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TWENTY-EIGHTH ANNUAL REPORT
OF THE
FRUIT-GROWERS' ASSOCIATION
OF ONTARIO.

1896.

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO.



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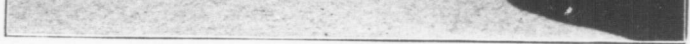
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W. E. WELLINGTON, ESQ., TORONTO.
PRESIDENT FRUIT GROWERS' ASSOCIATION OF ONTARIO, 1897.





H. L. HUTT, B.S.A.

[HORTICULTURIST AT THE ONTARIO AGRICULTURAL COLLEGE, GUELPH.

FRUIT

To the Honor

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GRIMSBY, Dec

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TWENTY-EIGHTH ANNUAL REPORT

OF THE

FRUIT GROWERS' ASSOCIATION OF ONTARIO.

To the Honorable John Dryden, Minister of Agriculture :

SIR,—I have the honor to present the Twenty-eighth Annual Report of the Fruit Growers' Association of Ontario. The meeting at Kingston, reported herein, was one of the most profitable in the history of our Association, and we believe it will mark a step forward in the fruit growing industry.

I have the honor to be, Sir,

Your obedient servant,

L. WOOLVERTON,

Secretary.

GRIMSBY, December, 1896.

OFFICERS FOR 1897.

PRESIDENT—W. E. Wellington, Toronto.

VICE-PRESIDENT—W. M. Orr, Fruitland.

SECRETARY-TREASURER AND EDITOR—L. Woolverton, M. A., Grimsby.

DIRECTORS.

Division No. 1	.....	Harold Jones, Maitland.
Division No. 2	.....	R. B. Whyte, Ottawa.
Division No. 3	.....	George Nicol, Cataraqui.
Division No. 4	.....	W. Boulter, Picton.
Division No. 5	.....	Thomas Beall, Lindsay.
Division No. 6	.....	R. L. Huggard, Whitby.
Division No. 7	.....	M. Pettit, Winona.
Division No. 8	.....	A. M. Smith, St. Catharines.
Division No. 9	.....	J. S. Scarff, Woodstock.
Division No. 10	.....	John Stewart, Benmiller.
Division No. 11	.....	T. H. Race, Mitchell.
Division No. 12	.....	Alexander McNeill, Windsor.
Division No. 13	.....	G. C. Caaton, Craighurst.

AUDITORS—A. H. Pettit, Grimsby ; George Fisher, Burlington.

COMMITTEES.

Tariff—W. E. Wellington, M. Pettit, W. M. Orr.

Cold Storage and Transportation—L. Woolverton, W. M. Orr, G. E. Fisher, A. H. Pettit, E. D. Smith.

New Fruits—John Craig, H. L. Hutt, L. Woolverton.

Finance—W. M. Orr, A. M. Smith, M. Pettit.

Executive and Program—W. E. Wellington, W. M. Orr, L. Woolverton.

Delegate to Quebec Pomological Society—R. B. Whyte, Ottawa.

Representatives on Boards—*Western Fair*, T. H. Race, Mitchell ; *Toronto Fair*, W. E. Wellington, A. H. Pettit ; *Central Fair*, R. B. Whyte, Ottawa.

FRUIT GROWERS' ASSOCIATION OF ONTARIO.

ANNUAL MEETING.

The annual meeting was held at Kingston, Wednesday, December 2, in the Dairy School lecture hall, the first session opening at two o'clock p.m.

The president, M. PETTIT, of Winona, expressed pleasure at seeing so many present at the opening session, which promised a good meeting, and called upon

The secretary, Mr. L. WOOLVERTON, who read a telegram from Mr. Alf. Brown, Picton, regretting his inability to be present and read his paper; from Mr. Holtermann, of Brantford, calling the attention of the Association to breach of the law forbidding spraying fruit trees while in blossom by some fruit growers. Referring to the latter, the secretary stated that this Association is fully in accord with the Bee Keepers' Association on this matter, and will use its influence in endeavoring to prevent any transgression of the law on the part of the members throughout the Province.

The secretary also read telegram from the Minister of Agriculture for the Dominion stating that he would be present on Wednesday afternoon and deliver an address; also from the same, suggesting that the Association should discuss what tariff changes are desirable; also from Mr. Lockie, of Waterloo, inviting the Association to meet in that town next year; also letters of regret from Prof. Taft, Mr. Rice and Mr. Watkins of Michigan, regretting inability to be present; also invitation from St. Catharines to hold convention there next year; also from Whitby, inviting the Association there in 1897.

The secretary read the regrets of Mr. Anthony Copp, of Hamilton, at his inability to be present. The secretary stated that Mr. Copp and Senator Sanford were ardent advocates of the establishment of a station in London, England, for Canadian fruit. The secretary, the president, and some other of the fruit growers in the district near Hamilton had the honor of putting up some boxes of choice fruit for Her Majesty Queen Victoria, some of which, as mentioned in the newspapers, had appeared on Her Majesty's table. It was thought that this would be a good means of bringing Canadian fruit prominently before the English public. A letter received from the Dominion Department of Agriculture has been received stating that the award for the exhibit of horticultural literature at the World's Fair had been received, consisting of a medal and diploma. The judges considered our exhibit of literature unique, and such as was not exhibited by any other horticultural society. This diploma is not an ordinary one, as it has engrossed upon it the reasons why our exhibit was considered meritorious, as follows: "This exhibit consists of a complete set of the reports of the Ontario Fruit Growers' Association, and it is of a very high order of merit. It illustrates the extensive and progressive work of a wonderfully successful organization."

MR. THOS. BEALL suggested that all our medals should be exhibited at the annual meetings, so that the public might see what the Association had received in time past.

THE SECRETARY: We have a set of medals received at the Centennial, and medals received at the Massachusetts Horticultural Society and other places. We shall endeavor to show them at the next meeting.

THE PRESIDENT'S ADDRESS.

BY MURRAY PETTIT, WINONA, ONTARIO.

Again we are permitted to meet and extend to each one that friendly greeting we owe to each other as horticulturists. All are interested in one common and grand industry, that of horticulture in all its various branches, an association less selfish than any other association, having only as our object the benefit of mankind, the building up of the Province in which we live, and the health and wealth of its people; for health is wealth. What association is to-day laboring more earnestly for this than the society of which you and I have the honor to be members, by encouraging the growing of fruits, flowers and vegetables, and ever advocating the doctrine that every land-owner in this Province, no matter how small, can have a fruit, flower and vegetable garden, thereby bringing health and happiness to his family? What is more elevating to humanity than the outgrowth of our industry? What more advances the wealth of our Province than the work in which we are engaged? What to-day has placed our beloved Province more in advance of the other provinces than the fact that fruit growing has become a success in all her borders, largely through the work of this Association?

Now that every home in our land can be fully and cheaply supplied with fruit, and an abundance for export, should we not turn our attention more fully and earnestly to better means of transportation and development of markets? The abundant crop and low prices of the past season warn us of the danger of over-production. When we consider the fact that hundreds, if not thousands, of acres are yet to come into bearing, this is a question of great importance to the fruit growers of the Province of Ontario. Apple culture has engaged the attention of our association, at their annual meetings, for the last thirty years, new varieties continually claiming our attention, but it would appear to me that the time has fully come when the question of transportation and the development of new markets should engage our careful consideration. While we claim to be a progressive association, and welcome the advent of new additions to the already large list of choice varieties, we might now leave their development to our fruit experiment stations, where their true value, hardiness, productiveness, and quality, as well as their adaptability as to locality and soil, might be fully tested, and not, in our ambition to secure a mine of wealth in some new and untried variety, forget that almost millions of barrels are being produced now of exceedingly fine quality, the value of which might be enormously increased could we place them upon the markets of the world in proper condition and at reasonable cost. Thousands upon thousands of barrels this year are scarcely bringing freight and commission charges in the British market, and we ask ourselves can it be possible that after subsidizing railways and steamships for the transportation of our products we are now called upon to pay the total value of the product to these companies to carry them to their destination, or does the fault lie at the other end? That part of the transaction we do not see. Reports as to the prospects that reach us are very encouraging, but returns are most discouraging. Much fault is laid at the door of the packer, but this I cannot endorse as being general. We have before us to-day an object lesson, and one we might carefully study for our future guidance. Large quantities of choice apples wasted in the orchards. "Why?" Because of doubt and uncertainty in regard to the system of marketing on the other side, and, to add to the doubt, the increase in freight rates, which are usually made when the quantity to go forward is large. Let us analyse the matter as it has stood with many a shipper this season. Freight from, say Toronto to Liverpool, \$1.07½ per bbl. by the car load; insurance, say 3c per bbl.; cable charges, 1c per bbl.; receiving, delivering, and sale expenses, etc., 18c per bbl.; commission, 5 per cent., this year, on selling price of say 8s. per bbl., 10c, and he has the respectable sum of \$1.40 against him. Now, out of the small balance of 52c in his favor, there is one barrel to pay for, 28c; picking, 10c; packing, 10c; cartage, well, we will only charge half what they do on the other side, because we can do it ourselves, 5c, and we will throw in small items, such as nails, postage, telegrams, stationery, etc., for the sake of doing business with those large receiving firms in the Old Country, always remembering the

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special injunction to "put in only the *choicest specimens*," otherwise the slightest neglect in this regard would bring discredit upon Canadian apple growers! We want a change in the present system, and you, gentlemen, fruit growers of Ontario, will need to solve the problem. Slack, wet and wasty are convenient terms too frequently applied, unless the product is towed across like a raft behind a scow. We see in the public press and from high authority in the land that cold storage facilities for the transportation of our fruit products will be put in proper shape before the next season's crop. I sincerely hope such will be the case. But one additional link will then be necessary to make the chain perfect and establish confidence with the producer—the establishment of a depot for the handling of Canadian fruit, and by one who has some knowledge and experience in Canadian fruit culture. This I consider all important, and his return to this country at the close of the season to report to the fruit growers the conditions that exist and the possibilities of trade in the future. At present all is uncertainty and doubt. "Distance lends enchantment to the view," but when we pause and reflect that our big English brother is to-day revelling in choice Canadian apples at cost of freight and commission, or less, it does not inspire the Canadian apple grower with much respect for the present system of handling the product. Up to November 30th the quantity gone forward from this continent was about 1,000,000 barrels, or about two quarts for each family living in the market boundaries to which they have been shipped, while in Canada the probable consumption would reach one bushel or more per family, which shows an almost unlimited market under proper conditions.

Spraying experiments were again conducted by the Department of Agriculture during the past year, and we expect valuable information from the report on this work. Now, it has been practically demonstrated to the fruit growers that spraying with Bordeaux mixture is an effective remedy for all fungus diseases. We think a careful system of experiments should be conducted, either in a similar way or by the Fruit Experiment Stations, for destroying the Codling Moth. Great improvements have been made by the manufacturers of spraying outfits, and in answer to the numerous enquiries continually being made as to which spray pump is the most suitable for general use, the Board of Control of the Fruit Experiment Stations of Ontario decided to invite a public trial of spray pumps, which was held last April, at Grimsby. Eleven pumps were exhibited, each being required to use one barrel of the Bordeaux mixture. The pumps and their work was judged by H. L. Hutt and your President on a scale of points as follows:

1. Ease of operation.
2. Evenness of distribution.
3. Compactness of style.
4. Durability.
5. Power.
6. Agitator.
7. Accessories.

The judges, in their award, class the pumps in three groups; group one standing as follows:

Spramotor, London, Ontario.

Eclipse, Benton Harbor, Michigan.

Anderson, Aylmer Iron Works.

