establishing a record that is valuable, and no man can take it away from us. When we establish a reputation in one market then the purchaser at that market is always going to go there. Do not shift about year after year. A man who buys from you this year

and is satisfied with what he gets, is going to look for your name next year just as sure as the year comes around. But he wants to find you. He wants John Smith or Thomas Williams on the head of the barrel, because he knows they are good. Here is a man. What do you know of this? He says this is the first time I have handled his stock. You see at once he is handicapped. I stood by and saw some of this. A barrel of apples was put up at auction; a gentleman standing by said the barrel may not be what it is represented. I knew the name of the man who packed that barrel. I said I will guarantee that barrel of apples. I said I would stake my reputation on that name. We opened that barrel of apples to make sure. I am happy to say that my good friend did not disappoint me and they sold first rate. I did not do him any harm.

With regard to what we want in the apple trade: We want first of all good fruit; we want honest packing; we want quick transportation; we want good stowage; we want proper ventilation; we want care in handling; when we have got all of that the rest will come as surely as day follows the night.

We have our misgivings about the markets, afraid we will overstock them. I do not think it is possible to overstock that market. There are millions there that have not tasted our apples; but in order to induce them to buy you must supply a good article at a moderate price. When the price is low and the quality good, they will want them; and from the east, west, north and south they will send to purchase your products. You remember how it was in 1896. Some people sent their apples over to England and had to send money after them to pay the freight. There is practically no need of this. If the ships are properly ventilated and use exhaust fans run by steam, it will help our trade. There are sixteen fans in the St. John City, a capital boat for the business. Even with all that the ventilation is not perfect. There should be complete passages from bow to stern and from keelson to deck. Tubes or boxes of light boards might be constructed and distributed through the ships, so that fresh air could circulate between the tiers, and the boards could be sold on the other side to pay expenses. But this will take some space on the ships. These ship owners have

acknowledged to me that it is the best freight that crosses the Atlantic, and surely if it is so we are entitled to consideration; but the manner in which the freight is carried is the grand point on which everything rests. It is profit or loss, progress or ruin, and we might as well make up our minds to that. I saw Mr. Campbell, of the Dominion Atlantic Railway. I was urged to do this. I found Mr. Campbell on this side of the water. It is well known in the autumn that it is impossible to get cars to handle your fruit, and vessels have to wait, and our fruit has to wait, perhaps piled in places where it should not be. We want more cars on the D. A. Railway; and we want ships to take it away from Halifax each week. If from any cause the ship does not arrive at the proper time and take the cargo, then it is tumbled in on top of another shipment. We should have a ship leaving Halifax every week regularly in the shipping season.

I concluded over there as my best judgment in the matter that our fruit should be shipped in its season. Do not hold your gravensteins and ship them on top of your kings and ribstons. Do not hold them until they are mellow and ripe. When they get our fruit in good shape they can dispose of it. When it comes to them in bad shape they can do nothing with it, and you have to bear the loss. Let us ship good fruit in a proper manner, and let us have these vessels so we can control them, and if we can, persuade them to handle them with more care. I saw a man tumble a barrel of apples some six or seven feet to the floor, falling on its head. I told him the man who packed that barrel would carry it across the room sooner than let it drop. In two minutes I showed him how to handle it and he took it good naturedly. It wants some one to tell them how. I went to the people who controlled the Furness Line and they assured me they superintended that business, but I slipped out on the dock and saw some rough work going on. However, I am persuaded, unless you keep remonstrating with them they will continue doing it. It will be for the fruit growers of this country to determine in the future what means they will adopt to secure better treatment in this very important matter. It is well known that this is one of the most important industries in this country, and it would appear that it

is only in its infancy. But it entails upon every man the duty, the obligation to be up and doing and pay attention to business, not patiently enduring losses that may be avoided.

Dr. Chipman—Tell us if there is any way of cutting down expenses?

Mr. J. E. Starr—With regard to cutting down expenses, that is a matter for competition. Scows take them from the steamers to the warerooms without any rough handling. They are hoisted into the warehouses, piled in lots and are ready for sale. It is the same in the auction room, where they have to truck them. They take them to their warerooms and assort them in the same manner. When they come to auction they open a barrel or two; if they happen to get a good barrel it is well. The lot is sold at auction on the credit obtained from that one barrel. The man who sells at private sale has a chance to open another barrel. He will not open a second barrel if he strikes it right the first time. But at auction the first barrel opened is used as a sample. I believe they are sold honestly. I could not see anything that would lead me to believe that we were cheated. When you come to see the force of men they employ, the expenses they are put to, the reputation of their business—for a dealer has to establish a name for himself—he must have money, standing, reputation—his name is as valuable to him as his warehouse. He will not destroy that reputation for a trifle. It is his stock in trade; his capital, and he will stand by it. I believe there are no better men in the world than the business men over there, solid, substantial, honest men. If you cannot trust them, I do not believe there is any man in the wide world you can trust. Take a good firm and stick to it. If he does well for you do not leave him. When you get him and he has got you, work together for your mutual advantage.

Dr. Chipman—Can the sale of apples be conducted any more cheaply over there?

Mr. J. E. Starr—Every business that we engage in is subject to the law of supply and demand, competition. You have got a host of them over there. We presume they are working the thing as low as they can afford to. In the rivalry they underbid each other. I am inclined to think that their charges are not excessive.

Dr. Chipman—We get returns that there are so many barrels slack, which cuts down the average. Some barrels not up to the standard. Is this thing right?

Mr. J. E. Starr.—They have been cooked in the ship, softened and ripened. When they go over there with proper treatment they are as good as when rolled out of the warehouse. Whenever I could hear of a barrel being opened I went to see it, and found in every case that it had not been nailed. When people are shipping a large quantity they sometimes neglect to nail the heads of a few, or when rolling the barrels out they may neglect putting nails in them. Every barrel should be nailed and the nail driven in the right place. And with respect to hoops, I believe that in the London market a good yellow birch round hoop is just as good as anything else. It is stronger and the barrel is safer. I saw a barrel tumbled into the hold of a ship and expected to see it smashed to pieces, but to my amazement it was not apparently injured. If we go to the Liverpool market we will meet Ontario and American produce there, and I would advise using the flat hoop in that market, and larger barrels. If we could adopt a uniform barrel it would be desirable in many respects. In Liverpool we want to have the same size of barrel as our competitors. In London I think I would still stick to our own Nova Scotian barrel with round hoops.

Mr. Patterson—The Australian apples and the New Zealand apples arrive in London in boxes, while we send ours in barrels; which system is the better?

J. E. Starr—A barrel is a better package, and is stronger, cheaper, and more easily handled. We should stick to our barrel. Some superior apples, like Cox's Orange Pippins, might be put in bushel boxes with advantage. This apple is a most delicious one. If we could grow it successfully and pack in half bushel boxes, I think it would bring us great profit.

Mr. Gates—Will the Tasmania apples ever come in serious competition with ours?

J. E. Starr—It is not thought so by the dealers in London. It will cost so much to get them there; although rich men pay a large price for a small quantity of them.

Q.—Where did we get the best prices ?

J. E. Starr.—I think the price obtained in London was a little better than in Liverpool.

Dr. DeWitt.—I saw 100 barrels of apples in the wreckage room in London. They were round hooped barrels. That is one reason why we have barrels slack.

J. E. Starr.—I saw more wreckage amongst the Ontario barrels. I believe ours stand better.

P. Innes.—If some person was appointed to see to the stowing and the unloading I think it would be well. The whole discussion seems to show the necessity of the Apple Shipping Company. This shipping company proposes to treat the whole of the apples as if they belonged to one individual.

J. E. Starr.—With regard to the shipping of the apples, I called upon Sir Christopher Furness. He wanted me to assure the government that they were most anxious to meet their wishes in the arrangement of their ships, and would carry out any reasonable request with respect to the business.

Colonel S. Spurr.—We want to look after them from the time they leave the trees until they are sold. A great many of our apples are ruined in bad handling. We want proper facilities for handling them.

Mr. Chase—This question seems to me to be pretty well exhausted. We have had it for three or four years. I have heard it well discussed before, and to-day it has been most thoroughly gone into. To my mind there is a great laxity in looking after the fruit at Halifax as well as in London. I have seen a great deal of rough handling in Halifax; quite as rough handling as Mr. Starr described in putting apples on board the steamers, and I believe it would be well to have this matter looked after. How it is going to be brought about is the question. Sir Christopher Furness is a very *promising* man, and doubtless he is trying to hold the control of this trade. I hope to see in the future a good line of steamers other than the Furness Line, then I believe, and not till then, will we have proper attention paid to our fruit in Halifax and in London as well.

Howard Bligh—I concur in what Mr. Chase has said. Until there is competition we will have to contend with the same difficulty. I have seen apples handled with greater care at Halifax than the grower would bestow upon them, but in many instances it is the reverse. Many cars are unloaded in the night, and I often wonder they are not handled even more roughly. What Mr. Chase has said covers the whole ground. This business should be carefully looked after from the start, and the remedy rests with ourselves. We want more careful attention given to the growing of apples, packing, handling, sorting, barrelling and having them handled properly all the way to London. If we had opposition from other lines of steamers we would, no doubt, get better freight rates. And if we can ship a million barrels of apples we will then be in a position to have people bidding for freight, and we will also have better arrangements.

Dr. DeWitt said at present the steamship companies engaged in this trade had everything their own way. He said he had been offered freight at two shillings and sixpence. He had mentioned the matter of ocean freight to Mr. Hughill, of the Furness Line, and he promised to give us that if we could guarantee some thousand barrels with a commission besides. We did not get the 2s. 6d. ocean freight. There were not many apples to go forward this fall and so there was no competition. A company could do it, and do it well, if we could only guarantee them the freight.

THURSDAY, 7.30 P. M.

Fruit Farming in England.

By CECIL H. HOOPER, M. R. A. C., SWANLEY, KENT, ENGLAND.

Unlike Nova Scotia, in which the occupier of the farm is also owner, in England, I would judge, about nine-tenths of the land is owned by landlords and rented by tenants. This, in fruit growing, is an important consideration, as for this kind of cultivation greater security of tenure is necessary than in ordinary farming.

Leases are made for 7, 14 and 21 years; many landlords agree to compensate for fruit planted on the tenants leaving. In 1890 a Market Gardeners' Compensation Act came into force, whereby

in future, compensation will be compulsory on land recognized as "market garden" land.

The west of England, which receives a heavier rainfall than the east, produces the largest quantity of apples. In the counties of Devonshire, Somersetshire, Herefordshire and Worcestershire, they are chiefly grown in grass orchards. A large proportion is used for cider. In Worcestershire and Herefordshire pears are also grown in the same way for perry; many of the trees are of great size and age. In Worcestershire, in the neighborhood of Pershore and Evesham, plums are largely grown, with gooseberries and vegetables between the trees; here a variety of plum known as the Pershore egg plum, is largely grown, which is not grafted, but comes true from seed or suckers; also around Tenbury, cherries, dessert and cooking apples and plums are grown in grass orchards. The Blenheim Orange apple is largely grown in this district. Bush fruits (gooseberry, black and red currants) are also cultivated extensively in this locality. The fruit from this county is sent to Evesham and Manchester.

In Shropshire damsons are grown, and sent to Birmingham. Cheshire grows damsons and strawberries, which are sent to Manchester. Around Worthing, in Sussex, figs are grown in the open air for market.

In Hampshire, near Southampton, strawberries are extensively grown and sent to the London and Manchester markets. These are a little earlier than those from Kent.

The few districts of Cambridge supplies a large growth of gooseberries, which are mostly picked green and sent to London and the northern markets.

In some parts of Scotland, south of the Caledonia Canal, strawberries and raspberries are extensively grown, and heavy crops obtained.

In Middle Kent, around Maidstone, cob and filbert nuts are extensively grown; around Faversham, cherries, which are the finest in Europe; walnuts are also grown for pickling. Between Middle Kent and West Kent, near London, apples, plums, damsons, pears, red and black currants, gooseberries, raspberries and strawberries

are largely grown; some farmers have from 100 to 200 acres under this fruit.

In this brief sketch I propose dealing more particularly with fruit growing in Kent.

