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TRANSACTIONS

AND

REPORTS

OF THE

Fruit Growers' Association

AND

INTERNATIONAL SHOW SOCIETY

OF

NOVA SCOTIA.

1888.

Published by Order of the Government of Nova Scotia.

HALIFAX:
NOVA SCOTIA PRINTING COMPANY.
1889.

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HENRY CHIPM

W. H. BLANCE

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Hants	"
Halifax	"
Lunenburg	"
Digby	"
Yarmouth	"
Shelburne	"
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Pictou	"
Cumberland	"
Antigonish	"
Guysboro'	"
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FRUIT GROWERS' ASSOCIATION

AND

INTERNATIONAL SHOW SOCIETY

OF

NOVA SCOTIA.

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.Kentville.
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.Halifax.

FINANCIAL STATEMENT.

FRUIT GROWERS' ASSOCIATION OF NOVA SCOTIA in acct. with C. R. H. STARR, Secretary-Treasurer.

1887. Dr.		1887. Cr.	
To Expenses Meetings	$ 27 54	By Balance from Acct. 1886	$ 673 16
" " " Pictou, 1886	33 50	" 52 Dinner Tickets sold at 75 cents	39 00
" " Annual Dinner	48 75	" Annual Membership Fees	72 50
" Reporting Annual Meeting	29 50	" Government Grant	300 00
" Stationery, Printing Notices, &c	7 85	" Amount Securities	365 37
" Express, Postage, and Telegrams	14 37		
" Salary Secretary-Treasurer	100 00		
" Amt. Securities in balance from 1886	365 37		
" Balance to acct. 1888	823 15		
	$1450 03		$1450 03

Port Williams, Dec. 31st, 1887. E. & O. E. C. R. H. STARR, *Secretary-Treasurer.*

WOLFVILLE, February 16th, 1888.

We report having examined accounts and vouchers of Secretary-Treasurer Starr for 1887, and find them to agree. We find no change in the amount of securities during 1887, and the same amount is brought forward as per account of 1886, and the amount of the balance, eight hundred and twenty-three 15/100 dollars, carried forward to Jan'y 1st, 1888, includes amount of securities.

J. H. CALDWELL,
G. H. WALLACE.

SPRING MEETING.

The Spring meeting of this Association was held at Fisher's Hall, Berwick, on Tuesday, May 3rd.

Promptly at two o'clock the PRESIDENT took the chair, and with a few remarks called upon the REV. T. D. HART to engage in prayer.

The PRESIDENT expressed regret that owing to the non-receipt of papers read before the Annual Meeting, which had been sent to their authors for revision, the Annual Report for 1886 had not as yet been issued.

There being no business left over from the Annual Meeting the reading of the minutes of that meeting was waived.

The SECRETARY read letters from PROFESSORS HIND and SMITH, expressing regret at being unable to be present, and stated that similar letters had been received from GEN. LAURIE and others.

PROF. LAWSON, whose address was the main feature of the Afternoon Session, was then called upon, and on rising expressed his pleasure at being able again to meet with the Association, after having been under the necessity of declining on so many previous occasions. He then spoke of the objections which formerly existed in this Province to the application of scientific knowledge to agriculture; was glad to know that this feeling was changing, referred to the recent action of the Local Legislature looking toward the establishment of an experimental station, and spoke of the happiness connected with a life of active labor, instancing a gentleman with whom he had conversed that day, who, though a man of wealth and over 80 years of age, was working daily at the construction of a *steam engine.**

*We very much regret there had not been a Stenographer present to preserve the whole of Dr. Lawson's most interesting and instructive address. The following few notes give but a very imperfect idea of this valuable address.—SECRETARY.

The Professor then announced his intention of addressing the meeting on the subject of fruit trees, "looking at the inside of the tree," and giving a scientific statement of the manner in which the growth of the fruit tree and fruit proceeds.

The speaker proceeded to illustrate his subject by diagrams on the blackboard, drew representations of longitudinal and cross sections of growing tree, showing the arrangement of cells and layers of wood, and proceeded to describe the process of formation. The outer cells which are continually forming are filled with a mucilaginous substance. Under the influence of heat, water (sap) rises in the tree uniting with this mucilaginous matter and necessarily causing the cells to increase in size and extend in length. This process continues until the cells change to tubes of woody matter, forming each summer another circle of wood around the tree. This explains imperfectly, said the Professor —the manner of growth of the tree. To explain from whence the material was derived, it would be necessary to go on to the production of leaves and the relation of leaf and root to the production of woody matter. As agriculturists, said he, you know that certain substances applied to the soil increase the growth of plant, but of substances thus applied little trace can be found in the tree or plant. The plant derives its food mostly from water and air. An apple consists, besides water, of certain solid substances, acids, and sugar. Its odors are derived from ethers, its taste from sugar and acids. These are produced from oxygen and hydrogen, the elements constituting water, and carbon derived from carbonic acid gas found in the atmosphere. These three gases are the elementary substances concerned in the production of the tree, fruit, and everything connected with the growth thereof. The Professor further explained that while cells formed early in the season between the wood and bark were continually changing, the inner ones to wood and the outer to bark, those formed in the autumn remained in the cell state until another spring.

Large quantities of starch and sugar, substances formed from the elements previously mentioned, and which are the main constituents of vegetable growth, are stored in the plant during the summer. Starch, which is insoluable in cold water, in the spring under the action of heat and moisture in the living plant changes to sugar, and is rapidly used in the formation of wood and growth of tree, the plant being found to have the least quantity of these substances just before the formation of the leaves.

Leaves, under the microscope are found to have little valves on the under surface which open and close according to the state of the atmosphere, receiving or excluding the atmospheric substances. Through these valves the carbonic acid gas passes into the tree, and uniting with the elements found in water forms the starch and sugar required for the growth of the plant. The fluids in a tree are continually in motion, this motion is affected by the temperature, and is a result of the movement of the Protoplasm of the cells. Protoplasm is a substance always found in cells, and always in a state of motion except when the temperature is too low. Each plant has a minimum temperature of protoplasmic movement below which there is no motion of protoplasm and consequently no growth of vegetable or plant. This minimum differs much in different plants, and accounts for the different keeping qualities of different vegetables and fruits.

For instance, the Professor said he had often been asked by the farmers "Why cannot we keep mangel wurtzel?" In answer would say, that this vegetable if kept at a temperature below its minimum of Protoplasmic movement, which was low—would keep as well as any. The moment the temperature rose above the minimum the plant would begin to grow. Cold would not necessarily destroy the life of the plant.

On the other hand each plant has a maximum of temperature, and when this is exceeded the life of that plant is destroyed. Why? Because under the influence of excessive heat the protoplasm in the cell is coagulated exactly like a boiled egg, and can no more live or move again than a boiled egg will hatch.

In this connection the Professor described some interesting experiments regarding the growth of plants, incidentally stating that in some countries. Germany for instance, almost every garden was an experimental station. The growth of plants could be noted on a sheet of ruled paper tacked to a fence, and if the changes of temperature were noted by the thermometer it would be found that the growth of the plant was slow or rapid as the mercury rose or fell, but that the effect of changes of temperature would not be noticed on the plant till some hours later, the rate of elongation of the shoot generally following the fluctuations of the mercury at some two hours distance. What is a fruit? Simply something to hold seed. A pea or bean

pod consists of two valves containing seeds. An apple, in the eye of the botanist, is like a pea-pod. The pod consists of two valves, the apple contains five double valves in which the seed is found.

When a tree is well fed there is a large production of starch and sugar more than the seeds can use; these materials go to the production of the fleshy part of the fruit, which is large in proportion to the amount of these substances supplied.

Speaking of the production of new varieties of fruit from seed, the speaker thought more experiments should be made in this direction. If one variety better than any now known were to be obtained, the trouble would be amply repaid even though 100 new varieties proved worthless. In one respect agriculture could scarcely be said to be advancing. The grains now produced could not be said to be superior, if they were indeed equal, to those produced in ancient times. It seems to require the ablest effort of the agriculturist to keep to what we have attained.

The Professor then spoke of the diseases which affect the life and health of plants. The most destructive organisms are found among the fungi. Vine mildew for instance is simply a fungus. In illustration of the nature of fungi the speaker referred to the spunk found on decaying birch trees, which begins by minute threads running through the tissue of the tree living on it, and causing the woody matter to grow thin and to decay. As the growth of this fungus proceeds, seeds (spores) are formed which appear on the outside of the tree. All plant diseases caused by fungi (piltze) proceed in the same manner growing from spores or seeds. These are of two classes distinguished as growing and resting spores, the former grow at once, the latter rest in the soil or elsewhere perhaps for years The potato rot is a disease caused by a fungus, so is the black spot that is ruining the once popular Bishop Pippin apple. The only remedy seems to be to destroy all such fungi whenever practicable.

In concluding PROFESSOR LAWSON again expressed his pleasure at meeting with the Association; hoped to meet with them in the future, and would be glad to come and talk to them, if possible, at any time the Association considered it desirable.

Questions on various subjects connected with fruit growing were asked by various members and answered by PROF. LAWSON. In answer to one asked by Secretary STARR, he stated that the agency

of flies and insects was found to be necessary to the fertilization of fruit blossoms, and that certain insects were necessary to the fertilization of certain plants. This valley, the Professor said, evidently had the insects necessary for the fertilization of apple blossoms.

On motion of MR. MILLER the thanks of the meeting were unanimously tendered to PROFESSOR LAWSON.

A discussion upon the subject of the disease known as "Collar Rot," took place after the Professor's departure. MR. T. H. PARKER said he had had sad experience with the disease in question. His remedy consisted in cutting out, with chisel and mallet, if need be, all the diseased wood, and applying salt and ashes as fertilizer.

The subject of scraping fruit trees was then taken up. In reference to this the general opinion seemed to be that except for the removal of moss the scraping proves not beneficial. Instances were mentioned where scraping had resulted in the death of the tree. MR. EDWARD PARKER compared the scraping of trees to the clipping of horses in the winter. In reference to diseased trees, he had found benefit from boring into trees and filling with sulphur. MR. T. H. PARKER said sulphur had no effect whatever on trees from the fact that it was insoluble.

The Borer was the next subject of discussion. MR. SHAW had detected the little insect in the act of entering the tree, making a very small aperture out of which a gummy substance oozed, by cutting in had found the borer inside; thought if the insect was not killed when commencing operations it was little use to fight him, as the work of destruction was accomplished early in the season on the outside of the tree (within the bark.) A letter by DR. PRIMROSE of Annapolis Co., on the subject of the apple tree borer, was read,—when the opinion was expressed that the insect now under discussion was the Quince borer, a much smaller and less easily detected creature than the apple tree borer.

A. B. PARKER said that he had seen the apple tree borer in all stages of growth, but had never seen one on a healthy tree. "The borer," he said, "will not attack a healthy tree any more than a louse will live on a healthy animal." Several members dissented from this

idea, expressing their opinions that health on the part either of tree or animal was no safeguard against the attack of insects. MR. E. C. BANKS said he had known healthy lumbermen whose experience was totally at variance with the idea expressed.

EVENING SESSION.

MASTERS' PLUM.—SECY. said it was reported that Mr. Masters had sold 40 trees of this variety to an agent with a conscience so elastic that from them some thousands had been distributed.

EDWARD PARKER said people had been swindled by agents selling Masters' plum.

A. B. PARKER said he had a large plum which he had feared would be rivalled by the Masters', but from all reports he felt now quite easy.

E. COLLINS said he had a number of Masters' plum trees which were great growers.

J. BYRNE said his were slow growers.

SECRETARY then read the following paper:

PEAR AND APPLE SCAB BLIGHT.

RECOMMENDATIONS OF REMEDIES AGAINST ITS RAVAGES.

The peculiar climate of the coast of California, especially that of those sections within the more direct influence of the fogs of the ocean, offer specially favorable conditions for the development of injurious fungi, popularly known as rusts, smuts, mildews and blights, which as cultivation extends, seem to increase, and cause serious loss if not total destruction of our crops.

NATURE OF FUNGI.—The study of fungi, at least of the lower and most destructive forms, does not date very far back. Owing to their minuteness of structure our knowledge of their character is due to the microscope, without the aid of which they cannot be scientifically determined. The number of species and families of fungi is very great, and, in fact, the difference in size between the smallest and largest is as great in proportion as it is between the tiniest herb and the giant

of the forest. But, with all their great differences, they have, of course, certain points in common, which separate them from higher plants, although some of these characteristics are shared by ferns and lycopods. I refer to their mode of reproduction.

Before entering upon the discussion of the separate kinds, it may be well to review the characteristics of this function. The organs of reproduction—that is the spores, analogous to seed—in the higher fungi, as the toadstool, are contained in the most conspicuous part of the organism, which we see above ground. That which answers to the stem and root of the plant combined is below ground, or feeding on the object that supplies its nourishment by sending its minute threads through the tissues, is known as myceltium.

To become a true resting spore, which, like the seed, can remain dormant for seasons, until favorable conditions for its development are offered, a certain process, analogous to the fertilization of the pollen on the egg of the flowering plant, is necessary. But these resting spores are not necessary during the time of the most active growth of the fungi. Then spores, which may be compared to bulblets such as are produced by the onion and lily, are delveloped, and these seem to posess the power of indefinite multiplication. It is this power which explains the very rapid development of fungi, and renders them particularly destructive. It seems evident that nearly all of the blights, so called, troubling our fruit trees, are due chiefly to some sort of fungus which has gradually spread. This will account for the fact that orchards of certain varieties of fruit, once bearing sure crops, are now very uncertain and often failures.

SOME OF THE FUNGOID DISEASES AFFECTING OUR DECIDUOUS FRUITS.

Fusicladium dentriticum.—The first species of fungus to be discussed, because, perhaps, one of the most serious, is the black pear and apple smut, the fusicladium dentriticum. Mention of this can be found in older horticultural works, although nothing very definite.

Robert Hogg, in his "Manual of Fruits," says of the so-called Fox Whelp apple, that it may be known by its peculiar scabby spots (a figure in the book shows this), but adds that this is not a distinguishing mark of this apple, being in reality the effect of a species of fungus, spilocæe pome (this is the old name of the fusicladium dentriticum.) which affects other apples as well. The disease then cannot have been considered anything formidable, as no further mention of it is made.

In "Du Breuil Cour d'Arboriculture," is described a disease which undoubtedly is the same as the previous one in question, affecting certain varieties of pears, causing black scab on them, and rendering them unsaleable. It further says that sulphur has been tried as a remedy, but without success. The report of the German experimental school at Geisenheim, on the Rhine, speaks of the fusicladium affecting the White Calville apples seriously, and says that sulphur dusted five times over the apples had counteracted the disease, and also records that these sulphured apples, compared with others not sulphured, were little affected by the codlin moth.

In 18—, Professor Trelease, of the University of Wisconsin published a very interesting paper, in which he demonstrates the fact that the fungus or blight of the foliage of the apple is identical with the smut causing the scab on the fruit.

Comparing the effect of the fungus on the fruit and foliage, there can hardly be any doubt that it is the same fungus that affects both pears and apples, and that the so-called blight of the Winter Nelis pear is due to an aggravated form of fusicladium, or rather, the Winter Nelis, more than other varieties of pears, is subject to this disease. In endeavoring to prove this, it will be necessary to review the history of this blight.

Ten years ago nothing was heard of this trouble. Winter Nelis bore and matured in many places on the coast where they are now being abandoned as a failure. About five years ago, I noticed at the experimental orchard of the University the leaves of two trees in the extreme southwest corner of the orchard, during the month of May, becoming smoky looking, revealing under the magnifying glass a smut-like fungus. The trees produced but little fruit, and most of this was badly affected with the same smut. The warm weather dissipated nearly all signs of the fungus, and it was not until next season that I discovered it again on the foliage of the same trees, as well as on the six or eight adjoining pear trees, attacking the latter in precisely the same manner as it had the first variety, affecting the foliage and fruit as well. Next season again I was astonished to find, after a few days absence, that the same blight had made its appearance in all parts of the orchard, affecting some varieties very severely, others less, and some not at all. It was the same year that the blight of the Winter Nelis was so general, that the so-called

apple tree blight proved very severe. In fact, from every quarter within the region of the fog belt, complaints of this blight were heard.

This season, I determined, if possible, to reach some definite conclusion in regard to the nature of the blight as reported from various quarters, and from a thorough comparison I am satisfied that the fusicladium dentriticum is the cause of all the trouble. In the experimental garden at Berkeley, we have had all grades of it on the pears, and on one variety, the first attacked, the bloom is affected precisely as in the case of Winter Nelis, and the consequence is that the fruit does not even form. The branches of this one when young are attacked by the fungus, and the second year reveals the damage done. I have found the same thing in several orchards, notably in an eight-year-old orchard near Watsonville. This orchard, although otherwise in an apparently healthy condition, has failed to bear at all.

In the case of the White Winter Pearmain, we have in the cracked back peculiar to this variety abundant protecting places for the resting spores, which carry the disease over from year to year. Most probably the spores, seating themselves under the scaly bark, are protected from such changes of atmosphere as are brought with the dry north wind, that destroyer to all form of fungi. On the smooth branches of other varieties comparatively little opportunity for the lodgment of resting spores is presented, and the time of blooming has passed before any great number of spores have developed, so that the harm that is done does not show itself until the young fruit has advanced a little, while on the other hand, varieties seriously affected have sufficient spores present to destroy the bloom.

EXPERIMENTS AT BERKERLEY.

Having read of the good results of the application of sulphate of iron on certain mildews, we determined to spray with it. The results produced were not favorable; when used strong enough to affect the fungus, it affected the foliage and fruit also. One pound to forty gallons was the strongest solution that could be used on the trees in foliage without hurting the latter seriously; used stronger it had the effect of checking the fungus and the fruit and foliage at once. Even with the solution one pound to forty gallons of water the foliage suffered and the fruit dropped. Next season the sulphate of

iron was used early, before the leafing out, one pound to thirty gallons; and again, weaker, after the foliage was out. The season proved unfavorable to the development of the fungus, being a warm, dry spring. Still, the disease showed itself on such trees as were much subject to the disease, proving that the wash had but little effect.

Professor Riley's kerosene and sour milk emulsion was also tried partly as a scale exterminator. It proved likewise of little use as a cure for any of the complaints. The following season, spring of 1885, substantially the same compound, used the succeeding season so successfully, was used again, but applied cold. It produced favorable result, but not enough to be called successful. A great deal of scabby fruit could be found, the spring also being very dry, and the comparatively healthy looking fruit we attributed to this favorable condition. The season of 1886 brought out the fungus in full force again, this time showing itself all over the experimental orchard.

SUCCESSFUL REMEDY.

The sulphide of soda with whale oil soap prepared as follows: "Dissolve thirty pounds whale oil soap (eighty per cent. soap at the most costing five cents per pound,) in sixty gallons of water, by heating the two thoroughly. Boil three pounds of lye (American concentrated lye is what we have used) with six pounds of sulphur and a couple of gallons of water. When thoroughly dissolved it is a dark brown liquid (chemically sulphide of soda.) Mix the two, the soap and the sulphide of soda, well, and allow them to boil for about half an hour, then add about ninety gallons of water to the mixture, and it is ready for use." This was applied warm at the temperature of 190° F. in the barrel from which it was sprayed. The remedy this time proved a decided success, and with the exception of the variety first attacked years ago, only such fruit as had not been covered with the solution was affected in the least. Such varieties as for years, and even last year, a favorable season, had suffered so severely that they were almost cracked to pieces, were perfectly smooth.

Sulphur mechanically mixed with soap had also been tried several times before in the shape of the so called codlin moth wash, but its effect when used in this locality had been nothing. Reports from sections with a warmer summer temperature show better results. It seems, therefore, that in a cool climate, when sulphur simply is used

it does not develop the vapor sufficiently strong. But the sulphide of soda, especially when the compound is used warm, gives a brisk action and the germs of the fusicladium are killed.

As the varieties of fruits suffering from the fusicladium are affected in very different degree and at different times of development, some apples and pears being attacked already in bloom, it is evident that they cannot successfully all be treated alike.

According to this theory we have arrived at the conclusion that the different varieties affected in different degrees require different modes of treatment.

Varieties of which the bloom already affected is not allowed to set.—For these I should recommend a very thorough spraying in the fall, and also in the spring before the blooming, and if the fruit should show signs of fungus, spray again after the setting.

Varieties blooming and setting before the fungus attacks them.—One thorough spraying after the fruit is set.

It should be distinctly understood that we do not claim to have proved that the sulphide of soda is a perfect remedy for the Winter Nelis blight, or for apples blighting in bloom, but we think it will prove so. The following remedies are suggested for trial against the latter two afflictions:

REMEDIES TO BE TRIED.

1. Substitute, in place of concentrated lye or powdered caustic soda, *caustic potash* 98 per cent. now for sale in this city.

2. *Powder of lime and sulphate of copper*, as prepared in France and used successfully against the downy grape mildew. *Perenospora viticola* (see Lambson Scribner's report on fungoid diseases, published by the Department of Agriculture) as follows:

Have the quicklime entirely slaked in the air. Take two hundred pounds of the lime which has first passed through a coarse sieve so as to remove foreign bodies. With ten pounds of this lime and thirty of water make a clear milk of lime. Dissolve twenty pounds of bluestone (sulphate of copper, the purest possible) in sixty pounds of warm water. Let the solution cool to 68.77° F. Mix the solution with the milk of lime and stir well. The remaining one hundred and ninety pounds of lime is spread out on the hard ground preferably on stone flagging or concrete to a depth of about seven

inches, and the mixed liquid being placed in a watering pot, one man sprinkles the lime with it while another stirs and mixes it, by means of an iron rake with very long teeth, then shovels it over and makes into a heap. Let the powder which is only moist, dry for some days; roll it after drying, sift it through a fine sieve, and bag it. Two hundred pounds will be sufficient for over two acres of grapes. This powder might be dusted on trees by means of strong sulphur bellows, and should be used shortly before blooming.

3. Liquid solution of bluestone and lime; fifty pounds of bluestone to two hundred and twenty-five litres, then adding fifty pounds of lime in form of milk of lime. As this makes a too thick paste to pass through a spray nozzle, it will either have to be put on with a brush or diluted about one half, when it will pass through a coarse spray.

4. Air-slaked lime has been used successfully by Dr. E. Kimball to counteract the fungus causing scab on apricots. It may likewise prove efficient on the Winter Nelis pear, dusted on at the time of blooming.

W. G. KLEE,
Inspector of Fruit Pests, California.

PRESIDENT said if we had a remedy for black spot it would increase our profits very largely.

R. W. STARR referred to Prof. Penhallow's paper on the subject and expressed great pleasure in listening to the article just read, and hoped we now had a starting point from which we should reach success.

MR. ELDERKIN—What is the cost of the best pump for spraying?

R. W. STARR—About $9 or $10.

PRESIDENT described different kinds of pumps.

T. H. PARKER—Don't wait till you are obliged to destroy the worms, take them early and remember that prevention is better than cure. Advised those wanting information to join this Society, whose reports would give them much information.

MR. COLLINS had had a severe experience with canker worms and would recommend trapping with printer's ink mixed with fish oil.

A VOICE—We are cursed with printer's ink now.

MR. C.—That's owing to the manner in which it has been used.

MR. PARKER recommended a tin band and cotton as best.

R. W. STARR cited an instance where printer's ink had been thoroughly used but enough eggs were left to destroy the trees.

MR. MILLER—Boxes with a trench of coal tar have proved successful. The question is, Will the worms not die out in a few seasons?

MR. COLLINS knew of one orchard that had them five years.

MR. BYRNE—40 years ago the Prescott and Starr orchards were stripped for two years.

T. H. PARKER—Has the canker worm been seen west of Kentville?

PRESIDENT—Yes, at Paradise.

The PRESIDENT here appealed to people to join the Fruit Growers' Association which had indirectly put thousands of dollars into the pockets of the people, and he thought it only fair and honest to themselves and to the Society to enroll their names on its list of members.

Alluding to the prophecies of many that our apple orchards were getting too numerous, the SECRETARY said his observations in Europe led him to believe that there were very many places to which no apples were now sent which were capable of consuming as many as any of the markets to which we were now sending. First we must raise enough fruit to be able to load and send steamers direct to these points as the expense of transhipment was so great as to absorb all the profits.

MR. PARKER—What about cranberries?

SECRETARY.—Cranberries are safe if they can be made profitable at $4.00. On account of Dutch competition cannot depend on more than this.

SECRETARY incidentally stated that the best apples he saw in the London market were from Waterville station.

The following paper by Prof. Lintner, New York State Entomologist, published in *The Country Gentleman*, was then read:

APPLE TREE BARK LOUSE.

The scales which completely cover the piece of apple tree twig sent by Corwin Jacks, Genesee County, N. Y., are those of the apple tree bark louse, *Mytilaspis pomicorticis*, Riley—regarded by many as identical with the *M. pomorum* of Bouché. These scales have become so common in our orchards, and are so destructive to apple trees, killing large numbers of them, that they should be known by all of our apple growers.

They are generally, when they have been permitted to multiply, unduly crowded together upon the trunk, branches and twigs as thickly as they can be placed, forcing one another out of position, and frequently overlying. They give to the bark a peculiar roughened or blistered appearance, which should make them at once recognizable. Individually they are about one-twelfth of an inch long, and of the shape of an oyster or muscle shell, being narrow and pointed at the apex, rounded at the other extremity, and broadest centrally. Their color is brown, nearly approaching that of the bark, except at the apex, where they bear two of the cast-off coverings of the young insect, which are of a dull yellowish or horn color. The scale beyond these exuviæ consists of waxy secretions of the insect, which have been thrown out by successive layers from underneath, very much as the shell of the oyster is built up.

The many changes that the insect undergoes—from its hatching from the eggs beneath the scale, through its becoming fixed to the bark, and its subsequent moultings, until it has assumed the full-grown scale, bearing underneath it perhaps fifty or a hundred minute oval white eggs—are full of interest, but they need not be related at this time, as they are to be found recorded in the writings of nearly all our principal entomologists.

In reply to the inquiries above made, we state: The insect is not one that is fitted for rapid spreading. Its introduction into orchards is usually through planting infested trees. As the male only is winged, wings are of no aid in its distribution, unless it be those of birds, or some other insect to which it may attach itself, and thus be conveyed from tree to tree. The chances for this, however, are few, since the free active life of the females is extremely brief. Upon their hatching from the egg, they may be seen for a little while moving rapidly over the bark, but in a few hours' time they usually attach themselves by means of their sucking tube or beak, and never thereafter leave the

position chosen. The secretions that they throw out soon fasten them securely to the bark.

I do not know any particular species under the name of "the orange louse of California." Our apple-tree bark louse closely resembles two species which infest the orange in Florida and other southern States, viz., *Mytilaspis Gloverii* or the long scale, and *M. citricola* or the purple scale, but I am not aware that these have as yet become California pests. Allied to these in California and proving destructive to the orange are the red scale (*Aspidiotus aurantii*), the white scale (*A. nerii*), and the ribbed scale (*Icerya purchasi*). For an interesting account of the spread and ravages of the last-named most destructive pest in California, and the methods there employed in fighting it, see the COUNTRY GENTLEMAN for Jan. 7, 1886, page 9.