Pomona, Seneca Falls, New York.

Medals and diplomas have been received, awarded on fruit at the World's Columbian Exhibition to districts and societies in different parts of Ontario. At the suggestion of the Honorable Minister of Agriculture, Mr. Dryden, these awards will be placed on exhibition and kept in the Parliament Buildings, Toronto, showing the great achievements of the fruit growers of Ontario. This arrangement we consider much better than having them buried in the private houses of the presidents and secretaries of the different societies. I would suggest that they be placed on exhibition each year, for a few years, in the Horticultural Department of the Industrial Exhibition, Toronto. It is a matter for regret that fifteen individual awards, after this long delay, have not been received.

Fruit experiment stations have been established during the past year, making ten in all, covering every section pretty fully, and, in a few years, the fruit growers of this Province should receive from them a great deal of valuable information. We think the

work of these stations should not be confined to experiments in varieties alone. Careful experiments should be conducted with the different fertilizers for a term of years from the time the trees or vines are planted. Also experiments in pruning, cultivation, spraying, and, in fact, everything that would tend to lessen the cost of production of fruit.

Through the patriotism of Mr. Anthony Copp, of Hamilton, the fruit growers of that section sent a collection of fruit to Her Majesty the Queen. Unfortunately it was not thought of early enough to send a good collection of summer fruit. Twenty-nine cases were forwarded to the Canadian High Commissioner, Sir Donald Smith, consisting of about fifteen varieties of apples, half-a-dozen of grapes, a few pears and quinces, and the following reply was received:

LONDON, November 21.

The Canadian High Commissioner received the following note from the Queen's Private Secretary, Lieutenant-Colonel Sir Arthur J. Bigge, dated Windsor Castle: "I am commanded by the Queen to beg you to be good enough to arrange that Her Majesty's best thanks be conveyed to those fruit growers in the neighborhood of Hamilton, Ontario, who kindly offered, through you, for Her Majesty's acceptance, a beautiful consignment of their year's crop, which the Queen is glad to hear has been unusually large and excellent in quality. The cases were received yesterday by the Master of the Household, and their contents were in excellent condition, and some of the fruit served at Her Majesty's table proved excellent."

HORTICULTURAL REMINISCENCES.

By C. E. WOOLVERTON, GRIMSBY.

[This paper was read by the Secretary, who stated that his father had been asked to read this paper because he was one of only two or three living representatives of the Association as first formed about the year 1860, and he was one of the constituent members at its organization.]

Truths of revelation, facts in science and art, development of mind and matter, are the right of no particular class, but are designed to be free for all. Therefore, every man ought to gather and distribute what he can for the well-being of his fellows, and for the progress of his country. He should learn from the running river, and not from the stagnant pool, which breeds miasma in all directions; from the merry rill, which gathers from many other streams, meanders through the meadow, swells in the vale, turns the mill, and bears on its bosom the ships laden with commerce to the broad ocean. Thus good men have travelled and collected knowledge of laws and art to bring home, and show their own people how to use soil and climate to better advantage. Pope said: "The fur that warms the monarch warmed the bear," and how much more may it be said of Mother Earth that she warms and feeds the rich and poor. God, who planted the first garden on the virgin earth, seemed to select from the fields the trees and vines, indicating that horticulture was of a higher grade than agriculture. The proverb, "Prepare the cage before you catch the bird," is verified in that God prepared the garden before he gave man a wife. Solomon said, "I made me gardens and orchards," and he reigned in peace when every man sat under his own vine and fig tree, using the plowshare and pruning hook instead of the sword and spear, and it seems as though the people would be more happy than the Athenians who spent their time in inquiring "What news?" Each savage owns the forest, but has no garden. The sluggard sleeps and neglects his garden, while the thorn and the thistle grow broader and higher: The cultivated garden indicates civilized man; here he may show a refined taste in fruit and flowers. England, by her position and sovereignty of the sea, has not only selected the best of all lands, but has also cultivated in peace the richest of them, and to us she may well be called the Mother Country, while the German speaks in similar terms of his "fatherland."

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In the time of the Revolution some sterling men called U. E. Loyalists, settled in the Niagara District. King George gave them land in the wilds of Canada where nuts, plums and crab apples grew. They had read that one of the finest trees in Rhode Island sprang from a seed dropped in the grave of Roger Williams, so many tried the experiment of sowing apple seeds, but few apples of any size were produced, and the small ones were often gathered with the wooden scoop. About 1790 John Smith offered his right to 200 acres of land for a cow, but found no buyer; about 1798 he sold it to Jonathan Woolverton, my grandfather, for 40 pounds of York currency, and the said Smith gave five natural apple trees to bind the bargain. About the year 1830 there came a man from England, about fifty years of age and weighing about fourteen stone, and he called himself Peasley, the Grafter. He carried with him scions which he said would bear pound apples, full sixteen ounces to the pound. When at work he took his stand on a wooden chair, clothed in a huge jacket with pockets like the pouches of the kangaroo, in one of which he carried wax and scions and in the other grafting tools. After grafting in our neighborhood, he returned to the Mother Country, and after six years came out again. I remember his joy when he found his word true and saw the pound apple which he said was the Gloria Mundi. I thought of old Santa Claus with his grey whiskers and loud laugh; and "his little round belly that shook when he laughed like a bowl full of jelly." He hailed from England, but his port and bearing were of the German order. He came out in the reign of George III., and when he swore, it was "Py George," the then popular oath of the U. E. Loyalist; for the king gave them their farms, their government and their church; and that they might not fracture the third commandment, allowed them to swear by his name. He brought the Ribston Pippin, Pearmain, and English Russet. When Peasley's Pearmain, Ribston and Gloria Mundi began to bear, I took a load to Hamilton and supplied that village where Cary kept hotel and Stinson the principal store.

Dr. Beadle was selling trees from St. Catharines, and one Moore, a Canadian, brought a few pears and peaches from Rochester. Delos Beadle had graduated from the Grantham Academy and, I think, was studying law at Harvard. He afterwards took up his father's calling, and at his instigation the fruit growers met in the Chief Magistrate's room in the Court House at St. Catharines. About 1857 A. M. Smith appeared on the scene. He had learned the nursery business with Mr. E. Moody, of Lockport. Mr. Moody came over for Canadian evergreen trees, he stopped at Grimsby to give us some advice about raising peaches. He praised our soil and said he had only one objection to living in Canada and that was that then he could never be president of the United States.

When our Association met at St. Catharines, we were twice surprised. First, at the knowledge of Judge Campbell and Delos Beadle about fruit, climate, and soil, and secondly, at our own ignorance of the fruit we had handled for a term of years. The genesis of our Association budded in St. Catharines. Judge Campbell was the first life member, but did not live to see it bloom. Delos Beadle was the Moses of our exodus, leading us out of our ignorance into the present fruit-bearing stage.

The formal organization of our Association elected W. H. Mills, of Hamilton, as president. He was not of the mills of which it takes ten to make one cent, nor was he a wind mill to crack corn, but he honored the goddess Pomona by cultivating fruit and flowers, and at one of our meetings took us out to see how faithfully he raised the finest plums and pears by the sweat of his brow.

Charles Arnold had rather a set countenance and appeared somewhat cross, and he believed in cross fertilization of fruit and grain, but his crossness was something like the chestnut burr, only on the outside, for we never had a more welcome visit than at his residence when he invited the Association to Paris.

A. M. Smith and the writer were honored with a like visit at Grimsby, when we followed suit and invited the Association to our hearts and homes. I cannot forget the two who brought their wives to add to the sociability of the occasion, Mr. Holton and Mr. Hoskins, of Hamilton. It seemed at once to put a link in the chain of friendship which death alone could sever, and that only for a time.

In conclusion I may say that I have had the honor of being a full private member of this Association all these years, and have seen with pleasure its rise and progress to its present character, and the assistance it received from such noble men as Rev. Mr. Burnett, Wm. Saunders, Judge Logie, P. C. Dempsey and others. And I wonder why I, who have done so little to advance the work, should still live at nearly four score, while these useful men, younger than I, have been called away. But we bless their names for their works which follow them, and we hope to meet

"On the other side of Jordan
In the sweet fields of Eden,
Where the tree of life is blooming,"

where the eternal tree of life bears everlasting fruit, instead of temporary trees bearing perishable fruit only once a year.

GARDENING IN RELATION TO CIVILIZATION.

BY PROF. SHORT, OF QUEEN'S UNIVERSITY, KINGSTON.

When I was asked to contribute a paper or address to this Association I felt, of course, extremely flattered, but I felt also that I had really nothing that was worth contributing to gentlemen who were so well acquainted with the practical aspects of gardening, fruit culture, and so on, and I was therefore at a loss to know on what subject I might address the Association; but being a lover of gardens and a reader of history and a student of civilization, I thought that possibly I might select something which would enable me to approach you more in my own line. Therefore I thought that possibly I might throw some suggestions before you of a historic nature, dealing with the relation of gardening to the progress of civilization. I may take as the text of my remarks the statement by that eminent philosopher, noted scientist, great statesman—and, I am sorry to add, great political boddler—Lord Bacon, once Chancellor of England. He said, in one of his inimitable essays: "God Almighty first planted a garden, and indeed it is one of the purest of human pleasures. It refreshes the spirits of men, and without it, buildings and palaces would be but mere gross handiwork; and a man shall ever see that when nations grow to civility and elegance, man comes to build stately sooner than to garden finely, as if gardening were the greater perfection." And indeed the remainder of this essay is an extremely good illustration of this fact; for while it expresses the science of the new development in gardening of the Elizabethan period, yet it does not express that perfection of gardening which the architecture of that period expressed in the stately mansions which were then rising all over the fair British land. But although I shall return to that period as an extremely interesting one in the history of gardening, let me briefly refer to some of the earlier stages. Now, civilization is something which, in its origin, is shared by the few. The great mass of men in the early stages know little or nothing of the forces which are leading them on. They know only that which interests them immediately, but not the final outcome of that, nor the bearing of it on their future development. Only kings and princes, slave-masters and so on, know or have a glimmering of what is meant; and those are the men in ancient times who build palaces, plant gardens, rear fancy animals, and in general lead the lines of civilization. Later on, when we find an aristocracy rising, we find these men surrounded by others who are equally interested in such things, and who become the patrons of art and the leaders of civilization; and the great merchants and the great traders and politicians, and so on, come to be the leaders of humanity and carry on the progress of man. And then, of course, when we come down to our modern times, and begin to recognize what democracy means, and the spread of this thing abroad, these things come to be shared by the common man; and it is one of the chief features of congratulation of our modern civilization that it has carried forth to the common man, to the ordinary citizen, the opportunities and privileges of civilization; that he can now have a