Cherries grow and thrive best when planted on cultivated land, which is worked and manured for say 10 years, and then laid down permanently to grass and clover. Cherries are frequently planted in old hop gardens, in which it is intended after a few years to grub up the hops and sow down to grass. The cherries are grown chiefly in grass orchards, kept closely grazed by sheep, which receive as food, in addition to the grass, cotton, linseed cake or oats. Sheep are preferred in these orchards to cattle or horses; the latter are apt to nibble the bark and leaves.

For young trees it is necessary to protect the trunk from the rubbing of the sheep, as the grease in the wool is injurious. For this purpose a ring of wire netting 3 or 4 feet wide is placed round the stem. For orchards where cattle and horses are grazed, the trees should not branch at less than 6 feet from the ground, and tree guards are required till the stems are strong enough to resist the weight of the animals.

Morello cherries on the Mahaleb stock, are grown as bushes, branching near the ground. They are planted about 15 feet apart, at first with bush fruit between. The land is kept cultivated between them. The birds attack these cherries less than other varieties.

Apples in Middle Kent are grown as standards, over grass, planted about 30 feet apart. Nearer London they are more commonly grown as half standards, on cultivated ground, at about twenty-four feet apart, with bush fruit between them. These plantations are, during the winter season, pruned, manured and dug 8 to 10 inches deep by spade or fork, decreasing to 4 or 5 near the tree trunk. In early spring the trunks are sometimes lime washed, and fresh slaked lime is thrown up among the branches; this clears the trees considerably from lichen and insects. During spring and summer the land is frequently hoed. Apples are sometimes grown on the Paradise root to dwarf their habit of growth and bring them into bearing earlier. In this case they

commence branching about 1 foot from the ground. They are planted about 10 or 12 feet apart, with strawberries or vegetables grown between them for some years. These dwarf trees produce some of the finest specimens of fruit. They are conveniently pruned, sprayed and fruit-gathered and suffer less from high wind in the falling of fruit than tall trees.

Pears are usually considered less profitable than other fruits, as the French produce keeps down the price; they are therefore not extensively grown. They are, in some cases, grown as dwarfs on the quince stock, and bear very choice fruit.

Plums are usually planted about 15 to 18 feet apart; sometimes in alternate rows with apples. They are trained to commence branching about 2 1-2 to 3 feet from the ground; generally with bush fruit grown between, and often, for the first few years, with strawberries between these. Large fine quality plums sell well, small at low price; many plums are picked unripe for preserving.

Damsons are chiefly grown in the hedge rows around plantations for shelter and on roadsides. About every 6 years the branches are cut hard back, to within 1 to 3 feet of the trunk, to encourage young wood, which is more fruitful than old.

Cob and Filbert nuts are planted about 16 feet apart, either alone or with apple and plum, and bush fruits between. The nut bushes are trained to branch about a foot from the ground, the centre is kept open and cup-shaped. The form of their branches resembles the ribs of an umbrella held point downwards. The branches of the bushes are kept about 6 feet high. The object in pruning is to encourage as much fine spray wood as possible, as it is on this that the nut blossoms form. The pruning is generally done after the catkins have shed their pollen. The suckers coming up from the roots around the trunk are cleared away with a mattock, and the suckers or "wands" along the boughs are detached by a sharp pull, which is preferred to cutting, as young shoots are less likely to form around the wound. These wands are used for packing fruit and for flower sticks.

Red Currants are planted about 5 feet apart. They are kept open in the centre with five or six branches. Each year the spurs on each branch are cut loose above the ring of fruit buds at the

base of the spur, and the terminal shoot is shortened by about one-third.

Black currants are planted about 6 feet apart, and the bushes are kept with plenty of young wood by cutting out the oldest branches. A mite has been spreading which injures the bud by causing it to swell, and prevents its opening; so much injury has this done that many plantations have been grubbed up. Black currants, at present, sell at about as high a price as any of the hardy fruit.

Gooseberries are planted about 5 feet apart, more or less, according to variety and soil. The bushes are pruned so as to keep the wood comparatively young, sufficiently open to admit light and to allow the hand to enter the bush to pick the fruit. The bushes are commonly grown on a single stem, rather than branching from the ground, in order to allow the bush to be more easily hoed underneath, and kept free from weeds. The fruit is largely picked green, in which state it travels well for long distances, in early kinds picking is commenced when they are quite small.

Raspberries are planted in rows about 4 1-2 feet apart, and 1 1-2 feet from plant to plant. The canes when planted are cut down to 1 foot long to encourage throwing up more young canes. Early potatoes are frequently grown between the rows the first year. The yearly work consists in cutting out the last year's canes during winter; the land between the rows is either ploughed and forked between the plants, or the whole surface is dug by spade or fork. In early spring the canes are shortened to about 2 ft. 8 in. During spring and summer the plantation is horse and hand hoed.

For strawberries, runners are taken from one or two-year-old plantations, and planted about 32 inches row from row, 16 inches plant from plant. They are planted about September or March. During the following summer the plantation is frequently horse and hand hoed, and the runners cut off; in late autumn the rows are either dug between, or an earthen plough is used. In the following years the cultivation is the same, but when the plants come into blossom, straw is placed under the blossom, and between

the rows; after fruiting the runners are cut by hand-hook, and the straw is raked off, after which horse and hand hoeing is continued.

The plantations usually last for about 4 pickings.

The following is a short list of some of the varieties of fruits commonly grown for market in Kent:

Cherries—Elton Heart, Kentish Bigarreau, Bigarreau Napoleon, Rivers' Early, Black Eagle, Waterloo, Morello.

Apples—Early Julian, Manx Codlin, Cox's Orange Pippin, Worcester Pearmain, Lane's Prince Albert, Bismarck, Wellington, Pott's Seedling, Duchess of Oldenburg.

Pears—Pitmaston Duchess, William's Bon Chretien (Bartlett), Grosse, Calibasse, Hessele.

Plums—Victoria, Pond's Seedling, New Orleans, Rivers' Early Prolific, Prince of Wales, Czar, Monarch, Bush.

Damsons—Farleigh, King of Damsons.

Nuts—Kentish Cob (Lambert's Filbert).

Red Currants—Scotch, Raby Castle.

White Currants—Dutch.

Black Currants—Baldwin's, Lee's Prolific.

Gooseberries—Lancashire Lad, Whimham's Industry, Crown Bob, Berry's Early Kent.

Raspberries—Carter's Prolific, Fastolf, Norwich Wonder, Superlative, Hornet.

Strawberries—Sir Joseph Paxton, Noble, Royal Sovereign.

Early varieties of gooseberries, strawberries and plums are aimed at as the fruit fetches most. Good prices are, in some cases, obtained for late season fruit.

In Kent there is a tendency to grow early apples to send to market direct from the trees, and to store very little; thus having nearly all sold before the apples from the United States and Canada arrive and bring down the price. The very large number of varieties of apples grown in England makes the business for the farmer, salesman and public more difficult than if, say, 10 varieties were grown instead of 100. I have been surprised at how few of the varieties of fruit grown in Canada and the Northern States,

correspond with those generally grown in England. This is notably the case in strawberries and raspberries. In strawberries the American varieties do not appear to show up well in England, and vice versa. The Blenheim Orange, and the Ribston Pippin, are among the few apples that thrive in both countries, but in England they grow of better quality than they do here. The plums grown in England and Canada have many varieties. Apples and unripe pears are sent to market mostly in bushel baskets of drum-like shape, covered over with grass or hay, and held firmly by two "splints" (pieces of split wood) placed across, the ends of which are stuck into the rim.

In the west of England square hampers, called "pots," are used. Plums, cherries, gooseberries and currants are dispatched in half bushel baskets covered over with grass or blue paper, secured by splits.

Raspberries are dispatched in pound punnets and gallon baskets, but the bulk in tubs holding 56 pounds, ready for the jam manufacturer. These tubs have a smaller mouth than base, so as to allow them to be stood one on the top of the other. The fruit is usually picked into handled gallon baskets. About 1 cent per pound is the usual price for picking.

Strawberries leave the farm mostly in peck baskets, holding about 12 pounds, usually not covered; a few are picked into punnets. The general price for gathering is 8 cents per 12 pounds. The fruit is either picked into gallon baskets or direct into the peck basket.

Fruit and vegetable growers farming within 21 miles of London send up most of their produce by road to market, as it arrives in better condition, at less cost, and more punctually than by rail. The vans start in the evening and reach home again about noon.

Market days are Tuesday, Thursday and Saturday, the busiest time being about 5 in the morning. During the strawberry and raspberry season there is a market each day, lasting all day. The markets other than London, to which fruit is sent from Kent, include Manchester, Leeds, Glasgow, Edinburgh, Aberdeen, Birmingham, Cardiff and Liverpool.

Fruit sent up by rail is delivered by the company at the various London markets. The rate from Swanley, which is about 18 miles from London, is about \$5.00 per ton for strawberries in pecks, and \$4.00 for apples in bushel baskets. (Equivalent to 25 cents per barrel.) The rate to Manchester is about twice these amounts.

During the strawberry and cherry season ventilated railway cars are employed for taking the fruit to the Northern towns. The principal London fruit and vegetable markets are: Covent Garden, (which has a special foreign fruit market, in which imported apples, oranges, grapes and bananas are sold); Spitalfields, The Borough, and Stratford, the latter market has a railway running through it.

Some growers have stands in market and sell their own produce, but the bulk is sold through salesmen, who usually provide packages (baskets and boxes), marked with the salesman's name.

Their charge is usually about 6 cents per peck, 8 cents per half, and 12 cents per bushel, or at 5, 7 1-2 and up to 10 per cent. commission, varying with produce market and salesman.

The selling is mostly by private sale, though cherries in Covent Garden are in some cases sold by auction.

The choice of a trustworthy and capable salesman, with sufficient capital, is of great importance and merits careful enquiry, as it is a business easily entered and easily left.

Early fruit in general, fetch the best price, even though sometimes inferior.

France sends strawberries, cherries, red currants, pears, peaches, apricots and a few apples, also prunes (dried plums); Holland sends black currants; Germany, small plums for jam making, at about \$35.00 a ton at any port; Spain, white grapes; Italy, walnuts; Norway, cranberries.

The following table gives roughly the approximate average yield per acre, price per pound, and life of the plant in Kent, England:

	Yield per acre. Tons.	Price per pound. Cents.	Profitable lif of plant in Years.
Strawberries	1 1-2	.04	5
Raspberries	1 1-4	.05	10 to 15
Gooseberries	2	.03	20 to 30
Black Currants	1 1-2	.06	15 to 20
Red Currants	2	.03	20
Cherries	2 1-2	.06	70
Plums	6	.03	30 to 45
Damsons	5	.03	50 to 60
Apples	0	.01	60
Pears	6	.02	70
Cob Nuts	1-3	.07	60 to 100

SUGGESTIONS TO NOVA SCOTIAN FRUIT GROWERS.

I would recommend that more bees should be kept in the valley. In Kent, we consider they do great good in fertilizing the fruit, and honey in Nova Scotia sells at a good price.

I believe there would be a good sale for the best apples and cranberries of Nova Scotia in every town in England, Scotland and Ireland, if arrangements were made for distribution.

Knowing the preference which exists, and is ever increasing in England, in favor of trading with her colonies rather than foreign nations, provided the quality and prices are right, I would recommend putting the words "NOVA SCOTIA" or "N. S., CANADA," on every barrel of apples or other fruit exported, as in England at the fruiterers, apples from both Canada and the United States are called "Americans," most of which are considered inferior to the English, so that, if the apples of Nova Scotia are superior to those of the rest of the American continent; if clearly marked they would have a better chance of being known and asked for by the British public.

Our New Departure.

MRS. A. H. JOHNSON, WOLFVILLE.

Perhaps this title, "Our New Departure," will recall to most of you the saying of the wise man that there is "nothing new under the sun," and wonder what this woman can tell that it is not old and stale. In this you may be right, and when I speak of a new departure it may be "men" only in my imagination. Although the male population of our fair province legislated to themselves the sole right to legislate for the whole people, yet they cannot usurp our right to criticize or to commend what our clearer vision may discern. To-night, in the spirit of commendation, I speak of what I consider a new and wise departure on the part of our legislators when they established by act of parliament an annual provincial exhibition in the city of Halifax. In this advanced movement they were ably seconded by the city council, who cheerfully shouldered not only half the burden of this annual fair, but also half the heavy outlay for the handsome and commodious grounds and costly buildings erected there and dedicated to exhibition purposes.