Remedies.—If a tree has become so infested with the bark louse that it has extended over the entire tree, even occupying the smaller twigs, there are but two ways to deal with it, either cut the tree down and burn it, or treat it thoroughly with the kerosene oil emulsion, the method of making which has several times been given in the COUNTRY GENTLEMAN, and in other agricultural and entomological publications. This might be used at any time during the spring, or in the autumn after the gathering of the fruit. The oil will penetrate the scales and kill the insect or the egg within.

If the tree is small and the scale not generally distributed over it, the scales may be scraped off and gathered upon a sheet placed underneath, so that the eggs may be destroyed instead of being left on the ground to hatch and thence ascend the trunk.

If the scales are confined to the trunk and larger branches, the insects may be killed by hand without the aid of a force pump for spraying, by the use of a soft soap solution, provided that it be used at the proper time.

The time of all others when the insects are the most vulnerable, is when they have just hatched from the eggs and are exposed on the bark as soft, delicate, naked little creatures. This is usually late in May or the first of June, and will often be found to be contemporaneous with the opening of the apple blossoms.

Prof. Cook, who has had much experience with this pest, has told us just how he has successfully fought it at the Agricultural College at Lansing, Michigan. He states :

The old remedy, soft soap, or a strong solution of the same, will surely vanquish this enemy if it is applied in early June and again three weeks later. I have proved the efficacy of this treatment over and over again. The trees at once put on new vigor, and in a short time only dead lice are to be found. To apply this specific, I know of no better way than to use a cloth and scrub by hand. To be sure, we can, if dainty, use a brush like a shoe-brush, but I like to go at it with a good cloth, when, with sleeves rolled up, I make pretty sure that no louse escapes.

For the past few years I have added to the soap crude carbolic acid, which I think improves it, especially if but one application is to be made. I heat to the boiling point one quart of soft soap to two gallons of water, and while still hot thoroughly stir in one pint of crude carbolic acid. (Bulletin No. 14 of Agricultural College, Michigan.)

The above experience of Prof. Cook is of too much importance to be disregarded by any one who is willing to undertake some labor in order to preserve his apple trees. Where one is the owner of a good spraying apparatus, the above application, not too much thinned, could doubtless be applied with about the same efficacy and with less labor, by the aid of the pump and a finely perforated nozzle.

In Saunders' "Insects Injurious to fruits," the recommendation made against this insect is, brushing with a strong solution of soft soap and washing soda, or a solution made by dissolving half a pound or more of washing soda in a pailful of water.

Painting the twigs and branches with linseed oil has also been recommended and claimed to be harmless to the tree, and effectual for the destruction of the eggs sheltered beneath the scales.

A. S. FISHER made an eloquent speech advocating the interests of the Association, and was supported by T. H. PARKER, who said if he had had, 30 years ago, the experience and knowledge of to-day, it would have been thousands of dollars in his pocket. He advised young men to join the Association and stay at home.

PRESIDENT had been informed that strong brine was very effective in removing this pest.

J. M. PARKER and others thought ashes, if they could be so placed on the tree that every rain would give a washing of lye, would be found beneficial. Meeting then adjourned.

Bridgetown, July 15, 1887,
Dennison's Hall, 2 p. m.

Owing to the fact that this was the first really fine day for some time, most of our Annapolis friends were too busily engaged securing their hay to attend this meeting, consequently an adjournment was voted till 7 p. m.

A party consisting of PRESIDENT HART, PROF. SAUNDERS, MR. PERCY SAUNDERS, PROF. H. W. and MRS. SMITH, R. W. STARR, A. MCN. PATTERSON, T. H. PARKER, A. B. PARKER, and several other prominent members of the Association, embraced the opportunity to visit some of the principal orchards in the vicinity of Bridgetown. One tree in VICE-PRESIDENT MILLAR'S orchard was found to cover a circumference of nearly 200 feet, and from which 20 bbls. of Nonpariels have at different seasons been taken. The party returned to Bridgetown much pleased with their drive and the appearance of the country generally in this locality.

EVENING SESSION.

PRESIDENT HART, upon taking the Chair, addressed the meeting briefly. Referring to the report of one of the London apple men that our crop of apples would be large this summer, thought observation did not warrant this assertion. He considered the Nonpariel crop far below the average. Strawberries had been a smaller crop than usual.

The SECRETARY read minutes of the Spring Meeting, held at Berwick, which were adopted.

Attention was called to the proposed meeting of the American Pomological Society to be held in Boston in September.

R. W. STARR.—It is very desirable that this Association should be represented at that meeting.

PRESIDENT HART said it was his intention, if possible, to attend.

It was moved, seconded, and passed unanimously, that the Executive have power to issue credentials to any member in good

standing who may be desirous of attending the meeting of the Pomological Society in Boston.

PRESIDENT HART said he had endeavoured to get some valuable information relative to the "Masters' Plum," but so far had failed.

T. H. PARKER asked if there was any means of ascertaining the number of fruit trees planted this season. He had heard it estimated at 40,000 in Kings and Annapolis Counties alone. He believed 10,000 had been planted in the vicinity of Berwick.

On motion the SECRETARY was instructed to endeavor to obtain some reliable information as to the number of trees planted.

PROF. WM. SAUNDERS, Director Government Experimental Farm, being called upon addressed the meeting at considerable length and in his usual happy manner. It is greatly to be regretted that a stenographer had not been present to report Prof. Saunders' remarks in full. The notes made by the SECRETARY must necessarily convey a very imperfect idea of the value and volume of the Professor's practical suggestions.

He remarked he had not expected to give a lecture at this time and therefore was unprepared. He had pleasant recollections of our last Annual Meeting at Wolfville, and had been much pleased with this and his first visit in October last, when he was deeply impressed with the fruit growing capabilities of this part of Nova Scotia. Our apples were becoming celebrated, and he was pleased to see them quoted at high figures in London. Western Nova Scotia seemed peculiarly adapted to fruit growing, and trees here are subject to less disease than in other districts.

We had heard from our Secretary something of the N. S. fruits at the Colonial and Indian Exhibition. These were very creditable and did much to advertize this Province. While we had done well there remained much more to be done. What the future might develop rested largely with the people and this Association.

Nova Scotia Cranberries attracted much attention, and he thought their cultivation would prove a profitable industry.

Our pears and small fruits had not been as well represented as he had wished for. Would advise the more general cultivation of small

fruits for home use. This would prove abundantly satisfactory. Our markets were insufficiently supplied with

STRAWBERRIES.

At Amherst, in strawberry season, he could not buy enough to supply his own family.

When berries were sold at 6 to 7 cents a quart the consumption would increase enormously, and these prices paid the Ontario grower and would be found to pay here.

"The Wilson" still stood well to the front amongst the numerous varieties. "The Crescent" held its fruit more uniformly to the end. "Sharpless" was large and highly esteemed. "The Manchester" should be in every collection, as it ripened about 10 days later than the other sorts named.

Twenty thousand plants including twenty varieties had been planted at the Central Experimental Farm this season.

"The Jewel" had given samples four inches in circumference, a little irregular but a most desirable sort. "The Jumbo" had shown indications of being good. These were his impressions so far, but he should reserve the right to change his opinion should further experiments show that he was not correct.

RASPBERRIES.

"Shaffer" would be found hardy. "Cuthbert" good. PRESIDENT HART said he had found "Cuthbert" tender.

PROF. SAUNDERS said don't be discouraged by one failure, pinch back the wood that it may ripen better, then there will be no trouble

Several gentlemen here testified to the hardiness of the "Cuthbert," which they considered one of the best.

BLACK RASPBERRIES

were desirable. "Taylor" and "Souhegan" were probably the best sorts. "Gregg" had winter killed.

BLACKBERRIES.

Would recommend "Snyder" and "Kittatinny."

"Mammoth Cluster" and "Fay's Prolific" had revolutioned CURRANT growing.

GOOSEBERRIES

Seemed to grow abundantly in Nova Scotia and could be cultivated with great advantage. "White Smith" or "Crown Bob," or other English sorts, should do well here. These varieties were doing well in Prince Edward Island. He thought all the small fruits could be grown in much larger quantities in Nova Scotia than at present with a good prospect of success and profit.

At the

CENTRAL EXPERIMENTAL FARM

they had planted 500 or 600 varieties of apples, pears, plums, and cherries. Among these was a large collection from Northern Russia. He did not think we would require many of the so-called "iron clad" varieties in this province, but they hoped to find some sorts that would be valuable in colder parts of the Dominion.

In addition to these fruits they had about 120 varieties of grapes, and 100 varieties of small fruits.

Experiments would be carried on in different parts of the Dominion, with a view to ascertaining the varieties best suited to the several localities. This information would be published from time to time as well as the results of experiments in all branches of agriculture.

They should be glad to receive from any source samples of new or seedling varieties of fruits that give promise of being valuable, also trees, scions, or plants of anything persons wished to have tested. These, when within the limits of weight and size prescribed by the postal authorities, could be sent by mail to the Central Experimental Farm free of postage.

THE BORER.

T. H. PARKER presented a specimen of *Twig Borer* which PROF. SAUNDERS said was found under rather different conditions from those in which this little pest was usually discovered. Experiments had been tried but the only cure known at present was to cut and burn. It would be unsafe to come to a conclusion in regard to these insects without most thorough investigation. There were undoubtedly different varieties of borers, and PROF. SAUNDERS was not in a position to say whether the borer was always the cause of the trouble or whether the insect sometimes took refuge in trees which were first diseased.

R. G. FITZRANDOLPH.—This disease is something new here. Orchards are being injured but our farmers are unable to contend against this enemy in the absence of proper knowledge concerning the habits of the borer and the best methods of destroying it.

PRESIDENT HART.—The Longley orchard was attacked by a small beetle or borer about one fourth of an inch in length.

PROF. SMITH being called upon, said owing to the pressure of work connected with the closing exercises at the school at Truro, he had been unable to prepare anything for this occasion. He hoped to be excused from making any extended remarks.

At present he was not much of a fruit grower, but the prospects were brightening, and there was likely to be a farm in connection with the School for Agriculture very shortly, which would place them in a much better position.

He hoped to make the school more and more efficient each year. Six young men had taken the course. The work had been thorough so far as they had been able to go, and he hoped that those who had gone out as teachers would be able to guide the youth in channels that would enable them to deal intelligently with many of the enemies that were likely to be encountered.

He urged those who had sons who wished to become farmers to send them to the Agricultural School. It was criminal to expect boys to be successful farmers without proper education. Farmers required education more than lawyers. The latter could be dispensed with, but what would become of the country without the farmer?

PROF. SMITH continuing, said some orchards were not sufficiently cared for. They must be manured and cultivated if we would have strong and healthy trees. The effect of neglect may not be seen until it is too late to remedy the evil. Neglect of a grain or root crop affects one year only, but years of careful cultivation may be needed to overcome the evils arising from neglect of a young orchard or of over cropping without manure.

PROF. SAUNDERS said he heartily endorsed the closing remarks of PROF. SMITH'S address.

He had seen many young orchards struggling in grass fields. This was like tying a cow when she could not get half enough to eat or drink and expecting her to give milk.

Many diseases had their origin in neglect of this kind. Grass or rubbish about the trunk of the tree caused a moist and soft condition of the bark, which made it more liable to attack by insects. Upon being cleared the trunk was exposed to the sun which may cause further injury.

QUESTION.—Is it best to grow currants and gooseberries upon one stalk or a number of stalks to each plant?

PROF. SAUNDERS.—The danger from borers is reduced when there are a number of stalks.

PROF. SMITH.—What is the limit in Nova Scotia where raspberries and blackberries will grow?

R. W. STARR.—Thought these berries would grow anywhere from Yarmouth to Inverness.

PRESIDENT HART was pretty well acquainted with every part of the province, but knew of no section where these berries would not grow.

PROF. SMITH said nearly all the cultivated strawberries used in Truro were grown in the valley. The people in that part of the country seemed to be satisfied with the wild strawberry. The price this season had not been less than 15c. per box in Truro for cultivated strawberries.

DR. CROSSKILL said he had had much pleasure and derived a great deal of information from the addresses and discussions, but would like to ask why the best wild strawberries grew in the grass.

PROF. SAUNDERS replied, the strawberry does the best it can under the circumstances, but take it up and cultivate it and make the improvement.

R. W. STARR presented some statistics regarding the cost of growing an orchard and the profits of the business.

T. H. PARKER agreed with MR STARR that there was a splendid chance for the investment of capital in orchard lands throughout this valley. His son had spent some time in Florida orange groves and had thought of investing in a plantation in that country, but after looking carefully into the matter had decided that the same money invested in apple orcharding in Nova Scotia would be a better

investment. A. B. Parker had trees planted in 1854 from which he had picked 18 barrels last season.

B. S. GRIFFIN endorsed MR. PARKER'S views re orcharding, and said he had unbounded faith in the future of our country. He had seen Gravenstein trees bearing a barrel of magnificent fruit seven years after planting. Orchards might be largely increased with safety as new markets were being opened up each year. He thought there would yet be a large market for our apples in South America.

A. B. PARKER said 40 trees per acre was not enough. He believed it better to plant one rod apart which would give room enough for 20 years growth.

R. W. STARR knew of orchards planted 30 feet apart each way, now 16 years old, that were interlacing their branches. They required 40 feet.

T. H. PARKER considered 33 feet as close as apple trees should be planted, unless the grower was prepared to cut from half to three quarters of his trees out by the time they were 20 years old.

A. MCN. PATTERSON regretted that a greater number of fruit growers were not present to listen to the important information presented at the meeting, which was just such knowledge as a great many required.

MR. BROWN, referring to PROF. SMITH'S remarks, said he knew trees that had never been cultivated that were healthy and productive.

MR. PICKARD did not believe in close planting. Had kept his orchard in grass but cultivated about the trees two or three times during the season. Some Baldwin trees growing in the grass had become cankered and diseased. Had found Borers in the trunk, and *Limb* Borer, resembling the turnip flea, in the branches. These must be *cut out*. Probing with a wire would not do.

R. G. FITZ RANDOLPH had been much interested in the discussion, but would like to have heard more about the *Borer*, which was proving very destructive in some places. It was necessary for our farmers to look sharp after this enemy and know the most effective means of exterminating it. A neighbor had coated his young trees with soft soap and lime with apparent good effect.

PROF. SAUNDERS said he should have given the Borer more attention in his remarks, but supposed that all were familiar with its habits and the treatment best suited for it. Would advise using an alkaline wash made of soap and washing soda diluted with water to the consistency of thin paint. This wash should be applied to the trunk and branches with a brush about the first of June. After carefully scraping out all crevices the solution should be worked into places where the eggs or young Borers are often to be found. The Shot Borer would seldom, if ever, be found in a healthy tree, but would quickly attack a tree injured by the Flat Headed Borer or otherwise diseased.

A. B. PARKER said he had never seen Shot Borer in a sound tree, but had observed injured trees to be attacked within a month.

The PRESIDENT tendered the thanks of the Association to PROFS. SAUNDERS and SMITH for their valuable assistance, and at a late hour the meeting adjourned.

ANNUAL MEETING,

HELD AT WOLFVILLE, FEBRUARY 16th and 17th, 1888.

The following report was then read :

SECRETARY'S REPORT.

Herewith I beg leave to submit a brief report of the work of the Association for the past year.

The twenty-third Annual Meeting, held in this hall, during January 19th and 20th, 1887, was one of the most interesting and successful in the history of our Society.

The presence of several gentlemen who have made and are still making a study of the diseases of our fruit trees, as well as of the insects which attack them, their instructive addresses upon these subjects—the remedies suggested—made our meeting of great practical value. Throughout the six sessions discussions were maintained with marked interest, and much information was elicited. The closing session took place in the dining room at Chipman Hall, after a bountiful repast provided by the managers of that institution, and was a most enjoyable affair.

The Spring Meeting, held at Berwick on the 2nd of May, was also fairly well attended. Prof. Lawson's address on the growth of trees was very interesting and instructive, and listened to with great attention throughout.

The Summer Meeting, held at Bridgetown on the 15th of July, was appointed at that time in order to secure the presence of Prof. Saunders, who was passing through the valley, but it proved to be a very busy day with our Annapolis friends, many of whom were unable to attend. The afternoon meeting was abandoned, owing to the small attendance, but the opportunity thus afforded was made use of by visiting some of the large orchards in the vicinity.

The Association is under obligation to the several gentlemen, who, by their addresses and efforts in many ways, contributed so largely to the success and interest of our meetings.

The annual membership shows some increase over the previous year, but is still far too small.

The meeting of the American Pomological Society at Boston in September last, was attended by four members of this Association, viz. : The President, R. W. Starr, Ross Chipman, and your Secretary. The meeting was not as largely attended as might have been expected, and while several valuable and interesting papers were read and discussed, the absence of Secretary Garfield and the loss of President Wilder seemed to have deprived the Society of its main springs, and left vacancies that will be hard to fill. Our President remained until the close of the meetings, and was privileged to enjoy the hospitality offered by the city and the Massachusetts Horticultural Society. From an account of the banquet given by the letter which appeared in the *Boston Herald* the next morning, we clipped the following :

Rev. Mr. Hart of Nova Scotia responded for the "Dominion of Canada." He claimed to be a descendant of the Tories who fled from Boston about the time of the Boston tea party, and he now comes back to another tea party where the international feeling is more amicable. Nova Scotia, he claimed, had made vast improvements in the fruits that had their origin in Massachusetts. He had seen better Baldwin apples and better Bartlett pears in his own country than he had ever seen here.

Several members of the Association took an active part in connection with the exhibition at Windsor last Autumn, but the Association as a body took no active part or responsibility in any exhibition further than to suggest the names of suitable parties to act as judges on fruit, the suggestion having been made at the request of the executive committee of the exhibition, but it so happened that some of the parties recommended could not attend and others had to be substituted.

It is a matter of very great regret that unavoidable delays have prevented the publication of last year's Transactions up to the present time. Every effort has been made to have the volume ready for distribution at this meeting, but without success. However, the last of the proof sheets have beeen returned to the printer, and it only

remains for the binder to do his work when the reports will be mailed as fast as possible.

Of the present meeting I have only to say that we are again under obligation to several gentlemen who have kindly consented to address us. I regret very much that owing to pressure of other engagements, several gentlemen from whom we had expected to hear with a great deal of pleasure, have been obliged to defer their addresses till some future meeting.

After the adoption of the financial statement and Auditors' report, the PRESIDENT'S report was read as follows :

PRESIDENT'S REPORT.

FELLOW WORKERS.—With thankfulness to the Giver of all Good I again address you. As an Association of Fruit Growers we have special cause for thankfulness to our Heavenly Father for His favor shewn to us in blessing the labours of our hands in the line which comes immediately under our notice, as well as in other kindred lines. Though our fruit harvest was not large, yet we have had enough for home consumption and a goodly quantity for export to supply the needs of those not so highly favored as ourselves.

While the quantity of fruit raised in Nova Scotia was not so great in the past year as it has been in some other years, the quality was exceptionally good, and the prices realized give a remunerative margin of profit to the producers.

Although some were troubled with the depredations of insects and injurious fungi, in general there was less damage done from these causes than usual. We may under Providence have still greater freedom from these enemies, but at the price of greater watchfulness and by calling to our aid the assistance which nature and science have put within our reach. Let us give increased accommodation to our bird friends ; drive away the small boy with the shot gun or the ever ready stone ; keep the domestic cat in her proper place, near the domestic hearth stone, forbidding her the run of the orchard and the fruit garden ; use freely the force pump with the various insecticides suited to our needs ; give the roots of plant and vine and bush and tree abundance of nourishment and suitable culture ; regulate heart and lip and life by the rules laid down in the great Book of Life, and He who placed our first parents in a garden " to dress it and to keep

it" will cause His smile to rest upon us, still filling our barns with plenty and causing our presses to run over.

We are pleased to know that our Federal Government has located the Experimental Farm for the Maritime Provinces within the bounds of our own Province, and though not situated where the greatest benefit to us as fruit growers may be looked for, still there are problems with reference to fruit growing under difficulties to be solved, and we may rest assured that under the able management of Professor Saunders and his capable assistants all that can be done to solve these problems will be performed in good time.

We are pleased to note that our own Local Government will establish a Model Farm in the near future, and we may hope in common with other producers of the riches provided by the teeming earth, we fruit growers will reap large advantage from the lessons there imparted.

Upon the whole the outlook for the industry we represent may be considered a brightening one, and if he who makes two blades of grass grow where one was produced may be considered a public benefactor, we who are aiming to broaden the area and increase the production of rich fruits in our province may hope that some praise as well as profit may accrue to us.

After a vote of thanks had been tendered the PRESIDENT for his address, the following was read :

REPORT OF FRUIT COMMITTEE.

Mr. President and Members of the Fruit Growers' Association of N. S.:

Your committee on fruit beg leave to report as follows :

APPLES.

The crop has been an unusually small one, very little, if any, over one-third of that of 1886. This may be attributed to various causes, but probably was largely owing to the very heavy crop the previous season. In some localities, particularly in the eastern part of Kings county, orchards were injured by the canker worm. The failure in the crops was principally in the old orchards, many of the young plantations turning out fine crops.

Contrary to the general rule when crops are small, the fruit has been of excellent quality. The weather during the summer tended

to produce fruit of unusually fine color as well as almost entire freedom from black spot or blemishes. This has been particularly noticeable in the Bell Flower, R. I. Greening, Spitzenburg, and other sorts that have for some seasons past been almost worthless on account of the black spot. The Baldwins also have matured and colored much better than usual, and growers who have numbers of young trees of this variety are feeling more hopeful in consequence.

The Gravenstein continues to hold the place which it has so deservedly gained as the premier apple for profit, and the grower who will produce another apple with all the good qualities of tree and fruit as has the Gravenstein with the keeping qualities of the Baldwin, will indeed be a benefactor.

The Ribston Pippin holds first place in the London market for price, closely followed by the King of Tompkins, the latter having this advantage, that it will command the highest prices in all the great markets while the Ribston is almost a London apple at present, altho' Manchester is enquiring for the favorite and doubtless other cities will follow when they find its real value.

The exports of Nova Scotia apples have been almost entirely to London this season, only a few carloads and small shipments of Gravensteins being sent to Boston and New York, the balance of the Gravensteins finding places in local markets.

The shipments to Britain up to this date has been as follows: London, 38,682; Liverpool, 540; Aberdeen, 150; Newcastle-on-Tyne, 70. It is not probable the total shipments to England will exceed 50,000, or about half of that of last season; while shipments to the States, if we had the exact figures, would show a much greater falling off in that direction.

The report of the Fruit Committee last year, shows by figures taken from traffic returns of the Windsor and Annapolis Railway, kindly supplied by the managers, the steady increase in the quantity of apples handled by the company. It may be of interest to quote from the trade returns the exports of apples from Halifax and Annapolis since 1880 and 1881, when we exported 24,250 barrels; 1881 and 1882, 35,340; 1882 and 1883, 38,435; 1883 and 1884, 3,758; 1884 and 1885, 49,819; 1885 and 1886, 41,143; 1886 and 1887, 121,541. The figures must not be taken as indicating the whole export from the province, but they seem to show something of the

proportionate increase in the apple production. The present season, however, as stated before, will, like the season of 1883 and 1884, show a large decrease on the previous seasons exports, but in the natural course of events we may expect the season of 1888 and 1889 to far exceed any previous ones.

The prices realized during the present season have been on the whole most encouraging, and the total returns will in a very great measure make up for the small quantity shipped.

The number of apple trees that are likely to be planted next Spring bids fair to exceed by far any previous season's planting in the history of the province, and it is gratifying to note a general disposition to plant home grown trees when it is possible to obtain satisfactory stock, and further. growers are beginning to understand the importance of selecting varieties suitable to their soils with a view to productiveness and market value. This subject has been pretty fully discussed by the Association from time to time which doubtless has been the means of enlightening many, but the question is by no means exhausted.

There are many knotty questions and hard problems in connection with fruit growing yet to be solved, and it is by such meetings as this, when discussions, interchange of ideas, and comparison of practice with theory, that we may expect to arrive at the best results.

The treat necessary to exterminate the insect pests is a question requiring very serious consideration, notwithstanding we have received much valuable instruction from Professor Fletcher, and that most severe of school masters, *Experience.*

Paris Green in a weak solution applied at a very early stage in the life of the canker worm, has been found very beneficial in some instances, but the great uncertainty as to the strength of the poison has often rendered this treatment futile, and while the fact was being discovered the worms had so increased in size and strength that a solution of sufficient strength to kill them would destroy the entire foliage, and thus the remedy was equal to if not worse than the disease. Finding this to be the case some orchardists have returned to the old system of bands of paper and printer's ink, or a substitute for the latter. This system has proved fairly satisfactory when properly followed up.

The planting of orchards in uncultivated ground is now being practiced to some extent with a large degree of success so far, but time only will prove the result of what is yet largely experimental.

How to manage frozen apples so as to prevent total loss is a question admitting of much argument. We have had apples frosted, and are likely to have the same occur again so long as we have no means of protecting them at Halifax, and are obliged to send them forward when the steamers are ready, let the weather be what it may. A FROST PROOF WAREHOUSE at Richmond would admit of apples being forwarded and stored in safety during mild days any time previous to the steamer's arrival, and at the same time relieve the periodical congestion of the traffic over the Windsor and Annapolis Railway when steamers arrive in Halifax to carry away our fruit.

STRAWBERRY GROWING

is being successfully prosecuted by many persons in the Annapolis valley as well as elsewhere in the province, and for the most part with satisfactory financial results, particularly is this the case throughout a section of country extending from Waterville to Middleton on the Windsor and Annapolis Railway. From New Glasgow we hear of the great success that Mr. Shaw (a native and former resident of this county,) is making in small fruit culture.

In Aylesford and vicinity large preparations are being made for cranberry growing, and the experience of those who have been in this industry for a few years would seem to warrant the expenditure necessary for reclaiming bogs and suitable spots for cranberry culture. There is a large demand for cranberries in London at prices usually ranging from 20/ to 24/ per barrel. We are pleased to note that fruit growers generally are giving more attention to small fruits than formerly, and it may be said to their credit there are but few gardens throughout the country that do not supply the family with some of the small fruits at least, and the days when the farmer's table was supplied with berries only from the pastures and barrens have about gone by.

Signed on behalf of committee,

C. R. H. STARR.

T. H. PARKER.—The report contains very much of interest to us all, and suggestions for discussions that might continue with profit for a greater length of time than we have at our disposal during these

meetings. Not the least important are the references to the treatment of frosted apples, and the necessity for a frost proof shed at the Halifax end of the railway. For the want of such a building we often have to take great risks in shipping apples during cold weather, when perhaps a few days previous had been mild enough to ship with comparatively no risk, but having no convenient place to store apples in safety shipments cannot begin until we know the steamer is at hand. Then everybody must ship at once, cars are not to be had and regular trains cannot carry all that is to go forward, thus causing vexatious and often dangerous delays. The management of apples once frozen is a task seldom performed with satisfaction. Would advise thawing as slowly as possible and, if possible, would not allow the apple to be moved or handled in the least until the frost is all removed ; to touch a frozen apple with the hand will surely destroy the fruit.