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garden of his own, especially on this side the Atlantic, and that he may rear in that garden things which would have been the despair of kings and princes in former centuries. We find from ancient history that the Persians were among the first to develop a great civilization, and they were among the first to develop gardening. I refer to the Persians in particular because from them western Europe, through Greece and Rome, obtained the chief flowers and fruits which were familiar in that part of the world from the time of the Persians down to almost the present century. England, as I shall point out afterwards, has been one of the leaders in developing the condition of horticulture, agriculture, and everything else, beyond that point. We read in Xenophon, for instance, that the great Cyrus in his journeyings about was careful to have a paradise, that is, a garden, established at the various places where he made his permanent or semi-permanent residences; and those gardens were furnished with pears and plums and peaches and apricots and things of that kind, which came to be the favorite and permanent fruits of Europe. They were also supplied by the various kinds of vines and climbers, the rose, the violet, the iris, different kinds of lilies, and a few other flowers; but the range was extremely limited when compared with the enormous range of the present day. I need hardly refer to the contribution of Egypt, which was very considerable, towards the development of agriculture and horticulture, too, in the growth of flowers, because, so far as it seems to have had an influence in developing Europe, it came after the Romans had conquered it; and although there was a good deal of fruit grown in many of the districts by the Phœnicians, still they do not seem, so far as any records we have or that I have been able to discover, at any rate, to have carried with them much of their gardening operations. The Greeks, who obtained most of their arts from the east, and who seem to have developed gardening along the Persian line first, were very particular in arranging their gardens artistically. In other words, the Greeks put a polish on gardening as they did upon literature, art and philosophy, and brought it to a much higher perfection than it had ever enjoyed before; and that they must have used forcing green-houses or something of that kind, is quite evident from the fact that we find in commercial records of Greece that flowers such as violets were sold in abundance in the Athenian markets in mid-winter; but just how they managed to produce them is not quite certain. When Rome came to swallow up Greece, and to sit at the feet of her Greek slaves for learning and knowledge and so on, Rome brought with them from Greece a knowledge of gardening; and the Romans, in their own sumptuous and gorgeous manner, with the pillage of the world, you might say, at their feet, went into gardening on an extremely grand and extensive scale. They incorporated into it, for perhaps the first time, an extensive architectural element, and a great feature of the Roman garden was its architecture, its fountains, its terraces up on the hills, the cascades, the immense plazas, stairways, balustrades—and all of these ornamented with the most expensive and delicate and often artistic statuary. Some remnants of those ancient Roman gardens are still to be found. Up on the hills, where the wealthy Romans had their country houses, and—most astonishing of all—out over that malarial district around Rome, through which the Appian Way passes—a place which was originally an extensive and malarial and poisonous marsh, but which the Romans, from the remains which are discovered there to-day, evidently converted into a suburb containing the richest, most expensive and elaborate palaces that the world has ever seen, in proportion to the ability and the extent of the people. These palaces were each surrounded by beautiful gardens; and the Romans managed in some way to control the malarial features of that region, and to convert the rich alluvial tract into a garden capable of producing the finest fruits and the finest flowers. But the Romans, like a good many other people who become suddenly rich—who are sent out, say, as poor governors to distant provinces and come home laden with spoils which were not all honestly obtained—went to work to expand these by means of their riches, and therefore there crept in a very extensive element of vulgarity, and the consequence was that they began to imitate nature, or rather, try to make nature imitate art. They built artificial mountains and artificial terraces, canals, and all sorts of things out on the plain territory, and thus led nature captive, as it were, after the ideal of human art. I hasten on now to the period succeeding Rome. It is an extremely interesting thing to go into the details of Roman garden and fruit growing, and so on; but I want to refer to that

which brings us most nearly to England, and that is the period of the next great development after the fall and decay of Rome. That was obtained in what is known as the Renaissance; but the Renaissance only brought to life again the fragments of Roman civilization which had been maintained in the monasteries awaiting the period of the decay of Rome and the beginning of an extensive civilization on the new basis. The church, the dignitaries of the church, and especially the monastic institutions, kept within themselves these fragments of civilization, of literature, of science, of art, and so on, and among them the element of gardening; for they retained that method and system which was the science of the Romans, and also spread over Europe the trees, shrubs and plants which the Romans had obtained from Greece, and the Greeks from the Persians. Now, the Renaissance generally was simply a period in which the seeds—these fragments, these ideas that had been husbanded and kept—burst forth from the monasteries once more, were taken up by the common people, and extended with extreme rapidity over the country. But I should hardly say common people; they extended quite to the common people, because the masses did not change very much in this period, and that is one reason why it was so short-lived—this blossoming of the gardens of Italy during the Renaissance period, particularly those supported by the great houses of the Medici and others of those who lived around Florence and Pisa and Milan, and so on. Those were the wonder of the world; and in no respect did that remarkable development of art find a higher or more beautiful expression than in those magnificent gardens; and one of the finest things about them was their extreme artistic effect—because some of them, in a somewhat dilapidated and fragmentary condition, remain to this day, and may be seen as exhibiting the finest features of artistic combination of architecture with gardening. From northern Italy this love for art and letters and statesmanship and so on, and with it gardening—though, as Bacon says, always after it, the finer, more delicate process, apparently—swept over the western part of Europe; was taken up by France first; from France spread to the Low Countries; then to Germany and to Spain, and so on—because Spain had really at an earlier time shared in the magnificence of Rome to a greater extent than the other countries of Europe; and from France and Holland it passed to England, mainly at the time of the Tudors, and found its first magnificent expression in the reign of Elizabeth after the troubles which had attended the Reformation in England had calmed down. Before this period in England there had been gardens; but they had been small affairs, confined to the castles within the moats, because although England began to expand in the time of the early Edwards beyond their castles a little, yet the Wars of the Roses and the troubles with France shut them up again, and the consequence was that nobility, civilization, letters and everything of that kind was walled in by those great castles, and placed in situations which were favorable for military defence rather than for the development of civilization. This is why it is that there was little opportunity for the development of gardening in England until the time of Elizabeth; but in the time of Elizabeth the gardens and the houses and so on crept out from those moated castles and strong walls and began to spread over the beautiful valleys and hills and country of England; and in no part of the world could they have found, with the facilities then at hand, a more beautiful region in which to expand themselves. Now, the first development of that gardening in England of which this essay of Bacon's from which I first quoted is one of the finest expressions, is characterized by two features distinguished by the sources from which they came. The people of Holland, according to their national proclivities, seem to have gone in for the cultivation of bulbs and bulbous flowers, in a somewhat formal manner, and everything was made after the fashion of tarts, mud pies and that sort of thing, and everything to this day has been characterized by extreme formality, dreadful in design, and unattractive in delicate matters, rather than presenting a broad and fine effect. In France we have another national characteristic expressing itself in their gardens—the love of display, of spread, of art in the formal rather than in the natural form, and the consequent development of architecture as an essential feature—the last crude expressions of which you have in the magnificent waste of lands in the Garden of Brussels—because there you have, as an English writer very well expresses it, an immense attempt to garden a whole township, as it were, and the consequence is that you lose all the effect which is obtained from this idea carried out

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on a small scale—as though a man were to attempt to build a cottage of the size of Windsor Castle. Well, England took over these two features, because her commerce and intercourse were with France and with Holland; and the consequence is that the gardens of that period represent a sort of combination of those two elements; and also they run in two different lines, that is, some of them following the Holland idea, or the Dutch idea, and some of them following the French idea. Not, however, till the seventeenth century did they begin to develop some of the ideas of their own, and then during the eighteenth century they began that conflict which is continuing to this day in England and America—the conflict between the formal garden and the free garden, as they are called. This conflict comes down to the present time. Now, just a word or two about the nature of that, because that is perhaps the only practical outcome of what I have to say. The question upon which this strife turns is the question as to what the merit and use of a garden is—and here I am speaking of a garden particularly from its artistic point of view, not so much from the point of view of utilitarianism, although I cannot see any reason why you should call the production of fruits and vegetables which supply the physical and lower wants of man as any more practical than the presentation in a garden of the higher artistic features which supply, in far greater degree and in far greater prominence, the highest aspects of man. Surely that is as practical as the other; and it is that with which I wish to close in making a few general remarks. The point with the formal gardeners was this: that unless you train nature down into set and definite ways, and trim your hedges and flowers and so on, and trees, into ornamental shapes—pyramids, columns, even into the figures of animals and birds and that sort of thing—you are not really improving on nature, and you are not making nature express the highest possible amount of artistic effect of which it is capable. The free gardener, on the other hand, claims that unless you leave nature to follow her own sweet way, and simply enable her to do so to the greatest possible extent, you are not realizing the highest artistic effect. Now, it seems to me that there is a compromise, or at least meaning in this. Each one, to my mind, expresses a half truth, and it consists in this: that certainly with reference to the cultivation of flowers and trees and so on, and their arrangement, we are after the essence of natural beauty; but nature, in this as in other respects, in other forms of art, does not express to us, or turn out to us, in concrete shape, all the phases of her natural beauty altogether; and I am not such an ardent admirer of nature in the abstract as to believe that nature is always beautiful, because I have seen some things in nature that if one were confronted with them for a very long time would simply have a tendency to drive one mad. Therefore I believe that the extracting of the beauty from nature consists in taking the beautiful phases of nature and bringing these as closely and in as great variety within human ken and within human influence as possible. Now, in so far as I agree perfectly with the idea of the free gardeners, that nature's principles, not man's principles of art, must lie at the basis of gardening, and that all man can do is simply to coax nature, to systematize and to arrange nature, but to give nature in the arrangement perfect freedom, and added opportunity if possible, to expand herself in color, in shape, in shade, and all that sort of thing; and from the fact that man has himself been produced, as it were, and grown up in the face of nature, so the earth shows to man, when it is cultivated wild, a natural thing and not an artificial thing; and we should therefore go to those who have lived in the presence of nature, and not to those whose ancestors had been born and brought up in cities for generations, to find what are the principles of gardening art. On the other hand, the houses and buildings about which these gardens are to be arranged are expressions of architectural art—a wholly different art, resting on natural principles of course, the natural principles of physics, of dynamics, and the conditions and the laws of gravity, and the nature of material, and so on. That is the fundamental element in architecture, and none of these must be violated without destroying all the after effects of architecture. Given these, the next range of elements that must be respected are human comfort, human convenience, the purpose for which the structure is constructed, whether it be municipal, state or domestic. Now, the last element in architecture is the ornamentation; but the ornamentation must not obliterate, contradict, or infringe upon any of these other requirements, but simply supplement them, beautify and render more perfect the fundamental elements as

they come upwards. Now, the garden is to surround these structures. The structure itself obeys these hard and fast architectural and stringent laws; and the garden is of the freedom of nature, you see—but there must be something to make the transition from the one to the other. The consequence is that it is an absolutely necessary principle that some compromise must be made in the immediate neighborhood of your building; that is, that the elements of gardening—borders and walks and shrubbery and so on, in the immediate vicinity of the house—must conform to the laws of architecture, and must therefore take on a more or less formal element, but the further it recedes from that, the more freedom it can be given, until in the outskirts it is given most absolute freedom. And thus we get what I take to be the most perfect and reasonable adjustment of the two conditions. But nature being able to present us with such an immense variety—a variety which in the species and genera of plants which are now placed at our disposal by the discoveries of men in all the different parts of the world, and the enormous facilities for transportation which enable us to bring them from all corners of the world, and to understand their conditions, and so on—enables us in the same area, with a little care and adjustment, to produce all varieties and kinds of plants, or at least an immense range of them, taking your glass houses as well as your open-air gardens; and the consequence is that if you set out with the formal idea of gardening—such an idea as will put them all in one place, in one square—it is quite obvious that you cannot cultivate any more than are suited to that one spot. But, given the variety of soil and situation and plant, and so on, it does not follow that our gardens must be on the same principle or plan, but you may get in the same city an immense development of loveliness, as it were, and love of beauty, and understanding of nature. But when we come to our public parks—and here is where the difficulty comes in—the architectural element has vanished, unless, indeed, there are architectural structures in it; and the nonsensical element in most public parks is the fact that people insist on treating the flowers of the parks in precisely the same way as you would treat the beds nearest to the house, and these go in for top-airy work and all sorts of nick-nacks and a carpet garden such as finds extreme expression, and an immense waste of means and labor, to the utter vitiation of the public taste. Don't believe that when a man comes along and opens his mouth in wide astonishment at some latest production of carpet gardening, and some monstrosity that is causing nature to imitate some form of human device, that that man is being benefitted. Not at all. He is opening his mouth with the same sort of sentiment and feeling that a man has on looking at a two-headed calf or any other freak of nature. Here is something that excites curiosity, but is rather degrading than elevating; and that man is not helped in the slightest by what he sees there, to go forth and appreciate nature, but he is helped much in the opposite way, and he goes forth and he looks on nature outside and he says, "Oh, it's rough, it's miserable, it's not well kept, it's not well combed or curried," or something of that kind; and he goes back and gazes on that extreme formality and childish work. If, then, our civic gardeners and our municipal gardeners generally and others could be brought to see this difference, and the realm in which the two elements work, we might have much greater beauty in this country and in other countries than we have; and I believe the few suggestions I have made may not be out of place in that line. (Hearty applause.)