Although provincial fairs have been held intermittently for the last forty years, yet I think we can fairly claim that in its prominent features, the late fair held in our sea-girt capital was truly a "new departure." A board of commissioners, representing a union of interests and composed of men endowed with far-sightedness, determination and courage, overcame the myriad obstacles thrown continually in their way, and to their honor be it told that three short months only elapsed between the granting of a reluctant title to the land and the entrance of the Earl and Countess of Aberdeen to formally open the completed and equipped fair.

What wonder, then, if a few mistakes were made? The wonder should be that there was any fair at all, and in our gratitude to those who thus saved our province from being made the laughing stock of the Dominion, and a credit instead we should be to their faults (if there be any) little blind. And to their virtues very kind."

That each class of exhibits had its own premises presided over by its special commissioner—that the prizes were many and worth competing for—that the amount of prize money was greater than ever before offered, together with the number and variety of original, amusing and interesting special attractions presented each day, combined to prove the statement undeniable that from its inception to successful completion, this exhibition was a new departure.

For the first time horticulture received recognition as a distinct science from agriculture, and a special building was assigned us, central, convenient, well-appointed and tastefully decorated, and in it we and our twin sister horticulture held royal court, receiving a liberal amount of the admiration and interest to which our sovereign sciences are entitled, as well as for the queenly pageant we presented of fruit and flowers in bewildering loveliness and tempting array.

I would like to say something of our clear-headed, quick-witted and tactful commissioner, whose watchful vigilance and personal magnetism was the keynote to our department's success, but his well known modesty and retiring disposition so appeal to my sympathy that I spare his blushes.

But of the many improvements none were more signally successful than the appointment (wisely insisted upon by him) of a special horticultural police to guard our fruit and flowers—these were selected from the fruitgrowers' ranks—men whose social position were their credentials, and who, by their carefulness, industry and intelligence, conquered and disarmed the prejudice and jealousy arising from what seemed an unnecessary introduction of the country into a city prerogative, and won a hearty meed of approval from our good friend the chief of police, who may be looked upon by some as a terror to evildoers, but we found him an appreciative and agreeable visitor, and a praise to those that do well.

Notwithstanding that all have inherited from our first parents the desire to taste forbidden fruit, yet such was the vigilance of our "fruit police" that the loss from theft and injury was so trifling that on closing day we could point with pride to as fair an

array as on opening, and not a dreary expanse of empty plates. This we may claim above others where fruit and flowers are concerned as the best "new departure."

I look back to those ten days in Horticultural Hall as ideal—that panorama of fruits and flowers in geometric conventional and artistic designs—proofs of the skill and energy of the twin sciences which had collected such a creditable display in defiance of the worst season even our variable climate has known for a century.

Our building was at all times a favorite resort. Here the illustrious guests were received with honor and here the most unvarying politeness was shown to the humblest visitor, kindness, forbearance and courtesy the rules laid down by our commanding officer and faithfully obeyed.

No small part of the pleasant good fellowship our department enjoyed is due to our courteous associates, Mr. Power, of the City Gardens, and Mr. Harris, of the Nova Scotia Nursery, with their corps of obliging assistants. To Mr. Harris we are indebted for the loan of a large collection of valuable palms, rare ferns and beautiful plants with which he decorated our whole fruit exhibit.

The lovely plants and flowers and floral decorations exhibited need a whole separate paper for themselves—seeing them the loyal Nova Scotian can take pride and pleasure in his country's heritage.

God gives us with our rugged soil
 The power to make it Eden fair,
 And richer fruits to crown our toil
 Than summer-wedded islands bear.

Who murmurs at his lot to-day?
 Who scorns his native fruit and bloom,
 Or sighs for dainties far away,
 Beside the bounteous hoard of home?

Thank Heaven instead that Labor's arm
 Can change a rocky soil to gold,
 That brave and generous lives can warm
 A clime with northern ices cold.

And let these altars, wreathed with flowers,
 And piled with fruit, awake again.
 Thanksgiving for the golden hours,
 The earlier and the later rain.

When and where did the idea arise that exhibitions were money making concerns instead of self-supporting only, or that prize money is all profit, when in truth, to win an actual prize frequently means an outlay equal, if not exceeding, the gain. The only way we can prove the superiority of our goods is to show them in competition with our fellow laborer in the same field. If we succeed in winning first place, our profit comes from the extended knowledge the public has of our superiority. Our exhibit is but an advertisement of a specimen article of our business products. Advertising has to-day become a science that extends far into the realm of art and literature; poet, painter, author and orator are freely pressed into the service of the "ad." and originality and genius find more liberal patrons. A successful exhibition is but a concentration of advertisements with extensive artistic environments—a methodical arrangement of pictures whose precision of detail, accompanied by object lessons, emphasize the points of merit claimed to prove the ascendancy of the real over the ideal.

Or from another point of view, an exhibition is an enterprise whose primary object is to extend our country's claim as a factor in the world's commerce—to show the busy people of one section what the industry of another has accomplished—to lift us out of the groove that our daily grind has worn to a rut; that we may see how nearly our progressive neighbor has overshadowed us—to remedy our mistakes by the success of others—these are but a few of the ethics of exhibitions which we forget when we harp on its sordid features (though these should be neither eliminated nor lessened).

In addition it is well also not to forget that no economic enterprise ever stands on a firm basis without an ethical foundation.

Filled as I was with admiration for our fair as I saw it (and from the nature of my occupation there I had wide opportunities for observation) finding order and system where from the newness

of things I had expected chaos, I observed a provision for contingencies, a readiness for emergencies, the comfort and well-being of every one well considered. I was always in wonder at the executive power of those who carried all this to completion.

Whence, then, came those torrents of abuse that were hurled upon the heads of those luckless commissions of management?

Could they have been genuine expressions of public disapproval, or were they only the humming of those "busy bees" the reporters, who though gathering honey every day "are not content with their own draught of nectar but must strip the very petals from the stalk of every opening flower" lest some other bee should receive a larger sip. Or was it the dear "general public" who felt aggrieved that while all other comforts were provided free, and sandwiches so cheap and plenty, that what should be so scarce and dear was—a—champagne.

If in its early infancy our fair shall wrestle with obstacles small and large, and surmount them as a proof of the "survival of the fittest;" it is time for the country at large and the fruit growers in particular, as liberal minded workers in an advanced age, whose first interest is our country's advancement, upholding our coming years in all their best features, which are many—let prejudice and envy die with the old century, and initial the men in the interest of our new departure—

Ring out false pride of place or blood,
The civic slander and the spite.
Ring in the love of truth and right
Ring in the common love of good.

Address---The College and the Farmer.

BY REV. T. TROTTER, D.D.

Dr. Trotter, on rising, was greeted with loud and enthusiastic applause.

Mr. President and Members of the Fruit Growers' Association, Ladies and Gentlemen:—It is quite obvious that the speakers who

have preceded me were to the manor born, and I have no doubt the speakers who succeed me will evince the same with respect to themselves. I shall not proceed very far before you will know that I was not to the manor born. I have been wondering what motive prompted the secretary of this association in sending me an invitation to speak to you to-night. I wonder whether it was not because the farmer is essentially a humorist, and likes to be lectured by people who know nothing about farming. (Laughter.) If that is not the explanation, I wonder if there may not have been a philanthropic motive in the hearts of the members of the committee. You know we are trying to raise for this college the sum of \$75,000. Now, ex-Mayor Bigelow is a warm friend of mine, and Secretary Parker is a cousin of my wife, and I am not sure that these good men have not created this opportunity for me, giving me a free hand, and with the sly expectation that I would improve the opportunity by pouncing down upon this wealthy congregation of farmers, and carrying off the shekels. I need not tell you that the temptation has been very strong; but I want to tell you that I have resisted it like a man. (Laughter.) If these are not the motives, then I think it possible that the invitation grew out of the fact that the farmers are not simply apple raisers and butter makers, but they are conscious that they are members of a commonwealth—a commonwealth rich in life, in which they sustain intimate and important relations to everything that is going on. They not only have commercial interests, but they have social, intellectual, moral and political interests, and deem no man and no subject out of place on this platform, provided the man be a man of sense and the subject be some high and worthy theme. It is under the aegis of this thought that I am here to speak a few words to-night. And I think I ought to remember the old counsel "let the shoemaker stick to his last" and keep away from farming, and to a subject that I may know or should know something about. I had thought, therefore, that I would say something to you to-night on "The College and the Farmer."

These two, the college and the farmer, sustain very intimate relations—relations of mutual dependence. Let me speak first of the farmer as a contributor to the college. Now we people of the col-

lege are most ready to acknowledge our obligations to the farmer. The farmer is a contributor to the college in many ways. We owe a basal obligation to him in that he furnishes us with a physical subsistence. He grows the oats which make our porridge, and the wheat which makes our bread; he stalls the oxen and pastures the sheep which provide us with meat; he raises the chickens and poultry, the apples, the potatoes, the pears, plums, strawberries, raspberries, gooseberries, currants, and numberless things which satisfy our varied cravings and embellish our tables. Without the farmer we should soon all be reduced to starvings, living on codfish from the sea, and blueberries from the bog. (Laughter.) I am not sure that we reflect on this basal obligation to the farmer as much as we ought; but we do reflect on it somewhat, and are conscious of our obligations to him, in common with other people.

But the farmers have helped the colleges in higher respects than this. You know this collegiate education is a very expensive thing, and its benefits can only be placed at the command of the people generally on one condition, and that is that those colleges be endowed. We had 124 students in this college last year, taking the B. A. course. This institution paid out about \$11,000 for the tuition of these 124 students. The students themselves paid in fees less than \$2,500. That is, it cost the college about \$90 per head for tuition, while the fee was \$24. The balance was made up out of interest accruing from endowment, and the yearly gifts of the Baptist churches of these provinces. It would be impossible to place the advantages of these institutions of higher learning at the command of the people generally without these endowments. The farmers of this country,—if I may speak with reference to this college in particular,—the farmers of this country have contributed to the endowment of this institution a very generous amount and have helped to make it possible to invite young men and women to come, and to offer them the fullest advantages of the institution, for the fee of \$24 a year, when it costs the institution \$90 a head for every man and woman receiving education in its halls. We feel our obligations to the farmers for this, and I may say that we hope to be under greater obligations to them in the future in this respect.

Then the farming communities contribute to the colleges of this country in another way, and that in a very important degree. We have this year in the Freshman class 51 regular Freshmen—53 in all. Two-thirds of them have come from the farming community. The farming community furnishes us with the raw material to work up in these institutions—and it is the best raw material there is in the country. (Applause.) Yes, and they not only supply the institutions with students—the farming communities supply these institutions of higher learning very frequently with professors more frequently than any other section of the community. It is this young life that comes from the farm, with vigorous physique, with clear brain, with simple, wholesome ideas, uncontaminated and uncorrupted by city influences, full of energy and capacity for work—it is this young life that five times out of six forges ahead and takes the best positions, and the colleges on this continent are manned very largely by the young fellows from the farm. Thus we recognize in various ways our relation of dependence upon the farming community. They give us our physical subsistence, they give liberally of their profits for the support of higher education, they fill our halls with their sons and daughters.

The college, however, is a contributor to the farmer. Now, sir, it may seem to some that the contribution of the college to the farm is very slight. We send the young people out to be teachers, to be doctors, to be lawyers, to be ministers, to be politicians, and to be business men; but how many do we send back from the college to the farm of those who take a full course? Very few, indeed. Here and there one or two, but very few. And I should not wonder if the farmer should feel disappointed sometimes.

We must, however, take a wider view. Admitting for the moment that that contention is true, and, if true, deploring that the fact should be thus, yet see the indirect contribution which the college makes to the farming community. Where did the public school system come from? Is the college an evolution of the public school, or is the public school system a product of the college? The latter is the fact. The history of education has been this: first the college, then the secondary schools, then the common schools. In England, Oxford and Cambridge date back to the

twelfth century. Then the secondary schools like Winchester, Harrow and Eton belong to the 14th century. The common schools belong to our own century. In the old colony of Massachusetts the people were taxed to support the University of Harvard before any common schools were established or existed. Something like that has been the development of education here. There was much collegiate development before the common school system was organized. The public school system is the fruitage of the college. There may have been, of course, some education concurrently with the development of the college education in the rural districts, but the public school system as you have it to-day, or in any sense as you have it to-day, was the product of the brains of college men. The colleges have sent professors into your normal school; they have sent teachers into your academies to make them efficient. This public school system, which has brought its blessings into every farmer's home is the fruitage of college life.