JOHN STARR was of opinion that the air should be excluded from frozen apples, they should not be handled in any manner, and should be left as long as possible in thawing out. Nonpariels and Baldwin's would stand a great amount of frost and come out uninjured, but with other kinds, though they might appear all right, yet after being frozen were generally flavorless. He advised early storing and care in the employment of the best means to prevent frost from entering the cellar or other storage place. As to the necessity for a frost proof warehouse in Halifax he agreed with MR. PARKER.

E. E. BANKS remarked that in his judgement the best plan to follow was to exclude air and keep the fruit in a place cool enough to allow the thaw to be very gradual.

J. S. DODD.—In this connection I would like to ask ; suppose you find your apples frozen, as there is a probability they will be to-morrow morning, and a steamer is to be ready for their shipment in about a fortnight—the weather has been very severe—would any of the gentlemen present, under such circumstances, take steps to remove the frost at once, or should the fruit be allowed to remain to within a day or two of shipment ?

JOHNSON H. BISHOP.—I have in my practice put a fire in my cellar when the apples became frozen so as to thaw them out at once. He then referred to the Eastman Car Company cars for freight, which being heated by oil were found to be free of frost, no matter how

severe the weather or the time taken in transit, provided that the oil lamps were kept burning.

A. WHITMAN recounted his experience with a barrel of apples which had frozen solid, he took them from the place they were in and placed them in the cellar, not opening them till the following April, when one would not know that they had been frozen. He had used them for his family and they were found to be as good as any of those not frozen.

The following paper by DR. A. P. REID, Superintendent Hospital for Insane, in the absence of the writer, was then read by the Secretary :

AGRICULTURE A PROFESSION.

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

GENTLEMEN,—In an unguarded moment I left Mr. Starr under the impression that I would write a paper to the Association as I will be unable to be present at the meeting. When I sit down to think of it I find that I have a larger contract than I can handle, for it would take a large book to hold what *I do not know* about farming, and what *I do know* could be summarized in the single word "nothing." As you will perceive there is one thing I can take credit for, *wisdom*—if we accept the dictum of the late George Buchanan, court fool to His Majesty James I. of England : "he is a wise man that knows his own ignorance."

I have embarked in an enterprise with the farm, and am perhaps in the position of the oft quoted Yankee and German firm and with possibly the result of that enterprise in store for me, occupying the position of the German, and the farm that of the Yankee; as tersely given by the Teuton, "when we began I had the money and my partner the experience, our business is closed and our positions are reversed, he has the money and I the experience." However, in this paper we will start fair, the document will receive the importance it deserves. In any remark I may make I will assume that farming and orcharding are synonomous expressions, as I do not see how the departments can be dis-associated. Though I know nothing of farming yet I may give you impressions concerning it that have induced me to put capital and work into it, and an unfavorable criticism will not be considered unfriendly. The old saying, "let the

cobbler stick to his last," is trite and correct, and you will no doubt say, in the present instance apropos, yet I will ask you to permit me to suggest the fact that no discovery of importance was ever made by those in whose special domain it lay. I will give a few illustrations. Watt, the inventor of the steam engine as we see it, was a repairer of mathematical instruments. George Stevenson, that made railways a success, filled the lowest and poorest paid situation in a coal mine, and learned to read when by mending shoes and such like he got money enough to send his boy to school, and the boy taught the father. A. G. Bell, who made the telephone a success, was a teacher of deaf mutes, and so I might go on interminably. The amateur is generally the discoverer, because he is bound by no previous training or pre-conceived opinions. He trusts solely to his observation, reasoning and experiments built thereon, and having no fear of the pitfalls on his way very often stumbles or lights upon a foundation of fact that would not be seen by those travelling in the beaten path. I need go no farther than our own province for an apt illustration. Judge Weatherbe, with the enthusiasm and rashness of an amateur, is now developing ideas in orchard growing that will very likely, in this province at least, revolutionize our methods of tree planting and orchard culture. I only bring these things to your attention as an excuse, I would not say justification, for my departure from what should be my proper department. Occupying the position of a free lance I have the liberty of attacking the problem at any part, and will start from a wide base of action.

If we take a general view of the diverse methods adopted by mankind to make a living they can be divided into five classes. The nomads we will dismiss with the name, as they are not a practical issue if we exclude the genus *tramp*, that society will be forced to annihilate. We have,

First.—The Professional classes.

Second.—The Working classes.

Third.—The Manufacturers and Miners who convert natural into finished products for special uses.

Fourth.—The Merchants and Middlemen.

Fifth.—The Farmer, including in this term those that furnish the direct products of the soil.

Fishermen we will not now consider.

At a glance it will be seen that all these are necessary for each other, but the law of supply and demand is an absolute barrier to the unlimited expansion of any but the last class. To the farmer is given (alone), by natural law, the power of unlimited numbers, (if he be the owner of the soil,) the only penalty he incurs is perhaps diminished profits or luxuries. His living cannot be assailed as he himself produces it. This can be said of no other avocation.

I have assumed that the farmer owns his land and is not burdened by mortgage or debt. This unhappily is not the case, but will disappear under improved methods. Even in this case he is not so bad off as are all the other classes, and our comparison is not weakened by admitting this condition. By the way a very interesting paper would be "why is debt the normal condition of the great bulk of the human family?" by some close observer, taking our province as a basis of comparison.

The professional classes, (I need not enumerate the score of varieties,) have been inclined to assume positions of superiority and this has been unhesitatingly granted, justly so when the merits of the individual deserved it, unjustly so when the mere position was supposed to represent merit.

Head, as opposed to *Hand* work has been considered the more honourable, and so it is in fact for, in other words, intelligence is the power which directs the unthinking labour of the world, whether it be the steam engine or the navvy; and I think it is well that this point be thoroughly understood as well as conceded. But of this again.

The professionals rarely amass wealth by their professional labour, but where competition is not too keen they have a competence which is apt to be jeopardized by the many untoward incidents common to all. The working classes are in precisely the same position as the preceding, though their society circles rarely touch.

The third and fourth classes represent those who have the prospect of wealth as they make their profit from the labour of others, and the wealth is only limited by the number of those they can profitably engage. But what are the facts? Of the millions who engage in commerce, mining, and manufactures, how few there are who attain a competence or can pass their lives in moderate comfort. Competition is so keen—chance of profit means chance of loss—and loss always comes to each.

Loss is a very general rule and the routes above referred to are strewn with the relics of shattered hopes, ruined families, tarnished honour, crime and suicide, with but rarely an instance of success, from special ability, and I am justified in saying, combined with a special luck. Many men attain wealth and dazzle their poorer neighbours, who in a few short years find themselves candidates for charity or worse.

The history of Wall Street and Fifth Avenue, New York, contains the saddest scenes of our civilization, and the end is not yet. Truth is stranger than fiction.

No, if one wishes to lead a quiet and happy life let him shun commerce and its congeners.

There are three merchants to do the work of one, and so it is throughout the whole range of employments, excepting only one, the farmer, who supports them all as well as himself, and too often allows himself tc be cuffed about by designing ones as well as politicians.

Having given you enough of platitudes I would conclude by instituting a comparison between the farmer and the others, and though you may think it a little roseate yet it is founded on a solid substratum, and with well directed intelligence would be an accomplished fact.

I will describe what a farmer should be, what he is, to a great extent, is his own fault. The farmer touches the basis of all other occupations, and may rise to the grandest of intellectual heights or sink to that of the lowest navvy. While joining hands with the manufacturer and merchant he should be a professional as regards mental culture, and his hands should be educated to every variety of labour, for such must pass under his attention in his varied employment. Our fathers had to till a rugged, reluctant soil by muscular force, and had but little time to think of anything but hard work, now, as a result of their labour and improved appliances, skill may replace the toil that can now be more perfectly performed by machines. I never pass an old grave yard but I, in spirit at least, raise my hat as a mark of respect to those sturdy, honest souls who have left to us the fruits of their labour. They had but little pleasure, and meagre board and lodging for their share, but they left smiling valleys, fields, and orchards, to successors not always sufficiently grateful. There are two kinds of farmers described, the book farmer

and the practical man. The first is considered a simpleton, the latter as the one we are to look up to. If I may be permitted to give an opinion I would say they are both failures, if we look at possible results. The first in trying to do what he knows nothing about. The second because he does not accomplish what he should be capable of. If I were to hazard another opinion I would say the *observant* farmer can only be the successful man. He takes the "book" for what it is worth, he sifts the "practice" and finds a great deal to exclude in this line, he reasons from careful and continuous observation and experiments in new lines, tentatively fails no doubt, but learns why, tries again, avoiding, however, mistakes, and so on to the end, and in the end success is certain. Then he can teach the practical man how to proceed by his "rule of thumb." No other profession or occupation is surrounded by so many of the secrets and beauties of nature that are calling for attention and yet receive but little. The seed goes through its mysterious, beautiful and wonderful changes with scarce a passing thought, except how much money it will bring for the labour expended, yet this scientific study by observation has rendered immortal a host of names I have not time to mention. The wonders of animal life, the daily duty of the farmer but rarely receive other than a passing note, yet the most fervid imagination can but grasp a few of its details. He is surrounded by animal and vegetable pests aad parasites that one would think would appeal to the most sensitive part of his anatomy, his pocket, yet they receive but scant observation, and he, child like, looks up to some one to tell him about them, one who very likely has not anything like the opportunity the farmer has for observation and knowledge. And so I might go on and enumerate his duties, agreeable and otherwise, and point out that each is a study in itself, for the most brilliant intellect can only enter the portals of knowledge. There is no pleasure so keen or absorbing as that of the naturalist, and unlike the pursuit of wealth it will not vanish.

PROFESSIONAL TRAINING MOST NEEDED.

Would it not be possible to teach the coming generation how to utilize the wealth of heritage scattered around them, and the various intellectual pleasures at their command ?

If the farmer wishes he can be more than the peer intellectually of any of the professions, and possess the higher social status that

mental ability deservedly commands. All this can be done while he is earning and enjoying the best of "bread and butter and clothes," while independent of the frown of any task master, politician or government.

No other man on this earth can do so, and yet how often the farmer thinks his lot a hard one, if it be so it is to a great extent his own making.

No business will respond so freely to the brains and capital expended on it as the farm, and I know of none that receives so little of either. No one expects to get more out of a financial bank than he puts in, yet the bank of earth is expected to give generously every year and receive nothing outside of its own waste products as deposits. This will not continue. Farmers must give the farm capital and intelligence to reap the possible reward.

If a farmer wishes to amass wealth he must touch the lines of the manufacturer, (with risk of loss may be,) and he has many ways of doing so. He now manufactures butter, cheese, beef, milk, his crude vegetable products soon stock the market, and he says a good year brings poor prices and a bad year there is but little to sell.

He can manufacture, it is not either difficult or costly to convert his raw potatoes, turnips, cabbages, &c., into products that will not decay, and that the world is the market for at all times. He can thus wait for a rising market and have plenty in the year of scarcity.

One branch of this department is the canned fruit manufacture, but it is a costly process and very limited in the articles to be treated, with prospect of decay, even with care, and they are not unfrequently poisonous from developing some noxious compound. This does not obtain with the better and cheaper evaporated products that can include everything from hay or straw to eggs.

You can't raise too much of anything, for half the world is yet but half fed. You will make more money with apples at $1 a barrel than now, as you should have ten apples for one, and there are so many ways in which they can be manufactured to last for an indefinite time, and furnish delicacies, if not necessaries, to the many who cannot now afford them.

No matter in what way I look the farmer's prospects are bright, but more observation, experiments and brains, (even more than capital,) must be put into the business.

Personally I can only look forward to the time that, if I am spared to get through the worries and responsibilities of professional life, I may perchance, under my own "vine and figtree" calmly accept the decline of life in the only condition of earthly existence which permits one to be his own master. The possessor of millions is the veriest slave in the world, (to keep his money is a harder task than to make it.) The successful merchant has his means invested in securities that he fears any day may disappear in the frequent crashes of banks and commercial affairs, government securities rise and fall or are called in, and he is again at sea with his funds to secure such a safe investment as will give him the means of living, but he is never without care, or I should say *fear*.

The man who owns his farm, with a moderate judgment and industry, is safe in the commercial crises, or rise and fall of governments. If he have no money (he has value,) it matters not he has good, it may be plain living, but if he wishes health plain living and attendant exercise alone will give it. He, before all others, can, looking over his acres and giving thanks to the Giver of all good, say: "I fear no man's frown and court no man's favour." Or in the words of the "Miller of the Dee," (transposing farm for River Dee.)

"I owe no pence I cannot pay,
I thank the River Dee
That turns the mill
That grinds the corn
That feeds my babes and me."

A. P. REID.

Hospital for Insane, July, 1888.

THE PRESIDENT.—There is a matter mentioned by Dr. Reid in his paper which I think should be taken up during this meeting and discussed, namely, that of evaporating fruit. I find that English buyers have gone into the markets of the United States, and have bought this description of fruit very largely, and in view of advices as to prices it may be that this industry is operating somewhat against the price of fresh fruit. However it is possible that something ought to be done in the direction indicated by the paper.

JOHN E. STARR thought there was too much heard on the subject of farming of an entirely speculative nature. He was of opinion that notwithstanding theorising every farmer did his best

with the resources at his command. On the whole it was with a lively interest he had listened to Dr. Reid's suggestive paper, some of the principles enunciated were golden ones. While it was laid down that intelligence and capital were needed principally, yet he thought that perseverance and industry were equally as necessary for the farmer. The cause of so many unsuccessful farmers was that they had not done all that they should have done, and yet it is almost impossible to perform all the work that was to be done on the farm, something remained undone. He took exception to the statement that a farmer was nobody because he had not reached the highest point in his labors. There were many professional men, lawyers, doctors, etc., who never reached the top of the ladder in their professions, to whom such a word was not applied. While all farmers did not succeed yet all strived after success, and he hoped the good time was coming when all would attain the highest degree of success, as also the highest degree of recognition to which they were entitled.

A. McN. Patterson.—Much had been said as to the want of capital, energy, etc., by the farmer, and that there was a lack of activity, he opined that to follow a plough all day long was a sign of anything but inactivity on the part of a farmer. He agreed with Dr. Reid that in the past farmers had neglected their education, this was now being remedied in a measure, but while the colleges, etc., made lawyers and doctors, there was no such means provided for the higher technical education of the farmer at so many centres. It was a well known fact that the development of learning was now in a much more satisfactory state in the farming class, while teachers, lawyers, doctors, clergymen, and others of the professional class were being worn out with thought the farmer could, by reason of his daily work, study out much better than the former classes many problems, and doubtless the time was coming when it would be in the power of every farmer to study out the nature of his trees and plants and soil, and when he would develop the highest style of mind, when in fact, if all he heard were true, a farmer would in knowledge excel the judges. What was needed by the farmer was a practical knowledge of the needs of his trees and plants, and their adaptability to the soil on which he was located. He repudiated the idea that farmers were generally lazy, on the contrary they were and had to be industrious; but of course there were, as in all other professions, exceptions to the general rule.

T. E. SMITH concurred in the views expressed in the paper as to watching the markets of the world for the product they were chiefly concerned with. In order to be able to meet any deficiency which might arise in other centres of supply he advocated that more attention be paid to the raising of apples.

C. R. H. STARR.—I am aware that Dr. Reid is making extensive preparations to establish the evaporating process on his own farm. There is a great deal in his remarks on this subject, and I do not think it is out of the way of any farmer or orchardist to adopt this means of preserving fruit to a certain extent. We have with us to-day Mr. Banks, one of our largest fruit growers, and he evaporates a large quantity of fruit. One of the best paying industries in our midst was the evaporator factory at Canning, which was destroyed by fire a short time since, and had that business been pushed with a little more energy probably than was displayed, it would have yielded enormous profits, for as is now well known the market open to such products is exceedingly large. We find in London, in the summer of 1886, that there was a great demand for evaporated vegetables, this was not confined to the people of England, but extended even to people from Australia and other countries in the southern hemisphere. Such vegetables had already an enviable reputation in the navy. When you consider the amount of raw material which one of the packages will contain, and which retails at twenty cents, then the wonder at its rising popularity will cease. It is much more economical in space than canned goods, and the prospects for its wide adoption are exceedingly bright. I would like to call the attention of the meeting to the fact that this subject was dealt with last year, and will be found in the report of 1887 at page 94.

J. E. LOCKWOOD had visited the canning factory at Aylesford, where sweet corn and green peas were put up, and which met with a ready sale. They also put up cherries in two kinds of syrup, one heavy and another light, the former being preferred in the Saint John market, one dealer there taking the whole product of that description. The manufacture of Boston baked beans was also carried on at this establishment, a ready and rising sale being found for all their products.

E. C. BANKS, (on being called on to favor the meeting with his experience in evaporating,) said, all I have done is to experiment, and

from those experiments I am led to believe there is money in the business. By it use may be made of apples otherwise undisposable. I first got my idea from the *Farmer's Advocate*. Acting on the hints there contained I erected a small evaporator with well paying results. This year I have not worked it, but during the preceding five or six years I was in the habit of working up all the apples I could obtain which were not marketable in their original state. In my opinion this method of dealing with apples is preferable to that of making them into cider.

DR. CHIPMAN thought that in connection with evaporating the business of making jellies and kindred articles could be combined, thus rendering it still more profitable. Such a business would of course be most profitably carried on after surplus seasons, for it required a good description of fruit.

C. R. H. STARR remarked that it was well known that the description of marmalade called Dundee was largely made of carrots flavored with orange peel. The evaporating of fruit would of course be more profitable in years of plenty, but the evaporating of vegetables was more likely to prove the most profitable investment. Of course the trade was at present somewhat limited, but room existed for its rapid extension.

J. S. DODD was of opinion that there was money in the business, and if it paid outsiders to supply the people of Annapolis valley with such goods, surely it was equally profitable to supply their own wants when they had all the means at their disposal.

JOHN E. STARR.—What was to become of the large quantity of apples which were not fit for shipment if they were not evaporated? There would presently, in all probability, be more apples than would be exported or used in their original state, and it was there that the process of evaporation should come in.

A. WHITMAN thought with Dr. Reid that there was a growing inclination to farm too much land, and that it would be well to work a less quantity and do it well. That such a mistake came home to himself in the many different things he had endeavored to do.

In response to several questions as to the best kind of apple to evaporate, C. R. H. STARR read from Professor Smith's paper, report of 1887, page 94.

DR. CHIPMAN.—I have heard it remarked that Judge Weatherbe is going to revolutionize farming in this country, and especially that of apple growing, but for the life of me I cannot see, having studied the matter, where the revolution is to come in. True he has planted trees in uncultivated lands which have done well, but others have not, the trees doing well are no better than others in the neighborhood. Where the trees were planted on knolls they did well, where planted on low ground they are not thriving well. As to Dr. Reid's paper there are many good points, but I do not think that farmers should at all times be found fault with.

A vote of thanks was then unanimously resolved to be given to DR. REID for his paper, which was ordered to be printed in the Annual Report.

EVENING SESSION.

The following paper, by A. McN. PATTERSON, Acacia Villa Seminary, was then read :

GROWING ORCHARDS.

The importance of the subject of this paper, at the present time, seems so great and extensive, that I feel altogether incapable of doing it justice, yet I may succeed in opening up a discussion that will be beneficial.

The development of the apple trade and apple growing in Nova Scotia, through the instrumentality of this Association, has reached a very important period of its existence. For several years a steadily, increasing demand has been developed in the London market ; the superior quality of our apples is being acknowledged ; the prices have gradually advanced and are quite remunerating ; and the conveniences and equipments for shipments are becoming quite satisfactory. We are, therefore, on the verge of a very profitable and extensive industry, one in itself calculated to revolutionize the entire farming interests of this beautiful valley, and fill it with a large and flourishing population.

At the same time, to secure this much desired result, our present success must not be allowed to drive the enterprise into its own destruction by a heedless, ignorant rush of foolish investment. It is said about 40,000 young apple trees were set out last year, and this year the amount will be doubled. Here then is a rush for raising

orchards. Many of these orchards are set in land without any previous preparation. Any person travelling through our valley can perceive these young trees by the hundred, being dwarfed and stunted, and prepared to bring an evil report upon our land. Many individuals are planting orchards that know nothing about it, and rushing into the work as though all that is needed is to get a tree, dig a hole, and set it in it. This mode of proceeding will bring failure, and tend seriously to check the business.

It should be understood that raising an orchard is a business requiring a large amount of skill and knowledge. We have reached our present position by cultivating up to excellence, and we can hold our position by continuing in the same intelligent course.

I presume there is not a fruit grower within the reach of my voice to-night who thinks he knows all he desires to know about young apple trees, indeed each one feels as though he had only begun to know.

There is as much knowledge and care required to raise a profitable and paying orchard as to raise a profitable and paying herd of cattle. As not every calf is fit to raise, so every young apple tree is not fit to cultivate and train. As some families of cattle have a natural healthiness and ruggedness in them, so some kinds of trees have a natural healthiness and ruggedness in them, while others have a natural feebleness and tenderness. Indeed the analogy holds good throughout, whether we regard kind, food, productiveness, or rapid maturity. This planting of trees in unprepared fields, on exhausted lands, such as played out farms, and giving them little or no food and cultivation, is very like a man buying a lot of calves and making no provision for a sufficient quantity of calf food, but expecting them to forage for themselves, and perhaps giving them a little salt hay. The result is, after many die, a stunted scrubby herd, while their readiness to take up disease and vermin makes them injurious in the neighborhood, as well as a disgrace.

It is precisely so with these poor orchards, they are scrubby, diseased, and unproductive ; they also are the nests and propagators of the vermin or pests that spread year after year over our land and cause us so much labor and expense to exterminate. A few starved, ill-cared for, and half dead orchards in a neighborhood, will breed enough worms, moths, caterpillars, and borers, to seed and half

destroy all the rest. It becomes, therefore, a very important matter, that strong, healthy, vigorous orchards are raised. It matters very little what the soil of a field selected for an orchard is, provided it is cultivated and enriched as the orchard grows; of course some soils are better than others, but all our soils are good with proper treatment, and no soil can raise a healthy orchard unless it is cultivated and fed.

The first grand essential then is some provision for a regular supply of manure and cultivation, and no more ground should be planted to orchard than can be properly cultivated and enriched. You may set out an orchard on very poor land, by giving each tree a few shovelfuls of old, compost manure, but you must commence that same year to plow and enrich and crop the whole field, and follow it up year after year, so that as the trees grow and require more food, the roots will extend and find the food, and in the proper form.

Too many persons do not understand that buried manure is of little service, it requires to be brought near the surface and in contact with air to prepare it for plant food. Trees do not eat manure in the state in which it is put in the field, it must change into plant food or gas, and this is done by stirring the soil. Too much cannot be said upon the great necessity of enriching, cultivating, and deepening the soil of the field devoted to raising an orchard.

The second is a good, healthy tree, from three to four years of age, and having a proper amount and arrangement of roots. It matters little what is the kind of apple that may be produced by the young tree, as when the tree is six years old it can be grafted into any particular kind desired, and thereby be brought into good bearing some three years sooner than by setting the tree producing the desired apple at first. This is particularly true with regard to the King, but not so true with the Gravenstein. The Gravenstein is a natural grower, and produces wood and fruit rapidly, only give it plenty to feed upon. It occupies the place among our apple trees that the Shorthorn does among our cattle, when well attended it has returned more money to its owner, and made quicker returns than any other apple. We do not advocate the planting of wild trees such as are found about the fields, for they are not growthy, nor properly rooted. They have been starved, and consequently are stunted and seldom can carry a vigorous top. We mean to recommend the planting of nursery raised stock of some good, healthy, growing sort, such as the Emperor

Alexander, the Greening, or Red Astrachan. These are also good limbers, that is, they are apt to send out their limbs alternately, not like the Baldwin all in a heap, or spangled like the Bishop Pippin. It is true a tree can be pruned and trained into proper shape, but time and labor are saved in getting trees that grow naturally correct and healthy.

As to the most desirable kinds to raise fruit growers have pretty generally settled upon the Gravenstein, the King of Tomkins, the Ribston Pippin, the Baldwin, and the Blenheim Pippin. These form a sufficient variety for commercial purposes, but for home and family use the Bishop Pippin, the Calkin Pippin, and a tree or two of some early kind is necessary, but too great a variety is not profitable.

After an orchard has been planted two years all sickly and delicate trees should be dug out and good, healthy trees put in their place, for it is impossible to make rugged, good trees of sickly young trees, the sooner they are discarded the better. If a young tree is healthy for ten years and then begins to fail, it should be doctored and saved, if possible. Many young trees are saved when looking pale and feeble, by removing about six inches of the earth within three feet of the tree and placing some fresh earth with a little salt and ashes in its place. We have saved many trees in that way.

It would make my paper much too long to treat of the proper depth for planting trees, the proper time for pruning, the diseases to be guarded against, as well as the various manures to be used in the cultivation, these have all been ably treated in other papers on former occasions.

My object has been to prevent failures in an enterprise, that when properly conducted is sure to be profitable. There are few better employments at the present time than the planting of orchards, but it must be done in a proper manner. We do not wish to discourage orchard planting but to encourage it and make it successful. The receipts from good trees is something bordering on the marvelous. This last autumn a gentleman in Wolfville sold the apples from one-quarter of his small orchard for over $300, which would mean about $600 per acre of receipts. There are many trees in the valley this year that have brought their owners $30 each. Now an acre of land properly cultivated, will carry forty such trees, which will give $1,200 per acre, so that the possibility in this enterprise is exceedingly remunerative and money making. But this possibility can only be

obtained by proper cultivation, and by educating up to excellence in the entire work of raising an orchard. Two acres of good orchard, properly raised, are worth more than four acres of poor orchard starved up into existence. Orchards should not be valued simply by the trees, but by the number of good, healthy, well formed, productive trees.

Every person should avail himself of all the helps and information within his reach. This Association has, at much research and expense, accumulated a vast amount of knowledge, and has in its officers and members an extensive experience in fruit culture, so that every person entering upon fruit raising should join this Association and avail himself of this knowledge and experience. Let our young men stay in Nova Scotia and aid in making this valley, from Windsor to Annapolis, into one vast orchard, the proceeds of which would excel the most glowing tales of Florida or California. Let our local government attach an experimental farm to Acadia, and have an agricultural school therewith to teach our sons and daughters the philosophy of plant life and growth. Let College Hill bristle with the apple, pear, and plum tree, and small fruits. Let our children be taught and trained to those employments which develop industry, health, success and patriotism, then will our fair Dominion have its interests protected, its resources developed, and become the brightest gem in our noble Queen's diadem.