Mr. HUTT, of the O. A. C., Guelph: I am sorry I came in late, but I have enjoyed very much what I have heard of the address. There are a number of ideas brought out with great benefit in our city and town parks. I was pleased with the park in Kingston, where they have been letting nature have full swing, or assisting nature so as to produce a fine effect. Great good would result if farmers and fruit growers gave more attention to this subject. We cannot go into the country without seeing the great lack of attention paid to landscape gardening and the beautifying of our surroundings. No one has a better opportunity than a farmer to beautify his surroundings, as he has plenty of room for it. They often make the mistakes of having some fancy little flower beds instead of green sod or tastefully arranged trees, and the flower-beds are not seen much farther than the house windows. I was struck with the professor's idea of the conformity of the landscape immediately surrounding the buildings to the buildings themselves. We see

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around country houses a fence that would make a good chicken yard if put in some other place, and these unsightly fences go a long way towards spoiling the appearance of the house. (Applause).

The SECRETARY: I do not see why all our fruit growers particularly cannot make their surroundings very attractive, somewhat after the suggestions made by Prof. Short. They are always planting trees and orchards around their places, but too often they set them off one side and fence them in by themselves when they might be made an extension of the surroundings of the house. They would form a good addition to the house-yard, and the land and garden surrounding the house might gradually unite with the orchards which surround them, and not be shut off by those palings or tight board fences we often see.

FERTILIZATION OF FRUIT TREES, AND SOME CAUSES OF FAILURE.

BY PROF. FOWLER, OF QUEEN'S UNIVERSITY, KINGSTON.

The professor first showed a model or diagram of flower, and described its parts, calyx, corolla, stamens, anthers, pollen, pistil, ovary, etc. The stigma, he explained, is without epidermis and always moist, the only part of the organism which exposes living tissue. After describing its action and the effect upon it of external agents, he described the process of fertilization, and said:

To understand or explain the process of fertilization we must notice that the pollen grains of different plants are of different forms and of different sizes. So distinct are they that any one accustomed to examine them carefully can tell at a glance the kind of plant to which any specimens of pollen grains that may be presented to him belong. The grains may be smooth, rough, dotted, covered with prickles, ridges, etc., and they may be dry or moist, attached to each other, or light and separate. Each grain is covered with two coats or membranes, the outer coat being perforated with one or more pores or openings. In the pollen of wheat there is one pore, in the Evening Primrose there are three, and in some plants the number reaches eight. When a pollen grain is placed in water, especially if the water is sweetened, it swells by the absorption of the liquid; its membranes expand and the internal one protrudes through pores in the outer one. (A diagram was shown in illustration). When one of those grains is placed on the moist surface of the stigma, it absorbs moisture and begins to expand; the interior membrane gradually pushes its way through one or two of the pores in the interior coating in the forms of delicate tubes which lengthen by degrees and penetrate the substance of the pistil. Each tube elongates and grows by absorbing nourishment for the pistil and insinuates itself into cellular tissue of the style, and traversing its whole length, penetrates the ovary and comes into contact with the ovules or young seeds. Each ovule possesses a small opening (the micropyle), through which the pollen tube passes till it reaches the embryo sac, into which its contents or a part of them containing germinative cells pass and produce the effect which is called fertilization. In many cases a few hours or days are sufficient for the pollen tube to reach the ovule, but in some plants months are required. The ovule now acquires a new character and begins to grow.

In some cases the ovules may grow and attain the size of seeds without being fertilized, but they have within them no living germ and are incapable of independent life and growth. Unless they receive the germinative cell from the pollen tube they soon wither and die. This point I wish specially to emphasize, that without the action of the pollen, no seed would set and no fruit be produced.

Our next point is how does the pollen reach the stigma? (The professor here illustrated the difficulty on the diagrams.)

The botanists of the last century and the first sixty years of the present one held the belief that the adjustments in flowers possessing stamens and pistils were such on the whole as to secure the application of the pollen to the stamens of its own pistil. It was

acknowledged that great difficulties were encountered when efforts were made to explain the process by which the pollen reached the stigma, but the fact that the two organs, stamens and pistils, existed in such close proximity, and the further fact that the stigmas were fertilized by the pollen generally, silenced all doubts about the matter. In 1862 the view that every flower was fertilized in its own pollen was completely disproved. It is now held that a few flowers are so fertilized, but that the great majority are cross-fertilized. There are structural arrangements in most flowers that absolutely prevent close fertilization. (1) As examples we have poplars, willows, etc., which have their stamens or male flowers on one tree, and their pistils or female flowers on another. This necessitates transference of the pollen from the one plant to the other, as without this no fruit or seed would be produced. (2) Again most of our forest trees, oaks, elms, birches, beeches, hickory, hazels, etc., have the male flowers on one part of the plant, and the female flowers on a different part. The Indian corn has the male flowers at the summit of the stem and the female flowers near the base. (3) Again in very many plants the male flowers mature their pollen before the female flowers are in a receptive condition, or on the other hand the female flowers ripen first and the staminate a few days after. In each of these cases the pollen must be carried in some way from the staminate flower where it is produced to the pistillate which is ready to receive it.

With these difficulties in the way how can the plant be fertilized? How can the pollen reach the stigma? It is a case of do or die. Nature has secured the necessary agents for the work. Of these there are two which perform the greater part of it and are constantly seen attending to the duties assigned them at the proper season. These are: (1) Winds; (2) Insects and birds. Broad lines of demarcation separate these two classes of plants. Those trusting to the wind to bring them the needful pollen require no alluring displays to attract the breezes. They have small and inconspicuous flowers, presenting no light or attractive colors; they are destitute of fragrant odors and furnish no honey to reward the visits of insects. In further adaptation for transportation by the winds, the pollen is produced in immense quantities to allow for waste. The grains are also light so as to be carried by every gentle breeze, and dry and incoherent so as not to form heavy masses or to adhere to objects which might be encountered on its journey. The pistil-tips or stigmas of these plants are also especially adapted to catching and holding the grains of pollen blown upon them, as they are divided or branched into plumes or feathers and plentifully beset with hairs or bristles. The anthers also hang out to the air and wind only when just ready to discharge their pollen, and are suspended on suddenly lengthened capillary, drooping filaments fluttering in the gentlest breeze. Most of our forest trees blossom in early spring when the weather is seldom calm and before the leaves are sufficiently developed to interfere with the scattering of the pollen. They are native to the country and adapted to its climate, and consequently they produce their flowers in the most favorable season to secure cross fertilization. All grains, such as wheat, oats, rye, barley, Indian corn and all our cultivated grasses are also wind-fertilized, but they are all foreigners and they have been introduced by man. They are natives to other lands and are adapted for a different climate and are here exposed to certain disadvantages. A few fine, calm, summer days occurring at the time when they are ready for fertilization will prevent the transportation of the pollen and the harvest will prove a failure. Again, a few foggy or rainy days at the same time will equally produce the same result. The rain will wet the grains of pollen and carry them down to the ground, where they soon perish. Near the sea coast where fogs and continued rains are frequent, wheat is a very uncertain crop. From these facts it is very easy to see that a field of wheat which is ready for fertilization during a few fine days with gentle breezes will yield an abundant harvest, while another alongside of it which is not ready till a few days later when damp or rainy weather is experienced may be a comparative failure. Complete failure, however, will seldom occur for the following reason: The process of fertilization begins at the base of the head of wheat and gradually extends upwards for several days before it is complete. In the meantime several changes of weather may occur and one part of the head may be fertilized and produce good grains, while the top or some other part may be completely empty. Another fact worthy of notice is that if

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We now important during their aid entertainment advantage is and varied colors as beautiful varied colors secure their and yellow to the aesthetic (2) Odors of inviting the when certain ing flesh and insects. (3) most flowers verticements concealed in lines or dots their visitor's for the furnish carries the pollen fertilized, cross obeyed. (4) The grains of tions, or structural slight coherence insects. The or glutinosity hairs or bristles in contact with of nature that

A few examples and its value, nature's labor cucumbers with Mr. Belt, the some scarlet red and the scarlet their career excellent laborers garden as a understood the

When clo produced,—the but the quantity of These venerable destroyed the but fruit trees are would be felt in what should be ought to do, it

two fields of wheat alongside of each other are ready for fertilization at the same time, the pollen may be carried from the one to the other by the wind, the one field will produce pure grain, while the other may be largely crossed or hybridized.

We now come to the most interesting part of our subject, which is to show the important duties performed by insects in the process of fertilization. All plants requiring their aid display certain attraction or hang out advertisements which mean "Good entertainment for bees and butterflies free." But where free lunches are provided some advantage is expected from the treat. The most prominent attractions are (1) Brilliant and varied colors, which render them conspicuous from a distance. All flowers admired as beautiful for their red, white, blue, purple, violet, lilac or other colors, or for the varied colors arranged in lines or dots are intended to catch the eyes of the insects and secure their attention. Expanded color surfaces are conspicuous from a distance, white and yellow being often very noticeable in the twilight. The different colors are adapted to the aesthetic tastes of different classes or species of bees, butterflies and other insects. (2) Odors of various kinds and in different degrees of intensity, are also allurements inviting the attention of insects. Some plants are only fragrant in the twilight when certain moths flutter round and visit them; some emit the odor of decaying flesh and appeal successfully to the blue-bottle flies and similar carrion living insects. (3) The real attraction, however, is the nectar, the sweet liquid which most flowers produce. The bright colors and the fragrance are merely the advertisements announcing the presence of the feeding places. When the nectar is concealed in some deep and safe recess where wet cannot injure it, many plants have lines or dots upon some of their petals to point out where it may be found, and thus save their visitor's time. What advantage does the plant derive from its elaborate preparation for the furnishing of free entertainment? The answer is easily perceived. The insect carries the pollen to the spot where it is needed. The great law of vegetable life is "Get fertilized, cross fertilized if you can," and these are some of the means by which it is obeyed. (4) Another set of adaptations is conspicuous in these entomophilous flowers. The grains of pollen are mostly moist or glutinous, or roughish or studded with projections, or strung with threads so as not to be readily dispersed in the air, but to have some slight coherence as well as capability of adhering to the head and limbs or bodies of insects. The stigma is also fitted for the reception of the pollen by roughness, moisture or glutinosity. It is also worthy of notice that the bodies of insects are covered with hairs or bristles and rough excrescences, to which the pollen grains adhere till they come in contact with the stigma which is fitted to receive them. It is true that in the realm of nature that no one liveth to himself, not even an insect.

A few examples of the need of insects at the proper time may illustrate their work and its value. Orchards and gardens may be a mass of blossom, but without the aid of nature's laborers few apples, strawberries or raspberries and absolutely no melons or cucumbers will be produced, however favorable the weather may be. For example Mr. Belt, the naturalist, tells us that in his garden at San Domingo, Nicaragua, he sowed some scarlet runner beans. The soil was good, the climate was favorable for bean life, and the scarlet runners grew and flourished, and finally blossomed abundantly, but there their career ended. They did not produce a single bean among them, simply because the right laborers were not at hand to give the requisite help to secure fertilization. The garden was a new one in the forest, the beans were foreigners and the species of bee who understood the wants of the scarlet runners was absent from the district.