Then here is another thing which has come into your homes—a rich and varied literature. A man goes into your homes and finds in almost every house a large and well-selected library. Now open the covers of your books, and if these books have any permanent value, if they are worth reading, nine out of every ten have been written by whom? By men who have received their inspirations in poetry, in literature, in the sciences, in philosophy in the colleges, or have received the discipline which has enabled them to put their knowledge into form for your use and appreciation. If we cannot all go to college, the college comes to all of us.

There is also a very special literature which is now contributing to the life of you farmers. I am thinking of the literature which is used in the form of text books in your horticultural school, and which is finding its way into all your homes, which is the source of information for the horticultural journals and farmers' papers. What is the source of this scientific learning, which has such a large bearing upon your life? What is the source of this higher intelligence in horticulture and agriculture which is the force behind this association which is meeting here to-day, and which has given dignity and power to your association? These books, this higher learning, has issued from the experimentalists and scientific

investigators in the colleges. That is its source. It is a matter of scientific investigation by erudite men at the start stimulated by the laity, who are looking for information and asking for help. In this respect, then, the colleges are making a most important contribution to the farmer's life.

Then I have said we send out from the colleges—I think that it is a pity that it is so—we send out for the most part teachers, doctors, lawyers, ministers and politicians. But whose children do the teachers teach? Whose bodies do the physicians tend? Whose affairs do the lawyers look after? (A voice—Their own.) (Laughter.) That is only when they get a green man to handle. And despite the differences of politicians you are enjoying with the rest of the people the advantages of our civil institutions and the higher applications of political law. Who are enjoying the ministries of these ministers, good, bad, and indifferent (I can say that being a minister and knowing myself to be an indifferent one) Who are enjoying these? Well, the farmers in common with the rest of the community. Yes, though the lawyers are such rogues, and the doctors give us pills which have no virtue in them, nevertheless, it is necessary to a well-organized society that there should be this development of professional life, that there should be men able to make these varied contributions to our comfort and to right relationships in life. These provisions are very important, and farmers share them. Were they abolished, and were the colleges, which are able to make this ministrations to life abolished, you would find that you had lost heavily, and very heavily.

Consider another point. I said a moment ago that the farmers made a very important contribution to the life of the colleges by supplying us with students. But now turn that around on the other side and see what the colleges are giving back to the farming community. Here in this valley there are more boys and girls in the homes than the farms will support. What shall the farmers do with these boys and girls? Well, it is surely a contribution to the life of this community for an institution like this to stand in its midst and offer for one quarter of what it costs, to take these young people and give them the best discipline, both intellectual and moral, to fit them for high services in some other calling.

Surely it counts for much in the farmer's life that these institutions stand ready to take the young people and help them into qualifications for high service in some other walk of life.

In these varied ways, then,—by having developed, and by rendering efficient the public school system, by bringing into your homes the beneficial influence of a rich and varied literature, by helping forward this matter of scientific farming, by disciplining men for all the varied professions that will minister to the comfort and happiness of life, by this readiness to take the young people who are the overplus of the farming community, and discipline them for other services, the college is making a most important contribution to the life of the farmer and the life of the farming community.

And I believe, sir, to speak finally, I believe the time will come when the colleges will send more men back to the farm, and not merely when they have taken the Freshman year or Sophomore year, but when they have taken the full course. I think, however, that some conditions will have to be met before that time comes. Particularly, I may say that I am not sure that it is desirable that all the boys should go back to the farm. What would become of the cities if you did not fertilize them with the wholesome life of the country? I do believe, however, that the time will come when more of the young men of the farm will go back to the farm after having availed themselves of a college education. But certain conditions will have to be complied with before that takes place. One condition is that the colleges must adjust their work so as to furnish more immediate and practical help along agricultural lines: I think the colleges must in the main labor for the development of mind as mind, and for the development of character as character. We do not train our young men for lawyers, we do not train our young men for doctors, but we try to train their minds for any sphere to which God shall call them. But it does seem legitimate to endeavor to adjust college life so as to meet practical demands, when we see that the effect of existing conditions is to carry college bred men away from the farms. That, however, is a matter of finance. To open up a special department in addition to the departments already in vogue means money. Happily this is not a

I am much pleased to meet the people of this valley; I am desirous of meeting as many of the farmers of the Province as possible; hope by coming in touch with them to be better able to carry on the work at the experimental farm, Nappan. I trust that we may be mutually benefited by our meeting here to-night.

As you have had so many good speakers, and the hour now is late, I will be very brief and hope not to weary you. I think the dairy industry can be carried on without the apple tree, but I cannot understand how the apple tree can be grown successfully without the dairy cow. The prosperity of the country depends on what it produces, and this being an agricultural country, the agricultural products mean everthing to us. It is true this particular section of the province produces a great many apples. If we are going to make this an agricultural country and a prosperous country, we cannot do so unless we keep up the fertility of the soil. I believe in the intensive system of farming—that is growing all the rough coarse food you possibly can and feeding it on the farm. The question is, how can we produce the most from our farms and still keep up the fertility of the soil. If our farmers could only get to believe that their occupation was as honorable as any other occupation, I think it would do good to the farmer himself. I think I am right in saying that the farm has furnished a great many professors to our colleges, and I have not the least doubt that they furnish the best ones.

I heard one speaker to-day advocating plenty of cultivation and manure as the best remedy for black-knot. I think the cow can do a great deal towards furnishing fertilizers to make the trees more vigorous, to better enable it to protect itself against this disease. I think if we had more of this kind of fertilizer we would have less black-knot. There is no doubt but that the system of intensive farming pays and pays well. I think there is room for all the different breeds of live stock. You can take your choice. When you fix upon a particular kind of stock, by all means choose an established breed and stand by it. Stick to the one of which you make choice. You cannot be entirely successful in the dairy business with an animal that has been bred partly for the beef business. If you are going to raise animals for the beef business choose them according-

ly and rear them having that object in view. But if you are going to carry on the dairy business you must have stock for that special purpose, and you must look after it for the purpose of making that business a success. Feed your cow for a special purpose. I read an article in an agricultural paper recently which gave my views exactly as follows: "Mr. John Gould says that a good many farmers want a cow that will give a big flow of milk, that will give rich milk, that will be a real good cheese factory cow, that will give milk suitable for the city milk trade, that will drop a heifer calf one year which will develop into an ideal dairy cow, and the next year give a bull calf that will make an ideal broad-backed deep-fleshed beef steer. You might just as well inquire for a general purpose farm machine, one that will plough the ground, harrow and sow it, then reap the harvest, thresh it, and haul it to the barn, plant and dig the potatoes; then during the winter pull stumps and cut wood. Just as much sense in one as the other. Get a special purpose cow and feed her for a special purpose." If you choose a dairy breed choose a breed which suits your particular idea. Ten stock men may each have different breeds and each think his the best. I have had considerable experience with different breeds, and there is a great deal less difference in the breeds than in the best of the different breeds. It may not sound well for a stranger to tell the people of this province that they do not care for their cattle as they should be cared for, but I think that it is so. You do not care for your cattle as you should. Judging from the cows I have seen in the province, nine-tenths of them are not cared for nearly so well as they are where I came from (Western Quebec or Eastern Ontario), and even there I am quite satisfied that 75 per cent. of the dairy cows are not fed well enough to bring out the best dairy qualities born in them. It is simply astonishing how much cows can be developed from year to year by good feed and proper treatment.

It has been the general custom to have cows fresh in the spring, the object being to have a large flow of milk in the summer months, and by November allow them to go dry for the next six months, and board them as cheaply as possible during that time. No matter how cheaply it is done, it is turning our stables into

burdensome question with us. The Horticultural School being near us, our young men can take advantage of that, and we encourage them to take advantage of it. A young man, while taking his literary work may keep in touch with farming by taking a course of two years in the Horticultural School.

But that is not the only condition which must be supplied if the young man is to be won back to the farm. There must be in the management of the farm and the life of the farmhouse that which will call into requisition the acquirements of college life; there must be a demand for the exercise of intelligence which will approximate to the demand that will be made in the professions. If a young man having got this intellectual training finds a sharp demand on him in the professions, but finds on the farm no special demand on his intelligence, it is going to be very hard for him to go back. There must, I say, be an effort so to manage the farm and farmhouse that his learning shall be brought into requisition and a demand be made upon him for the exercise of high intelligence. If, instead of this, a farmer says to his boy: "I am not going to waste any money on you if you are going to be a farmer, but if you are going to make something of yourself I will send you to college." So long as farmers talk like that, the boys will not go back. The conditions kill out any hope of that happening. A mother in this valley said to me—I was speaking to her of the young people—and she was an exceptionally intelligent woman. She said to me: "Well, of course, we shall not think of wasting any money on our boy if he is going to stay on the farm." I said: "Do you mean to tell me there is no need of higher intelligence in a farming community?" She said: "Where would he use his knowledge?" I said: "He doubtless will expect some day to be a husband. He may have a well-trained and intelligent wife. He may have children. Surely his relations to his children and his wife will be improved if he is a man with a wide outlook. Then in a farming community is there no social life? no church life? no civic life? no political life? Is there no adequate room for an educated man?" Then I turned to the consideration of the daughter, and I said: "Do you mean to say that there is no room in a farm house for a girl who has gone through a college course

of four years, other things being equal? I talked over with her what it might be to a girl, what it would be to her children and the community in general.

So I say again it seems to me that there is hope that a larger number of young people may go back to the farm; but it will be on condition that in going there the men and women in the farm houses cease proclaiming that an educated man and woman has not a proper place in a farm house. We will do our best, you helping us, and I believe that a good many of these young people will before very long choose to return. Some will go into city life and starve when they would have a richer and nobler life if they had stayed with the rural community.

We are under obligations to the farmers for the contributions they make to us. The farmers, I am sure, recognize the contributions we make to them. Let them continue to give us their sons and their daughters to train, and we will do our utmost to send them back to them better able to meet the responsibilities and opportunities of life, and to be of service not only to their parents, but also to their generation. Let them continue to give us of their material subsistence, and in a hundred ways we will give back to them riches which are riches indeed.

The Cow as an Adjunct to the Orchard.

R. ROBINSON, SUPERINTENDENT EXPERIMENTAL FARM, NAPPAN, N. S.

Mr. President, Ladies and Gentlemen:—I have no doubt that the chairman wished to convey a compliment when he spoke of me as Professor Robertson. I think I had better make that straight just now, and impress on you that I am just plain Robertson, and not the Professor. I have not written an address, as each time I have attempted to do so I was reminded of the Scotch Presbyterians. They do not like to see their young ministers reading sermons, so on one occasion, after a sermon had been read, one of them was asked how he liked it. "Well," he said, "I did not like it at all—first he read it, and secondly he did not read it well, and thirdly it was not worth reading." (Laughter.)

a boarding house from which the boarders go out in the spring without having paid their board bills. A fair average cow, fresh in the fall, will give a good flow of milk all the winter months, and when let out in the spring will give almost as much milk as the one which was fresh in the spring, and drop in milk the same time as their equal which came in fresh in the spring. You can then afford to let such a cow go dry for two months. You are then at your busiest and the days are shortest, and you can turn her off to a back pasture until time to bring her into the stable again. By having our good cows calve in the fall we can get all of 50 per cent. more milk from the cow in a year, about 50 per cent. more manure, and give employment for the boys on the farm. By consuming all we grow on the farm we can soon grow not only hay of one ton per acre, but corn, roots, clover, etc, and get four to six times as much per acre as formerly.

The cow is much more a creature of habit than anything else I have ever had to do with; almost everything you teach her she will continue to do in after life.