Geo. C. Johnson.—There is one thing in this paper respecting wild trees to which I cannot give my acquiescence. Some seven years ago I obtained some fifteen wild trees and planted them out on the line in the grass between Mr. Payzant and myself. Having allowed them to grow one year I grafted, and now there are no healthier trees on my place than those. I do not know how they would have fared had they been put into ground in a high state of cultivation, the land they are on is not too good, and they are yet in the grass but are growing beautifully.

Dr. Chipman.—What sort of wild trees were they?

Mr. Johnson.—I cannot tell you, they have not borne yet.

A Voice.—They were so young that perhaps they had not put their wildness on. (Laughter.)

I do not advance what I say as a theory, I have actually worked it out.

W. H. BLANCHARD.—I was very much pleased to listen to the paper just read, and upon the whole I think I can record my approbation of its contents, but there were some points in it which seemed to me not to be in accordance with ideas I had previously formed on the subject of fruit raising, and I think the statement of the writer himself favors my view. He said, if I remember correctly, that it was really no matter, or but very little matter, what kind of apple might be produced by the young tree. I think that we all yet feel that this matter of fruit raising is still in its infancy as regards our knowledge, we know but little yet of the influence of the stock upon the scion, and perhaps the results of Mr. Patterson's experiments with wild trees will confirm the idea that seems to be growing in the minds of many, that it does matter what kind of fruit the stock would raise if left to itself. If these wild trees had borne a fruit which would commend itself to a person acquainted with fruit raising he might have success in his grafting, but perhaps it was owing to the miserable character of the tree as regards its fruit bearing that that failure in its growth happened. I am inclined to think that the more we learn, and the more we know of these matters, we will find that it is very important that the scion should bear some relation to the stock as regard the nature of the fruit which each would bear if allowed to grow to maturity. I think that the nature of the stock for instance not only largely influences the growth of the tree after the scion is placed in it, but it also influences the nature of the fruit. For instance, if you wish to have a highly colored fruit of any particular kind, you will be more likely to get it by grafting into a tree the natural fruit of which is highly colored. I also believe that the matter of the early or late maturity of fruit will depend to some extent upon the earliness or lateness of the fruit bearing of the stock into which you graft it. Now, therefore, I think, if I am correct in holding these views, that the idea advanced by the learned gentleman is somewhat heterodox, and I would like to hear the opinions of some other fruit growers who know more about fruit raising than I do.

A. MCN. PATTERSON.—The last speaker does not seem to take in the full import of my meaning, perhaps this may arise from my giving expression to my thoughts in clumsy sentences, but sir, the idea I meant to convey was, that if an orchard of Gravensteins was required it was not essential to plant Gravensteins. In another place it will

be noted that I have said it was important to select a young and healthy growing tree then having that you can graft the species required. I agree with the idea that you must adapt the scion to the tree. As to coloring, I may say that last season I met with some difficulty in getting highly colored apples, and I think the want of coloring is more contributable to not getting the scion from highly colored trees.

R. W. STARR.—I am very much pleased with the paper just read before us, and the discussion which has arisen thereon has followed somewhat in the line of study which I have been pursuing for some little time past. This matter of seedling stock is one of great importance. I believe it to be of the highest importance to get good scions. If you want healthy trees you must first look at the seed from which you get those trees, there is as much in the breeding at the outset as in getting the best of stock. If nursery men would only take the pains to select the apple seeds only from first class fruit, the result would be healthy and growthy trees, and if these be grafted with healthy scions there will be no trouble in getting good trees. Where this is done it would be an advantage to double work the trees, putting a healthy scion on to the graft in the nursery and top graft with others that do not grow so well, then you have the ideal tree. All nursery men know this, and you will find that they do not set out ordinary stock, but will have their pick of the best if they are wise. As regards double working, it is well known to all nursery men that the stock has an influence over the root. Take 1000 trees of one kind, they are now put on a thousand different stocks, every one of these trees, if left without grafting, would each produce a different sort of apple, and each would have its own individuality of growth, but graft them all with one kind of apple when one year old and place them in a nursery, and any old nursery man will tell you by the roots as well as the stock what kind they are. This shows the effect of the stock upon the root, and if you wish to get the best qualities of roots why double work them, first with a good habit of growth of root, then top them, when you will have ideal trees. Those of the best habit of growth are not at all times the best fruiters or the trees you want, but by combining the two you may get the ideal tree. This idea of growing orchards without previous cultivation of the land is a thing with which I

cannot agree. My experience is, to first prepare the land as well as you are able to do, if you cannot get absolute perfection get as near perfection as you can; get the best trees, and set them in the best manner possible, and then take the best care of them.

As to setting out trees in newly cleared forest land, I think it better to do that than to put them in used up land or in a pasture which has been denuded of phosphate and all its plant life food. I would no more think of following this latter course than I would of putting them in a swamp. Setting trees out on forest lands amongst the stumps is a different thing, there will be found plant food. There is a quantity of unexhausted plant food, if the land is of natural fertility, a thing which is easily determined by the nature of the forest growing upon it. If it has natural drainage and fertility enough to grow a good forest life, then when that forest is removed it should certainly grow a fair quality of tree for the purpose of the orchardist as well as for any other purpose, and by the time the trees require a greater area of soil the land can be brought into a good state of cultivation. By the end of ten years the trees will have got over their unprofitable stage, and in this way orchards can be hurried on and brought on much better perhaps than by waiting to clear and prepare the land first. But to attempt to leave the land in an uncultivated state and raise good fruit will be unsuccessful, such an attempt is scarcely imaginable, it is almost folly to think of it. You do not expect to grow corn, potatoes, or any other crop without preparing food for it, and you cannot pretend to grow apples in any other way.

T. E. Smith.—I have listened with great pleasure to the paper just read, but at the same time I must object to some of the statements which have been made in it, and also to some of the remarks in the discussion on it. Mr. Patterson said it was of little matter what sort of tree was planted. This may, to some extent, be tru with such gentlemen and others who have plenty of time to graft, but ordinary farmers have not the time. Having had some experience with a large number of Nonpariel trees, I have concluded that had I planted one-third of the number of Astrachan I would have done better. The great difficulty in purchasing trees from outside places is that dependance cannot be placed on them that they are the specimen required. On one occasion I have known trees sold for Gravensteins

to bear Crab apples. I am happy to say that I have often learned many things from Mr. Starr's book, but I must now beg to differ from him as to the getting of best stock. In taking from seed it not unfrequently happens that you get an entirely different species of plant from that which produced the seed, for instance, a Double Aster will often produce a Single, &c. If a seed were taken from the Wild Crab apple, which the French planted for us, then there would be obtained a good, strong tree. If a bushel of fine pears were taken, on the other hand, there would probably not be found one good seed, of course the apple is not affected to the same extent, but I only mention these instances to show the difficulty of following out the lines laid down by Mr. Starr. True, there may be something in what he says as to double working, but generally I find that people do not come up to that point. It is certainly a wise plan, but it will not always be so successful as was indicated.

R. W. STARR.—I consider it part of the nursery man's duty to do this double working. The proper time to do it with success is when the tree is two years old.

A. MCN. PATTERSON reiterated his statements as to the sort of stock required for favorable cultivation, and maintained that if an apple tree was worth anything to its owner it was worth careful cultivation, if he expended nothing he could not expect any other return than nothing.

MR. KIMBALL agreed with Mr. Smith that the French stock was the best.

T. H. PARKER.—After having listened to discussions in connection with apple raising during the past forty years, was of the opinion that in that direction there were no fixed rules, as in mathematics, &c., but that experience was the only schoolmaster. They should hasten slowly in all things pertaining to their business. As to double working he considered there were many essentials necessary to success, discrimination should be employed. In some cases a seedling top grafted would give the better tree, in other cases the nursery stock would be better. As to root growth and the selection, still greater discrimination was necessary. He did not favor this method of growing, but thought that the better way of producing good trees was to take one year old seedlings and crown graft them. Great stress had been laid on the importance of brains to the farmer, but you

would, to make a good fruit grower, according to this theory, require men of the greatest minds and then give them forty years training.

A. C. BORDEN desired to know whether a person wishing to raise Ribston Pippins should procure them from the nursery or obtain them by grafting.

R. W. STARR'S experience would lead him to say there was no difficulty in raising them from good grafts. The trouble with those from the nursery lays in their branching out rather low down. As a rule the pippin was a strong grower, and the defect he had noticed could be removed by careful pruning.

T. E. SMITH found as great a demand for Ribston Pippins as for any other variety.

JOHN E STARR thought that in this matter, as in the case of frozen apples, the variations were due to different circumstances surrounding them. There was a theory that the roots of a tree partook of the nature of the top of the tree, if this was so then the tree with a spreading top would have spreading roots and vice versa, from which he inferred that it could not be of importance what kind of root was employed to be grafted into, as the tops would eventually control the root. In his opinion, however, there were no fixed rules governing these matters, for the nature of the ground, the graft, and many other elements combined to give different results in a great many cases. Double grafting was applicable to some trees with great advantage, but not so with others. A great deal lay in the purchasing of stock from reliable nursery men who had a reputation to maintain, of whom, he was pleased to say, there were many.

W. H. BLANCHARD moved that the thanks of the Society be expressed to Mr. Patterson for his paper, and that the same be printed in the Annual Report. This, on being seconded by Mr. Parker, passed unanimously.

The following paper was then read by DR. HENRY CHIPMAN:

THE DIETETIC VALUE OF FRUIT.

Mr. President, Ladies and Gentlemen:—

Although my subject is one of so great importance as to constitute the foundation on which rests the entire fabric of this Association, yet I do not recollect ever having heard it discussed at any of our

meetings, and I regret that I have been too busy to give it that time and study which its importance demands. I hope, however, this imperfect paper may induce some abler writer to consider the subject and present it to us in all its bearings, on some future occasion. I dwell on the importance of this subject because the intrinsic value of fruit, the value upon which all other values depend, is its value as an article of food; take this away and fruit culture stops, orchards are cut down, and the Fruit Growers' Association loses its vocation.

Without this the apple tree is of no more worth than the willow, or the horse chestnut, whose fruit drops to the ground unheeded, and all the beauty of blossom and perfect hanging fruit has lost its true meaning, and become only a painting of apples of gold in pictures of silver.

Food is force, and four-fifths of all the labor of mankind is expended for food. Many there are who live to eat, and all must eat to live. Civilization rests upon hunger, it is the spur which drives half the world to destruction and the other half to deeds of mercy and beneficence. The hungry millions of earth must be fed or die, and two worlds—the animate and inanimate—are ransacked for food, and all articles are valued according as they are wholesome, palatable, and capable of nourishing the body and invigorating the mind. The ox eats grass, the carnivorous animal flesh; but man's mechanism is so complex that a great variety of food is necessary. Bread is called the staff of life and meat the life of the blood; but a man would starve on either of these alone, and with plenty of both perfect health could not be long maintained. In addition to these the starch and sugar and cooling acid of vegetables and fruit must be supplied if we would have perfect digestion, a well nourished body, and a sound mind. This is where the true value of fruit comes in. The title, "dietetic value of fruit," embraces the whole list of the horticulturist, but, as the apple is of paramount importance to our fruit growers, and possesses certain elements and properties in common with all fruits, I have selected it as a type, and hastily grouped around it a few thoughts and facts which are not new, but will bear repeating. There are many kinds of fruit that are pleasant to the taste and possessed of agreeable and nutritive properties; but, whether we search the tropics, sub-tropics, or temperate zones, none can be found superior to the apple as a luxury for dessert, or equal to it in value as a common, daily food for the people.

While other fruits are regarded as a luxury, the apple has become a necessity, and bread and meat are not more desired. With the exception of the banana it is unsurpassed as an article of food, and, unlike most tropical fruits, it requires no training to become acceptable to the palate, and whether raw, baked, boiled, or made into jellies, puddings and pies, is everywhere popular. Downing calls it "the world renowned fruit of temperate climates."

Such, however, were not originally the characteristics of our apple. Whatever may have been its tempting qualities in the Garden of Eden, it is certain that it was anything but a tempting morsel outside of Eden, having been at an early period in its history the worthless crab, a native of Britain.

Professor Eaton of Yale College, says: "The present apple was due to the cultivation and development of the crab-apple, and the peculiarity of the apple in its evolution is that the part most valuable was simply the calyx thickened and become fleshy, which had formed around the original plant or seeds." From this crab, or embryo apple, sour, so sour, Pliny says, "as to take the edge from off a knife," fleshless and worthless, by careful selection, the propagation of seedlings, and the hybridization of varieties of fixed characteristics have been developed or evolved the countless varieties of apples which now are such a delicious food for millions of people the world over.

All fruits and vegetables contain a large proportion of water. The apple has 83 per cent. of water, which has been so skillfully combined with an acid and a sweet in nature's laboratory as to produce that delightful flavor so agreeable to the taste. The slight variation in the percentage of water and sugar in the different varieties classify them as acid, sub-acid, and sweet. The first two are by far the most popular, both for dessert and cooking purposes, though the sweet apple is more quickly and easily digested.

The experiments of Dr. Beaumont with the stomach of St. Martin, proved that raw, sweet, mellow apples were digested in one hour and a half, while two hours were required for sour apples. Dr. Beaumont's experiments further proved that apples are among the most healthy and most quickly and easily digested of vegetable substances.

Many dyspeptic and nervous people would enjoy better health if they ate more fruit and less meat, and in many febrile states the juice

of fruit is not only refreshing but curative. Fruit taken early in the morning, a time when few of us think of taking it, is as helpful to digestion as it is refreshing. The *British Medical Journal* says: "The newly awakened digestive organs find in fruit an object of such light labor as will exercise without seriously taxing their energies, and the tissues of the stomach acquire, at a little cost, a gain of nourishment which will sustain those energies in later and more serious operations."

We do not eat enough fruit. Apples are within the reach of all of us the year round and we can afford to eat them freely, and still have thousands of barrels to ship across the water to tickle John Bull's palate and bring back his sterling cheques. The economic value of anything which has become an article of commerce is apt to be overlooked, but is not the less real. In computing the value of our apple crop, those consumed at home in the families of the producers, and their influence in promoting the health and proper nourishment of our people, are lost sight of, but the quantity and value are not inconsiderable. There are two qualities which render our apples profitable for cultivation—their hardy, long keeping quality, and their value as an article of food. Their superior excellence in these respects place our Nova Scotia apples ahead of all others in foreign markets, and it is this excellence which will insure a good price to our fruit growers in the London market in the future, when the production of apples shall have increased a thousand fold.

Too much attention cannot be given to these two points, the highest food value and the long keeping quality. The lines along which we should now work, it seems to me, are the educating of the masses of the great cities across the water up to the value of our apples as a food—not a luxury—placing them in good condition in the market, within their reach as to price, and striving in every possible way to produce varieties as nearly as possible perfect in food value. Our aim should not be to grow a fancy apple which shall command for the present a fancy price from the few, but to build for the future and the people and strive for real excellence. Surely since culture in the past has evolved our present apple from a calyx and a few seeds, there are possibilities of still further improvement in the future open to our scientific specialists. It is well known that the Nonpariel and Baldwin are long keeping varieties, that the Gravenstein and Ribston

are superior for dessert, and that the Bishop Pippin excels for culinary purposes, is it not possible, nay, is it not probable, that by careful selection and hybridization all the good qualities of the foregoing varieties may be combined and reproduced in a new variety, which shall be the perfect apple of the future? The value of apples as an article of food is a real and fixed value, while all other values are fictitious. A barrel of apples is worth a pound sterling in London at present; it has been in the past, and may be again next winter, worth only one-half, but the real food value of that barrel is just as great at ten shillings as at a pound. A sterling pound is an inflated price, more than the apples are worth as compared with other articles of food, and our fruit growers should not base their calculations for the future on it. Planting an orchard and raising apples will yield a handsome profit at a much smaller figure, and the large price should not be so much thought of as the production of perfect fruit, careful, honest packing, and rapid transit at fair rates to "London Town." Under these circumstances the price can be safely left to our agents there.

I feel safe in asserting that our Nova Scotia apples will sell at a profit to the grower in the London market for a generation to come, I care not how many thousand trees are planted. I make this assertion on the principle of the "survival of the fittest." London's millions are learning the value of our apples as an article of food, and they are becoming a necessity for the many where they were a luxury to the few. God has given us a soil and climate which produce the finest apples in the world, and a magnificent harbor which is nearer London than any other port on this continent, consequently Nova Scotia apples will command the highest price in that great market of the world—London.

I forecast a magnificent future for this beautiful, fruitful valley, and forsee additional honors for this Association that has ever been faithful to the work of developing the fruit industry of our country, which is already attracting the attention of the world to this Canada of ours, and conferring honor and wealth on our Province in general, and these Western Counties in particular. I consider it an honor, sir, to pay my dollar and have my name on this roll of membership; and I esteem it a privilege to be permitted to take even the smallest part in the transactions of your society. It seems to me that every

man and woman, in our principal fruit growing counties at least, should regard it in the same light, and come forward and swell our membership and increase our influence.

A. McN. Patterson.—The only question that struck me while that paper was being read was: what shall we take as the standard of price? all other commodities have a standard price, and why should not apples also have a standard price?

Dr. Borden.—I have read a lecture delivered by Dr. Richardson of England, who is probably one of the most scientific doctors in the world, and who maintains, in common with other eminent men, that fruit is the proper food for man. The propounding of such views by such men as Cardinal Manning, the Earl of Derby, and other gentlemen of note, must eventually give an impetus to the growth of fruit, which it was the duty of the people to note.

Dr. Chipman contended that the nourishment obtained from meat could not be supplied by any other food, and that it would be injurious to the system to partake of only one description of food.

W. H. Blanchard.—The paper we have just listened to is one of considerable importance. It places one phase of the apple trade before us in a manner which we have been apt to forget in the past. In exporting our fruits we have generally looked upon the trade as depending upon the taste of the wealthy people of England. We have always known that there are many people there who are willing to pay any price for the article suitable to them, and we have been looking forward to these large prices to be paid by such persons. The doctor has brought before us another phase of the trade, and that is the cultivation of the taste of the multitude, the mass of the people on the other side of the water, so that they will soon begin to recognise the apple as a necessary part of their food. When that time arrives we may not realize the prices we now sometimes receive, but our trade will be more steady and the demand will be proportionably greater, and although the prices may not vary so much the average price will be remunerative. I think it is encouraging to have this view of the matter brought before us. I had great pleasure while listening to the paper. I expected something good from the learned doctor, and have not been disappointed. Again, the patriotic

ideas he has brought to our notice are well worthy of careful consideration. It has got to be too common now-a-days to say our country is not worth living in, but I am glad to know that the patriotic expressions contained in the paper were so loudly applauded. (Applause.)

A. WHITMAN was led to concur in the ideas enunciated by the paper as to the healthfulness of fruit from the fact that he had heard in common with many others present, of the man who ate half a peck of apples every night after three hearty meals, as also of the man whose family almost subsisted on strawberries.

PROFESSOR COLDWELL asked how apples acted upon the system. They had not been told by the writer of the paper whether apples would sustain life for any length of time. Were apples essential to health or were they only a luxury? Had a man but a small sum of money to invest in food would the doctor advise him to lay in apples in lieu of other kinds of food?

DR. CHIPMAN.—In my paper I did not go into the minutiæ of these matters particularly. It would be extravagant to say that any one article was really necessary to life. A Scotchman could live almost wholly on oatmeal. (A voice: and whiskey,) while some of the poorer classes of the United States lived upon almost nothing. Dr. Tanner, indeed, eat nothing at all and lived a great many days, and the time might yet come when all men would be able to do the same. Speaking to the question, however, I believe apples are in a certain measure essential to health as a food. Either apples or something similar to them are necessary to help digestion. There are certain diseases in which fruit alone can be taken as nourishment, and if fruit were entirely removed from the articles of diet there would be much more sickness than prevails at present. It was with this fact in my mind that I stated in my paper that apples were a necessity. As to the man with only a small sum of money purchasing food, I should say he should first obtain other kinds of meat, but we all know that very few men indeed are in the condition indicated by the questioner. To remove the fear that the fruit business would be overdone I advised the remedy of inducing the masses to eat the apple.

PROFESSOR COLDWELL.—Some people in preparing the apple for food throw away the core and seeds, some people, on the other hand,

think that these are the best parts of the apple. Perhaps the doctor can enlighten us on this point?

DR. CHIPMAN.—The core and seeds are, in my opinion, more a matter of flavoring than anything else. The flesh is the most important part of the fruit, were it not then all our labors would have been in vain.

J. S. DODD.—Desired to know if any gentlemen present had had any experience in shipping fruit to warm climates. He acknowledged the force of all that was said in relation to the market in England, but thought, if practicable, the work should be extended to southern countries.

R. W. STARR stated that in the days of the West India trade from the Basin it was not an uncommon thing to ship apples to the West Indies as part of the then commercial speculations, and it was invariably found to be a paying part of the venture, but since that trade had languished the exporting of apples had not existed to any extent. He then moved that the thanks of the Association be tendered to Dr. Chipman for his paper, and that the same be printed in the Annual Report; this, on being seconded by Mr. Blanchard, passed unanimously.

QUESTIONS.

THE SECRETARY.—The first question here, "Is there not danger in growing too many apples"? has, I think, been fully answered in the discussions which have taken place.

The next, "Which are the best apple trees for the farmers of Nova Scotia to plant, those from outside nurseries or those grown in the Annapolis Valley"? has also been dealt with.

The third is: "Has the application of poisons or the use of printer's ink proved most satisfactory in contending against the canker worm?

The PRESIDENT.—This question was dealt with in some paper.

The SECRETARY.—It was merely alluded to in the report of the fruit committee.

R. W. STARR had not had much personal experience in the use of printer's ink, though he had been a careful observer of its results in the orchards of those around him. The result of his observations led him to conclude to use poisons in the future as he had done in the past.

A. McN. Patterson asked if the present silver frost would destroy the insects that affected fruit trees?

R. W. Starr.—I am not able to say.

Professor Coldwell doubted if the ice some three years ago killed the caterpillar as was attributed to it.

G. V. Rand was inclined to think that the disappearance of the caterpillar was due to some disease which had affected it that year and not to the silver frost.

The Secretary had not had very much experience in this matter, but they would remember that Professor Fletcher had advised the use of Paris Green in small quantities, early in the season. The Department of Agriculture at Washington, however, advised its use in large quantities. There existed a difference of opinion as to the amount to be used. In his practice he had dissolved one-quarter of a pound of the poison to a kerosene oil cask of water, and applied with the ordinary hand pump at a time when the worms were small. In places where the trees were not too thick the result proved satisfactory; but where the trees were thick and the spray unable to penetrate every part, he had found, shortly after the application, that the worms were working great havoc. He then prepared a solution twice as strong with the result that he not only destroyed the worms but also the leaves. What struck him as most remarkable in the use of Paris Green was, that he knew that some of his neighbors were using twice the quantity with satisfactory results, and this led him to think that the poison was not, in all cases, of the same strength, and hence no precise formula could be laid down for the guidance of all. He, last Autumn, tried printer's ink, as also cotton bands wrapped very closely to the tree, and found in some cases that moths were entangled in the cotton, while on other trees they had got over the bands and ink. From his experiments he was led to conclude that that system was not effectual.

A. McN. Patterson.—Have you tried two bands of printer's ink, one above the other?

Secretary.—No, I have not.

John E. Starr had had considerable experience in this connection. His brother had used tar paper and printer's ink while he had

depended upon the free use of poison, with the result that his brother gained a good crop of fruit and had scarcely a worm in his orchard. His own, however, was so unsatisfactory that he had determined to use the same remedy in preference to the poison, and he would strongly urge all to adopt preventive rather than curative measures.

T. H. PARKER had, some years ago, formed the opinion that the remedy was as bad as the disease when Paris Green was employed, it was unsafe to use it. The government should adopt some measure to test the poison so as to ensure its uniformity of strength, and he thought it was the duty of the Association to take steps towards attaining that end.

GEO. V. RAND was strongly in favor of London Purple, it being of a more uniform quality in strength. In using London Purple, which was not so expensive as Paris Green, it was necessary to first dissolve it well in a small quantity of water and then pour into the vessel from which it was to be used. The danger of burning even the most delicate trees would not arise when using this material.

F. C. JOHNSON, while congratulating those who had used Paris Green with success, regretted that its use during two seasons had injured his trees to a very serious extent, while only killing a part of the worms. He had used one pound of green to an oil cask of water, early last season, when the worms were so small as to be scarcely discernable, yet that did not kill the worms, and on giving the second application he found that while it failed to kill the worms it took half the leaves off his trees.

R. W. STARR.—Did it rain after the first application?

F. C. JOHNSON.—It did, within 24 hours. Having used printer's ink since last fall I find the worms are not so thick, and I am of opinion that if I use it again in the spring I shall wholly eradicate the pest.

J. H. BISHOP remarked that experiments had proved that while printer's ink and wool might prevent the worm to a certain extent from getting into the tree tops yet it would not kill them.

F. M. BORDEN's acquaintance with the matter led him to believe that the use of Paris Green was beneficial.

The PRESIDENT, replying to Professor Coldwell, said that the use of iron bands was found unsatisfactory by reason of the difficulty

in getting them to fit closely to all parts of the stem of the tree.

PROFESSOR COLDWELL suggested that cotton wool might be wrapped around the tree tightly and the iron band then fastened over that.

R. W. STARR had remarked during his visit to the Pomological Society last year that arsenical poisons seemed to meet with most favor, and the opinion seemed to prevail that mechanical appliances had not been effectual.

THE PRESIDENT corroborated the views just expressed by Mr. Starr as to the remarks of the speakers at the Pomological Society, the general consensus of opinion being that London Purple was more uniform in its strength and consequently more definite in results.

A. MCN. PATTERSON urged upon the Society the necessity of adopting some means to endeavor, as far as possible, to obtain full prices for the apples shipped by them, the returns in some cases showing very great and unaccountable fluctuations, and he now mentioned the matter in the hope that it would be dealt with at some meeting of the Association on the morrow.

SECOND DAY.

Friday, February 17th, 1888.

The meeting was called to order by the President at 10 30.

The minutes of yesterday's proceedings read and confirmed.

The following committee on organization was then appointed: The President, R. W. Starr, J. W. Hamilton, T. H. Parker and W. R. Wentzell, and retired for the purpose of electing officers for the ensuing year.

R. E. HARRIS asked which was the best method of obtaining Ribston Pippin trees, whether it was more profitable to set out that description, or to first set some other species and then graft.

W. H. BLANCHARD.—I take from the discussion of yesterday that it is better to set out other kinds and then graft.

R. E. HARRIS found that he could obtain better trees of the species indicated by grafting than by growing them in the first instance, as they were very slow growers.

SECRETARY STARR.—I have had some little experience in this matter in a young orchard of seedlings, and if they are properly trimmed, though they are slow growers, yet they make good trees. While top grafting other trees might do as well, yet I prefer the seedling. I have found that in grafting on to Nonpariels with other strong varieties, Emperors, Ben Davis, &c., there is not likely to be the trouble which arises when grafting with Pippins.