When clover was sowed in Australia and New Zealand at first no seed was produced,—the busy bee was not there to fertilize the flower. Prof. Huxley used to say that the quantity of clover grown near London depended upon the number of old maids. These venerable ladies kept cats, the cats wandered round and killed the mice, the mice destroyed the bees' nests and the young bees, and the bees fertilized the clover. Our fruit trees are dependent upon the bees and any agency which lessened their numbers would be felt in the harvest. Take another case. When the young gooseberries, or what should be gooseberries, wither and drop in early spring, instead of swelling as they ought to do, it is not so much because they have been nipped, but that the frost has kept

the bees at home. A few days too cold for the bees to pursue their labors when fruits are in blossom will often account for the failure of particular kinds. A few rainy days would produce the same effect. Strawberries are altogether dependent upon bees for the perfecting of their fruit. Each berry produces from 100 to 300 seeds, and every one of these must be fertilized that fruit may become soft, fleshy and sweet. The hard spots sometimes found on strawberries with the number of little seeds crowded together are due simply to the fact that the ovules have not been fertilized, and have withered instead of growing. Apples are sometimes deformed on one side for a similar reason.

Where birds are destroyed the insects increase to such an extent, and so many varieties of them seem to make their appearance, that they totally destroy the fruits in many places. For instance, Frederick the Great of Germany was a great lover of cherries. He had some very fine cherry trees, but he found that some birds were taking the cherries. He issued orders that all the birds should be destroyed, and the birds were destroyed in the whole neighborhood. Next year he had no cherries. The year following there was no fruit; and he was compelled to acknowledge that the birds had got the better of him altogether, and at great expense he succeeded in bringing back birds which kept the insects in check. When our little birds are being killed off the insects increase everywhere, and they will increase as long as birds are being destroyed. About thirty million birds are destroyed every year in Europe in order to ornament ladies' bonnets and hats. In the island of Sicily they destroy them in enormous numbers. When the small birds of Europe want to migrate to the southern climate of Africa during the winter, Sicily furnishes them a resting place on the way across the Mediterranean. They arrive there in immense flocks. The people in Sicily know about the day when they will arrive, and they have an ingenious way of hanging up hooks that are baited with insects to catch the swallow and little birds of that kind, the result being that in some parts of Ireland at one time it was impossible to raise crops owing to the number of insects that were being developed. In some parts of France it is the same way. However, they are getting over the destruction of birds now, and the crops are in many places better than they were. Down in the southern states of America most of the birds are killed off. In the island of Jamaica they killed them off altogether; the result was that insects were brought there that were never known before. Some species of tick came over in cattle and not only destroyed the crops, but annoyed human beings exceedingly. (Applause.)

Mr. HUGGARD (Whitby): Will pollen from the plum tree pollenize the pear tree?

Prof. FOWLER: I am not sufficiently acquainted with the practical part of the subject, but I hardly think it would. If it would, the fruit would be a hybrid between the two. I think a good many of those trees will fertilize one another to a certain extent—plums and peaches and pears—and you can get a cross between them, but they don't amount to much. In a place in France the children have a region where they fertilize different kinds of fruit trees that way, and they grow a very extraordinary kind of fruit. Different fruits would be on the same tree, because they fertilize from different kinds of trees—plum and apricot and so on.

Mr. MORRIS: Can the "yellows" on a peach tree be carried from the pollen of that tree and infect a healthy tree by bees spreading the disease?

Prof. FOWLER: I do not think that the pollen would affect it at all. I do not think that any disease would be carried by the pollen, because the pollen is newly shed on the body of the bee. The pollen sticks to the body of the bee, and he gets it from the anther where it is produced, and he lays it down on the stigma of the next plant that he visits, and I do not think there is any carrying of disease in that way, though I cannot be positive.

Mr. MORRIS: It is my firm belief that it is spreading in that way.

Prof. FOWLER: It would not be by means of the pollen; it would be by the germs of the disease getting on to the bee from that plant.

The SECRETARY: The question would be whether the little bacillus, the microbe, of that disease could exist in the pollen.

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Prof. FOWLER: I hardly think it would, but I have not the practical knowledge to decide the question.

Mr. BURRELL (St. Catharines): I understood you to say that the strawberries depend almost altogether on the bees?

Prof. FOWLER: Yes, different kinds of bees.

Mr. BURRELL: I keep bees, and I have noticed very few of the ordinary honey bee, and very few of the humble bee ever fertilizing. Do not a large number of those syrphus flies fertilize?

Prof. FOWLER: Yes.

Mr. BURRELL: I see Prof. Erwin Smith is beginning to doubt the bee theory although it is very plausible. Anyway, we know that yellows is on the increase, and it has been decided that the axe and the fire are the only ways of curing it. On hearing that story of Frederick the Great we will all regret that he hadn't a spray pump.

Mr. CASTON (Craighurst): I watched very closely one year and did not see a single honey bee fertilizing; but I believe the bee that fertilizes strawberries is one smaller than the honey bee—I do not know the name of it.

Prof. FOWLER: Strawberries are native to this country, and were here long before honey bees were here, so that it is a native bee that must fertilize it.

Mr. CASTON: Yes, it is a native, but it is not what we call the wild humble bee nor the honey bee. It is a smaller insect that is very industrious, and that works all the time the blossoms are out.

The SECRETARY: I think we are very happily situated on this occasion by holding our meeting in the vicinity of Queen's College. We are very much indebted, I am sure, to the two gentlemen who have given us addresses, and we very much appreciate this one on cross-fertilization, because it is a line of study that we hope our more intelligent fruit growers will take up and pursue, because it is in this way that our new and valuable fruits are produced. In the history of horticulture in Canada there has been too much haphazard and chance work in the production of the excellent varieties that have originated in Ontario, with very few exceptions. We are happy to say we have had some gentlemen who have done some good work in this line, and to them we are very much indebted. I refer more particularly to Mr. Charles Arnold, of Paris, who was the originator of the Ontario—that beautiful and valuable commercial apple; and to him we are also indebted for some other valuable hybrids in other lines. I may also refer to the late P. C. Dempsey, of Trenton, to whom we are indebted for some very valuable apples and pears—notably the Trenton apple, the Dempsey pear, and others. I am glad to know there are others who are pursuing this line to a certain extent, thought not so largely as perhaps they should be. I am glad to say we have with us to-day a hybridist who is an enthusiast, although not in the line of fruit; I refer to Mr. Groff of Simcoe, who has made a special study of the canna and the gladiolus, and who is very enthusiastically devoting a large portion of his time to the production of new varieties of gladioli. Therefore I hope this very interesting and valuable paper of Prof. Fowler's may be the means of stimulating some member of our Association to do some practical work in the line of producing new fruits by cross-fertilization, by understanding more scientifically the methods of hybridization. It is very important, I am sure, that these should be produced. It is only recently that we learned how important it is that the blossom of one variety be fertilized by the pollen of another variety. We have only recently learned that some varieties of fruit will not produce much fruit unless they are fertilized by another tree; and this is explaining the trouble with some of our barren orchards. We have large orchards of Northern Spy, for instance, that have not been producing, and possibly the reason is to be found in this fact, that the Northern Spy may not be able to fertilize its own blossoms. We have large orchards of Baldwins that have not been producing, and probably this is the reason; it wants cross-fertilization between the different varieties of apples. So with the different varieties of pears. It has been demonstrated that this is true with regard to pears; some varieties have been artificially pollinated with

their own pollen, and they would not produce fruit; but when they were pollinated with another variety of pear they would produce excellent fruit. We will be very glad if people are stimulated to think out along this line and work out these problems.

MR. GROFF: I am sure it is very kind of the Secretary to refer to my work, but there is really nothing for me to add. I would like to say, in reference to the queries that have been put, that they show how limitless is the field for study and observation in natural things, and how great is the opportunity of any of the members who are here to have it said of them, as has been said of the late Mr. Fuller, "He learned from the open book of Nature, and the universities learned from him." (Applause.)

Mr. RACE: I would like to ask Prof. Fowler or Mr. Groff if any hybridizer has actually seen the bee conveying the pollen—that is, if they have ever seen the bee or other insect loaded with pollen and conveying it from one flower to another? I notice from a German writer that that theory has been very severely attacked. This writer says that the only service they perform is by the use of their wings as a fan to distribute pollen in times of calm, when the wind is not doing that service, and that they have never yet been seen loaded with pollen. The same writer says it cannot possibly be, without a current of wind, distributed a very great distance by those insects.

Prof. FOWLER; I think there are a good many thousands of observations recorded. For instance, Baldwin, in his work on cross-fertilization, expressly tells us that he examined the bees themselves, that is, caught the different insects, examined them, and found the pollen of certain flowers on them. (Hear, hear). He has seen those insects going from one flower to another, and has written down a good deal about it; and Baldwin was an exceedingly careful observer—very few men have been more careful. Of course, he might be mistaken sometimes in conclusions. There is another book, by Mueller, on cross-fertilization, where he gives lists of the insects that he has seen, and the plants on which he has seen them, and the plants on which they arrive carrying the pollen. It is a large volume, filled with observations that he has devoted a number of years of his life to. There is a little popular book—which is not quite so reliable, however—namely, Grant Allen, on the "Colors of Flowers," showing the value of the colors to secure fertilization by means of insects. Then every work on botany, if it is of any size, has a few chapters devoted to fertilization. Both Baldwin and Mueller refer to a large number of others for special observations. There is a little book called "Spraying of Plants," published by McMillan & Co., in New York, that gives the names of the insects that affect the plants, and the plants that are fertilized, and goes on with all kinds of spraying that have ever been used in the world from the old Persian times down to the present. I think those works show conclusively—at least, I have perfect faith in those writers that have devoted years of attention to the subject—that they have seen the bees going from one plant to another; and a special point is that if a bee sets out to visit any kind of flowers, he sticks to that special species the whole day. Bees have been watched by the hour going from one plant to the other, but he always goes to a plant of the same kind as the one that he has set to. In that way he fertilizes every plant as he goes along. If he went from one plant to a different one, of course his labor would be all in vain so far as fertilization is concerned. (Applause.)

Mr. GROFF: From my limited observation the theory I have formed is that the bee carries the pollen, but that the pollen is mixed on the stamen and not on the stigma, and what we call natural fertilization takes place by the contact of the pollen and the stigma. It is not transferred to the stigma by the bee.

Mr. RACE: Of course I was not heterodox myself, only I wanted to see what these professors had to say on that question; I saw that it had been attacked.

Prof. SHORT: When visiting a few years ago at my brother-in-law's fruit farm at Winona I happened to be there at the time when the grapes were in blossom, and he remarked that quite a number of valuable grapes often did not mature well in the bunches. I asked him to show me those—I think several varieties of Moore's Early and Worden and several varieties of the Rogers, and so on, were pointed out. On examination I found that the stamens on those particular varieties were extremely small, slight and

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feeble, that they contained a very small quantity of pollen, that the stem of them was short, and that they did not apparently contain much. I spent about half a day observing the matter in order to make sure that this was not the stamen in the second stages of decay. Then I went to some of the other varieties that were said to almost always bunch well, and observed that the stamens there were strong and almost always longer than the stigmas. The bees then would naturally carry more pollen and fertilize more readily in the case of those that had strong blossoms; in the case of the others, not so. My idea was that if these could be assisted artificially by taking a feather duster, working it industriously over the strong flowers, and then striking it over the weaker ones, possibly it might help the matter. I did so, and at the end of the season my brother-in-law reported that that particular part of the vineyard had bunched ever so much better than the rest. (Applause).