Dairy cows require a great deal of heat, in fact more so than beef cattle. I do not believe a dairy stable can ever be profitable unless it is kept at fifty degrees. I would like to keep it at sixty. If you want to be successful with the dairy cows you must look after the feed, water and light. Tuberculosis in cattle is nothing more or less than consumption in man—and a dark stable is a good place for the disease to grow. It is a fact that a few hours' sunlight will kill tuberculosis germs, but they will live for months in a dark place; and another thing I would tell you, cattle are quite liable to take tuberculosis from consumptive people.

Kindness is a thing that does not cost much. The more nervous a dairy cow is the more she will respond to kind treatment. And, with respect to regularity, a dairy cow is very fond of regularity, and if she pays well for heat, water, light and kindness, she will also pay well for regularity. A cow is very much a creature of habit, and it is well to look after those habits in early life. The earlier you teach those habits to an animal the better she will stand by it.

Through the medium of the dairy cow we can increase the productiveness of the farm and keep more cows than formerly, employ much more labor, and it is just adding interest to interest, until I do not know where the limit is. But above all the good results that come from the system is the giving of remunerative employment to your best young men on the farm. As a rule it is not the drudgery on the farm that drives the boys away; it is the lack of income all the season. What farmer would not rather keep his boys at home if he could see a prospect for his being as prosperous there as in the city?

I wish to express my thanks to you one and all for your kind attention, an indication of good will and sympathy in my work, which, coming amongst you a stranger as I do, I greatly appreciate. I can assure you it is a pleasure to be with you to-day.

Mr. P. McFarlane, who is in the employ of the Dominion government as cold storage and dairy expert, was called on, but owing to the lateness of the hour did not make any extended remarks.

Mr. Logan gave a dialect reading in costume—The Habitant Farmer, which was well received.

Mr. D. Munro kindly favored the audience with several selections on the graphophone.

Meeting closed at a late hour.

FRIDAY, 28th JANUARY, 1898.

The Association met at 10.30 o'clock, President Bigelow in the chair.

The report of Mr. G. W. Munro, Treasurer, was read and adopted. (See page 5.) Election of officers was then proceeded with. (See page 3.)

Mr. W. C. Archibald, Chairman of the Council Board of the School of Horticulture, presented the following report:

Mr. President:—

The Nova Scotia School of Horticulture owes its existence to the desire of the government of Nova Scotia to encourage the

establishment of an institution of learning, with central experiment station especially designed to furnish a liberal and practical education to the fruit growers of the province. This desire is manifested by the founding of the school at Wolfville, with one professor in 1893. The enrolment for the first year was 60 students, second year 55 students, third year 61, fourth year 61, and fifth, and present year, 56, making a total of 293 students for the five years. The government pays tuition for 193 of these, leaving the expense for 100 students to be born by the Nova Scotia Fruit Growers' Association. By the terms of the act of establishment parliament did not provide for the growth that has taken place. Although the attendance has increased, and the quality of work improved parliament has not increased the endowment. The executive of the association engaged Mr. F. C. Sears, a native of Massachusetts, and a graduate of Kansas Agricultural College, for director of the school for the present year. Professor Sears is highly commended as a teacher. The course of study adopted is given from text books instead of by lectures, as heretofore. The professor has already lectured before the Aylesford Agricultural Society, the Pictou Agricultural Society, and at the close of the present school year will give a series of lectures throughout the province. On January 11th he attended a meeting in Boston of experimentalists in horticulture of New England, New York and Canada. These gentlemen formed an association for comparing and discussing experiments made within the latitude of these countries. The library of the school is being enlarged by completing as far as possible the files of bulletins from Canada and all stations of the United States. We hope the day is near at hand when this valuable literature will be in general circulation among the fruit growers.

The business of the school is to teach what is known. The business of the station is to discover what is not fully known in knowledge and practice. I have received from the meteorological office, Toronto, the apparatus for weather records. A weather map for the Dominion is now published monthly. It is hoped this may yet prove of value in fruit growing. An experiment

fruit station, near to the school, of 50 or 100 acres, is now a positive necessity. We are not unmindful of the fact that the government has established a model farm at Truro. But it must be remembered that the principal fruit interests of the province are here in the Annapolis Valley, and many of the problems with which our fruit growers are confronted are peculiar to this locality, and can be solved only by investigation here. In an important sense, the station is the necessary aid in the work of giving instruction. Your board urge the present importance of planting a series of sub-stations in other counties. It is believed that the government of the province and the fruit association are jointly committed by the prospectus and act conditioning the government grant to the planting of these stations. The school and central station must not be discriminated against; a bonus to students or its equivalent should be provided, such as is now given to the agricultural school and farm. In these western counties orcharding is of chief importance, amounting to almost a million dollars in a single year. The great object of the school and station is to assist the masses of the people, who have their own or borrowed capital invested in the industry. Your board realize the tide of general interest is rising and the work should go forward. It now remains, Mr. President and members of the association, for you to determine the ways and means to increase the facilities and efficiency of the work.

The report, after discussion, was duly passed.

Pruning.

PROFESSOR SEARS, M.S.

There is, perhaps, no other subject connected with fruit raising about which we know so little as about pruning. It offers an unrivalled field for investigation and experiment. Yet there are some points which are sufficiently well established to at least merit our careful consideration, and in order to place the subject before you for discussion let me state briefly a few of these.

It is impossible to emphasise too strongly the importance of beginning early in the life of a tree to shape it, and control its growth. If we look at a tree whose pruning has been neglected it does, indeed, present a most complicated problem for solution. Large limbs grow out where they are not wanted; bare portions of the trunk are found where branches would be desirable, and the smaller branches cross and re-cross one another in a way that is truly bewildering. But all this may be, in great measure, obviated by beginning when the tree is set and pruning it carefully. Of course this pruning will vary somewhat with different fruits, but some general rules will always apply. A young tree should consist of a central leader with the main branches distributed evenly about it, forming a well-balanced head. On no account should a tree be set which has a decided fork in the trunk. It may grow well enough for a few years, but just when it is full of fruit and you flatter yourself that you are about to reap some reward for the care you have given it, it will suddenly split apart, and if the crop is not a total loss it will at least be injured in quality and reduced in quantity. Trees like the peach, having little wood, are of course, most likely to give trouble in this respect, but all fruit trees will bear watching.

The point at which a limb should be removed is just at the upper part of the flange or shoulder, which will be found at the base of each limb where it joins the main trunk. It is plain that if we cut closer to the trunk we increase considerably the size of the wound without reducing to any great extent the stub over which the tree must grow. If we make the cut further from the tree the scar is not much smaller than it would have been at the shoulder, and a long stub is left, over which it may take the tree years to grow.

If possible avoid removing large limbs, and the best way to avoid this is to begin when the tree is young and prime it systematically and carefully. But if it becomes necessary to take off a large limb, use a sharp saw and begin by sawing in a short distance from the bottom. Then saw down from above and the limb can be removed without fear of its splitting off below. Very large wounds should be smoothed off with a knife, and then cov-

ered with some substance to keep out moisture and prevent decay. Gum shellac dissolved in wood alcohol is the best substance for this purpose, though paint is better than nothing.

And now as to the time of year for pruning. In a general way we may say that to promote fruitfulness pruning should be done in summer, while if wood growth is desired winter pruning should be resorted to. Let us see if we can offer any satisfactory explanation of these results. First, as to summer pruning—we know that usually a strong growth and great fruitfulness do not go together; that a plant must reach a certain degree of maturity before it will produce fruit; and further that the presence of an abundance of plant food at the time the buds are forming is necessary for fruit buds. Now if, in summer pruning we remove the growing point of a branch, we first check the growth of the plant which gives us one condition for increased fruitfulness; and secondly, we remove that part of the plant which was maturing the largest demand for materials for growth, and to that extent plant food becomes more abundant in the other portions of the tree, another condition of fruitfulness.

Next as to winter pruning. When the tree goes into winter quarters at the end of the season we may say that the roots and the top are in a sort of equilibrium, they balance each other. There are just enough roots to support the top. Now, if during the dormant period, we remove a considerable part of the top we reduce by just so much the surface to be supplied by the roots, and therefore there is a stronger pressure of sap brought to bear on the remaining buds, and a greater supply of nourishment for the growth of each. The result is that we get a strong growth of wood which draws heavily on the plant, and as a consequence, when the time comes for the formation of buds for the following year plant food is not abundant in the tissues of the tree, and few blossom buds are formed.

DISCUSSION.

W. C. Archibald—Is it desirable when resorting to winter pruning to cut when the frost is in the wood? Some people think not, and some are in doubt about it.

Prof. Sears—I belong to that class that are in doubt about it. It is common opinion that winter pruning in severe cold weather is not desirable. I do not know of any experiments to prove that such is the case. I have carried on some experiments with oak, alder and I think apple was in the list, and I did not find any injury resulting from winter pruning. I would like to know if any person present has authentic information on that subject.

G. C. Miller—The only injury I have seen from winter pruning is the bark dying back some distance and taking a long time to heal over. There are advantages and disadvantages in pruning in the winter. When the trees are bursting into bloom I have found a good time.

T. H. Parker—I think it matters little what time you actually prune as long as you do not prune in very cold weather. That is most injurious to the man who prunes. (Laughter).

J. E. Starr—If the sap is in full flow do not take off a huge limb during that time.

G. C. Miller—Regarding the bleeding of a tree. I never saw a sound tree really bleeding. When I cut off a limb and the tree takes to bleeding I have found that the tree has been diseased. You might as well destroy the whole tree then.

R. S. Eaton—Would you advise using thick paint on the cut surface?

Prof. Sears—Paint is very good. The object is simply to cover up the surface so that the spores cannot get in, and to keep out the water. A cheap quality of wood alcohol and gum shellac made to the consistency of thick paint.

R. S. Eaton.—Is it lasting as thick paint?

Prof. Sears—Yes, sir, forever.

Dr. Reid—You will find it difficult to get wood alcohol here. I think it is called methylated spirits.

Prof. Sears—It was sold to me under the name of wood alcohol.

A. McN. Patterson said he would like to know which was the best system of pruning, whether it would be better to prune on the top or the bottom.

Prof. Sears—I prefer pruning low. That is the system adopted in the country I came from. Of course the other has its advantages. The special object we had in view was to protect the tree from the hot sun. It is a matter of taste how you shall prune. I prefer low headed trees.

FRIDAY 2.30 O'CLOCK.

P. Innes, Vice-President, in the chair.

Cranberry Culture.

Henry Shaw said:—

The cranberry crop in the vicinity of Berwick, Waterville and Cambridge the past season was very fine. There were no spring frosts to injure the blossoms and no fall frosts to injure the berries. Plantations that were flooded in winter, and this is the proper season for successful cultivation, yielded from one to two hundred barrels per acre. The unflooded or upland plantations suffered considerably from the ravages of the common cranberry worm. The crop in this vicinity is estimated at between five and six hundred barrels, and the price is good. At this time of writing they are worth from eight to eight and a half dollars a barrel in the markets of the upper provinces. A moderate quantity was shipped to London, G. B., and netted the grower \$5.00 to \$6.50 per barrel. The demand for the cranberry is increasing very rapidly in the British market, said to be doubling each year. The demand this year far exceeds the supply in the Canadian markets, and with the increased call for them in England the prospect is exceedingly bright for the growers in this province. It is safe to estimate that the increase of acreage put under cultivation in this vicinity this year is fully 20 per cent. Cranberry growing under favorable conditions is undoubtedly the most profitable of all fruit growing in this province, as there is not enough now grown to supply the home market. Parties contemplating going into their cultivation should be careful to get the most productive varieties, also kinds that ripen early. Our Nova Scotia berries are the best in the world and free from insect pests.

The chairman asked Mr. Shaw what his crop netted this year.

H. Shaw—They sold in the Montreal market for \$1,135. Freight and commission cut them down to \$939.

Q.—For how many barrels? A.—174 barrels. Picking, packing and cleaning cut them down to \$720. That left \$360 per acre clear of all expenses. A few years ago that two acres was a perfect paradise for bullfrogs and mosquitos. (Laughter.)

A. Whitman.—I would like to ask Mr. Shaw if he would prefer a black muck soil?

A. Shaw—If you can throw the sand up on top of it it does not matter what is underneath.

A. Whitman—I was thinking that the muck might neutralize the sand.

H. Shaw—If the mud is too thick it will not bear. You must make it poor with the sand.

Q.—You do not mean to say that the cranberries will grow where there is no mud at all?