W. H. BLANCHARD.—In my own small ground there is a vast difference between Ribston Pippins, set out at the same time as other trees, in their growth, but I am not certain whether it is from the Ribston Pippins, growing from the root graft or because they have been attacked by root borers, but it seems to me that they were more injured by the latter than by any other cause; at the same time it is probable that both causes had something to do with it.

R. E. HARRIS asked if it was the opinion of the Association that the Ben Davis, which was a strong and good thrifty, bearing tree, would be a profitable tree to raise.

W. H. BLANCHARD.—It was mentioned by one gentleman in the discussion yesterday, and it seemed to be the opinion, that there had not been sufficient experience in connection with it to decide on its merits, it was stated to be the coming apple, but the question with us is: Will it be the going apple?

A. WHITMAN'S experience with Ribston Pippins had led him to conclude that they were best raised on a heavy soil. While on his feet he would like to ask what was to be the apple of the future? As was well known the quality of the barrel did not seem to affect the price obtained for the apples. It was true that the hardwood barrel was highly recommended, but he would like to know what was the result of the past year's experience in the matter.

SECRETARY STARR, in response to Mr. Geo. Johnson, said he had used flat hooped barrels last year.

GEO. C. JOHNSON was at a loss to understand how he came to realize a higher price for his apples than Mr. Starr and others, who had not, like him, sent them forward in soft wood barrels. Again, he had picked some Ribston Pippins some eight or ten days earlier than was usual, and for these he received a higher price, and they were said to be much better than those picked at the usual time.

These were questions of paramount importance to every orchardist, and their solution should be arrived at as early as possible, so that advantage might be taken of every point that went to make the business a profitable one.

SECRETARY STARR.—My own experience is that the barrel of the future is the spruce with flat hoops. The flat hoops cannot, it appears, be made here, for those manufactured by the Windsor Company some years ago were not satisfactory, and as the result of their experiments with all kinds of woods, it has been found that good ones cannot be obtained elsewhere than in Quebec and Ontario. Doubtless some arrangement could be arrived at with the coopers at the Halifax Sugar Refinery, who use a large number, to supply all the hoops needed in the valley, otherwise the expense would be very great in obtaining proper hoops. Any enquiry made of Mr. Hays, at the Sugar Refinery, would doubtless be cheerfully answered. With such hoops and the ordinary barrel staves obtainable here, satisfactory barrels could be made. In regard to the variation of prices obtained, that is largely due to the wants and tastes of the customer. I have noticed that as a rule the flat hooped barrels go first; if there were 1000 barrels, half flat and half round hooped, in a salesroom in the morning, it would be found after the day's sales, those left would be round hooped barrels.

W. H. BLANCHARD.—The fluctuation in price is probably due to some condition of change which took place during the voyage, and if a person were present when the apples arrived and were opened, he would be able to explain the cause of it, and we must therefore conclude that there was something in the condition of the apples that made the difference in price.

R. E. HARRIS suggested that the cause might be found in the way the business was transacted, for instance, as well known to persons who went to market here, that if you went with a load for sale, there were always some customers from whom you could get the highest price, but in other cases you could not make such a good bargain.

SECRETARY STARR in answer to Mr. Blanchard, said that the apples in question were not sold at auction.

G. E. JOHNSON asked if anyone could explain why barrels marked No. 2 brought four shilling more per barrel than those marked No. 1.

SECRETARY STARR said he felt a little delicacy in speaking in this matter at all, yet he felt like expressing his own opinion, which was to the same effect as that given expression to by Mr. Harris, though that gentleman had not so fully explained as the speaker would have done had he spoken in the first instance. Mr. Geo. Johnson had been shipping for a number of years, for instance, and certain customers have a choice for his packing, they want certain qualities, and they are not particular as to the price so long as they get what they want. He had known orders to come into the office in London in the morning for certain quantities, from regular buyers, who simply sent the van and took them away at the price named by the seller, and it may be on such an occasion Mr. Geo. Johnson's apples were purchased. Another does not happen to be so good a customer, as Mr. Harris says, and you do not get such a good price. There were various causes which tended to make prices fluctuate in even one day.

A. WHITMAN explained that he had, at one time, received a higher price in the Halifax market for No. 2 apples than he received for No. 1, also that certain buyers preferred a small apple for retailing, and would pay a higher price for such apples than they would for a larger and better class.

J. COLDWELL said he had at one time left some Gravensteins on the tree after having picked what he desired, at the usual time. On picking those left, some time after, he found they were unfit to eat, whereas those picked at the usual time were good. In answer to Mr. Blanchard he said the two pickings were kept in different places, which would probably account for the difference in a measure.

REPORT.

The committee on organization presented their report.

MR. HARRIS moved that T. H. Parker be substituted as Vice-President for Kings in lieu of the Warden.

The committee having nominated Dr. Henry Chipman as President:

SECRETARY STARR.—I do not think there is any disposition on the part of the Society to remove our President, and we should like to hear from him his reasons for resigning.

Rev. J. R. Hart.—I must demur to going into the secrets of the committee, (laughter.) Personally I would say that I am willing to serve the Association in any way they may see fit to order me. If I remember rightly, before I was appointed your President the last service I did for you was that of door keeper, and now as then, I am willing to do all I can for the Association, but I know you can be better served by any other man than myself. Neither do I believe it right to allow any one person to run the Association for too long a period. Again, since the first of the year I have accepted a position which would materially interfere with my duty to you as President, and consequently I must positively decline to serve longer as your President.

T. H. Parker, in declining the Vice-Presidency for Kings, begged to nominate Mr. Rand, and on motion it was resolved to send back report to committee for amendment.

The committee having amended report now presented same, which, on motion of C. Y. Johnson, seconded by R. E. Harris, was received and adopted.

President.—Henry Chipman, M. D., Grand Pre, N. S.

Senior Vice-President.—W. H. Blanchard, Esq., Windsor, N. S.

Vice-Presidents.—Annapolis Co., Rev. J. R Hart, Bridgetown; Kings Co., Leander Rand, M. P. P., Canning; Hants Co., Professor Hind, Windsor; Halifax Co., Professor Lawson, Halifax; Lunenburg Co., W. R. Wentzell, Bridgewater; Digby Co., John S. McNeil, Esq., Barton; Yarmouth, C. E. Brown, Esq., Yarmouth; Shelburne, R. W. Freeman, Esq., Jordan River; Queens Co., Jason M. Mack, Esq., Liverpool; Colchester, Professor Smith, Truro; Pictou, F. M. Borden, Esq., New Glasgow; Cumberland, Thos. R. Black, Esq., Amherst; Antigonish, C. C. Gregory, Antigonish; Guysboro', W. G. Scott, Esq., Guysboro'; Victoria, A. W. McCurdy, Baddeck; Cape Breton, William Purvis, Esq., Sydney; Inverness, Louis McKeen, Esq., Mabou; Richmond, Hon. Isidore LeBlanc, M. P. P., Archat.

Secretary-Treasurer.—C. R. H. Starr, Port Williams, N. S.

Executive Board.—The President, Senior Vice-President, Secretary-Treasurer *ex officio*; R. Starratt, Paradise, T. H. Parker, Berwick; R. W. Starr, Port Williams; William Miller, Clarence.

Auditors.—J. W. Bigelow, Esq., Wolfville; Geo. H. Wallace, Esq., Wolfville.

Fruit Committee.—Isaac Shaw, R. W. Starr, J. R. Hart, C. E. Brown, W. R. Wentzel, C. R. H. Starr.

Publication Committee.—The President, The Secretary, *ex officio*; R. W. Starr, W. H. Blanchard.

W. H. BLANCHARD.—I am exceedingly sorry to find that our worthy President has felt it his duty to resign the honor of the position he has so well filled for the last three years. It has been a matter of great pleasure to myself to have been associated with him as an officer in this Association. I feel that my own appointment to the position of first Vice-President is due entirely to the fact that I represent the neighboring county of Hants and not from any merits I possess. I feel it to be an honor to be a member of such an Association, an Association composed of gentlemen of intelligence, and I feel it to be a still greater honor to be an officer therein, and though I feel at times that I am in the wrong place, yet I ever do my best to further its interests. Whilst I cannot help expressing great regret at the loss of the Association in the person of Rev. Mr. Hart as its President, yet I thank you for the appointment of myself as first Vice-President.

R. E. HARRIS.—I feel very much the same as the last speaker as to the change of President. This change of Presidents is an important change, by it we lose one who has served us faithfully and well, and I hope that our new President will serve us equally well; and I have much pleasure in moving to Mr. Hart a vote of the thanks of this Association for the excellent way in which he has kept us together and performed his duties while in the chair.

R. W. STARR in seconding the motion said, I have the greatest pleasure in seconding such a motion. From the first Mr. Hart has been one of the most zealous men in the Association, and though we are losing him from the chair I trust his services will ever remain to us.

SECRETARY STARR.—I heartily endorse the sentiments uttered by the mover and seconder of the motion, and I must here say that while I have been in immediate communication with the President during the past three years our relations have been of the most friendly

description. He ever had a heart and hand willing and ready to assist me in every way possible, and like the last speaker I trust we shall still have his presence with us.

The motion on being put was carried unanimously.

Vice-President W. H. BLANCHARD to Mr. Hart.—I have much pleasure in tendering to you the thanks of this Association for the able and efficient services you have rendered the Association during the last three and a half years, and this vote of thanks I may say entirely accords with my own sentiments.

REV. MR. HART.—Mr. Chairman and Friends: I am certainly obliged to you for the vote just passed and tendered me. It came an unexpected though usual thing, and for your kindness I am thankful, but I think while you have done me an honor you have done yourself a greater one in permitting me to retire. I must be thankful for all I have learned of our business while in the chair, and in conclusion I can but repeat that I will at all times be ready to do what I can for the Association.

AFTERNOON SESSION.

W. H. BLANCHARD.—I am happy to see the President present, and have great pleasure in introducing him to you.

DR. HENRY CHIPMAN, who was received with great enthusiasm, said:

Mr. Chairman, Ladies and Gentlemen:

This is to me an entirely unexpected event, an event as well as an honor that I have never dreamed of, for such it is to be elected President of such an influential Association. I feel that I am unequal to the task. I certainly am not the best man, or the best qualified man to fill such a position, and I have almost positively declined to accept it. I must, however, I suppose, accede to the expressed wishes of many members. It would have been better were a more practical man chosen, for instance, your Vice President. I am but a young man having no farm or orchard, yet I have always taken an interest in the culture of fruit, as indeed I have in all matters that pertain to the welfare of our beautiful valley. I shall at all times be most happy to do all I can to further the interests of this Association.

Rev. Mr. Hart.—I think we, as a committee, were wise in our selection of a President, for while he has not been identified with the raising of fruit, he has most materially aided us in our endeavors to dispose of it. I congratulate him on his position, I congratulate you greatly in your choice of President, but I must congratulate myself most of all.

W. H. Blanchard.—You were kind enough Mr. President to mention my name in connection with the chair, but I am of the opinion that a great mistake would have been committed were our positions to be reversed by the committee. The appointment was made with my most hearty and entire concurrence, and whilst it may have been in the minds of some that the position would naturally devolve upon the Senior Vice-President on the resignation of the President, yet I am glad to know that the Association has departed from any such rule, and that they have left me in the position I formerly occupied, and have placed you, sir, at the head of the Association.

The President.—Had I been here this morning I should certainly have entered a protest against my appointment, it is now, it seems, impossible to avoid accepting the honor you have done me. I must here say, however, that I will ever do my best to make the Association as popular as possible, and as useful in the future as it has been in the past, and doubtless with your assistance I may accomplish it. (Applause.)

The following paper was then read by Professor Eaton of the Provincial Normal School, Truro :

CONDITIONS OF SUCCESS IN AGRICULTURE.

Mr. President.—I do not know that the title of my paper, as it appears on your circular, very definitely suggests the character of the discussion it causes. The truth is that I gave your indefatigable Secretary the title before the essay came into existence, and as I did not know exactly what trend my thoughts would take, I discreetly adopted a somewhat vague and characterless name for it. I wish, however, to present a few thoughts concerning the *personal* conditions of success in Agriculture, whether general or special, in distinction from the natural and material conditions by which the farmer finds himself surrounded. In other words : given certain conditions of

soil, climate, and geography, a country adapted to farming,—what sort of men must they be who will most successfully prosecute the business of farming under such conditions in these ambitious, active and progressive times The march of mind is moving forward at a tremendously rapid rate, and progress in all sorts of industry is following close after. These are times when a city is lighted by the turning of a wheel; when your voice can be heard a hundred miles as easily as one hundred feet; when standing on the shore of the Pacific you can ask a question and get an answer across the breadth of a whole continent and an ocean to boot in less time than it would take you to walk to your nearest neighbor's and get the same information; when the novelties of yesterday are the antiquities of to-morrow; when all the resources of scientific research are being taxed to the utmost to meet the impatient demands of the industrial world for new facts, new laws, new thoughts, which shall inspire some new invention by whose aid the necessities and luxuries of mankind may be supplied more rapidly, more abundantly, and more perfectly than ever before. These are times when science and industry, theory and practice, head labor and hand labor are coming closer and closer together, working in harmony towards the same end, mutually dependant, mutually helpful.

In every department of life s rong, vigorous competition is the condition under which men work; and success can only be achieved in any by the fullest constant recognition of the eternal union of knowledge and industry. "Whom God hath joined together let no man put asunder." Knowledge may not say I live for myself alone, I have no kinship with manual toil, nor can labour say to knowledge I have no need of thee; perpetual estrangement of these two is perpetual sterility to both. Perhaps, after all it is a recognition of this law of union, that consciously or unconsciously has brought together so many educationists, cultivators of the mind, in friendly converse with these busy, practical men, by whose labors in the field, orchard and garden society can only exist.

Now I take it that the *business*, *art*, or *science* of agriculture, call it which you will, for it is all three, is not holding its own in this competition among the avocations of men, is not being prosecuted successfully unless it fulfils two conditions; First, men must live by it, I mean those who are engaged in it, and, on the average, must be getting financially better off year by year; and second, it must be

intrinsically attractive to men of strong intellect, refined tastes, and high ambition. In a word the business of agriculture should pay, and it should draw to its ranks as good type of men as the country can produce.

I have said that farming is a business, I mean that it partakes very largely of the commercial character ; and the kind of talent and ability and execution necessary to success in mercantile pursuits are necessary to successs in agriculture. Beyond all question many a farmer has met with discouragingly poor success, or utter failure, because of his unbusiness-like habits. He has gone into the business with a stock of mercantile inaptitude that would have guaranteed him failure in any occupation whose processes begin with buying and end with selling. I do not mean simply that a farmer must be a shrewd buyer and a good salesman, that he must keep a systematic set of books in which all accounts are faithfully and accurately recorded, that he must scrupulously meet with promptness all his engagements with others and be equally scrupulous in insisting that others keep theirs with him, that he must be economical and ever on the watch for the "little foxes that spoil the vines." I do mean that such must be his character and such his habits, I mean all that and a good deal more.

In this mercantile phase of it farming is a complicated business, not as simple and direct as that which consists in buying and selling shoes, flour, or cotton. The farmer must buy and he must sell, and thereby obtain his profit. But between the buying and the selling there is usually an intricate tangle of operation and processes which obscures the all-important link between *outlay* and *return*. The merchant can continually keep, as it were, one eye on the cost and the other on the selling price of his goods. He can tell you not only what you must pay him for the shoes he sells you, but what they cost him, and what his profit is *to a cent*. You would think your friend's mercantile career likely to be very short and not so very sweet if he conducted his business in habitual ignorance of these most interesting and most vitally important facts. And yet where your every day farmer sells a bushel of potatoes, a barrel of apples, or a steer he has raised, can he tell you what margin of profit he has on either? How many in every hundred of your thrifty farmers up and down this beautiful, fertile valley, can tell you what the potatoes they sold last year for fifty cents a bushel cost them at the wharf or depot? Still

more, how many can tell of the grain and potatoes and hay that have this winter been converted into beef and sold in that form, either what the produce cost or what it brought in the selling?

But perhaps you would ask—no not any one present, but some one who has never thought of such things—"what difference it makes if he doesn't know, he knows how much money he has at the end of the year, or at the end of five or ten years. What matters it then if he never can tell you to a hair the cost of his various crops?" Will my easy going friend just give up his farm and try running a corner grocery on such principles for a year or two. How long would it be before some very interested parties would be looking over his stock and his ledger?

But our objector friend is in a practical frame of mind perhaps, and says that an ounce of fact is worth a ton of theory, and do not facts go to show that though merchants may go to the wall under such conditions it is different with farmers. Are there not many farmers who never thought of asking, much less of answering, such questions as these, who are, nevertheless, getting along very well. These nice calculations of cost and profit, especially in regard to individual items in yearly sales, are therefore not of any consequence. My reply is that this fact does not disprove the desirability, nay the necessity, of every man constantly and faithfully making such calculations, it goes to show rather, how safe and remunerative a business farming really could be made if only it were conducted on strict thoroughgoing business principles instead of in the loose, uncertain, hap-hazard way in which it is too often carried on. Do you know I often think that there is something in the very nature of his occupation that tends to make a farmer credulous and trustful, that develops a blind sort of faith that everything will come out all right if one only works hard enough. Be that as it may. I do not think that the farmer's inability to state in definite terms the equation of his profit margin as readily as the merchant is to be set down entirely to his discredit, it is due rather to the far greater intricacy and more complicated nature of his speculation, and by no means is it an indication of a lower grade of mercantile talent. The fact is simply that the farmer's business demands the constant exercise of a far higher and not of a lower order of business ability than the merchant's, if it is to be carried on with the same assurance of the higher success.

There is another question relative to the cost of farm produce which every farmer who claims to have mastered the mercantile features of his profession should be able to answer. It is this, if with a given expenditure for labor and fertilizers a given profit is realized, would a larger expenditure on the same acreage be a profitable one? Would the resulting increase in the crop give a profit on the increased outlay? And within what limits? To illustrate, suppose a given acre of land has yielded 200 bushels of potatoes, while with additional labor and manure 50 bushels more might have been raised, would the additional crop have warranted the additional cost?

Then there is the further question of the *relative* cost of different crops which the same soil is capable of producing, as compared with the market value of each. The solution of such problems as these is of the highest possible moment to every farmer, and to the solution of them every process in the cultivation of his farm should be carefully adjusted. Will it pay better to raise this crop or that? Will it pay better to concentrate cultivation on a small area or spread it over a large one? And to what limit can this principle of concentration or of diffusion be carried? These are questions that can only be answered by intricate calculations based upon the data furnished by systematic and painstaking experimentation.

The discussion thus far has served its purpose if it has emphasized the advantage which the possession of good business ability and good business habits gives the farmer, and if it has further suggested that in order to transact intelligently and successfully the business of farming there is need of a preparatory knowledge *far more difficult of acquisition* and *far more varied in its character* than that which would abundantly equip for the best possible success in any of the ordinary walks of mercantile life. If, in short, it has been made apparent that the conditions of successful farming, even in its purely business aspects, involve not only the possession of such tact and skill as is common to all forms of mercantile life, but beneath and beyond this a profound knowledge of what is called the science of agriculture. Obviously the farmer cannot solve the problems of his farm,—of his profit margin,—without a knowledge of the nature of his soils, the habits and characteristics of the various crops which are adapted to those soils, together with a minute and accurate acquaintance with the fertilizers which will best supply to the soils the substances which they do not possess and the plants need. He must know the proper

kind, amount, and varieties of fodder his cattle of various kinds and ages require, in order that they may best serve the purpose for which they are fed.

Of course very much of this knowledge, perhaps nearly all they have, most farmers acquire as the result either of their own or their neighbors' experience. There is a lack of practical knowledge, an accumulation of a sort of *rule of thumb* methods and practices which every farmer grows up into, the legacy of generations of farmers, but there is besides rapidly accumulating a large and most invaluable body of scientific agricultural knowledge, the result of the most patiently laborious experimentation on the part of specialists in every department of agriculture. All the vast resources of the most advanced results in natural science are being laid under contribution to improve the methods of agricultural industry. Science applied to agriculture has made agriculture itself a science. That which is good in the old empirical knowledge is receiving the sanction and justification of the scientific method, while that which is spurious and untrue is being rapidly supplanted by that richer and more reliable knowledge which bases itself on unimpeachable facts, and is always ready to justify itself by an appeal to the reason why.

There is a very serious difficulty in the way of a rapid diffusion of the benefits which a knowledge of scientific agriculture must confer, not only upon the industry itself, but on multitudinous interests which are dependent upon it, namely, the general lack of a knowledge of the various natural sciences such as is absolutely necessary to an intelligent appreciation of the results of scientific experiments in agriculture, and more particularly to enable each man to appropriate, adapt and modify these results to suit the peculiarities of his own circumstances, and the idiosyncracies of his own farm. To the farmer, then, who wishes to stand in the foremost rank of his profession, a good knowledge of the natural sciences has become indispensable, namely, so much of Geology and Mineralogy he must know as will enable him to understand how his various soils originated, and what their respective characteristics are. Physics will tell him how the action of heat and light, air and water, modify, help, or hinder the processes of his own labor in ameliorating the soil and rearing his crops. Chemistry will help him to understand the nature of his fertilizers and to adapt them to the particular soils and particular

crops. He will learn from Botany the nature and habits of plants, both useful and harmful, their laws of reproduction and growth, and the means by which original characteristics may be modified and improved, and new varieties developed. While to the proper and efficient care of stock a knowledge of Animal Physiology is an invaluable aid, one should know not only what prescriptions others have made for the general treatment of young animals, milch cows, and fattening stock, but why such prescriptions have been made, and how far they can be modified or departed from with safety and profit.

Valuable, however, as this wide and diversified knowledge of such subjects is to the farmer, perhaps of more importance even than the knowledge itself, is the peculiar *kind of training* which a proper study of the natural sciences gives; the investigating and experimenting habit, the disposition to be ever tracing results to their causes and predicting results from given causes, the habit of carefully collecting facts or studying their significance and basing conclusions thereon; the unwillingness to act upon the information of uncredentialed authority, which impels one always to find out for oneself if a thing be true or not. To all men in every walk of life is this training of the greatest value, but to none is it of higher importance than to the farmer, whose occupation is so wholly dependent upon the multitudinous complications of nature's wonderful laws.

But you cannot take a raw, untrained boy and set him studying chemistry, physics and the like, education is an upward process. You cannot begin at the top and work downwards. Foundation first and superstructure afterwards is the order of building. Such a course of natural science as will fit one for the proper study of scientific agriculture can only be taken by one who has already received a good, general education, whose thinking powers have been awakened by a vigorous course of elementary schooling, such an all round elementary training as it is to be feared many a farmer's son, even in this favored country, does not get.

It comes to this then that even with the view of perpetuating and fostering his own vocation the farmer has the deepest interest in the primary schools. In this province, to bring the matter home, we can boast of a school system which has secured, and is sustaining an average condition of school facilities in rural districts not surpassed by those in any other part of this continent. I say this advisedly,

the average country school of Nova Scotia is equal to that in any other province or state on this continent, and yet that average is far too low, much lower than it need be. However defective the machinery of our educational system may or may not be, the great and pressing need for our school system now is not legislation, but a great revival of an educational public sentiment. The sectional enthusiasm in behalf of public school instruction throughout the country is pitched far too low, and in consequence sectional support is too meagre. In the interest of the coming generation of farmers in Nova Scotia I would plead in behalf of the public schools for a more liberal financial support, for the employment of only the best teachers, and for a better chance at school for the boys. If the schools are what they should be and what they may be made, the education that the farmers' boys can get by constant attendance till they are fifteen years of age is of far more value to them and to their future calling than the work that can be got out of them if kept at home. Boys are very useful about the place. Yes, but they have rights which may be interfered with by making use of them at home when they ought to be at school.

If the points considered in this paper are well taken, it is evident that in Nova Scotia we have something yet to do in the education of our coming farmers. Not simply in the way of providing *greater facilities* for education in the various departments of primary, secondary, higher and technical education, but especially in awakening and developing a public sentiment which shall recognize the necessity of better mental equipment for the business of farming, which shall recognize that it is not the *so-called* learned professions which are to monopolize the advantages which our higher institutions of learning afford. Which shall indeed, on the contrary, gradually learn to rank agriculture among the learned professions.

Unless the claims of this essay in its behalf are untrue, there are few professions which demand for its votaries a wider, deeper, higher education that does this of agriculture. Let then the boy who have brains be given all the education possible in the public school, in the academy, *in the college*, if they will, and by all means in the school of agriculture if they wish to be farmers.

In brief then, by way of recapitulation, the education of the farmer should include; first, the foundation laid in the best of common schools; second, the broader and more liberal culture of the academies

and colleges of which thorough work in the natural sciences constitutes a large part; and third, technical agricultural education. The school of agriculture should provide not only a course in which the various departments of natural science are applied in a practical way to the many phases of agriculture, but also, what is of equal importance, a course of training in the handicraft of farming. In the art of agriculture, as well as in the science, a technical school which provides only for the science and not for the art of the profession it represents is only the half loaf, which is better than none at all. It is in this position in which we find ourselves to-day in regard to the facilities for agricultural training. We ought to be grateful indeed—every one of us who is anxious to see the greatest and most important in every way, of our many great and important industries, prosper, to know that we have a school of agriculture where—and permit me to speak on this point as one who knows—where most invaluable work is being done for the future of your profession. Young men of ability cannot afford to miss the opportunity which is now afforded them of qualifying themselves for the life of the farmer.

But we ought the more especially to congratulate ourselves that we are promised in the very near future the other half of the loaf. And that our school of agriculture is to be planted on a farm.

Now in reference to the main contentions of my paper, there are, doubtless, many who would say, this talk about the higher education of farmers is all very well in theory, but it won't reduce to practice, it is too high, too airy. They will charitably make allowance for the unpractical, visionary notions of a teacher who may be supposed to hold abnormal and extreme views of education. But *you* know gentlemen, that I have not pitched the key too high. You know, for I do not for a moment imagine I have been preaching a new gospel to you, that no line of progress marks the present time more deeply than the revolution that is taking place in theories and methods of agriculture.

No doubt the ideal education I have tried to sketch will not be realized in this country all at once, or by more than a few. Yet an ideal we must have, and there is far more danger of having too low than too high a one.

But I have trespassed too long upon your time; your programme for this and the remaining sessions is so full of important material

that I feel guilty at having detained you so long. Let me then conclude by saying—and this is the gist of my whole discussion—that in proportion as farming is carried on under the direction of strong, vigorous, cultivated minds, rather than simply by dint of slavish bodily toil, will the business in the future be a paying one, and be attractive to that class of men whom other professions will be only too glad to welcome to their ranks; but who on their part will be only too glad to devote themselves to a business so well worthy of their best powers, that business of which, so long ago, the Roman orator wrote with glowing enthusiasm: "I come now to the pleasures of husbandry in which I vastly delight. They are not interrupted by old age, and they seem to me to be pursuits in which a wise man's life should be spent. The earth does not rebel against authority; it never gives back but with usury what it receives. The *gains* of husbandry are not what exclusively commend it. I am charmed with the nature and productive virtues of the soil. Can those old men be called unhappy who delight in the cultivation of the soil; in my opinion there can be no happier life, not only because the tillage of the earth is salutary to all, but from the pleasure which it yields. The whole establishment of a good and assiduous husbandman is stored with wealth, it abounds in pigs, in kids, in lambs, in poultry, in milk, in cheese, in honey. Nothing can be more profitable, nothing more beautiful than a well cultivated farm."