Mr. MORRIS: The foxtail is better than a feather duster. That is what is used in the fertilization of tomatoes under glass.

Mr. ORR: And in hot houses for grapes.

Mr. PATTISON (Grimsby): Would it not answer just as well in the matter of grapes to plant a variety with strong stamens in close juxtaposition, say alternate rows, to those that have weak ones?

Prof. SHORT: I think that would be a good idea.

Mr. ORR: That is what we do.

Mr. PATTISON: I have found in my own vineyard that several Roger varieties, if planted in alternate rows, or alternately in the rows, with a variety such as the Concord or Niagara, will bunch very much better than if planted in blocks by themselves.

COMMITTEES.

The President appointed the following committees:

Fruit—Messrs. Race, Wellington and Hutt.

Nominations—Geo. Fisher and Mr. Race.

Programme—Executive Committee.

Resolutions—A. M. Smith, Mr. Beall and Mr. Orr.

New Fruits—Messrs. John Craig, H. L. Hutt and the Secretary.

The following three gentlemen were nominated by the meeting to be added to the Nominating Committee named by the President: Mr. W. H. Dempsey on motion of Mr. Wellington; Mr. W. M. Orr; on motion of Mr. Race; Mr. Scarff on motion of Mr. A. M. Smith.

Mr. WELLINGTON, on behalf of the Committee on Fruit, asked that larger accommodation be provided for the display, and this was arranged for.

PACKING FRUIT FOR EXPORT.

The SECRETARY: I notice a gentleman present who is a prominent member of the Montreal Fruit Growers' Association, who can bring us greetings of that Society, and who is very intelligent on the subject of fruit shipping to Great Britain, and he cannot be here to-morrow. It would be very unfortunate for us to lose the opportunity of hearing from this gentleman. I refer to Mr. R. W. Shepherd, of Omo, Que., near Montreal.

Mr. SHEPHERD was received with applause. He said; I am quite taken by surprise. I was kindly invited by your Secretary to attend your meeting; but I came as a listener, and came to learn. We have wonderful respect for your Society. Within the last two years we have formed a Provincial Society—the Fruit Growing and Pomological Society of the Province of Quebec, taking as our guide entirely your Ontario Society, which has been so successful that we try to imitate you in everything. (Hear, hear). I regret that Mr. Brodie of Montreal, and Mr. Dunlop the secretary, were not able to accompany me, the latter having been sent by the Commissioner of Agriculture for Quebec, to investigate the evaporating industry of New York State—which shows how our Province is going ahead. Mr. Woolverton has asked me to say something about packing. Well, that is a very big subject. I regret that I was not able to bring one of my cases that I have been using for fifteen years for exporting apples to England and the other side. It is a very convenient case, holding 196 apples, arranged in four layers, each apple being placed in a pasteboard compartment precisely as eggs are packed in cases. I believe there is a large market in London particularly for the Fameuse—you call it the Snow apple. I have seen what you call Snows about Hamilton; I think it is only a degenerate Fameuse, as far as I can understand; but I have seen as fine Fameuse grown about Owen Sound and Morrisburg, as I ever saw in the Province of Quebec. The best way to export table apples of first quality, is to pack them in boxes—not always in compartment boxes—and there should be no chance of them being bruised. I have tried this year packing them without compartments—packing them in tissue paper in layers, and the interstices packed with paper. The Army and Navy stores reported that they arrived in very good condition. The Fameuse is the apple which the Londoners wish to get. They seem to find it an extremely fine-flavored apple. I have sent at least half a dozen varieties of red apples which are considered good table apples, but they always ask for Fameuse. Now, it seems to me that there is a good future, particularly in the Province of Quebec, for the fruit growers to cultivate Fameuse; and in this section too, along the St. Lawrence, they can grow Fameuse, can't they?

Mr. BOULTER: Yes.

Mr. SHEPHERD: I think high prices can always be obtained for first-class fruit packed in a first-class way. We in Quebec are better situated for shipping Duchess to England than you are in the west, as we can pack our apples to-day and put them on board the ship to-morrow—at least I can do it, as I am only 40 miles from Montreal. The Duchess that I shipped in barrels to Edinburgh, netted me, after paying all expenses, \$1.25 to \$1.30.

The SECRETARY: Cold storage?

Mr. SHEPHERD: No cold storage. They were out on the ship within 48 hours after they were picked. In Glasgow the Wealthy netted me \$1.80, that is deducting all charges except the barrel. In Edinburgh the Wealthy netted me \$1.30. I was not as well satisfied with the firm I shipped to in Edinburgh, as I was with the Glasgow firm. I shipped a lot of No. 2 Famense to London in barrels. They averaged \$1.10. I could not have got a dollar for them in Montreal. I tried the Montreal market for Duchess, and got a dollar a barrel at auction, less 10 per cent., that is 90 cents. The same apples I shipped to Liverpool netted me \$1.25, so that I think we have the advantage. We have a market every year in England for our Duchess. Formerly we used to be able to sell our Duchess in baskets in Montreal and Ottawa and Quebec, but we cannot do it now. The California early fruit has driven that kind of business out of the market as far as Montreal is concerned. It strikes Montreal just about the time that our Duchess come in, and we cannot market the Duchess with profit, so that I certainly shall ship my Duchess every year to the other side.

Mr. BOULTER: Until the California fruit is kept out of Montreal.

Mr. SHEPHERD: Of course that might make some change.

The SECRETARY: Would you do better with a case than a barrel?

Mr. SHEPHERD: I certainly don't advise packing in cases to be sold at auction, as they dispose of fruit on the other side. They allow you nothing for the extra packing

or quality of there is no (laughter). extent, but I to take advantage is to arrange samples at a cases by the right to fill c The case holds squares, three next takes a work with, and they are just about packing Woolverton c side.

The SECRETARY:

Mr. SHEPHERD: signment Commission other day—these are the only full value on the rich people further: "I Commissioner fails to obtain the bulk that becomes the company until I fancy if the cost the fruit grow

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Mr. SHEPHERD: do it. This year 10 cases. The up the freight special freight great. About from commissi

Mr. BUREAU:

Mr. SHEPHERD: to put them in I don't care how press every apple will rot when e are carried with that in the end had in Canada

The SECRETARY:

Mr. SHEPHERD: frost; but it sh keep here.

of quality of the fruit. They do not seem to like the apple-case, because in my opinion, there is no chance for waste and all sorts of things to be deducted. (Hear, hear, and laughter). But that is not the business I have gone into. I have tried it to a limited extent, but I do not intend to give the commission men on the other side the opportunity to take advantage of a good thing when they get it. (Hear, hear). The system I follow is to arrange with several firms in London or Liverpool or Glasgow, to take my cases or samples at a fixed price—and that is the only way you can do the case business. Those cases by the hundred cost 40 cents apiece, with the pasteboard interiors. I buy up the right to fill cases in the orchard, and we always calculate $2\frac{1}{2}$ cases to a packed barrelful. The case holds over a bushel and less than a bushel and a half. I have three sizes of squares, three sizes of cases. My largest size square takes a large Wealthy; then the next takes a fair-sized Fameuse, not the largest size. The second size is the one I like to work with, and when they are turned out of the case every apple is the same size, and they are just the things that Londoners wish for their dinner table. There is no trouble about packing in cases if you can arrange your agents on the other side. I heard Mr. Woolverton or somebody speak about the necessity of having an agency on the other side.

The SECRETARY: That is to be discussed to-morrow; we have been speaking of it.

Mr. SHEPHERD: A firm has been started lately called the Canadian Produce Consignment Company, 18 St. Swithin's Lane, London. I received a letter from them the other day—they had ordered a few cases from me—in which they say: "Your apples are the only ones I have come across on this side that are packed so as to command a full value on the market." He is talking about the first-class market of London amongst the rich people who are willing to pay first-class price for a first-class article. He says further: "I have on many occasions during the time that Sir Charles Tupper was High Commissioner here, drawn his attention to the fact that Canadian produce in most cases fails to obtain a fair market price and ready sales from bad quality of packing. Unless the bulk that is shipped is equal to the early samples of shipments, the ruling price becomes the speculator's bid based on the worst samples." I had not heard of the company until I received this letter, but the gentleman at the head of it is a Canadian, and I fancy if the company is worked on the right basis it is going to be a very good thing for the fruit growers of Canada.

The SECRETARY: You did not tell us whether there was any advantage in shipping in cases, and the prices.

Mr. SHEPHERD: Not to ship to a commission man. I would not advise anybody to do it. This year 7s. 6d. was the highest I got for any case, and shipped in a small way 10 cases. The way I came to ship to these commission men was because I wished to fill up the freight space for which I have a contract with the Allans, and thus secure the special freight rate. 7s. 6d. is not enough to pay for fruit in cases—the expense is too great. About 10s. a case would pay very well; but 7s. 6d. is the highest I got this year from commission men.

Mr. BURREL: Are you satisfied with the case-packing system?

Mr. SHEPHERD: I am satisfied that for delicate fruit like Fameuse it is the only way to put them in first-class condition on the other side. You cannot put them into a barrel. I don't care how carefully you pack that barrel, when you press down the head you must press every apple to a greater or less extent, and when the Fameuse has been bruised it will rot when exposed and in a few weeks they will be all gone; but going in cases they are carried without any bruising. My brother, who resides in Surrey, wrote me last year that in the end of February the Fameuse he had in his boxes were just as good as he ever had in Canada.

The SECRETARY: Kept in ordinary condition?

Mr. SHEPHERD: Just kept in the carriage house outside. Of course there they had no frost; but it shows they keep as long if they are carried in good condition as they would keep here.

Mr. Geo. FISHER: Are the cases dovetailed, or nailed together?

Mr. SHEPHERD: Just nailed together with wire nails. They hold forty-nine apples in each layer—7 apples each way.

Mr. FISHER: Do you band these boxes with hoop iron?

Mr. SHEPHERD: We used to employ two and one-half inch wire nails, and drive those nails home through the pine boards, and it is very difficult to open a box that is well nailed up that way, but they will do it in London—and of all places in the world I think London is the worst for dealing with goods. I made a shipment of Wealthys early in September to the Army and Navy stores, but it was three weeks from the time the ship arrived till they got them in the stores, where my contract was to deliver them; and when they were delivered, ten per cent. of them were plundered, and the cases smashed up. Now to overcome that, I have had to put hoop iron about six inches around the corners. It is the corners they pry open, and the pine boards sometimes split.

Mr. BOULTER: How thick is this?—planed down to half an inch?

Mr. SHEPHERD: Yes, the covers are about half an inch. The ends are an inch. If you ship to London, make your packages very secure. I have had no complaints from any other port, either about plundering or delay in delivery. I understand that the ships have nothing to do with discharging the cargo in London. The moment they arrive they are taken charge of by the London Dock Co., and they discharge the cargo and deliver the goods.

The SECRETARY: What do you call No. 2 Fameuse?

Mr. SHEPHERD: What is not good enough for No. 1. (Laughter). I grade my apples very finely. The first quality I take out and put into boxes; then an eighth of an inch off an apple is an eighth of an inch too small to fit the square, so it goes as a No. 2, which is composed of imperfect fruit and smaller apples.

The SECRETARY: And yet those paid you for shipping, even this year?

Mr. SHEPHERD: I netted \$1.10 on those. We had no culls in the barrels.