H. Shaw—Yes, if it is only wet. You must have plenty of water.

Dr. Reid—Is it necessary to flow the bog with water?

H. Shaw.—No, when the vines are young it helps to flow as it destroys the cranberry worm. We have fine crops on land that can not possibly be flooded. If they can be flooded in the winter all the better. One of my neighbors flooded his bog and killed the worms. A few years ago there were only 100 barrels raised in the vicinity of Berwick, this year over 600 barrels.

Dr. Chipman—What is the cost of preparing the land?

H. Shaw—From \$20 to \$100 per acre. It will take from 6 to 8 barrels of vines per acre.

Dr. Chipman—How soon will they begin to bear?

H. Shaw—The fourth year.

Dr. Chipman—How long will the bog continue bearing?

H. Shaw—In Cape Cod they have been raising them for 40 years.

Q.—Is flooding a sure remedy for the worms?

H. Shaw—It is with me, and from what I have read it is the same in Cape Cod.

The Cranberry Crop.

J. S. BISHOP, AUBURN.

It has become customary in these annual gatherings to discuss at some length the subject of cranberry growing.

From an all-round standpoint the year that has just closed has been a satisfactory and profitable one to those engaged in this industry. The total yield for Kings county for the past season may be safely estimated at 2,500 barrels, a greater quantity than has ever been grown in any previous year. While a few sections represented a very large crop, the greater part of the bearing bogs only gave a fair average, hence the surplus is largely due to the increase in acreage.

It was a common thing to hear more or less complaint on all sides respecting the quality of apples, yet never since the culture began has a season produced finer cranberries than those grown in the valley last year. The autumn frosts being light only served to heighten the color and increase the hardness of the stock. The berry worm, that plays havoc some years with green fruit, claiming a large per cent for its share, did not figure to any extent, excepting on some of the bogs in the vicinity of Waterville and Cambridge, the result being that the fruit was allowed to remain on the vines until September 25th, when it was fully matured, was large sized, well colored, and as it subsequently showed, had all the essential qualities for long keeping. Never did the crop clean up in marketable shape, with less waste than the present one.

In addition to the effort made from year to year, in the way of preparing and planting new ground to vines, we now see a manifest interest in the care of our bearing bog. Vines that have formerly given good crops, but by being pushed out of the soil by the growth of moss, and showing symptoms of age, are being

restored to fresh life and bearing vigor by an application of sand, and in some instances where the soil is very thin and poor, by a top-dressing of bone or some other fertilizer. One of the first indications that a bog gives of its being on the background is lateness in coming into flower with a corresponding lateness in maturing its crop. If taken in hand at once, no great effort or expense is required to restore it to its normal bearing condition. Problems of this nature are being worked out from time to time as we grow in experience.

Already some of the insect pests that have proved troublesome to our neighboring cranberry growers in Cape Cod and New Jersey, have appeared in our midst and damaged our vines, in some places to a serious degree. But by better acquainting ourselves with their habits and the condition under which they obtain an advantage over us, we hope soon to be able to keep them in check. Professor Fernald, one of the leading entomologists at the Massachusetts Experimental Station during the past season has been conducting special enquiries along these lines. Possibly we may be able to avail ourselves of some of the professor's recently acquired experience.

Some thought has been given to the subject of how to treat the fruit after it comes from the vines, in order to place it on the market in the best possible shape and insure the longest keeping. It was at first thought that this could be best accomplished by keeping the berries in shallow boxes exposed to the air, or spread out thinly on floors; but it is a fact now admitted by those that have carefully tried both systems, that there is no better way known than to pick the berries dry, put them into dry barrels, head them up, place the barrel on the bilge in a cool dry cellar or basement of a building suitable for the purpose. When ready to ship they can be milled out on short notice, and go on to the market in perfect order.

From the disastrous experience of last year a degree of caution was exercised in marketing the crop of the present.

We naturally look to the cities of the Upper Provinces as a market for our surplus. By informing the fruit men of these centres of the quantity we had to dispose of, they appeared ready to pur-

chase their berries from us, rather than to place their orders with the people of Cape Cod. And by acting somewhat on their advice in respect to forwarding the same we avoided a glut on the market. Early in the season we began shipping in small quantities along with the apples to London and continued to do so as long as we had stock on hand. The sales there running from 25s. to 35s. per barrel, which we considered very satisfactory. While we had no complaint from them about the fruit being soft or reaching them in bad order, yet we gather the fact that a smaller package than the ordinary cranberry barrel would be more desirable for sending berries to a market so far across the ocean.

A bushel box with a division in it has been recommended and I think will be found in use another year.

Just how large a quantity of berries the London people will take at the prices just mentioned I am unable to say, but we have good reason to believe that the demand over there is doubling each year, and as they get more accustomed to the use of this delicious and wholesome fruit that they will be ready in due time for all our surplus.

When we reflect on the fact that cranberry growing has been the means of bringing between ten and twelve thousand dollars in cash into Kings County this past year, and this largely from a source where hitherto our products have not been in any great demand, and that this crop is the direct product from ground that would be utterly worthless for any other purpose, we should not be long coming to the conclusion that the industry is at least some help in building up our country.

DISCUSSION.

Mr. Shaw—Is there much increase in acreage?

Mr. Bishop—Every person engaged in this business seems to be extending. They seem to take the best possible care of the bogs they have in bearing.

Mr. Patterson—Will you inform us what amount was raised by Dr. Balcom on 15 acres?

Mr. Bishop—Dr. Balcom's bog of 15 acres has not yet come in to bearing. He only had one acre bearing, which gave him 40

barrels. It gave double the quantity last year. After a bog is planted it does not come into bearing until the vines are run over the ground. They are planted in rows. The first year they run out laterals; the second year the laterals multiply; and the third year they throw up their uprights; and the fourth year these uprights produce fruit. And from that time without any assistance they will give three or four good crops and then they come almost to a standstill, and require an application of sand, which operates to keep them in bearing. Sanding a bog bears the same relation to it as pruning does to an orchard. Once every three years we apply a half inch of sand. 50 two-horse horse loads to the acre is ample to keep them in bearing. It is useless to expect a great crop of berries every year. There are reasons why it should be so. What the vitality of the plant in this respect is I scarcely can tell. Our orchards will hardly bear us a large crop every year. The tip worm is the worst pest with which we have to contend. Dr. Fletcher did not think it was an importation, but rather an insect of this country. He was of the opinion that if we could turn on water we could effectually destroy it; and also suggested to cover the ground with straw and fire it.

Dr. Chipman—What about spraying?

Mr. Bishop—Dr. Fletcher thought three applications of Paris Green would prove effective. We propose next season not to flood but to let the frost destroy the eggs of this insect.

J. E. Starr said this was a very valuable paper, and he was much pleased with it. He had been assured in England that the market was unlimited, and they advise putting them in from 8 to 10 pound boxes. These small packages would be quite convenient for distribution by the retail dealers.

Dr. Chipman said it was a good thing for Nova Scotia if we could utilize the bogs that were not fit for agricultural purposes for cranberry culture and bring thousands of dollars to the province annually.

Dr. Kendall, M. P. P., for Cape Breton, was introduced to the meeting, and made an interesting address. The Dr. congratulated the Association on its interesting meeting. He thought in his

own county, though at present noted for fish and coal, agriculture would in the near future receive more attention. Apples and plums were grown with a measure of success. Dr. Kendall said the fruit crop of the Annapolis Valley yielded a greater net income to the producers than all the coal fields of Cape Breton.

Mr. P. Innes addressed the meeting at length on the changes in the prize list of the Provincial Exhibition. A lengthy discussion followed.

Roland Richardson, of Annapolis, presented an excellent paper on the Need of an Experimental Fruit Station. Mr. Richardson argued that the fruit growers needed such a station to enable them to compete successfully with other countries. Such a station would select varieties of fruit suitable to all sections of Nova Scotia; would instruct the farmers in combatting insect enemies, and under intelligent instruction enable him to overcome many difficulties which now hinder his work.

B. W. Chipman, Secretary for Agriculture, said he thought it the duty of the Association to urge upon the government the necessity of an experimental fruit station. It was not merely a local matter, as had been asserted by one member of the Association, but a matter of provincial importance. Already had he seen the leaven of the horticultural school at work in every county in the province, inducing more efficient methods of culture. A fruit station should be located in the centre of the fruit growing district, where it would do most good.

I. C. R. Express Rates.

W. C. ARCHIBALD, WOLFVILLE.

In the markets of England the apples of Nova Scotia come into competition with all the fruit countries of the world, thus giving our Valley a wide reputation as an apple producing district. As growers of small fruit we are not so widely known, in fact, we have scarcely reached beyond the cities of Halifax and St. John and the towns in the western part of Nova Scotia, yet with-

in the last few years this industry has developed at a greater ratio than the apples. It would appear that an extra large crop of apples, such as we had in 1896, would have no appreciable effect upon the English markets, unless as happened in 1896, there should be an unusually large crop in all the apple producing countries, a condition not likely to occur again. We are quite safe in increasing the quantity and improving the quality of our large fruits. The world's consumption of apples is steadily increasing. The small fruit grower, however, has not at the present time the same encouraging outlook. Our present shipping facilities will not put our small fruit into the English markets, and the production has already reached such proportions as to completely fill the markets of Halifax and St. John. We have been looking to Boston for more favorable tariff arrangements, but matters in that direction are getting worse instead of better. We are now met with a duty of 25 cents a bushel on plums, and 1 cent per pound on berries. In eastern Nova Scotia there should be a market for considerable quantity of small fruits, as they are not grown there to any great extent. These towns are all accessible by government railway, and have a population equal to the city of Halifax, and although not so much wealth as in the city of Halifax, there is a much smaller proportion of poor people. The towns of Amherst, Oxford, Springhill, Truro, Ferrona, Stellarton, Westville, Pictou, New Glasgow, Antigonish, the two Sydneys and other mining towns in Cape Breton aggregate a population of 50,000. What I have said of Nova Scotia can also be said of New Brunswick. There is a population of 50,000 outside of St. John, and all these towns are reached by railways. The question of transportation rates is now the only one to settle in order to almost double our markets. Last year this Association appointed a committee on this transportation. I took up the question of rates with Mr. Fraser, manager of the Express Company over the D. A. R. line, and the Canadian Express Company, with headquarters at Montreal, and operating over the entire length of the line of the Intercolonial.

The following is an accurate comparison of rates by distances :

Maritime Express.	Miles.	Canadian Express.
36c. per 100 lbs.	50	50c. per 100 lbs.
40	80	60
43	95	60
52	140	70
60	180	80
64	200	100

Taking an average with these comparative distances and rates, we find the Intercolonial Express rates are 30 per cent higher than the Maritime Express Company, or to put it in another way, the Maritime Express rates for small fruit are 30 per cent lower than those over the Intercolonial Express. The rates fixed by the Maritime Express Company seem fairly reasonable, while the rates over the Intercolonial Express effectually prevent opening and enlarging that promising trade with the home provinces. An additional evidence of discrimination inducing unfair competition with Ontario, is that the express rate on a ten-pound basket of plums, from Wolfville to a merchant in Moncton, delivered is 11 1-2 cents, and the same weight package from Niagara to a Moncton merchant, delivered, is 7 cents, or 4 1-2 cents in favor of the Ontario grower.

We are fully convinced if the Intercolonial Express rates were reduced equal to Maritime Express, we would reach all the towns to the east and north, and open markets for double their present consumption. We hear a good deal about heartless railway corporations, but in this case the D. A. R. give us an express rate 30 per cent lower than the Government Railway Express of Canada, over whose line we naturally look for the most popular rate for our fruits. I wish it understood I am making no reference to Intercolonial freight rates. Perishable fruit cannot be shipped by freight trains, they must go forward by express. The express company operating on the Intercolonial have definitely refused to lower their fruit rates. The question is, has the Intercolonial Railway given away its right to carry goods by passenger trains, and if so, are the tariffs of the lessees subject

to the approval of the railway management?

After discussion, this question was referred to a special committee, W. C. Archibald and M. G. DeWolfe.

Orchard Tillage.

S. A. PORTER.

There are different opinions among fruit growers as to orchard tillage. The different soils and circumstances of each grower require different methods, and there would be little use in attempting to give one system for the practise of all. Each orchardist should study his own surroundings, and learn for himself the best methods to follow. Still there are principles which everyone should consider, and which must become the foundation of all operations.