The PRESIDENT.—I have listened with much pleasure to this paper, and I am certain we must all approve of the line of argument employed. The news came from an educationist, yet it would be well for all to apply the precepts advocated and endeavor to obtain, as far as possible, all the benefits derivable from a highly scientific education.

JOHN DONALDSON considered that the paper dealt with a very difficult subject, and there was scarcely a paper read on the subject of farming which did not more or less censure the farmer, but the fact was that the objection to all those papers lay in applying science too closely. For himself he thought there was a great gap between the principles of science and practical farming. A specimen of the valley dyke lands, for instance, had been forwarded to Ontario for analyzation, yet on being analyzed by practical chemists it was found that

they could not tell its principal constituents. So it was with the fertilizers. From this he inferred that there was yet quite a chasm between the principles of science and the practice. They were told by scientific men that turnips consisted of ninety per cent. of water and ten per cent. of solid matter, yet experience had taught that the value of turnips was very much more. Again, as to coal ashes being used for fertilizers, science said they contained none of the elements necessary, and yet experience had proved that they did. More experimentation was necessary than was carried on.

PROFESSOR SMITH.—In order to understand a matter properly one must give a certain amount of diligent study to it. Knowledge is not acquired by mere random reading or guess work, it requires patient labor. Had Mr. Donaldson taken the trouble to cut up a turnip he would have found that it contained some ten per cent. of solid matter, and it is not the fault of the scientific man that the residue is water. As to experimentation I feel convinced that both governments are doing a great deal to widen this branch of agriculture, but to ensure individual success it is necessary that there should be individual experimentation. I have given some time and study to the chemical analysis of soils, and I must say that it is anything but an easy matter to deal satisfactorily with, especially when it is borne in mind that the phosphoric elements are contained in it in very minute quantities, and that the value of it depends on the quantity of phosphoric substance contained. Every farmer is to-day making use of knowledge compiled by scientific men and others, and perhaps does not know it because it has become part of the common knowledge.

JOHN DONALDSON.—The point I wished to exemplify by the analogy of the turnip was that the substance called water contains nutriment other than that which is contained in ordinary water, and from that I inferred that there is an intervening stage with which we are yet unacquainted.

A vote of thanks, (and that the paper be printed in report,) was then moved to Professor Eaton by Rev. Mr. Hart, and seconded by Mr. W. H. Blanchard, which passed unanimously.

The following discussion then ensued on the question :

"THE ENGLISH SPARROW—Is it an enemy or a friend to the fruit grower?"

MR. BISHOP reading the following :

REPORT OF THE UNITED STATES ORNITHOLOGIST.

SECOND NOTICE. THE EUROPEAN HOUSE SPARROW.

The first circumstance connected with this bird to which Dr. Merriam calls attention, is the wonderful rapidity of its multiplication and extension. The causes of this rapidity are not far to seek. It is, as he says, "a hardy, prolific and aggressive bird, possessed of much intelligence and more than ordinary cunning. It is domestic and gregarious in habit, and takes advantage of the protection afforded by proximity to man, thus escaping nearly all of the enemies which check the abundance of our native birds. Moreover, for many years it was looked upon with favor, and both food and shelter were provided it."

"Its fecundity is amazing. In the latitude of New York and southward it hatches, as a rule, five or six broods in a season, with from four to six young in a brood. Assuming the average annual product of a pair to be twenty-four young, of which half are females and half males, and assuming further, for the sake of computation, that all live together with their offspring, it will be seen that in ten years the progeny of a single pair would would be 275,716,983,698."

The ornithologist then gives a table showing in detail the yearly increase and the total number at the end of each year. He says that the sparrows "first invade the larger cities, then the smaller cities and towns, then the villages and hamlets, and finally the populous farming districts."

In 1886 the sparrow had established itself in thirty-five states and five territories. "In the United States the total area occupied at the close of the year 1886 is 885,000 square miles ; in Canada it is not quite 148,000 square miles ; in all, 1,033,000 square miles."

Dr. Merriam then goes on to make a number of important statements about the European sparrow, based upon official documents in his possession, and illustrated by numerous extracts from those documents. We shall give the general conclusions arrived at, but cannot in a notice such as this attempt to republish the evidence by which they are sustained. No doubt, however, Professor Lawson will be happy to allow any one interested to refer to the report at his office, in the provincial building. The first charge against the sparrow is that it is an enemy of our native birds. "Of all the native birds

which habitually make their homes near the abodes of man, the martin is the only species which is able to hold its own against the sparrows, and numerous instances are on record where even the martin has been beaten and forced to abandon its former nesting places by these belligerent aliens. It sometimes happens that the martin is killed outright."

"The birds which have suffered most from the English sparrow, and whose cheery presence in the parks and lawns in the nesting season we no longer, or only rarely enjoy, are the robin, catbird, bluebird, wren, song sparrow, chipping sparrow, yellow bird, oriole, vireo and phœbe. Not only does the sparrow drive away and sometimes kill the adult birds, but when it finds their nest it throws out the eggs and young, and not unfrequently feeds on them. Dr. B. Harry Warren, ornithologist of Pennsylvania, writes: 'Our native birds have rapidly and steadily diminished in numbers since the sparrows came. Former plentiful residents are rare. Even transient visitants and migrants have been so pursued by the usurper that they now seem to avoid West Chester as a plague-stricken spot. In 1877 I saw two cock-sparrows attack a nest of the warbling vireo in the absence of the parent birds, pull out one at the time the four half fledged occupants and drop them on the ground. After partly destroying the nest the sparrows alighted on the ground beside their victims, and, being reinforced by several of their kin, proceeded to enjoy the sanguinary repast.'"

The second accusation against the immigrant sparrow is that he is an enemy to the gardener and fruit grower.

"In addition to the indirect injury thus brought about by depriving our gardens and orchards of the protection afforded by our insectivorous birds, the sparrows cause a positive and direct loss to our agricultural industries, amounting in the aggregate to not less than several millions of dollars per annum. The damage done by the rice bird is limited to a single crop, and takes place during a few weeks in spring and fall, but the ravages of the English sparrow affect almost every crop produced by the farmer, fruit grower and truck gardener, and extend over the entire year. Indeed, it is safe to say that it now exerts a more marked effect upon the agricultural interests of this country than any other species of bird; and its unprecedented increase and spread, taken in connection with the extent of its ravages in

certain districts, may be regarded with grave apprehension. In the early spring it prevents the growth of a vast quantity of fruit by eating the germs from the fruit-buds of trees, bushes and vines, of which the peach, pear, plum, cherry, apple, apricot, currant and grape suffer most."

From the numerous communications referred to by Dr. Merriam, we shall cite only two. Mr. Norman A. Wood writes from Saline, Michigan: "They eat green peas as fast as they grow; also raspberries, blackberries and strawberries;" and Mr. F. M. Webster, of Lafayette, Indiana, writes: "The English sparrow is destroying my apples. I have two or three trees in my garden, and as soon as the fruit gets mellow the sparrows pick holes in it, and it either drops to the ground or decays on the trees. These birds are worse than all other apple pests combined. I can hardly get a single apple fit to eat; they have destroyed nearly, if not quite, three-fourths of them. A neighbor across the way is troubled in the same manner."

The sparrow is evidently in sympathy with the prohibition movement, being a pronounced enemy to grape culture. "The grape industry, which is one of rapidly increasing consequence in this country, encounters in the English Sparrow an enemy second only to the *phylloxera* and certain fungus growths. Already in some parts of the east it has become such a scourge that grape culture can no longer be carried on with profit, it being necessary to inclose the ripening clusters in bags to insure their protection."

The sparrow is also an enemy of the grain grower. We find the following language of Dr. Hoadley adopted as his own by the ornithologist:

"Annoying and injurious as the sparrow is to the fruit grower and vegetable gardener, the loss it inflicts on the producer of cereals is even greater. Though for its permanent residence it prefers populous localities and places of abundant traffic and commotion, still, in anticipation of the harvest season, it gathers in enormous flocks, and, leaving the cities and towns, moves off into the surrounding country to feed upon the ripening grain. Its consumption and waste of corn, wheat, rye, oats, barley and buckwheat, in many parts of the country, is enormous. It feeds upon the kernel when it is in the soft, milky state as well as when it has matured and hardened, and in fields of ripe grain it scatters upon the ground even more than it consumes.

Instances have been reported where in the place of a full or fair crop only the straw remained to be gathered.

Continuing he said: Whether indeed in the older seats of civilization the house sparrow is not decidedly injurious to the agriculturist and horticulturist has long been a matter of discussion, and no definite result that a fair judge can accept has yet been reached. It is freely admitted that the damage done to growing crops is often enormous, but as yet the service frequently rendered by the destruction of insect pests cannot be calculated. Both friends and foes of the house sparrow write as violent partizans,* and the truth will not be known until a series of experiments conducted by scientifically trained investigators, has been instituted, which, to the shame of numerous agricultural and horticultural societies, has not yet been done

It is quite likely that the result will be unfavorable to the house sparrow, from what has been said above as to its being so dependent on man for its subsistence; but, while the evil it does is so apparent, for instance, the damage to ripening grain crops, the extent of the counterbalancing benefit is quite uncertain, and from the nature of the case is often overlooked.

The house sparrow, (the Fringilla Domestica of Linnæus and Passer Domesticus of modern authors,) is far too well known to need any description of its appearance or habits, being found, whether in country or town, more attached to human dwellings than any other wild bird. Nay, more than that one may safely assert that it is not known to thrive anywhere far away from the habitations or works of men, extending its range in such countries as Northern Scandinavia and many parts of the Russian Empire, as new settlements are formed and land brought under cultivation. Thus questions arise as to whether it should not be considered a parasite throughout the greater portion of the area it now occupies and as to what may have been its native country. Moreover, of late years it has been inconsiderately

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* The most recent attacks upon it are contained in the various issues of the "Report of Observations of Injurious Insects and Common Crop Pests." annually made by Miss Eleanor Omerod, and in a little volume bearing the title of "The House Sparrow," published in 1885, and consisting chiefly of three essays by Mr. J. H. Gurney, Junr., Lieut.-Col. C. Russell and Professor Canes, but the last has only reference to the behaviour of the bird in the United States of America, where, for the reason above assigned, its presence was expected by almost all well informed persons to be detrimental.

introduced to several of the large towns of North America and to many of the British Colonies, in nearly all of which, as had been foreseen by ornithologists, it has multiplied to excess and has become an intolerable nuisance, being unrestrained by the natural checks which partly restrict its increase in Europe and Asia.

If it is decided to exterminate the English sparrow I think the work should be done as soon as possible, for two reasons: First, the work can be more easily accomplished now than it can after several years when they will be more numerous and cover a larger extent of country. Second, it has been clearly shown that the English sparrow drives away many of our most useful birds. Now, if they are allowed to increase and drive out the other birds and then we were to kill out the sparrow, we would be left without any protection whatever until the native birds should find it safe to return, during which time great damage might be done by insects.

MR. BISHOP then exhibited specimens of the English sparrow, which were examined with evident interest by many present.

SECRETARY STARR explained that Hon. Senator Power was unavoidably detained at Halifax, but had forwarded him extracts to be read on this subject, some of which had, however, been given by Mr. Bishop. He then read a letter on the other side of the question from Mr. J. M. Jones, which is as follows:

February 16, 1888.

C. R. H. STARR, ESQ.:

Dear Sir.—Your favor with enclosed programme to hand this day. You say, "What do you think of the proposal to exterminate the English sparrow?" I presume you mean in Nova Scotia.

Were Nova Scotia a wheat growing country I would certainly say that the bird ought not be allowed to increase, because that grain when ripened forms its principal food, *if it is to be had.* As Nova Scotia, however, cannot be considered a wheat growing country, I do not think the farmers have anything to fear from the sparrow.

It would probably prove more of a friend than a foe to the general fruit grower as it is a great devourer of caterpillars on trees, especially at the time its young have to be fed in the nest.

Is it not strange to think that the *good* a creature does is never taken into consideration when anything *bad* is found in its character. If the sparrow's daily life in summer time was carefully observed, and the whole of its food examined, I am fairly certain that the sum total would show a large balance in its favor. for in its crop would be found

many a caterpillar which, had it lived to become a perfect insect, would have been the parent of thousands of its kind.

It is true the bird is very prolific, and if destructive to farm or garden crops would certainly be difficult to eradicate if it got dispersed over the whole province; but if we may judge from the small increase that has taken place in the colony planted in Halifax now 12 years ago, I hardly think the Nova Scotia fruit growers need fear anything from this cheerful and familiar little bird, which courts more than any other the society of man.

According to my experience *in England* the sparrow rarely touches fruit if it can procure insects, grain, or other seeds.

Believe me, faithfully yours,

J. MATTHEW JONES.

It might be asked what was the object of discussing this question now. In reply he would state that he had heard a petition was about to be presented to the Local Government in favor of an enactment for the extermination of the English sparrow, as it is becoming a nuisance in the country. There is a difference of opinion on the subject, and it would be well were the matter now ventilated. It was at the suggestion of Professor Lawson that the subject was placed on the programme for discussion.

It should be borne in mind that the report read by Mr. Bishop was to the American Government, and perhaps some antagonism was shown the bird by reason of its parentage.

DR. YOUNG combatted the suggestion that the sparrow was disliked in the United States on account of its parentage, and argued strenously in favor of the bird, citing the improvements its presence had caused in Philadelphia, New York, and Washington, where formerly persons could not walk under the trees for fear of insects falling on them.

PROFESSOR SMITH argued strongly against the English sparrow, referring to the havoc it had caused in Western New York, the great complaint against it being that while it did not destroy injurious insect life it drove away the native birds who had formerly performed that duty.

PROFESSOR COLDWELL had come to the conclusion that the English sparrow was an enemy and ought to be discouraged in this country. A bird or any animal might be harmless in its own country and when transported to another be injurious, and he instanced the troubled caused in Australia nd other countries from

the importation of foreign animals, it having been found in such cases that the attempted cure was much worse than the original complaint. An easy method of destroying the sparrows was to take some cheap kind of grain and run it along a drill, say of some 20 or 30 feet long in the winter, then when the birds came to feed a person with a gun could kill probably from 40 to 50 at each shot. Again, these birds being fit for food and not considered by many bad eating, many persons might be profitably employed in their extermination.

Rev. Mr. Hart said: I should be sorry to see war declared against the stranger, but I think at the same time that the strong point against it is its driving away of our native birds. It is our duty to protect our native birds, and though we are taught to be kind to the stranger, I do not know that in so doing we should be unkind to our own country birds.

Mr. Bishop, who had been in the habit of making a study of bird habits for many years, testified to the war the English sparrow made on all other birds instancing several cases which had come under his personal notice, and he strenuously urged their extermination.

The President desired to hear from any gentleman who had suffered by the sparrow by reason of its destroying his fruit.

J. S. Dodd related his experience with the sparrow and a number of grape vines. He had noticed the sparrows amongst them at times, but had never noticed their depredations till all the grapes were gone, when he then concluded that they were unfeathered sparrows, but from subsequent observation he was led to firmly believe that the sparrow was the cause of his loss.

Rev. Mr. Hart then moved the following resolution: "That as this Association is at present informed in regard to the English sparrow, they are not ready to give any decision as to whether it is injurious to fruit growers or not."

W. H. Blanchard opposed the resolution and thought the best method of proceeding at present would be to let the matter drop without any formal expression of opinion.

Rev. Mr. Hart begged leave to withdraw motion.

The President concurred in the views of Mr. Blanchard.

T. H. PARKER thought all the evidence went against the sparrows, but yet expressed the view that sufficient was not known of their habits to pass a just verdict.

R. W. STARR had plenty of birds but no English sparrows; they were, however, coming towards the valley in numbers, and he was of opinion that native birds were preferable, and that the sparrow should be summarily dealt with.

PROFESSOR COLDWELL thought delay would be dangerous and urged that Mr. Bishop's views should be adopted, and an order for the extermination of the English sparrow issued.

W. H. BLANCHARD moved, seconded by T. H. Parker: "That in the opinion of this meeting they are not sufficiently informed as to whether the English sparrow is a friend or enemy of the farmer or fruit grower, yet they are of opinion that measures should be taken to prevent its increase."

SECRETARY STARR wished it to be understood that he had not, when reading the papers they had just heard, expressed his own views on the matter. Personally he knew nothing about the English sparrow, and was not therefore prepared to give an opinion.

DR. DAY had formed a decided opinion from what he had heard that the bird was a nuisance, and as an amendment would move the following:

"That it is the opinion of the members of this Association that the English sparrow is a nuisance and ought to be exterminated."

MR. KIMBALL seconded motion.

DR. BORDEN, M. P., desired to know if it was the intention of the government to pass a repressive measure if the resolution was to that effect.

SECRETARY STARR explained that he understood a petition was to be presented for that purpose, and it was desired to have all the information possible before any action was taken.

DR BORDEN, M. P., had no personal knowledge in the matter, and had heard but two gentlemen speak during the discussion from their own knowledge, and was of opinion that the resolution withdrawn was the best to adopt in the present state of their knowledge.

W. H. BLANCHARD said there were two counts in the indictment against the English sparrow, one that they destroyed or drove away the native birds, the other that they were destructive to fruit, &c., grown by the husbandman. They should try the bird on both, and if found guilty of either the order for extermination should issue. There having been no positive information as to its destruction of grain and fruit, yet such as had been given was sufficient to show its antagonism to native song birds that its growth ought not to be encouraged, and he would therefore withdraw his motion.

DR. DAY begged leave to amend his motion as follows:

"That from the information placed before this Association we are of opinion that the English sparrow is an enemy to the farmer and fruit grower, and that steps should be taken to check its increase.

This was seconded by MR. KIMBALL.

DR. BORDEN, M. P., moved in amendment:

"That in view of the want of inadequate information as to the effect of the bird upon the fruit growing industry in this district, it would be premature to pronounce any opinion thereon at present.

Seconded by MR. INNES.

MR. HALIBURTON having spoken in favor of the English sparrow, it was decided that the vote taken should be confined to members. The amendment was then put, when there appeared for 17, against 17, the president then gave his casting vote against the amendment.

The original motion was then put, when there appeared for 18, against 18, the president deciding not to vote the matter rested.

L. RAND, M. P. P., thought it was the duty of the Association to urge upon the members for the county the necessity for calling upon the local government to locate the experimental farm in Kings County and in connection with Acadia.

Some discussion arose as to the propriety of such a resolution being moved in such an assembly.

EVENING SESSION.

The Association met in the Assembly Hall, Acadia College, at half-past seven. There was quite a large attendance, and great interest was displayed in the proceedings.

The glee club of the college rendered two part songs very acceptably during the intermissions.

PROFESSOR KEIRSTEAD, who was received with cheers, then delivered the following address:

Mr. President, Ladies and Gentlemen:

I will not undertake to make any extended remarks this evening, for what I may say will be said impromptu. It is my pleasant duty to bid you welcome to the halls of Acadia College, and this I do most heartily on behalf of the authorities of this institution. We meet you as fellow-laborers. For while the strength of our work is given to mental discipline, one of the results of our work is greater practical power, the same object you have in view. We, with you, recognize the great importance of wealth to a country; we know well that considerable accumulations must be made before the higher institutions can flourish and the fulness of life for our people be secured. I will not attempt to lay down the principles of political economy, but this elementary proposition may be stated, viz, that the production of wealth will depend on the natural resources of the country, upon the capital in the country, and the amount of labor available; or as the old economists expressed it, land, labor, and capital.

Now in regard to the first of these, our resources, the newspapers are constantly assuring us, and the information given by government confirms them, that we have large resources within our own Dominion, and in our own Province, with mines and minerals, with our agricultural capabilities, we have materials for far more wealth than we can yet boast. How much larger a population our country is capable of supporting we may perhaps conjecture from noting some of the older countries of Europe. It may be doubted whether or not any of these countries ever has reached the limit fixed by natural resources, certainly we are a long way from that limit. In regard to our resources, I say our own country has much to boast of, but we need to get this conviction into the minds of the people in order that they may have

that eargerness of quest necessary to find those riches. As to your special work no effort is needed to produce this conviction, for you know, and are being informed over and over again, that you have special advantages for the production of fruit; that if you had your choice of the portion of the world you would select for that purpose, this valley would be the place you would choose. So in that respect *the resources are here.*

Then as to the second point, the capital needed. True we go abroad and borrow a large amount of capital, yet the annual statements of the banks show that no inconsiderable portion of capital is within our own country, young as that country is. And when you take into account the additional fact that the wealth of a country is always of recent production, a few years producing most of it, we see that important as capital is, the want of it may be largely overcome by the abundance of resources at command, and especially by the third source of wealth, the practical power of the people, the skill of the laborer, the executive organizing power of our populations. This then is the important point you have to consider, the intelligence, the power, that is in the people, the labor fund and its efficiency. We all know how largely the productions of the country depend upon the labor, upon the skill that is there, upon the muscle available, upon the organizing talent, in short upon the power of the people. If this be well developed that people can take advantage of natural resources; if it be absent, no matter how large those resources, there will be no production of wealth. We have learned men telling us that large portions of Asia Minor, Northern Africa, Egypt, and other eastern countries were once productive and fertile lands in a high state of civilization, but have now become barren, not because the material resources have failed, but because the *immaterial* sources, the intelligence, the morality, have failed. Professor Senior, formerly of Oxford University, tells us that Ireland is physically poor only because she is morally and intellectually poor, because she is morally and intellectually uneducated; and he asserts that if she should exchange her population for an equal number of people from the north of Great Britain they would quickly create the capital that is needed. In a word political economy declares that while knowledge is power, *it is far more certainly wealth.* Now for the attainment of this knowledge both the College and your Association may be said to be seeking;

your work is allied to ours. We have to discipline minds in every respect yet we are glad to know that our labor may in some measure assist you in yours. We have faith in education; we wish to extend it to all the people; this college has always held this doctrine. It is yours to show the value of education in its practical application to the uses of life; we both say, with the ancient philosopher, that man must live before he can live well. You are doing much by the simple fact that you call attention to this subject, and in due time your efforts will be apparent in the country.

The achievements of science are marvellous; we have great high priests of nature who interpret her secrets for us. But we need to use the results of scientific thought. Agassiz said he had not time to make money; that the practical man always stood ready to turn to account the discovery of the naturalist. But we can see enough around us to show that fundamental natural laws are not yet obeyed, and that much scientific truth is not yet applied to industrial uses. This you are trying to remedy, success to you in it, for your sake and ours, and that of our country.

As to the Model Farm, I may say that I hope the natural and predominating claims of this part of the province, enforced by judicious advocacy, will result in its being located in this vicinity. If a number of faithful teachers in the department of agriculture should be sent among us they would be cordially welcomed by the authorities and our constituency as we would welcome a number of earnest men who came to teach a sound theology. This would be the spirit of large faith in the potency and breadth of educational work, and something like Carlyle's view when he said: "be honored two men but no third,—one of these being the man who with sweat of brow draws from the earth bread for man's body, the other the man who with toil of brain and heart draws from God's word the bread of life for man's soul."

The SECRETARY read letters of regret at not being able to be present from the Lieut-Governor, the Provincial Secretary and others, and a telegram from Hon. J. W. Longley, Attorney General.

T. H. Parker moved, seconded by R. W. Starr that,

Whereas, this Association has learned with much pleasure that the Local Government contemplates, at an early date, the establishment of a Model Farm for the province;

Therefore Resolved, that we recognize in this action of the government an important factor in furthering the aims and objects of this association, and trust that, in the selection of a site for such farm, the conditions for successful fruit growing will not be overlooked.

Which, on being put to the members of the Fruit Growers' Association, was carried unanimously.

W. D. DIMOCK, B. A., Truro, N. S., then read the following paper, which was ordered to be printed in the annual record, and a hearty vote of thanks was also tendered to the writer:

THE FARMER AT THE COLONIAL AND INDIAN EXHIBITION.

Mr. President, Gentlemen of the Fruit Growers' Association, Ladies and Gentlemen:

An apology is certainly due to the general public that has gathered here to-night to listen to the closing exercises of this the twenty-fourth annual meeting of the Fruit Growers' Association, for the paper that I am about to read. These pages were originally prepared for a Farmer's Institute in another part of the province, and I was informed by the active Secretary of this Association that he thought they would be of interest to the Fruit Growers—the most of whom probably are farmers, too—that at this time would be in session in their annual meeting. I therefore have to regret that time has not permitted me to make the paper of more general interest, and one that would have had "less of shop" in its details, but I can assure you, that, until too late to amend or change, I thought the reading was to be given to the Fruit Growers alone. Let this be my apology for coming before the general public on this occasion with such a subject as "*The Farmer* at the Colonial and Indian Exhibitition."

I might say further that I was only too willing to assist the Fruit Growers of this part of our province at least, in any way possible. There was a feeling in my breast of letting by-gones be by-gones, and of a willingness to offer any remedial measures in my power for youthful indiscretions committed in and around many of the bounteous orchards of this pretty town and vicinity. There was a time in the recollection, too, of many here to-night, when the momentous questions that stirred the Wolfville Fruit Growers, and brought them together in their deliberative wisdom, were not for learned debates upon "Hints to Fruit Growers," "the Growing of Orchards," "the Conditions of success in Agriculture," "the Dietetic value of Fruit," "the Importance

of Nitrogen to Plant Life and our means of obtaining it," nor "Nova Scotia Pomology," but the all-absorbing topic was, how to preserve apples, pears and plums from the midnight inroads and devastation of Collegians and Academicians from the neighboring "Hill." In those days of the pleasant but peculiar past the Savants among the happy possessors of orchards had no time to meet and bewail in concert the destruction wrought by the codlin moth, the canker worm, and the pestiferous apple borer, and to devise for the preservation of their fruit such simple remedies as to spray their trees with Pyrethrum powder or Paris green—no, more bold and daring enemies of their fruit were too often around, more effective engines of protection must be employed—ah those were the exciting times of the deadly spring gun, the ragged-jawed steel-trap and the fiercely-vicious watch dog! Ladies and gentlemen, I speak whereof I know, and, like the pious but boastful Trojan Æneas, *quorum pars magna fui!* "Old times have changed, old manners gone," and the descendants of the Nearys, DeWolfes, Rands, Morses, Johnstons and Browns of twenty years ago, whose wide-extending fruit areas caused them many a sleepless vigil, without doubt in these latter days are undisturbed in their pomological possessions by the gentlemanly students who annually come to drink deep at "Acadia's" Pierian Spring!

Conning over the past, however unprepared, I felt it my duty to respond to the call of the Secretary of the Fruit Growers' Association to "come over and help us," and thus show that I, at least, cherished no hard feelings against those who so deftly and ingeniously set guns and traps for my youthful, but wayward feet.