Mr. CASTON: It is very surprising and gratifying to me to learn that Mr. Shepherd shipped Duchess in barrels and that they arrived in England in such condition as to net \$1.25 per barrel. I see the Fameuse quoted in London as the Snow apple. It is a thoroughly Canadian apple, and originated, I understand, on the Island of Montreal.

Mr. SHEPHERD: I think you had better keep to the name "Fameuse;" it takes better in London than "Snow." It is rather a distinguished name—the "Fameuse" (the Famous)—and then it shows its origin. There is no doubt the Fameuse originated from seed brought over from France by the early French settlers. The late Mr. Charles Gibb and myself traced that fact very clearly. There is no apple corresponding exactly with the Fameuse in France. We have a great many other relations to the Fameuse in the Province of Quebec, apples that are very nearly like it, but there is always some difference; a great many of them are sold for Fameuse.

Mr. HUGGARD: How do you like the Wealthy as a market apple for England?

Mr. SHEPHERD: In my experience the Wealthy does not take as well as Fameuse. They don't like the quality of the Wealthy—I have had several letters this year to that effect. It sells very well, though, and is a good-looking apple.

Mr. BOULTER: The Fameuse tree is very hardy with you down there?

Mr. SHEPHERD: No, the Fameuse tree is not as hardy as we like. It is what we call a half-hardy tree.

Mr. BOULTER: A long-lived tree?

Mr. SHEPHERD: Yes, but they don't live as long as we would like them to. They have orchards down there fifty or sixty years old.

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Mr. BOULTER: There is a tree in our county that my father brought in 1818, that had a good crop this year.

Mr. SHEPHERD: I made a shipment of forty cases to Sir Donald Smith in London on the 14th November. The apples had never been barrelled up, and they were in my own shed. I have my own packers, always packing the apples in the cases. They were not bruised, and were in very good condition, and no doubt carried well. The Fameuse are quite crisp and in good condition now. By packing in cases they cannot be bruised, as each apple is fitted into a square. That is the reason I prefer the squares, and to have the apples wrapped in paper and tightly squeezed. After the case is filled the apples just come even with the top of the case, then we put brown paper right over the top, and then nail the cover on, and they can't move about.

Mr. JONES said he had pressed and shipped Fameuse on the 5th or 6th November, and noticed that they offered no resistance to the apple press in placing the head, and he was afraid that by the time they arrived at their destination they would be bruised clean down to the face, but they went in the finest possible condition. They were shipped from the St. Lawrence District to Ottawa, Buffalo and Toronto.

Mr. WHYTE (Ottawa): I can bear testimony to the excellence of Mr. Jones' packing. I bought a barrel of Snows, and they turned out perfect from top to bottom—the first time I ever bought a barrel and found that result. (Laughter).

Mr. CASTON: This is an exceptional year, and the Snows are now as far ahead as they usually are in January. I attribute that to the hard frost about the 23rd September and the bright weather in August. All apples are about two months ahead of time this year.

OVERPLANTING.

By F. G. H. PATTISON, GRIMSBY.

The time has come in my opinion for us to seriously consider whether we ought not to stop planting most varieties of fruit.

For my part I think that, for the present at all events, in many lines of fruit, production is exceeding the limits of profitable consumption. No doubt it is a difficult thing to limit production, for even when we are agreed that too much fruit is being produced, it is our neighbors whom we think ought to stop; but for ourselves we will go on just a little while longer. Yet if a society were established for the destruction of other people's fruit trees how popular it would be! But although difficult, it is not impossible. It is not too much to say that if every other fruit tree, vine and bush now growing in Ontario were destroyed at once it would be vastly better for us fruit growers, and vastly better for the quality of fruit put upon home and foreign markets. The fruit trees left would receive proper attention which too often they do not get, and the fruit would bring a living price instead of being given away as it was too often this season. When plums are sold by the carload at nine cents a basket, and grapes at from five to eight cents, it is time to call a halt. In this connection I would especially call your attention to the cases of plums and grapes, for while we are undoubtedly over-planted in other fruits too, I think that the pressure is more felt in these two varieties just now. Now we heard it said that this last was an exceptional season for plums, and that the like will not occur again for many years, but I do not for a moment believe it. Possibly the same trees may not bear such a heavy crop for three or four years, but when we consider the vast number of plum trees planted but not yet bearing, we can easily come to the conclusion that this crop—heavy as it undoubtedly was—will not be a circumstance to the crop we will have say in 1898 or 1900. And yet this year many baskets brought the grower nothing, and some less than nothing. Failing some large new outlet for our crop we must be prepared to cease planting or else produce at a loss. Take the case of

grapes. For the number of vines in bearing there was not a heavy crop of grapes this season, yet prices were dreadfully low, the profits very small, in some cases *nil*, when the cost of setting out and labor, etc., of properly attending to a vineyard is taken into account. Undoubtedly of late years the home consumption of grapes has greatly increased, but it seems to me that for the present it has about reached its limit and no fresh outlet is opening up for their disposal; indeed, the French treaty, by injuring our native wine trade, has rather decreased our market, and there seems but little hope of selling our grapes to advantage on the British market, consequently when the new vineyards now planted out come into bearing our prices will be further reduced and profits will be non-existent. Now I must say that I think that this Association is somewhat to blame for the overplanting taking place in this Province, for we have gone into new districts and aroused their enthusiasm for fruit growing which has too often taken the form of wildly planting out orchards without the least enquiry whether there was not sufficient planted already or no. This has happened in many cases, and in that respect I think that this Association has been a distinct injury to fruit growers. Fruit growing enthusiasm is all very well, but unless we fruit growers look forward to being supported in an eleemosynary institution it is bad business. In short, we are cutting our own throats.

Now it may be a fine thing for the public that every available spot of ground in Ontario should be producing fruit, but from the growers' point of view it is not business. Indeed, it reminds one of what the French General said of the Balaclava charge: "*C'est magnifique, mais ce n'est pas la guerre.*"

Another great factor in the matter of overplanting is nurserymen and their agents. Fruit growers have suffered much from nurserymen—in the past from frosted and diseased and over-priced trees, not to mention the mulberry, Russian apricot, prunus Simoni and other frauds, and in the present by being induced by plausible agents to overplant by specious tales of the fabulous profits of fruit growing, which exist entirely in their imagination. These latter remarks apply mainly to farmers and others who have had no previous experience in fruit growing, and I think it is time that this Association should inform such persons that fruit growing is a business of itself, that it is already overdone, and that they had better not undertake to enter a business of which they know nothing, and are only induced to enter upon the plausible representations of agents whose only desire is to sell their trees—and after that the deluge. This Province has a close season for deer and other game and for fish; why not have a close time for fruit planting? *i.e.*, a period of some years during which no fruit trees should be planted, excepting certain of the small fruits, such as strawberries. During that period let the nurserymen turn their attention to the production of flowers, ornamental shrubs, forest trees, and of course mulberries and Russian apricots and trees of like nature. There would then be a chance for consumption to overtake production and for the grower to receive a living profit in the future, otherwise I am afraid that the term fruit grower may become synonymous with that of pauper, and that most of us will end our days in the workhouse. A few of us may survive to afford an example of the truth of Darwin's, or rather Spencer's, doctrine, of the survival of the fittest. But it will be an unpleasant process and we had better avoid it whilst we may.

Mr. ORR: I would like to ask Mr. Pattison if he considers there was a full crop of apples in Ontario this year?

Mr. PATTISON: I consider there was a heavy crop in most parts of Ontario.

Mr. ORR: As far as I understand it, there was not five per cent. of a crop all through central Ontario from Cornwall to Windsor. The whole crop of plums was in the Niagara district and along Lake Huron and Erie shore. Through the greater part of Ontario there was no crop of plums.

Mr. BOULTER: In central Ontario we had no plums at all. If the production in the Niagara district made the price what it was in Ontario, what would it be if we had plums?

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The SECRETARY : Then it was not over-production that made them cheap?

Mr. BOULTER : No, because there is none in central Ontario.

Mr. PATTISON : If Mr. Orr's contention is true, I think it would only strengthen my case instead of weakening it.

Mr. ORR : That is what I wanted to confirm. If there was not over five per cent. production in the Province from the Quebec line to London, and if those points can produce a glut like that, what would it be if there was a heavy crop over the whole country?

Mr. FISHER : I understand that a great many of the plums were of exceedingly poor quality because of the excessive crop, and that many of them were not marketable.

Mr. ORR : For my own part we never had a better crop or finer plums.

The SECRETARY : It was not Canadian plums that blocked our market this year, but foreign fruits of other kinds.

Mr. RACE : The question might very reasonably be asked, is there an over-production of apples in Ontario? Is there a glut? From my own experience I can say that apples sent from here to Portage la Prairie cost laid down there \$2.70 to \$3 a barrel. It seems to me if we had reasonable freight rates to Manitoba and the great North West there should be no fear of producing too many apples in Ontario. There is not one settler in Manitoba out of twenty that can afford the luxury of apples at such a price as they now cost. The whole secret of the difficulty is the getting of the apples at a reasonable figure into the markets in the sections where they are wanted and will be consumed. Great masses of the settlers west want our apples. Many of them have not tasted an apple this year. I have had letters to that effect, and we have tried our best to send apples to our friends there but they cannot afford to pay the high prices of apples when they get there.

Mr. ORR : I do not believe there are too many apple trees planted in the country. If I were planting to-day I would very much rather plant apples than plums. I believe we have more plums planted in the country than we can possibly find market for when they all come into bearing.

Mr. PATTISON : I certainly agree with Mr. Orr that if there is any fruit we can plant largely it should be apples, because there is a large outlet for them. My paper was not intended to include apples, although in some districts some varieties of apples may be over-planted; but for those other fruits we have not an outlet, and for the present there seems no prospect of getting one.

Mr. MORRIS : Some shipments of early plums were made to Montreal from our neighborhood, and the word came back that there had been several cars of California plums that were shipped to Boston, sold by auction there, not wanted there, re-shipped to Montreal and thrown on the market, thus causing the low price for Canadian plums. These California plums are put up in very nice fancy boxes, but the quality is very inferior. The appearance takes with the people, and from reports received I believe that the cities of Canada have been glutted with the California plums, which have killed our market.

Mr. DALY : Why not ship our plums as well as our apples to the North West where they cannot produce them?

Mr. BOULTER : Very fine plums are being raised in the Okanagon Valley and a large portion of the plums in Winnipeg are British Columbia plums, and they work eastward, and we cannot successfully compete with them. I do not think we would find an outlet in Manitoba for plums on account of the enormous number of trees that have been set out and the quantities that are shipped from Vancouver east to Winnipeg.

Mr. FISHER : What are they doing in apples out there in British Columbia?

Mr. BOULTER : Well, I had a chance to verify a little what I stated last year. I was with an excursion of a thousand people at Agassiz and I saw some very nice fruit

and had the pleasure of meeting the Horticultural Society of British Columbia, and fine samples of the summer fruit were brought forward; but it bears out exactly what I say, and I will stake my reputation as a man that they will never grow a good winter apple in British Columbia outside of the Valley. The trees I saw at Agassiz are nearly all summer trees. There are points where you could grow probably a good winter apple; but I wish I could have brought home the report of the Horticultural Association of Vancouver Island, saying that after twenty years of honest, earnest endeavor to grow a good winter apple they failed. The climate around there is too moist to grow them successfully. The summer fruit was very nice. The trees on the farm look very odd. They are all grown very close to the ground—not pruned up to get the sun and air to color them. I have yet to learn where they can grow a good winter apple in British Columbia; but no finer plums and cherries can be grown on the continent of America, and strawberries and good summer and early fall apples can be grown in British Columbia. In Okanagan Valley, where Lord Aberdeen has spent so much money, he may succeed in growing hardy winter apples, but outside of that I doubt if they can be grown.