The soil is the great store-house of plant food, and we must consider, first of all, how we are to utilize it. Thorough tillage is the only satisfactory treatment, and it not only makes plant foods available, but is the best conservator of moisture. The orchardist must select a location and soil which will be adapted to the fruits he wishes to grow, and this should be put in the best condition before setting the trees. In many cases the land will need sub-soiling; perhaps draining will be sufficient, but some times both are required.

Select a position which is naturally well drained; if this is impossible, tile drainage should be employed; this not only drains the land, but loosens the sub-soil, making it possible to retain moisture in times of drouth. By pulverizing the soil we enable the roots of the tree to penetrate all parts, opening up the fertilizing materials, which were before unavailable, thus giving the tree more feeding ground and substance to feed upon.

One great advantage of tillage, which is many times overlooked, is its conservation of moisture. To obtain the best results, orchards need both moisture and fertilizer; but more often the former. Our heaviest rainfalls usually occur early in the

season, at a time when it seems not to be needed. Now, how shall this water be reserved for future use, in time of summer drouths?

The soil, if finely divided, is capable of holding in its capillary pores an enormous quantity of water. If the soil is left in its natural condition this will soon pass away by capillary action; but by breaking up these pores next to the atmosphere we prevent the water from evaporating. Therefore, we are first to plow, and then till the surface.

The best tillage is that which begins early in the season; make the first plowing as soon as the soil is in a condition to pulverize fine, and then keep the surface stirred until late summer.

A deep plowing should be made each spring for the first few years, and for later stirrings there are various styles of spring-tooth harrows, clod-crushers, cut-aways and smoothing harrows, which are adapted to the various soils. For heavy lands, the fruit-grower needs four types of harrows; the cut-away, for hard land and first work of spring; the spring-tooth; the acme or clod-crusher, and the smoothing harrow. The last-named is used for the last cultivation, or when the surface is in a fine condition.

In all loose soils shallow cultivation is to be preferred. After the land is in proper condition it requires very little work to run through the orchard and perform the necessary labor. Weeds should never be allowed to become established.

The whole surface of the orchard should be thoroughly stirred to about three inches in depth, at least every two weeks while the tillage lasts, and the drier the soil the oftener it should be stirred.

Level culture is generally considered the best, and this can be secured by plowing one year from the trees, and the next year towards them; one year east and west and the next north and south.

The first few years the land should be plowed deep in order to break up the soil, and to send the roots down sufficient depth to escape injury in times of drouth. If the trees are planted correctly, and tillage begun the first year or before, the roots will go deep enough to escape the plow. The whole surface of the

orchard should be tilled from the beginning, as the roots of a tree spread much farther than the top. Six or eight inches is deep enough to plough to send the roots down sufficiently. A careful man will turn his plow partly out when within two feet of the tree, as the roots near the butt are closer the surface. The deep plowing need only to be kept up for a few years in order to establish a root growth.

Tillage should begin early in the season, in order to save the moisture, which has accumulated during winter and early spring; it puts the soil in fine condition, giving it a chance to warm up and get the trees quickly to work.

All catch crops should be plowed under early, so they will decay as quickly as possible; the chief value of these crops lies in their fall growth and winter protection, not in spring growth. The longer they remain on, the harder the soil will become, causing more labor to cultivate.

Orchard trees stop growing before midsummer. Vigorous tillage should then cease, so the new growth will ripen sufficiently to stand the cold of winter. They can spare considerable moisture now, and some catch crops can be sown with advantage.

All poorly cultivated lands contain more or less fertility; therefore fine tillage is necessary to unlock and make available all the nourishment there is in it.

Fall plowing cannot be recommended for clay soils, as it will puddle and become hard and stiff. Frost will enter to a greater depth, and root injury the result.

We must remember that tillage can be carried too far; trees may make too much wood growth, and produce little fruit; winter may overtake them before the summer growth has had a chance to ripen sufficiently to stand the frost.

After the soil is in a fine mellow condition, shallow surface tillage to save moisture is all that is necessary. The most common remedy for too thrifty a growth is heading in; this is likely to spoil the shape of the trees, and after all the growth is aggravated and not checked. The satisfactory treatment is to lessen tillage and withhold the nitrogenous fertilizers.

Hoed crops can be grown to advantage in young orchards, and yet these should not be planted close to the trees, and the distance widened each year. After six or eight years all vegetable cropping should cease.

If fruit is to be grown, give the trees the whole benefit of the land, and the fruit-grower will be amply repaid.

The following report was read and received by the Association:

Report of the Delegates to the Farmers' Association,
January 26-28, 1897.

Your delegates beg leave to report that they attended the meetings of the Nova Scotia Farmers' Association, held at Middleton, in January last, and had the following resolution passed:

Whereas, In view of the extension of the work of the Nova Scotia Fruit Growers' Association requires additional funds for the diffusion of information throughout the province;

And whereas, At their annual meeting a resolution was introduced appointing a committee to wait on the local government, asking that an additional grant be made;

Resolved, That we, the Nova Scotia Farmers' Association, endorse the measure, and recommend that additional aid be granted.

J. RUFUS STARR.

MELVILLE G. DeWOLFE.

Fruit-Growing in Nova Scotia.

S. C. PARKER, BERWICK.

The Annapolis Valley is destined to become one of the principal sources of the apples of the world. The soil and climate are proved by experience to be admirably adapted to the growth of all the large and small fruits peculiar to this latitude; while our maritime position and contiguity to shipping ports gives us unrivalled opportunity of access to the great British and continental markets, thus securing to Nova Scotia undoubted advantages over

Western Canada and the United States. True, old fogies and pessimists are saying that the fruit business is overdone, that there are too many apples grown, and that the business will not pay in the future as it has in the past. Such talk did well enough last year, when it really seemed as if the fruit boom was broken, but to-day, when first-class Nova Scotia apples are netting the shippers nearly a pound per barrel, the prospect looks quite as bright as ever it has. Forty years ago (so our fathers say), when the Annapolis Valley only produced a few hundred barrels of apples each year, and these had to be trucked perhaps a hundred miles to Halifax, then the only market, prices did not compare at all favorably with the returns of the present day. The year 1870 witnessed about the first attempt to export apples to the English market, when a few hundred barrels were sent across in a sailing ship, on top of a cargo of lumber, and, by the way, it is reported that these first shipments arrived in quite as good condition as the exports of the present time, and there were no complaints arising from ill-ventilated and over-heated steamships, as in too common in this later day. The export trade increased gradually, a few thousand barrels went to London each year. Nova Scotians are proverbially slow, and the Annapolis Valley farmer took a long time to comprehend his unbounded possibilities for production, and the unlimited market across the ocean. Since 1880 there has been more rapid progress; regular steamship communication with English ports has increased trade; the Nova Scotian apple has become known and appreciated in the British market; the farmers are exercising more care in selecting and packing; the United States market has been largely cut off, perhaps not so much owing to the high duty, as is popularly supposed, as to the enormously increased production of American apples; and the paltry few score barrels of 1870 has rolled up into the hundreds of thousands.

The year 1896 produced the largest crop of apples ever grown in Nova Scotia, and, unfortunately for the farmer it was a banner year for production over this continent. Probably three quarters of a million barrels of apples were produced in the province in that year and the growers, who en-

tered upon the apple season with the brightest prospects, ran against a stonewall of low prices and slaughtered fruit. The grower was at the mercy of the consumer, and thoroughly the buyers repaid us for the many times we have had them in a corner. Every nook and corner of the maritime provinces was searched for markets. Newfoundland took a few thousand barrels, a few thousand drifted across the border, and nearly a half million barrels went to Britain, where they butted against two millions more from the United States and Canada. It would be a high estimate to place last year's net return at \$1 per barrel. Probably 50 cents per barrel would cover the net returns for one-half the crop, and thousands of barrels did not pay for the package they were shipped in. This was a record season for the pessimist. Through his blue spectacles the day for good prices was past, and nothing could be seen for the future but ruin. But the tide turned quickly. One extreme often follows another, and 1897 seems to be a record year in small production and fancy prices, as 1896 was in large production and small prices. This season a pound a barrel is the standard, and some are reaching and many approaching that high water mark. I have before me two sales of small consignments; one in 1896 of 20 barrels, which netted £1 6s., and a sale of 22 barrels in 1897, which netted £21 4s., or 32 cents in the first instance and \$4.60 in the other. Since 1890 a new spirit seems to be infused in the fruit growers. Orchardling has increased by leaps and bounds; the acreage has probably doubled in these few years, and the next record year, which is not far distant, will see a million barrels for export. If Nova Scotia orchardists were reduced to two varieties of apples, we would still hold place in the fruit economy of the world. In the Gravenstein we stand without a peer; beautiful, luscious productive, the pride of Nova Scotia. "Made in Germany" (its habitat) branded on the Gravenstein will give way to plain N. S. The Nonpariel, too, seems to have no competitor. It succeeds admirably throughout the Valley, and its remarkable keeping qualities bring it in season when other varieties are out of the market, thereby securing it a certain place.

The last decade has witnessed the inception of commercial orcharding. Until these few years the farmer treated his orchard

as a side show, to be cared for in snatches of leisure, when everything else was done. In these days the orchard is the first care, and the successful farmer, whatever else he may neglect, looks carefully to his trees. Quite a number of fifty-acre young orchards can be found in the Valley, the property of farmers; with improved methods of cultivation and extensive use of commercial fertilizers, there seems no reason why this increased area should not prove proportionately profitable. Beyond this a number of people have entered the business as a commercial venture. The Wolfville Fruit Lands Company have a large tract of land set with fruit in that town. In Berwick several Yarmouth gentlemen have some eighty acres set with trees, from two to ten years old. These gentlemen put their money up as they would in an endowment scheme, and are willing to pay yearly premiums, with the prospect of substantial returns in future years. There is abundant opening for more of this business, and the returns, though not directly available, will be certain and large. Fruit growing in the Annapolis Valley is profitable. Men who have seen much of the world say there is no place where people can live so comfortably with a moderate amount of labor as in the Valley. There is no great wealth—no fruit grower in Nova Scotia ever amassed riches—but there is no abject poverty, and I will challenge the world to produce a strictly farming community where the people import so much, and produce so little. Look at the importations—all our flour, carload on carload of meal, oats and feed, everything we wear to cover our nakedness, fertilizers and phosphates, furniture and carpets, pianos, organs and sewing machines, top buggies and bicycles, hardware and implements, oil, canned meats, tea, sugar and molasses. Look on the grocery shelves and you will find Ontario beans, Bermuda onions, imported canned beans, peas and tomatoes, cheese, butter and beef; and to our shame, be it said, imported canned apples can be found in every town and hamlet in the province. To pay the bills, and they are not small, what do we sell? A few potatoes, some of the smaller fruits and apples. Yet we continue to meet our bills (too often a year after they are due), and seemingly prosper.

To retain this progressing trade the orchardist must keep abreast of the times. Appearances must be carefully looked to,

better packages and better packing are urgently needed. Fertilization, cultivation, pruning and spraying all need more attention, and last, but not least, more careful selection. Too many poor apples are packed, as Halifax knows to its sorrow, and Halifax people pay too much money for rubbish when an extra dollar per barrel would give them first-class fruit. The honesty of the fruit-grower is often called in question, and sometimes with good reason, but in many cases it is the dealer who should stand in the gap for not knowing that the apples he buys are improperly selected and packed. During the past two seasons an English firm has been buying largely through a well-known Halifax commission house, as agents. It is notorious that these people have been swindled in a disgraceful manner. The local buyers, who get their commission by the barrel, seem only to want numbers, and pay little attention to the quality of the fruit, and scores of barrels have gone to this firm that should have gone to the cider mill. Some of the farmers who sold their crop to this firm at \$3 to \$3.50 per barrel are now buying dried apples from the grocery for home use. I venture to say these people will soon get tired of this method of business, and withdraw their patronage, and the goose that lays the golden egg will be thoroughly dead. Some ten years ago there was a similar experience in connection with Messrs. Scarborough, a firm of English buyers, who bought 20,000 barrels in the Valley. All kinds of rubbish was foisted on them, and after one year's experience, Nova Scotia knows them no more.