I regret also, Ladies and Gentlemen, that I cannot take you with me to-night through all the Courts, Annexes and Compounds of the "Colonial and Indian Exhibition of 1886," and dwell for a time upon the fruits of British pluck, endurance and industry that were everywhere around us. The "British Empire" that was used as a mere geographical expression, and that we all were wont to talk so glibly of, was proved by this great exhibition to be a real and substantial thing, and the world realized to some extent, outside of the region of poetry, the magnitude of an empire upon which the sun never sets.

I would like to take you with me through the great buildings ablaze with electric light; up and down the gardens lighted by 10,000 glow lamps of 10 candle power each; into the Tea Pavilions fragrant

with the richest productions of India and Ceylon; around the great galleries of the Royal Albert Hall hung with the finest art productions of India, Canada, New Zealand and Malta; adown the great courts adorned with the most precious of the precious silks, tapestry and gems of the Indies; out among the diamond-washers of the Cape of Good Hope; through the compound, where during almost the whole time of the exhibition were quartered from India 3 Punjabees, 19 Hindus, 15 Mahommedans, 6 Bombay and Madrasee boys, 7 Cingalese and 4 Malays; from South Africa a Kaffir priest, wife, son, daughter and little babe in one hut, a Bushman with his wife and baby in another, a couple of stalwart Zulu men, and others—making a most remarkable gathering of human beings, maintaining their own manners, customs and peculiar religious rites, as far as possible, and all during the beneficent sovereignty of Britain's beloved Queen—and then a run through "Old London," as it was called, in the centre of the grounds and opposite the gorgeous Indian palace, where could be seen a good bit of the city of London as it existed before the Great Fire of 1666—here are old fashioned statues in niches of William the Norman, Alfred the Great, the Earl of Mercia and others—one house is where Isaak Walton, *vir et piscator optimus*, lived from 1627 to 1644, in another, with the bold carvings of Elizabeth's time, the gunpowder conspirators met,—in this one Oliver Cromwell lodged when parliamentary duties called him to London—there is the gateway of the famous Priory of the Holy Trinity founded by Matilda, Queen of Henry I., and here is Grub Street immortalized by Pope,—but we must leave all these and thousands of other interesting sights and attractions on all sides, and come to the consideration of the paper we have started with,

THE FARMER AT THE COLONIAL AND INDIAN EXHIBITION.

Before such a practical body of men as farmers, and at this stage of perfection to which we have arrived in the noble pursuit of tilling the soil, and when granaries on every side are bursting with "whatsoever has been swept from the Libyan threshing-floors," there need be no time lost in inquiring the object and utility of the World's Great Exhibitions that have been held in different countries and at different times. Those of us who have in any way been connected with Agricultural and Industrial Exhibitions, even of the smallest dimensions, know full well that our farming population have ever been

ready to assist in making such Fairs or Expositions great successes. From the first Exhibition ever held in this province, opened in the adjoining town of Windsor, its population being 243, on May 1st, 1765, with a Prize List reading in such primitive language as "for whoever bringeth to the said Exhibition the greatest number of neat cattle, 1st prize—3 yards of English broad cloth; for whoever bringeth the greatest number of horses—1st prize—a saddle and a bridle; for the best 12 lbs of butter, 6 yards of ribbon," and so forth, down to the most elaborate and the latest of our Provincial or Dominion Exhibitions, we find that our agricultural classes have ever been alive to the benefits that, we believe, are to be derived from these friendly competitions. Manufacturers, and others once were too indifferent to these exhibitions, and oftentimes only with much persuasion were they induced to come forward and exhibit the products of their skilled labor. They have told us that the game is not worth the candle, and that there is only financial loss accruing to those who follow up the great expense necessarily attendant upon the frequent exhibiting at our Annual Fairs. Of late years our farmers, alive to their own interests, by their activity and eagerness to embrace the advantages that great exhibitions must bring in their train, have roused up our manufacturing classes to such an extent, that sometimes there is almost danger of the Agricultural Department, even in Agricultural Exhibitions, being made subordinate to the thousand and one products that the ceaseless-working genius of the manufacturer is constantly throwing upon the markets of the world. This danger is more apparent and more to be feared when we find the locality chosen for such an exposition is in some great manufacturing centre, or in some densely populated city, the inhabitants of which, as sight-seekers, are more apt to be interested in the innumerable and complicated wares of the skilled artisan than in the more modest and unpretentious produce that farm, garden or dairy might supply. The farmer has really taught the manufacturer the importance of frequently bringing the result of his skill before the public for their inspection; and the question now comes, is the farmer in this friendly race being out-run by the industrial classes, and does the agriculturist take a less prominent place in the World's Great Exhibitions than his rapidly, rushing, noisy brother—the manufacturer? Are the attractions, especially of our International Fairs that cause tens of thousands to pass the turn-stiles daily, all to be attributed to the many and varied

arts of the mechanic, or do our farmers ever advancing to greater perfection in their honorable and dignified vocation, also largely contribute, not only to the practical but to the ornamental, pleasing and beautiful, that go to make up a grand whole—a magnificent picture—that, for months together, is the attraction of gazing millions?

For a little time follow me through the different courts of one of the most unique and most successful exhibitions in modern times, with me hurriedly watch the *rôle* played there by those who till the soil, and then decide whether or not the farmer held his own in such a wonderful world's competition as the late Colonial and Indian Exhibition. It is to be regretted that our time is limited and that our visit through all these acres of buildings, filled with the representative riches of the richest empire in the world, must be very hurried, and we can but glance at what, to be intelligently appreciated and understood, we should spend days in carefully examining, inspecting in detail, and in studying in all their different and interesting phases.

The mania, we might almost call it, for International Exhibitions is now world-wide; and the inspiration for these dignified competitions in the arts of peace has been drawn almost entirely from the noble example given to the world, when, in 1851, Albert the Good—the lamented consort of our Jubilee Queen—devised, planned and brought to a successful close the Great Exhibition that for over four months was open in the Crystal Palace, Hyde Park, London, and that was attended by 6,170,000 visitors from all parts of the earth. Since that time almost all the nations of Europe have held great International Exhibitions, and our cousins over the border have followed suit with their monster centennial in 1876. The cities of London, Edinburgh, Dublin, Paris, Vienna, Moscow, Copenhagen, Berlin, Antwerp, and others have been the favored centres of Great Exhibitions—while Barcelona in Spain, Glasgow, and Melbourne in Victoria are friendly competitors this year ('88)—and no one can estimate the beneficial results—the civilizing, humanizing and refining effects—of these international exchange of courtesies and these meetings in friendly competition in all the arts of what go to make men feel their common humanity, and to say, (as old Terence sang more than a hundred years before the Christian era), "I am a man, and nothing that relates to man is foreign to my sympathy."

Carrying out the generous idea of his noble father, our Prince of Wales determined upon a series of Great Exhibitions that have just

been successfully closed. The first was the International Fish Exhibition, called the "Fisheries," in 1883, and attended by 2,703,051; the Health Exhibition, known as the "Healtheries," in 1884, with an attendance of 4,153,390; the Exhibition of Inventions, or the "Inventories," in 1885, with 3,760,581, and in 1886 the Colonial and Indian Exhibition, known as the "Colindries," the greatest of all the four, open only to the Colonies of Great Britain, and which was visited by 5,550,745 persons from all quarters of the globe. The eagerness with which the Colonies rushed to London to take part in this last Exhibition and its magnitude, may be judged when I give the list of the different possessions of the Crown that were represented at this late family gathering. These were the Empire of India, the Dominion of Canada, New South Wales, Victoria, South Australia, New Zealand, Fiji Islands, Cape of Good Hope, Natal, St. Helena, Ascension, Tristau da Cunha, Group of Islands, Ceylon, Mauritius, Straits Settlements, Hong Kong, British Borneo, British Guiana, Jamaica, Trinidad, Barbados, Windward Islands, Leward Islands, British Honduras, Bahamas, Sierra Leone, Gambia, Gold Coast, Lagos, Malta, Cyprus, Falkland Isles, &c., &c., &c.,—representing an area of over 9,000,000 of square miles, and with a population of 300,000,000. It was fitting indeed that such a world's representative and widely-extending family should be called together in the great city of London—the world's "political, moral, physical, intellectual, literary and commercial centre,"—in that great city of so many millions of people that a New York, a Boston, a Philadelphia, a Washington, a Chicago, a Toronto, a Quebec, and two or three Montreals piled together, do not equal it in population—in that city where a child is born every five minutes, and somebody dies every eight minutes—a city that increases at the rate of about 42,000 persons every year—that covers 78,000 acres, has 10,000 streets, lanes and courts over 30,000 miles in length—a city in which there are more Jews than there are in Palestine, more Irishmen than there are in Dublin, more Scotchmen than there are in Edinburgh, and more Roman Catholics than there are in Rome! In such a city was it that the greatest national family gathering that the world has ever seen or heard of, took place in 1886, and at that grand reunion it is our place now for a little time to inquire, how the great back-bone of our Empire —our modest farming population—fared?

Omitting the consideration of many products of the soil that were to be seen at this Exhibition, and that really are the result of the husbandman's labors, such as tea, coffee, cocoa, sugar-cane, tobacco, rice, cotton, &c., we will only give attention to the various products of the farm that we in this climate are more conversant with, and which may be called our staple products. Here we will take a look around among the handsomely decorated courts and annexes of these very extensive buildings, and ascertain how the farmer stands in his exhibit, of *Meat and Dairy Produce, Grain, Roots and Vegetables, Fruits, Wool, Flax, and Agricultural machinery ;* and we will carefully inquire, too, if the exhibits of the agriculturist, favorably compared, or not, with those of the manufacturer, the inventor, the artist, the sculptor, the fisherman, the hunter and the host more of exhibitors that jostled against you on every side at this Great Intercolonial Exhibition.

All must understand that this Exhibition was carried on by a Royal Commission appointed by Her Majesty the Queen, and of which H. R. H. the Prince of Wales was the Executive President The Exhibition was confined entirely to the Colonies of Great Britain and the Indian Empire, both British and Foreign exhibitors being excluded. The object of the Exhibition was to bring out publicly the vast strides in every department, and the great progress that had been made in various parts of the Empire, so that a thorough knowledge of the vast fields for enterprise and trade throughout the British Dominions might be obtained. It was to be the exponent of the unequalled Victorian age of prosperity, and was to show to the astonished nations at large, the magnitude, resources and strength of the greatest Empire since our world began.

In connection with this Exhibition the promoters had established a colonial market, where during the whole show from the opening day till the close, were exposed for sale the meats, fish, cheese, butter, vegetables, fruits, honey, wines and other products of the farm, garden and dairy sent from Britain's most remote colonial possessions. The mutton from New Zealand and Australia was side by side with Canadian hams and bacon. Our magnificent fruit and honey vied with all the delicacies of more tropical climes. All these were sold at most reasonable prices to the thousands crowding the stalls daily, and many Englishmen for the first time gazed upon and tasted the unrivalled

products of Britain's colonial dependencies. New supplies were coming in every week, and Canada, India and Australia were drawn upon to keep up the stock that so heavy a demand required. In this busy market place, situated in a convenient part of these Great Exhibition Grounds, the farmer seemed to reign supreme. The results of his toil were on every side, and were eagerly sought by those visiting the Exhibition. Soon the reputation of this market went abroad, and thousands came crowding in, inquiring for the colonial market—the place where Canadian apples, cheese and honey or Australian mutton and beef were sold.

Let us see what the colonial farmers had to tempt the fastidious taste of the 34,000 Englishmen, who every day visited the Colonial and Indian Exhibition, in the matter of *Meat and Dairy Products.*

Canada had no such large exhibit of fresh meat as had Australia or New Zealand. Our meat trade with the mother country, on account of the shortness of the sea voyage, of course almost entirely consists in live stock, yet the well-cured sides of excellent bacon, and our fine hams were considered first class. This colony was especially prominent in tinned meats of all kinds and in great variety. Here were exhibited canned poultry, beef and mutton. The boneless turkey and chicken in tins and the essences of beef—especially Johnston's fluid beef—were greatly prized, and it seemed almost impossible to get enough to satisfy the crowds that constantly pressed around these stalls. The "prime mess beef" from British Columbia was too salt to suit the English taste, and was considered only fit to be used on ship board. The dairy produce of the Dominion was exceedingly well shown. The supply was almost unlimited, so much so that when the special expert reporter came around he wrote in his report, "the Canadian dairy products in the Exhibition and Colonial market varied so much from week to week that it was difficult to know how and when to describe them." Our cheese was there in great quantities (one weighing nearly 900 lbs), and was pronounced excellent. A ready sale was found for it, and now Canadian cheese does not sell as heretofore in the English market as "American." Even before the Exhibition had closed grocers in different parts of London had the word "Canadian" attached to their best foreign cheese. The judges found considerable fault with much of our butter —even that from the Ontario creameries—and stated that there did

not " seem the same uniformity of quality, or the same evidence of careful manufacture which was exhibited in the cheese." The cheese sold for 6d per lb, and the butter brought 1/ per lb. Five hundred boxes of Ont., Stilton cheese were sent from some 40 factories, and some 250 tubs of creamery butter. The condensed milk from the Truro Condensed Milk and Canning Co. was much prized, and were it possible to put it in the English market as cheap as its much inferior competitor—the Swiss Condensed Milk—it would command the largest and best markets.

New Zealand at one time, during the Exhibition, had 100,000 carcases of mutton in London brought over the ocean in refrigerators. The colonial market at the Exhibition was kept supplied with it. The prices were from 6d. (12c.) to 5½d. per lb by the carcase. This country had also an exhibition of prime joints of beef that retailed at 7½d. per lb,—though the beef does not seem to stand the severe freezing process as well as the mutton. Hams, bacon, tinned meats (including the most delicate sheep and ox tongues), ox-tail soups and cheese were also always to be found in the New Zealand stalls of the colonial market.

The Australian colonies in the dead-meat line were as attractive as any in the market, and the stalls were invariably kept well filled. Mutton, beef (fresh and salted), hams, barrels of salt pork, beef and pork sausages, tinned rabbit, preserved meats and soups, butter, cheese, &c., &c., were in great abundance. Almost every produce of the farm and dairy away from the distant Australian colonies, was every day presented before the people who crowded into this popular department of the Colonial Exhibition ; and the farmers in the colonies would have felt well-repaid for the trouble and expense of sending such farm produce to this Exhibition, if they could have seen the crowds that daily inspected their exhibits, and could have heard the complimentary remarks that were generally passed thereon. During the Exhibition one cargo of 29,000 carcases of mutton, the largest single cargo ever delivered in London, arrived from the Faulkland Islands. The mutton trade with Australia and New Zealand is immense—the Melbourne Refrigerating Company alone shipping to London 100,000 frozen sheep per annum.

The colonies of Great Britain are largely becoming the source of Britain's food supply. Mr. D. Tallerman, who was superintendent of

the colonial market at the Exhibition, in his address to the London Working Men's Association, says: "that we may, within the limits of the British Empire, obtain such addition to the home supplies, as to be entirely free from reliance on foreign sources of food." Major Craigie, in his paper on the "Home, Foreign and Colonial Meat Supply," writes; "within the rule of the united British Empire there is therefore stock enough and land enough to secure plentiful supplies of meat without drawing on any foreign nations whatever."

But we must hurry on and find out how our farmers stood at the Colonial and Indian Exhibition in the matter of a proper representation of the great cereal production of the colonies of the Empire. Without any doubt the great feature of this part of the exhibition was the grain trophy or agricultural trophy erected in the Canadian court. This magnificent trophy clearly exhibiting what a race of farmers the Canadians are, was described in the most lavish terms of praise by most all the London newspapers. Its beautiful and artistic proportions were engraved and graced the columns of both the *Illustrated News* and the *Graphic*. To the general public there may not be much that is attractive or interesting in a lot of neat grain bags arranged in rows, or in bottles with samples of corn or other seeds piled up shelf after shelf, but in this Canadian agricultural trophy there was that artistic taste displayed in its construction, and in the arrangement of sheaves of wheat, barrels and bags of grain, with other farm produce, and neat farming implements everywhere interspersed, and with the lower part and pedestal completely surrounded with glass jars of our choicest fruits, that the whole was most striking, and, in every detail, was so perfect, that the trophy was invariably voted the most practical and most handsome in the whole exhibition.

Almost every exhibit on this great stand was the result of the toil of the farmer, and for six months it was a speaking advertisement of the perfection of his art in this Canada of ours. Every Province of the Dominion was thoroughly represented in the great variety of our grain products. On the trophy, in sheaf or in bulk, (in bag or bottle,) were numerous specimens of black oats, white oats, wheat, rye, barley, corn, fodder corn, buckwheat, wild rice, rye grass seed, flax seed, beans, peas, hops, &c. &c. The variety, quantity, and quality of grains from Ontario, and the Province of Manitoba, and the North West Territory were simple startling, and from day to day the products of some of

the finest grain lands in the world were the admiration of many thousands. Samples would daily be asked for and carried to all parts of Great Britain and Ireland to be experimented with in a new soil and under different climatic conditions. It was well shown by our grain exhibit that Canadian farmers were alive to their own profession and away in the front rank as agriculturists, in their tilling of the soil, sowing of the seed, reaping and harvesting.

New South Wales had numerous specimens of wheat, barley, oats, maize, millet, &c. The principal sorts of wheat were White Lammeras, White Tuscan and Red Lammeras. The largest yield given was 49 bushels per acre, and the highest weight 68½ lbs. per bushel. New South Wales does not raise enough grain for its own consumption, the average yield of wheat is but 15 bushels per acre, of barley and oats 20 bushels per acre, and of maize 30 bushels per acre.

Victoria, like all the Australian colonies, suffers from want of moisture, and very expensive systems of irrigation have to be employed. It had exhibits similar to New South Wales. The wheats were all very fine and of heavy weights. Maize was shown from an acre that produced 150 bushels.

New Zealand had fine specimens of grain, together with a collection of soils with carefully prepared analyses accompanying them—this latter was very instructive, and was much studied by those who took an interest in the grain-producing qualities of different soils. Wheat, oats, barley, beans and peas were on exhibition. Such wheat as "White Tuscan," 50 bushels per acre; "Velvet Chaff," 60 bushels per acre; "Purple Straw Tuscan," 50 bushels per acre; and "Hunter's Red," 65 bushels per acre were shown. The barley was "Carter's Prolific" and "English," yielding 63 and 60 bushels respectively per acre. Among the oats from this colony was a variety called "Canadian" with stalks upwards of 7 feet high, and yielding on reclaimed swamp, "without manure," 60 bushels per acre. A variety of grass shown was "Italian Rye Grass," which measured 9 ft. 4 in. in height.

The Cape of Good Hope, Natal, Ceylon, Cyprus and other colonies exhibited wheat and other grains in a great variety.

Mr. W. Proctor Baker, a special commissioner appointed to report upon the exhibit of grain at the Colonial Exhibition, gives Canada her full meed of praise for her exhibit and her apparently inexhaustible wheat-producing capabilities, and by a carefully prepared tabular

statement he shows that the cost of raising, in different places, one-quarter of wheat. (8 bushels, 480 lbs.,) and landing the same in the London market to be as follows ; from Canada, 30/ per quarter ; from South Australia, 39/; from Victoria, 32/ ; from India, only a fair wheat, 31/ 6d. ; and the cost of growing the same in England is 34/. The price of wheat at the time the statement was made was 33/ per quarter, thus leaving a margin of 3/ per quarter for the Canadian exporter, while the other colonies, except Victoria, would export at a loss.

In the exhibit of roots and vegetables it was not expected that the colonies would make a large show, both on account of the long ocean carriage and from the lack of any very large market for such farm produce in Great Britain from foreign countries. Yet at different times, from the Dominion at least, quite creditable quantities of roots and vegetables were sent over. Some specimens of mangolds and carrots were monsters, and were just as ugly as they were big. A marked difference was seen between the roots and vegetables prepared for exhibition purposes in England and the ungainly looking specimens that came away from distant British Columbia. At English exhibitions roots are carefully cleaned and washed and trimmed, and a big mangold with half a dozen horn like roots would be a monstrosity that would not be looked at, if allowed at all on exhibition. From Canada there were turnips, potatoes, mangolds, beets, carrots, parsnips, celery, tomatoes, onions and cauliflowers in small quantities. The evaporated vegetables of S. G. Kerr & Sons, Canning, N. S., were highly prized.

One curious collection was 30 different kinds of potatoes in glass jars in a preservative fluid, shown by Mr. S. H. Craig, of Truro, N. S.. Mr. Craig had raised most of these from the potato ball, as they showed different qualities from year to year he got lost for names, so he sent them on to the Colonial and Indian Exhibition, naming ten varieties after the ten lost tribes of Israel, two after the two tribes of Judah, another twelve varieties after the twelve apostles, and the remaining six varieties after members of his own family. The root and vegetable exhibit from other colonies was almost entirely a preserved exhibit and was not large.

Taking next our fruits we find a fine exhibit from many of the colonies. Very few departments were more attractive in the exhibi-

tion than that containing our fresh and preserved fruits. Canada was especially well represented, not only in the number and ability of those in charge of this department, but in the manner in which the exhibit was put before the public. The gentleman in charge of this department from Nova Scotia, Mr. C. R. H. Starr, of Port Williams, was ever on the alert to have the best that could be obtained from this for the daily sales in the colonial market, and, at the same time, was watching the different exibitions all over the country and sending there, as far as possible, specimens of our fruits. Canadian fruit was never so well advertised before. It invariably received a good name, sometimes bore off the highest prizes where allowed to compete, and the fruit trade from this country to-day must feel the good effects of the splendid advertisement it had at the Colonial Exhibition in 1886. We had on exhibition from Canada, apples, pears, plums, quinces, peaches, grapes, crab-apples, gooseberries, strawberries, currants, raspberries, cranberries, blueberries, &c., &c. Late keeping apples from the season of 1885 were shown at the opening of the exhibition in '86, and the early varieties of the season of '86 were shipped over, some in refrigerators, and arrived in fairly good condition. The special exhibition of Canadian apples held in the Conservatory of the Royal Horticultural Society in October attracted much attention. Our English friends especially seem to prize the Newtown Pippin, according to the opinion of the fruit expert, probably on account of its fine qualities as a late dessert fruit. I think Mr. Starr will agree with me that the experiment of packing fruit in infusorial earth was not as satisfactory as anticipated. Mr. D. Morris, M. A., F. L. S., a special commissioner on the Colonial fruit exhibit, says in his report of the Canadian fruit: "now that the merits of late keeping Canadian apples are better known, there is no doubt that the demand for them will steadily increase. At present, owing to the roundabout way of reaching the consumer, a barrel, (three bushels,) of apples, which in Canada is worth about 5/ or 6/, is sold in England at something like 25/ or 28/ per barrel. Hence the greater part of the profit, at the present goes to the middlemen." If Canadians would only club together and establish a proper commercial agency in London for the reception and sale of not only fruit, but a host more of our natural products, this plunder of the middlemen will be a thing of the past, and the producer will deal almost directly with the consumer with greatly increased advantage to both.

New South Wales exhibited oranges, (these arrived in London in June, July and August, when no fruit of this kind from the Mediterranean is in the market and hence they command good prices,) lemons, quinces, guavas, apples, apricots, peaches, nectarines, plums, figs, and melons, most of these were in a preserved state.

Victoria had an abundance of its finest fruit, the apple. This colony, together with South Australia, Queensland and Western Australia, had a very good display of apricots, cherries, figs, grapes, melons, peaches, persimmons, plums, raspberries, strawberries producing three crops in a year, pears, pine apples, bananas and olives.

New Zealand had lots of apples, pears, quinces, lemons, limes, walnuts, strawberries, cherries and other fruits similar to Australia. Some 30 consignments of fresh fruit were received from this very distant colony, and the fruit arrived and was opened in the exhibition ground in better condition than that of most other countries. The manner of packing was peculiar and certainly served well to preserve the fruit. "The apples were packed in cases of pine with no holes for ventilation. Each apple was wrapped in tissue paper and tightly packed in chaff from 1½ to 2 inches apart, at the nearest point. On opening the case from 10 to 13 per cent. only were found unfit for use, the rest of them being in perfect condition and still retaining their bloom. One small barrel had been packed for nearly 12 weeks when it was opened, and only 14 per cent. of the contents were found to be damaged." The best specimens of these apples sold readily at from 6d. to 1/ each.

The colonies of Fiji, Cape of Good Hope, Natal, Ceylon, Mauritius, Straits Settlement, British Guiana, Jamaica, Bahamas, British Honduras, Cyprus, Trinidad, Grenada, Tobago, St. Lucia, Dominica, Antigua, Montserrat, and Barbadoes had a most tempting display of rich tropical fruits that are indigenous to these countries. There were pine apples, oranges, limes, melons, cocoanuts, citrons, tamarinds, granadillas, nutmegs, shaddocks, custard apples, sapodillas, bread fruit, forbidden fruit, jack fruit, mangos, penguins, tomatoes, guavas, pomegranates, hazel nuts, almonds, and a thousand and one others, showing that the husbandman and vine dresser away in these tropical climes were well represented at this exhibition by the natural products of their labor and toil.

Prominent again, in some courts, does this omni-present farmer at this exhibition show himself in the magnificent and rich display of

wools. In this line of exhibits the Dominion of Canada almost completely failed. From the whole of our great country, when the exhibition opened on May 4th, there was not one fleece nor one sample of unmanufactured wool on exhibition. The agents had done all they could to get samples but had failed, whether it was fear of comparison and contrast with the Indian and Australian wools, or what, the fact was there; the sheep raisers of the Dominion, a country that at the last census, 1881, owned 3,048,678 sheep, or 4,050,000 from a return to the Department of Agriculture last year, 1886, were entirely in this respect unrepresented. Mr. F. H. Bowman, D. Sc., F. R. S., Edin., F. L. S., F. C. S., F. R. M. S., President of the Society of Dyers and Colourists, who was appointed by the Royal Commissioners to report upon the colonial wools at the exhibition, this man with nearly half the alphabet after his name, when he came around to inspect the wool exhibit from this Dominion, was compelled to sit down and sadly write for the edification of his royal master; "although the general display of products from Canada was, as might be expected from the size and importance of the Dominion, the largest in the exhibition, it is singular that up to the end of August there was not a single example of raw wool. The woollen manufactures of Canada were largely represented, and the exhibits were of excellent quality in every respect, but the large sheep rearing industry was totally unrepresented, except by tinned mutton." A few fleeces were at last obtained from Manitoba, and Dr. Bowman reported upon them as follows: No. 1 "was a fair specimen of a Leicester wether, with medium quality in fineness and length of staple, but with less lustre than usual in English wool of this character." No. 2, "was taken from a Southdown shearling, and was of medium quality also. The regularity in the length was good, but the staple was only of average quality, and not so fine in the fibre as usually seen in this class of sheep."

But if Canada failed in this particular line of exhibits the great Empire of India and the Australian Colonies and New Zealand were present with a most wonderful, rich and magnificent display. From India there were 23 different samples from the coarsest goat's hair down to the finest wool of the Thibetan shawl-goat. The Australian colonies though had the most magnificent exhibition of wools, and it formed one of the most admired features of the whole exposition.

The beautiful rich fleeces, almost without number, were shown very conveniently in long, flat, glass covered cases down the center of the courts, or in sets of upright cases along the sides. Here were shown fleeces of the finest wool-producing sheep in the world. The Australian merino fleeces were especially beautiful, one ewe's fleece was 14 lbs. in weight and a ram's fleece was marked 20 lbs. One sheep raiser in 1885 had sheared 54,000 sheep, and the average weight of each fleece for this great number was 9 lbs 12½ oz. Another had fleeces from 120,000 sheep with an average of 7 lbs. 10 oz. per fleece. Hosts of exhibitors had sheep runs of 20,000, 30,000, 40,000, and 50,000 animals. Some idea may be gained of the immense trade in wool from these colonies when it is noted that in 1884 New South Wales exported 174,000,000 lbs.; Victoria in 1882 about 52,000,000 lbs.; Queensland 42,000,000 lbs,; and Western Australia, 6,000,000 lbs. New Zealand, the Cape of Good Hope, Natal and Tasmania had also splendid specimens of as fine wools and hairs as are found in any part of the world.

The flax exhibit was only fair in either quality or quantity. It was considered by all well informed on this subject that flax growing in Canada could be made one of the most lucrative pursuits of the people. An authority, who had been inspecting a flax dressing machine in Belfast, said that he put some of the Canadian straw through the process and the yield was fully 25 per cent. and the straw and fibre of excellent quality. "The impression created in Belfast is such as to lead us," the flax expert judge said, "to anticipate a large trade with Canada in flax." In 1880 the value of the flax imported into England from the flax growing centres of the continent was £3,500,000, and there is no reason why Canada with its unrivalled agricultural capabilities should not supply Great Britain with a large part of her annual importation.

We now come to consider a feature of the Colonial and Indian Exhibition that perhaps, more than any other, proclaimed to the world at large the advanced condition and healthy estate of Colonial, especially Canadian farmers, and that was the grand display of the most modern agricultural machinery yet known. This immense exhibit was almost entirely in the Canadian courts, and the most of it was in rapidly running motion for ten hours of the day. There certainly was no part of the whole exhibition so attractive nor so

much visited as the Canadian Machinery Hall. The noise was almost deafening, but from morning till night thousands hung around the iron railing that enclosed this vast mass of machinery, watching with interest the smoothly running machines and asking questions from the numerous attendants that were ever ready to impart every information in their power. Nothing showed to the British public the advanced condition of Canadian farmers as well as the many agricultural implements that everywhere filled this great hall, either in motion or at rest. They were not only open volumes, that "he who runs might read" of the skill and inventive genius of the Canadian manufacturers, but also pages of commendation and praise on the advanced social position, the healthy estate, and the shrewd intelligence of the great body of Canadian tillers of the soil that use such modern labor saving machines in their every day work on the farm, and the demand for which is increasing from year to year. In this vast hall were on exhibition steam and other threshers, reaping machines, harvesters, self-binders, mowing machines, hay tedders, horse rakes, farming mills, upright hay pressers, broad cast screws, lawn mowers, hay and stubble rakes, scythes, cultivators, harrows, jointer ploughs, riding single ploughs, turf and stubble ploughs, one-horse ploughs, sulky "gang" ploughs, breaker ploughs, cross-furrow ploughs, ditching ploughs, fodder cutters, seed separators, feed grinders, post hole diggers, turbine water wheels, forks, hoes, and, in fact, every labor-saving machine that we use on our farms in Canada to-day. Time will not permit me to tell of the successful trials of many of these machines against those of British manufacture in different parts of the country during the summer. Now to speak of the many and profitable sales that were effected by the manufacturers, or their agents. Let it suffice to say that in this department of this exhibition the farmer was pre eminently to the front, and proved to the visiting thousands that old and obsolete ideas of farming, and the use of cumbersome and almost antediluvean agricultural implements and labor-saving machines in the tillage of the soil were things of the past, in this Dominion of Canada at least.

We have now very hurriedly glanced at some of the most important departments of the late Colonial and Indian Exhibition, and we certainly have found the farmer the ruling genius in them all. Take from this great exhibition, where it might seem that the humble products of the field and garden might be overlooked, the part enacted there by the colonial farmers, and we have but a meagre show

left. In no great exhibitions in modern times have the tillers of our soil come more willingly to the fore, and made a better representation than in the exhibition of 1886. The colonies of the empire especially encouraged every step taken by their agricultural population to make a creditable display in London. All were anxious to show the crowded, teeming, hungry masses of the motherland where an abundance of a cheap food supply could be obtained, and that we had hundreds of thousands of fertile acres awaiting the arrival of the tiller from the over-crowded centres of population of the old world. We were anxious to advertise our wares, and, for this Dominion, in no more effectual way could it have been done, than by the prompt and ready response of our Canadian farmers, who, at considerable trouble and expense, sent so complete a representative exhibit to the Colonial and Indian Exhibition.

This exhibition has done much good to our own country. Our tide of immigration has increased, and indications are that an unusual number of people seeking homes in our young Dominion will arrive during the present year. We have improved and enlarged our markets. The British people now know much of the nature of the food products that we have for sale. If we will only cater in the conservative manner that suits old John Bull, and if we can learn to put on his table just what he wants and all dished up in his own peculiar style, we have an unlimited market for our great surplus food supplies in this country.

To bring prominently before this fastidious Englishman the magnificent food products of our colonies occasional dinners would be given during the Colonial Exhibition, the menu consisting of dishes served up from the food products that were on exhibition, and we would tempt John Bull's epicurean taste with such a bill of fare as the following :—

SATURDAY, OCTOBER 30, 1886.

BILL OF FARE.

SOUP.

Queensland Turtle Soup.

FISH.

Salmon from British Columbia, with Piquante Sauce.
Shad from Prince Edward's Island, Stuffed.
Mackerel from New Brunswick, Stuffed.

Boneless Cod from Nova Scotia, Stewed with Potatoes, etc.
Croquettes of Preserved Salmon from Columbia River.
Preserved Lobster from Nova Scotia, Curried.
Fresh White Fish from Lake Huron, with Cream Sauce.
Fresh Trout from Lake Huron, Grilled.
Fresh Pickerel from Lake Huron.
Australian Rabbit, Stewed, with Onion Sauce.
Mutton Ducks, with Apple Sauce.
Roast Beef from Australia.

VEGETABLES.

Canadian Haricot Beans, Potatoes, Cabbage.

SWEETS.

Fiji Arrowroot Pudding.
Canadian Farina Puddings. Black Cap Pudding.
Tartlets and Pastry from Canadian Flour.
Canadian Apple Jelly.

DESSERT.

Pine Apples in Syrup from Singapore.
Victorian Pears in Syrup. Canadian Apples, Pears, &c., &c.
Victorian White Cherries in Syrup.
Canadian Cheese and Butter.
Australian Wines, from Victoria, South Australia, and New South Wales
Indian Tea and Coffee.
Western Australian and Canadian Honey.

A most admirable paper on "Markets" was read two weeks ago by one of the most intelligent farmers of Colchester County, before the Farmer's Institute, in which the author most clearly placed before all some of the requisites necessary before our farmers can approach the best markets and demand almost their own prices. We must put ourselves in the position of having the best products that can be thrown upon the market, and then there is not the least doubt of their profitable and ready sale. It will not do to sit back and regret that this or that market is not open to us. It is only by taking a firm hold of the advantages we have, that we, in any undertaking, will achieve success. The markets in the adjoining Republic, in much of our farm produce are not open to us, and even if as free as the air

of Heaven to our farmers, would be of but limited and periodical advantage. The United States is a farm product producing people. We are the same. The United States seek the large markets of the food-consuming nations of the old world. We must do the same. Nova Scotia apples, Maritime Province and even Scotch potatoes this year find unusually remunerative markets in the Atlantic cities of the Republic, because in many places in that country these crops have more or less failed the farmer this year. At the very best the markets of our Yankee cousins over the way are uncertain for us, and hence unreliable.

But we have a market only one week's sail from our doors that is wide open to us and is unlimited, and it largely rests with the farmers themselves whether or not they take advantage of the enormous trade in food products that our motherland holds out. There are difficulties in the way of getting immediately and profitably at this great market, but these difficulties are not insurmountable. We must first endeavor to supply exactly what the great markets of England demand, and we must put our wares upon these markets in the way that will suit the millions of consumers that we are catering for. It is almost impossible to force any product upon such a market, say, as London. We must, if necessary, educate the taste of London's millions of food-consumers for any food-product that we are desirous of selling, that is not already well known there. If we would be successful caterers in the great British markets we must study intelligently the nature of the demand and must cater to that taste accordingly.

Again, we must have more direct communication with the consumer. The middle man is the curse of our international trade. The profits on our shipments to-day to the markets of Great Britain, I care not whether the products of our farm, forest or seas, go largely into the hands of the middle men. The question comes with practical force, how can our farmers and other shippers from this country, from this Dominion, handle their own goods on the other side and thus deal almost directly with the consumer? The only solution of the difficulty I can see, and which I believe is thoroughly practicable, is to establish a mammoth Canadian co-operative agency, and to have men on both sides of the Atlantic financially interested in it. I know men in London to-day who are willing to assist in such a scheme to the extent of between five and ten thousand pounds, but they want farmers and others on this side to take hold of the matter with them.

Most suitable buildings with splendid wharf accommodations can be obtained in one of the best sites on the Thames for a rental of £2000 per annum. Salaried officials, with no commissions, can be obtained both here and in London, who can easily manage such a business, receive the products from this side, throw them immediately upon the best markets, and the whole transacted in such a way as to be almost entirely independent of the middle man, who, to-day, let him be ever so honest, someway manages to pocket the cream of the profits of every article sold by him on account of shippers on this side. Such a project as this, I believe, can be successfully carried out, and it only wants some of the live, pushing farmers in Canada to take hold of the scheme and success is assured. This agency could handle every variety of Canadian goods that there should be a demand for in Britain, though food products would command the best markets and could be handled with the most profit.

Since writing the above I find such a scheme for the disposal of the surplus food products of the United States is now seriously contemplated. Late dispatches have the following :—

BIG COMMERCIAL SCHEME.

WASHINGTON, January 31.—The *Republican* says information has been received here in regard to a gigantic Anglo-American commercial scheme in which several American millionaries, including Jay Gould, the Rothchilds, the Duke of Devonshire, the Duke of Westminster and others, are said to be concerned. It has been ascertained that the promoters propose to erect granaries, warehouses, pork curing establishments, and cheese and butter factories on sites convenient to several great lines of railroads leading into Chicago. All kinds of American produce, such as flour, bacon, cheese, butter, and fruits of every description as well as live stock are to be carried to Chicago, and thence by the Baltimore and Ohio railroad to New York. A bridge will be built connecting the mainland with Staten Island, where large docks will be constructed by a syndicate of capitalists from New York. Products of the United States will be carried by steamers specially built for the company and landed at Barrow-in-Furness, of which the Duke of Devonshire will be the principal proprietor, besides being president of the Furness railway at Barrow. The company propose to build a building alongside the docks abattoirs for slaughtering cattle immediately after landing; also tanneries for

preparing hides, and factories for making margerine out of tallow. Large warehouses will also be erected at Barrow, and thence food products will be distributed throughout Great Britain by means of retail stores which will be opened in all leading towns in order to supply consumers direct without any middlemen's charges. The capital to be invested in this enterprise will amount, it is said, to many million dollars. Already agents have been sent to this country to make necessary arrangements to commence operations in the spring."

An instance or two will shew the margin there is for splendid profits on food products that may be shipped to England. In January and February fresh salmon bring in the London markets from 1/6 to2/9 per. lb That fish can be landed away from distant British Columbia in London for from 7d. to 9d. per lb. A gentleman in Ontario, who has more money invested in the lake and river fisheries than any person else in Canada, during the past summer has built immense ice-houses and refrigerators in British Columbia. These he has filled with fresh salmon, and which he intends shipping in refrigerators direct to the London market, and which he says he can place there at a cost of, as stated, between 14 and 18 cents per lb., ready sale for which he expects at 30 to 70 cents per lb. This great trade he would doubtless throw into such a co-operative agency, as I have outlined, if once started. One example more—fresh eels, a food almost despised here, quoted in the London market at from £70 to £80 per ton. They can be carried over the ocean, at the highest figures, for £1 per ton. A refrigerator can be built in any country town for from $200 to $500, according to capacity, its freight, cost of ice and attendance on the voyage will not cost more than £3 per ton, the return freight of empty refrigerator will be 15/ per ton, so a handsome profit, not including cost of refrigerator, of at least £50—$240, can be made on even a five ton shipment. Other instances of the opportunities of profitable shipments to the great London market could be given but time will not permit. Our farmers and others have the making of a magnificent trade with the great markets of the mother land in their own hands. By paying attention to the apparently simple matters referred to, by producing just what we find the biggest markets demand, by working with a will and cheerfulness that has ever characterized the Canadian farmer, by feeling that we are part of a young and rising nationality whose inheritance we intend to sell to

no foreign state for a mere mess of pottage, and by the exercise of the powers of an intelligence that a great Creator has given us to adapt ourselves to the circumstances of our surrounding, we will become happy, successful and prosperous, and worthy citizens of the premier colony of the greatest nation on earth.

The following address was then delivered and was listened to with marked attention :

ADDRESS BY PROFESSOR G. LAWSON, PHD., LLD.

Mr. Chairman, Ladies and Gentlemen :

I can assure you that I have no varied bill of fare to offer, such as has been served to you within the last half hour. The tempting delicacies which our friend has brought before you were also, many of them, of a very substantial kind, and I feel as if there were nothing left after this intellectual feast, that will be attractive enough to present to you. What I have to say must be done briefly, for it is already late, and I must not prolong the meeting as there may be other business to transact.

I have read the proceedings of your meetings for successive years. I attended some of them, at all times with pleasure and profit. The great object of this Association has been, and is, to develop the fruit growing power of this country, and as an earnest of your work we can see around us on all sides great and profitable orchards, yet I may be pardoned for saying that there are some things in connection with the business which seem to have been overlooked. Now one point in regard to orchard culture that I thought it might be well to bring before the Association, especially the younger members of it, the young men who are growing up and whose lives, or the larger portion of them, will probably be spent in the orchard, is to show that there is something of interest in orchard culture, and an interest in agriculture and in every department of it beyond the mere making of money and the lusciousness of fine fruit. The fact is that agriculture, including orchard culture as a part of it, is one of the most intellectual of employments, I should say, that can be conceived, and one to which a large amount of scientific knowledge may be very profitably applied, not merely for the purpose of making of money, but in giving to the cultivation of the orchard and the management of the farm an interest to the farmer and the orchardist in all the various operations which

they must necessarily perform. People should not be applying themselves all the time trying to make money, they have other objects, yet all should ever find a pleasure in doing all we put our hand to. There have been, of late years, a great many interesting discoveries in connection with the growing of plants that ought to lead cultivators, especially all young people, to study the subject more freely than before, and I wish to explain to you the nature of some of those discoveries, and what exact bearing they have upon this subject of growing apples and of transporting apples.

For the last forty or fifty years—I may extend the period perhaps —the knowledge of the mere structure of plants or their anatomy has not advanced very much. But, as regards the true nature of the plant, what it is made of, the way in which the various tissues are developed, their relation to each other, and their functions,—in these subjects immense advances have been, and are now being daily made. Those things have not been taught in our schools until of late years, and comparatively few persons knew about them ; but of late years distinct enquiry has been taken up in regard to plants, and this has led to what is called the new botany, a thing which is very much misunderstood. Now what is the nature of those discoveries in regard to plants, and what relation have they to fruit culture ?

The old anatomists were contented to see a great deal of beauty in the mere structure of a plant, the skeleton, as it were. Of what does a plant consist ? It consists of what are called tissues, webs, fabrics, like cloth. Now plants are all made up of these tissues, which consist of little cells or bags interspersed with small tubes arranged in various ways, a most complicated arrangement. If you take the one-hundredth part of an inch of leaf and examine it under the microscope you will find a great variety of those minute structures. Now all this was known very well to the old anatomists, but they were content to know there was great beauty in the structure of plants, and to describe a great many different kinds of those little cells or tissues, and certain kinds of tubes that had certain forms and were arranged in certain ways, and that the whole went to make up a stalk or leaf, a fruit or part of the stem, or that the whole plant was made up of those tissues ; but there is something far more important than this to be known, that is the old anatomists did not know much of the matter and indeed it is only recently we have known very much about it. What is the use of all those little cells? If we look upon a

plant as a machine it consists, as we have seen, of a great many little things, minute things which we cannot see except under the microscope. Having it then under the glass we examine it to see what it is like, whether there are any marks on it, whether there are any holes in it, whether it has lining and so on. These questions or the like are put. How is this matter formed? Where did it come from? It is now in the plant, it was not always there, how was it produced in the plant? Let us see! Well it was not produced there without a purpose. What is the use of it? Is it of any use to the plant? It must be of some use or it would not be there. Let us find out its use. There is a little sack or cell and this we examine and see how big it is, we tear it open and see what is in it, we look and see if it has any lining, we watch to see if it undergoes any change in the growth of the plant, and we say, well, this little cell was produced in some way. We watch it to see what it does. We find branching tubes also, filled with a particular juice. We want to know their use. A great many of those tissues, as they are called then, are contained in the plant, the whole plant is made up of these and they must be of use; what is the use of them? In fact if we knew the use of those things we would know the whole secret of plant growth, and one great benefit of such study is that it enables the cultivator to recognize as living, moving beings all the trees and plants around him. Imagine a man planting even one tree or one plant in his garden.' It becomes a matter of consequence to him, and not in a mere monetary point of view, but in many other ways. He is constantly watching that tree or plant, he sees that it is continually growing, that it is not a dead thing, like a machine which moves only when acted upon. He sees it is a living thing, that it is just as active as any of the animals on the farm, that it is in perpetual motion, that if there is a circulation of blood in our bodies going on constantly, and that there are motions in our muscles, so it is with the tree, it is continually in motion, it is never at rest, that it has, in common with ourselves, motion.

A plant, like an animal, has a sort of skeleton. All the various tissues of the plant are divided into classes. First there are these tubes, fibres, you have examples of these when the flax plant is taken and beaten up so that the bark is removed you have an example of fibrous tissues. These consist of what? Threads. They are not ordinary threads, but they have threads running through them. If you take a number of straws and put them together then you have a

number of tubes like the tubes of plants, some are closed at the end, some open, some are called sieve tubes, others have a kind of beard, others again have lining and are thick and hard; some have spiral fibres running through them like a corkscrew but much more delicate, yes and infinitely more delicate than the spider's web.

You recollect what an apple leaf is like. There is a little stalk by which it is attached to the tree and this stalk seems to be projected into the leaf and it runs away up towards the tip, but there are branches growing off it like the branches of a tree. All this we call the skeleton of the leaf. You see a decayed leaf in the ditch and it gets skeletonized, the network has worn away and it consists of what? Those tubular, fibrous tissues; they give strength to the body of the plant just as our bones. What is the use of our bones? To form a framework for the attachment of the various other parts, and we have an internal framework just like the plant. The framework is necessary for the plant, if of any size. It begins at the root and extends up through the stem and up into every leaf. What is a plant then? It simply consists of this framework with other tissues spread over it. Into the structure of the stem and root I would enter to-night but it would take too much time to do so, and I must therefore confine myself to one or two points. The framework consists of those fibres, but those fibres are a large extent inert like our bones. We do not see any great change in them, but in the other parts we see constant changes going on. Now if we take one of the soft cells of a plant and examine it what do we find? A little bag which if examined under the most powerful of microscopes may not reveal any holes and yet water passes through it, this power it has in common with animal cells. We find certain things inside the cell, for instance, a remarkable substance which is called a protoplasm. What has that to do with apple trees? What is protoplasm? If there is anything connected with a plant that is abused it is this protoplasm. You will find references to it in all kinds of literature, and people have become afraid of the word. I wish I could explain how simple a matter of mere fact it is. It consists of mere mucus or granular matter. If a cell is active it contains this granular matter, of what it is we know but little. We know it has no definite chemical composition, that it is a mixture, and protoplasm is simply a name given to a combination of things in the cell, and this particular thing has forms of motion. I

have said that a living plant is always in motion. I do not mean that it travels, but that in every actual living cell there is motion going on. How does the plant grow ! The index of the growth of the plant is given by the movements of protoplasm. What are the movements of it?

Some of you may have seen on the seashore some simple animals, consisting of soft masses like pieces of flesh, they spread out and contract themselves and undergo various modifications of form. Now the protoplasm spreads itself out and draws itself in and is continually moving about in this way, and in this protoplasm there are little clear spaces formed. How are cells formed ! How is the tissue formed in the plant? By a change in the protoplasm when these clear spaces are formed and new cells are thus produced in the old, that is, cells within cells are formed, and thus one leaf or other part of the plant grows or extends. We have these new cells produced and ever go on increasing. Then arises the question : How does the plant feed? These cells contain besides the protoplasm other materials which are capable of changing from one state to another, which give rise to the tissues. What is contained in the tissues? The body of a plant is a living body, and the tissue of the plant takes up from soil and air dead matter. It is in the plant cell alone that dead matter can be changed into organized living substance. It is the plant that produces this material even for the sustenance of the animal. Where does this plant get its food? From the soil. If we burn a plant there is a small portion of ash left, that is all the plant takes from the soil. How has that been taken by the plant? It is only taken up in water, it is absorbed into it by the root, not at the tips of the root, that is the growing point, but at the other part and further back. It was formerly thought that the tips absorbed the moisture, but recent enquiry has found that they do not absorb. Then the matter held in solution in the soil is taken up, but how is this solution conveyed to the other parts of the plant? It would be of no use to the root so it passes up through this beautiful system of tubes. These capillary tubes are exceedingly minute and the water passes up through these from the soil and ultimately it gets to the leaves, carrying with it the potash and phosphates from the soil. What takes place in the leaves? The leaf of the plant is made up of those little cells, just like the other parts of the plant, and they are arranged in a very particular

way. The plant has a skin just as we have, going over it in all its parts, and this skin also covers the leaves on their upper and under surfaces. If you examine a leaf you will find it is thicker and harder on the upper surface than on the under surface, it is fine and glossy on the upper surface and hairy on the under surface. It is more delicate on the under surface. What is the meaning of that? Is that of any use to the plant? How is it caused? We find there are different kinds of cells giving those different appearances, not only different appearances but also different uses. The use of the varnishing of the upper surface is to prevent too rapid evaporation when the sun is shining above, that protects it. On the under surface there is a thinner epidermis as the evaporation would be less. I use that term evaporation, for although we have another term, transposition, the former better expresses the process that is carried on. On the under side the water passes out, and there are little breathing mouths that open and shut. What is the use of these? They are to allow the gas to pass out and in, that the plant needs, carbonic acid gas is obtained from the air, and oxygen expelled. What takes place when the gas comes? The water comes up from the soil bringing with it potash and phosphates and various other things, and these openings take in carbonic acid gas, with what result? A new material is produced in the leaf and fresh leaves are being continually formed, as can be seen if you examine any plant in your window. Does the protoplasm do it? There must be first the chlorophyll granules in the leaf, the material which gives it its green color, a certain number of cells in the leaf contain this green coloring material, and that when the carbonic acid and water are brought in contact with the chlorophyll they change into the organized materials of the plant, sugar, starch, gum, and substances like these, and this change can only take place when green leaves are on the plant, and are acted upon by the rays of light. Why is it that plants are green? Is that an idle question? They are green not only to make them beautiful, but because this green substance is the one which when acted upon by heat and light produces this sugar, starch, gum, &c., which are largely required by the plant, and upon which the existence of the animal creation depends. In order to produce these a certain amount of potash is required by the plant and beside potash, chlorine, otherwise there would be no healthy growth. This then, the leaf tissue, is the most important of all the tissues of the plant, as upon its

growth so much depends, but all are equally important in one sense. The starch and sugar are there as the materials that the plant is to make its tissues out of, and those tissues when made, have the power of forming new cells. They may be divided into two sets or kinds, those that have particular functions or work to do, and those that produce new cells.

Now take the apple tree. In the stem of the tree you have a number of tubes passing up which do not increase, they are there for the purpose of allowing the sap to pass up outside the woody circle, and between that and the bark there are cells which have the power of forming new cells, and as long as they are there and the plant is drawing up nourishment from the root or by its leaves, a new circle of wood will be formed every year. Now the cells are only at this point and your success in grafting depends upon the uniting of the graft to the wood, upon the bringing of these active cells into contact. Cells then are devoted to different purposes. In the case of the fruit of the apple we have what? The material of the apple is not *produced* in the apple itself, but in *the leaf*, and in proportion to the leaf surface is the capacity for forming this organic matter, consisting, as I have said, of starch, sugar, also acids giving flavor to the apple. The fruit is in fact but a storehouse for this organic material.

Now there is one point in which the protoplasm is of very great importance, or rather, as I should say a knowledge of its character is of very great importance to the fruit grower. Take the question of the transport and preservation of apples, and the one lesson I wish to inculcate to-night is that in dealing with the tree and with the apple we are dealing with something alive, a living being, with something we should treat as we would a living animal and not dead matter; it is in an *active* state, it is undergoing *change*. What does that depend on? Can we make the change slower or hasten it? We all know we can. What is the cause of it? If you take apples or pears and put them into a hot room they ripen and decay sooner than if kept in a cool place. What is the reason? It is the protoplasm that explains all this. If we notice the movements of the protoplasm in the cell of any part of a plant we will see it producing certain effects, we will see how it acts and is acted upon by heat, light, electricity, &c. Take an apple tree, see this material in the cell, this protoplasm, let the seed of the plant

ripen, what takes place? If the seed or a grain of wheat is dried so much that all the superfluous moisture goes out, then the protoplasm goes to rest, but when the moisture is restored the protoplasm is aroused and activity begins again. The protoplasm is in every cell and its activity depends upon moisture and upon certain temperature, a certain heat, the lower the temperature the less active the protoplasm, if you keep the temperature near freezing, for example, the protoplasm will not move or only move, so slightly that little change will take place. Roots and fruits can be kept over all winter and summer too till the following winter, if, by lowness of temperature, the protoplasm is kept at rest. If you freeze the apple then you destroy the protoplasm, it will bear a little frost under certain circumstances, but if the temperature is kept low you stay its action. In preserving fruit and grains it is done by what? By drying. Why do they not decay when dried? Because the protoplasm is dried up, it is not active, wet a dried apple and the protoplasm becomes active and must cause either growth or decay. I have only began to enter upon the subject. If I had plenty of time I would like to have said a great deal more, but at this late hour it would not be possible to treat this great subject in an adequate manner. In conclusion he called upon the young men present to take advantage of science so far as it is applied to agriculture; and then resumed his seat amid applause.

A vote of thanks having been given to Professor Lawson and suitably acknowledged, the meeting dispersed, having first sang "God save the Queen."

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