A larger and better barrel is imperatively demanded. We who claim to be in the front rank among fruit growers, ship our apples in the poorest and meanest barrels in the world. In London it is so well known there is comparatively little objection, but in every other market the competition of a better package places us at disadvantage. Liverpool, Glasgow, the United States, Newfoundland, and even Sydney and Yarmouth speak disdainfully of the Nova Scotia "keg," and Ontario apples, tightly packed, in full size, substantial, neatly-made barrels, are driving us from our natural heritage. These abuses energy, enterprise and honesty can surely remedy. At the present time it is unnecessary

to urge further expansion. The acreage will grow as the situation warrants. With a higher standard in quality and appearance, and improved shipping facilities, there is no reason why Nova Scotia apples should not retain the place they have already gained in the markets of the world.

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| Archibald, D., Halifax. | Bigelow, J. W., Wolfville. |
| Allison Augustus, Halifax. | Barss, John W., Wolfville. |
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| Brown, Amos B., Yarmouth. | Borden, C. A., Wolfville. |
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| Brignell, J., Bridgewater. | Borden, Geo. W., Wolfville. |
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| Burrill, Chas. E., Weymouth. | Black, J. B., Wolfville. |
| Bishop, W. H., Paradise. | Boak, Geo. E., Halifax. |
| Bryden, N. J., Berwick. | Bligh Howard, Halifax. |

- Borden, Hon. F. W., Ottawa.
 Beckwith, E. M., Canning.
 Blair, Col. W. M., Nappan.
 Brown, Walter, Wolfville.
 Cogswell, C. C., Port Williams.
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 Chase, W. H., Wolfville.
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 Chipman, Mr. Justice, Kentville.
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 Crowell, S. H., Yarmouth.
 Cann, Augustus, Yarmouth.
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 Daly, John, Digby.
 Desbrisay, Judge, Bridgewater.
 Dawson, Robert, Bridgewater.
 Dawson, Robert, jr., Bridgewater.
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 Kinsman, Dr. F. S., Digby.
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 Morse, Dr. L. R., Lawrencetown.
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 MacKinlay Andrew, Halifax.
 Munro, Dr. H. C., West River.
 Mitchell, F. F., Grand Pre.

- Macaulay, T. B., Montreal.
 North, J. B., Hantsport.
 Oxner, L. W., Lunenburg.
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 Oakes, I. B., Wolfville.
 Owen, Hon. W. H., Bridgewater.
 Parker, Rev. A. B., Weymouth.
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 Parker, S. C., Berwick.
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 Piers, Mrs. W. T., Wolfville.
 Parker, A. B., Wilmot.
 Pineo, W. W., Waterville.
 Richards, C. C., Yarmouth.
 Rudolph, J. Joseph, Lunenburg.
 Rudolph, Jas. R., Lunenburg.
 Robinson, Dr., Annapolis.
 Roscoe, C. W., Wolfville.
 Rand, Geo. V., Wolfville.
 Roach W. H., Windsor.
 Ritchie, Thos. A., Halifax.
 Reid, Dr. A. P., Halifax.
 Ritchie, Miss M. W., Halifax.
 Richards, C. C., Yarmouth.
 Rockwell, F. P., Wolfville.
 Sperry, J. D., LaHave.
 Spurr, Col. S., Kingston.
 Silver, W. C., Halifax.
 Scott, James, Halifax.
 Starr, R. W., Wolfville.
 Starr, C. R. H., Wolfville.
 Starr, C. E., Wolfville.
 Starr, G. L., Wolfville.
 Shaffner, E. C., Williamstown.
 Shaffner, J. E., Lawrencetown.
 Starrat, B., Paradise.
 Stewart, W. B., Digby.
 Shrieve J. C., Digby.
 Sawyer, Rev. A. W., Wolfville.
 Shaw, Isaiah, Berwick.
 Thomson George, Wolfville.
 Tingley Capt. J. B., Wolfville.
 Webster, C. A., Yarmouth.
 Wilson, B. W., Waverley.
 Webster, Barclay, Kentville.
 Wilcox, Geo. H., Windsor.
 Witter, H. B., Wolfville.
 Wallace, G. H., Wolfville.
 Wire, R. E., Wolfville.
 Whitman, J. H., Lawrencetown.
 Wetherspoon, W. M., Annapolis.
 Whitman, T. S., Annapolis.
 Wade, F. B., Bridgewater.
 Uniacke, R. T., Annapolis.
 Vickery, E. J., Yarmouth.
 Vaughn, F. C., Wolfville.
 Viets, J. M., Digby.
 Zwicker, P. B., Mahone Bay.

 ANNUAL MEMBERS.

- Axford, Rev. J. F., Port Williams
 Bishop, J. S., Auburn.
 Borden, A. H., Kentville.
 Beckwith M., Steam Mill.
 Bishop, N. E., Highboro.
 Beckwith C. E., Steam Mill.
 Bishop, G. A., New Minas.
 Blair, W. S., Nappan.
 Bill, C. R., Wolfville.
 Bligh, Rupert, Woodville.
 Chase, Oscar, Port Williams.
 Calkin, A. E., Kentville.
 Calkin, Geo. E., Kentville.
 Chipman, B. W., Halifax.
 Clark, J. S., Bay View, P. E. I.
 Coldwell, J. A., Gaspereaux.
 Chute, S. B., Berwick.
 Davidson, A. L., Kentville.
 DeWolfe, S. E., New Minas.
 Dukeshire, S. C., Middleton.
 Eaton, Freeman, Canard.
 Elderkin, A. D., Wolfville.
 Fowler Hugh, Bridgetown.
 Fitch, C. S., Wolfville.
 Fuller, F. L., Truro.
 Fitch, Harry R., New Minas.
 Griffin, A. N., New Minas.
 Harris, H. G., Kentville.

Hardwick, W. A. Canard.	Richardson, Ralph, Kingston.
Hibbert, Chas., Fort Williams.	Richardson, R. D. G., Kingston.
Hooper, Cecil A., Kent, Eng.	Rogers, W. S., Stellarton.
Innes, P., Kentville.	Starr, A. C., Port Williams.
Johnson, A. H., Wolfville.	Starr, J. E., Port Williams.
Jordan, W. B., Kentville.	Starr, J. Rufus, Port Williams.
Kinsman, J. E., Woodville.	Sears, F. C., Wolfville.
Kinsman, G. E., Steam Mill.	Shaw, Henry, Waterville.
McDonald, N., Steam Mill.	Seaman, Edward, New Minas.
McDonald, J. R., Wolfville.	Vince, J. A., Digby.
Nixon, C. S., Kentville.	Woodworth, J. W., Centreville.
Osgood, H. H., St. John.	Wolfe, C. I., Waterville.
Patterson, A. McN., Hortonville.	Whitman, Alfred, Waterville.
Porter S. A., Wolfville.	Whitman, L. J., Waterville.
Quinnan, Rev. James, Sydney.	Woodman, W. E., Steam Mill.
Robinson, Scott, Wolfville.	Young, Dr. Edward, Washington.
Rand, Ernest, Canning.	Young, Wm. Kentville.

EXECUTIVE COMMITTEE.

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Colin W. Roscoe, M. A.	R. W. Starr.
C. E. Starr.	S. C. Parker.
H. Chipman, M. D.	Edgar Higgins, B. A.
R. S. Eaton.	F. C. Sears, Secretary.
Dr. DeWitt.	Miss Mae Ritchie.

MEMBERS OF COUNCIL BOARD.

Chas. Burrill	Weymouth.
Miss Mae Ritchie	Halifax.
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James D. Sperry	Petite Riviere.
J. H. Sinclair, M. M. P	New Glasgow.
Geo. A. Cox	Shelburne.
John Donaldson, B. A.,	Canard.
Hon. J. M. Mack	Liverpool.
Arthur Kendall, M. D.,	Sydney.
J. Hart	Whycoconagh.
Percy Blanchard, LL. B.,	Baddeck.
C. B. Whidden,	Antigonish.
Chas. E. Brown	Yarmouth.
D. W. Dimock	Truro.
Allen Haley, M. P.,	Windsor.
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EXECUTIVE COMMITTEE N. S. F. G. A.

J. W. Bigelow, President.
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S. C. Parker, Secretary.
P. Innes.

G. E. DeWitt, M. D.
W. Young.
Geo. B. Munro, Treasurer.

MEETINGS.

The annual meeting of the Council Board is held the second week in January, also a second meeting in May, at close of school year. The Executive Committee of Board meets the first Friday of each month, and other meetings will be held when occasion requires.

ANNOUNCEMENT FOR 1898.

The establishment of the School of Horticulture is one of the most important works of the Association, and one of which every member is justly proud, for it is the only horticultural school in Canada, or indeed, in America. The school is aided by a grant from the provincial government, but many members have spent both time and money in the up-building of this institution. It offers to the young men and women of the province a thoroughly practical course in horticulture, where the principles taught in the class room are illustrated and enforced by the actual performance of the different operations.

The school is located in the most prosperous fruit-growing district of the province, a fact of no small significance, for on every hand the student may see evidences of the importance of this industry, and examples of men who have made a success of the growing of fruit. And, aside from this, it gives the student an opportunity to observe the details of school management, as performed by practical fruit growers.

The school is equipped with much valuable apparatus, making it possible to illustrate practically many of the subjects taught. The greenhouse is supplied with many plants which furnish material for microscopical study of their structure. A number of fruit trees are also grown in the house, so that students may become familiar with budding and top-grafting by performing these operations themselves. Root-grafting of various kinds is performed in the grafting room, attached to which is a root cellar, where materials for such work may be stored. A room adjoining the greenhouse is fitted up as a microscopical laboratory, with compound microscopes, dissecting microscope and various accessories. By the use of the microscope the student is made familiar with the structure and growth of such fungous diseases as the black-knot of plums and

the black-spct of apples, which knowledge will aid them greatly in combatting such pests in the orchard. The library and reading room are also connected with the greenhouse and form a very important part of the equipment of the school. Besides many scientific works, the library contains books on the spraying of plants, injurious insects, fertility of the land, and many other practical subjects. The leading horticultural journals are kept on the reading room table, and bulletins are received from all the experiment stations and experimental farms in Canada and the United States, so that the student may become familiar with what is being done in all lines to advance our knowledge of horticulture.

Text books have been substituted for the lectures formerly given in the different studies, it being believed that in this way a more thorough knowledge of the branches taught could be gained in the time devoted to each subject. The first year of the course includes the following subjects 1. "The Propagation of Plants—(a) by seeds, including requisites for germination, seed testing, preparatory treatment of seeds, sowing, requirements of temperature, regulation of moisture, etc. ; (b) by layers, including a description of the different kinds of layers, how made and with what plants they are used; (c) by cuttings, including parts of plants used, treatment to secure best results, different kinds of cuttings, etc. ; (d) by grafting, including a comparison of the different methods, with the special use of each; (e) by budding, including the growing of the stocks for different trees and various methods of performing the operation. In all cases where possible the student is given illustration work in the different methods. 2. "The Spraying of Plants," including a discussion of the various materials used, the preparation of each, spraying pumps and nozzles, and a study of the more important insect and fungus pests, with the treatment for each. 3. "The Principles of Pruning," which embraces the season for pruning, the effect of winter and summer pruning, best method with different fruits, etc.

The second year is devoted to the general principles of fruit-growing, much time being devoted to a study of the soil in its relation to fruit growing. Briefly outlined, the course will embrace the

following: The selection of land for different fruits, the tillage of fruit lands, the use of commercial fertilizers and barn-yard manure, cover crops, the planting of fruit grounds, renovating old orchards, wind-breaks, picking and packing fruit, packing houses, storing fruit, shipping and reaching consumer.

The character of the town in which an institution is located is always of the utmost importance, and in this respect the school of horticulture is particularly fortunate. Wolfville is strictly a temperance town, and the social atmosphere is exceptionally good. The fact that Acadia university is located here is also of advantage to the students in many ways.

The school year is arranged to suit the needs of farmers, opening on November 1st and closing May 1st. A diploma is granted for full two years' course, with certificate of proficiency for special courses. To all students, whether regular or special, a hearty welcome is extended. Tuition is free to all. Further information will be furnished upon application to Director F. C. Sears, Wolfville, N. S.