Mr. BURRELL: You don't consider the flavor of the British Columbia plums as good as Ontario?

Mr. BOULTER: They are large and more like the California.

Mr. BURRELL: All the pears and plums tend to elongation in British Columbia?

Mr. BOULTER: Yes.

Mr. BURRELL: The flavor of the fruit from Agassiz at the Toronto Exhibition was much inferior to the Ontario fruit.

A DELEGATE asked if it was likely if we would have a good crop all over Ontario in one year.

The SECRETARY: I have sent over 1,500 barrels to the old country this year and am receiving returns every fortnight or so, and the price has averaged from \$1 to \$1.25 and in some cases \$1.50 per barrel; and I don't think we ought to be altogether discouraged and give up the business and dig out our orchards from the present full year of apple growing. It is not a very great income we get from the apple orchard at those prices, but I think we can live and produce even at those prices.

Mr. A. M. SMITH: What other farm crop, even allowing the low prices of the fruit, has paid any better than the fruit crop?

Mr. HAYCOCK: I think we can account for the over-production of plums, etc., in another way than has been advanced so far. We will have to go back a year in order to get the real cause of the over-production and the low prices of plums this year. A year ago last May there was a general frost throughout the district, and fruits of all kinds were almost totally destroyed in the western part of Canada; consequently there was no fruit last year; and this year there was not only an over-crop of plums but of every other kind of fruit—strawberries and raspberries, wild and tame, and currants and gooseberries and every kind of fruit. They, coming into competition with the plums, brought a glut in the fruit—not in plums alone, but in the same class of goods, in fruits, and the consequence was that plums and grapes, coming in rather late, the good housewives through this country had their jam jars all filled, consequently there were lower prices than you need look for again. It is hardly likely that there will be another year when there will be such a general good crop of all kinds of fruit as there has been through Ontario this year. I think that is one reason why the later fruits this year got such extremely low prices. Then the prospects of a good crop of apples prevented people from laying in a larger store of canned goods for winter.

Mr. GROFF (Simcoe): A representative of a large fruit firm in Detroit told me that during the plum season they had to keep two men busy all the time breaking the California packages and transferring them to domestic packages in order to sell them, on account of the unpopularity of California fruit. In regard to the general question, it is

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just the same with the cattle market and the horse market, and these things cure themselves. You cannot order any man to stop planting or even suggest it. Individuals must be the best judge. Quality will always rule.

Prof. SHORT, of Queen's: Are farmers finding it more profitable to grow any other crops than fruit? It is quite obvious that they will go into fruit until the profits on fruit come down, and as long as the price of grain and other produce continues low the price of fruit cannot be high, unless you adopt Mr. Pattison's plan of restricting the planting. But there is another point of view—that of the consumer. (Laughter.) I wish there could have been put before this Association a fair sample of the kind of fruit that was put on the Kingston market this summer. As a regular visitor to the markets I must confess that I was lamentably deceived on quite a number of occasions this summer in purchasing what I took to be, from the aspect of it, a very fair basket of fruit, and when I arrived at home about half of it had to be thrown out, and as an individual in such cases I was discouraged from buying another basket of fruit; although if I had been successful in getting good ones I should have bought probably twice as much on account of the importance which I attach to the devouring of fruit. It seems to me that the Ontario people might take a leaf out of the California book and put up their fruit in some better order and in a shape that would guarantee that the bottom of the basket or package would be fairly in keeping with the surface of it, and the fruit would not be in such a dilapidated condition when it reaches places like Kingston, which has to depend largely on outside areas.

A DELEGATE: To what particular fruit do you refer?

Prof. SHORT: I refer to plums, peaches and grapes in particular.

Mr. JOHN STEWART, of Benmiller: I think the cause of the low prices in fruit put up for market is that it is not properly matured. I saw thousands of baskets of plums shipped from my section to London and Toronto that were not ripe and fit to handle; and I saw them sold in London for twenty-five cents a basket. I had some sold in the same market for sixty and seventy cents a basket. I think there is a great deal to be done wish proper selection in shipping. In regard to over-production this season, I have shipped several car-loads of apples to the old country and my prices have been fair, netting from \$1 to \$1.30 per barrel. I know parties that shipped at the same time to the same market and got \$1.14 a barrel for the King; I realized \$1 a barrel for the King. If the fruit is not put up well and in an attractive manner it will not sell well in any market. One trouble in shipping apples in barrels is that the fruit is over-pressed and heated up too high. There is no need for fruit in a barrel to be bruised any more than in a box.

Mr. WHYTE: Hardly five per cent. of the peaches landed in the Ottawa market were fit to eat; they were as hard as bullets. (Laughter). If the fruit had been put on the market in a fit state to use, I think a large quantity of peaches would have been eaten raw. I bought baskets of grapes this year that were perfectly unfit for human food. They were dirty and broken and bruised, and bunches only half filled, and never should have been sold at all. That is the condition of things that brings down the prices of fruit. When you are buying a basket of grapes you cannot tell whether they are good fruit or only fit to throw out. I think there would be a large market for western plums to be eaten raw if they could be put down in a good condition. The California plums you get soft and in a good condition to eat; but they are undoubtedly inferior to the Ontario plums.

Mr. FISHER: If you do not want this green fruit do not buy it. The reason we prefer to ship fruit green is that it then realizes more money than matured fruit.

Mr. WHYTE: This is not early fruit; all through the season we bought peaches that were unfit to eat.

Mr. BOULTER: Don't you get the names of the packers on the packages?

Mr. WHYTE: No, they don't do that.

Rev. PRINCIPAL GRANT: I think where we have been making a mistake the last half hour is forgetting that evidently Mr. Pattison is a humorist, and he intended that

paper of his as a joke, and we have been so dull that we have not found out his meaning. It has dawned on me for some time back that we might have seen it at the outset; for here is he a member of this Association, and yet his intimation is that the proper place for us is the penitentiary! (Laughter). Now it is quite clear that what he intended us to understand was that there is a field for this Association, and that is to point out that you cannot produce too much of good fruit. (Hear, hear). This is the whole point. Mr. Shepherd indicated it very clearly in his experience with the Fameuse apple. He could get splendid prices for them if, only the right steps are taken to bring the apple from the orchard to the tables of the consumers;—and it is a blessing that a word or two has been said on behalf of the poor consumer. I happen to be only a consumer, and I say I would have eaten a great deal more fruit this year even than I did, only that my experience was the same as Prof. Short's. The fact is it is almost the same with fruit as it is with eggs—if you once get a bad egg you don't eat another for a month. (Laughter). So you buy one basket of peaches or a barrel of apples, and you find the top ones good and all below very bad, and you get so disgusted that you fall back on your common chop and resolve to go without fruit. We could eat a great deal more fruit than we do if the fruit was only of the best quality and brought to the consumer, especially in the great markets, in such a way that he takes delight in it. Now what is needed is that steps should be taken along these lines. For instance, I have heard of one man in this Province who shipped 40,000 barrels of apples this year, and yet he did not make as much as Mr. Shepherd made out of one box—less in fact. (Laughter). And why? Chiefly because of the awful sinners in Montreal. (Laughter). There are not sufficient facilities there. For instance, on one occasion it was arranged that a great quantity should go by steamer, and they were sent in time, but there was some block or delay at the railway station, and as there was not another steamer, for some time, they were spoilt and had to be dumped into the harbor. Then again we have not got agencies in London that we should have, and that Mr. Shepherd referred to, or we have not taken the trouble to get into direct communication with stores such as the Army and Navy stores in London, and instead of that we allow the commission merchants to get the immense profits that we do. I think it is quite clear that the paper that was read was not meant at all to say that there are too many fruit trees or too much production. We have heard that cry all along the line. We are told that there are too many potatoes produced—(laughter)—that there is too much wheat produced, and we don't get a living price for wheat. And then manufacturers tell us that there is too much production of cotton and woollens, although all the time people only half-clad and half-fed. (Laughter). And yet we are hearing the cry of over-production! This is all nonsense—there is nothing like over-production in any one of these things. I, as a consumer, so think because I want to get them reasonably cheap so as to get enough of them; and you can only manage that, not by limiting the quantity of fruit produced, but by having the very best kinds, and that is what this Association is for, to show what is the best kind, what is the best way to get it into market in Canada and abroad; and I wish that there was ten times as much fruit produced in Canada as there is, for I believe that this is one of the very best countries in the world for apple production. I have eaten apples in almost every country in the world, and I do not know any country in the world where the apple is so good as it is in Canada. (Hear, hear and applause). And if arrangements are only made to get fruit in right shape to the best markets, and if we only raise the best kinds, there is almost no limit to the development that there can be all over Canada. You get peculiar kinds in different provinces. What Mr. Boulter says is true about British Columbia not producing certain kinds of apples; still they produce some kinds very well. The Northwest Provinces do not, but in Nova Scotia you can get Gravensteins the like of which I have eaten in no other country in the world. Then the Fameuse is the original habitant of Quebec because it was brought from France by the Sulpicians. But the great work of this Association is to go on doubling and quadrupling the production of good apples and seeing that these are got to the tables of the poor consumer. (Applause).

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ADDRESS OF WELCOME.

Mr. THOMAS BRIGGS, President Kingston Horticultural Society, read an address of welcome as follows :

To the President and Members of the Fruit Growers' Association of Canada :

GENTLEMEN,—On behalf of the District Society of the City of Kingston, I have the pleasure of congratulating and welcoming you on the occasion of this your annual meeting for the purpose of discussing and promoting the objects of the Association in all matters connected with the progress of horticulture and floriculture, in both of which great improvements have been made during the past few years, the result, no doubt, of the information obtained at your annual meetings by the discussion and explanation of the various experiments and different modes of cultivation.

The climate and soil of Canada are very suitable for growing most kinds of fruit, and every effort should be made to improve in quality and quantity, as fruit is becoming a leading article of export. Many thousands of barrels of apples have already this season been forwarded to England, where the Canadian apples rank foremost in market, and are readily disposed of at remunerative prices.

Referring to the floral department, the improvement in producing flowers in their varied classes is remarkable, as may be observed in some of the old leading kinds, such as the rose, gladiolus, chrysanthemums, dahlia, fuchsia, petunia, pansy and many other kinds too numerous to mention. This improvement is the result of skilful hybridizing and improved modes of culture, by which the plants are increased in size and form, and in colors and shades. It may well be said that the florist is perfect master in this department, and competent to produce flowers of almost any desired shade.

Yet, notwithstanding all the advances so obtained, it is expected, through the skill, science and perseverance of the members and cultivation, that further improvements will follow.

As electricity possesses light, heat and power and is now made available in nearly every branch of industry, it might possibly prove an assistant in advancing horticulture and floriculture, which you are endeavoring to bring to perfection.

I will not further intrude upon your time by referring to the subjects of your meeting, but will leave the numerous points for their proper place, to be discussed by those who have met here for that purpose. We hope that great benefits will result from your discussions and that your meetings will prove a success.

His Worship Mayor ELLIOTT then welcomed the convention. He alluded to the early history of the place, and referred to its many present advantages.

The PRESIDENT : On behalf of the Fruit Growers' Association of Ontario I assure you we appreciate very highly all the words of welcome that you have extended to us, also the kind invitations. It was with feelings of very great pleasure that our officers decided to accept your kind invitation to hold our annual meeting in the old historic city of Kingston, founded on a rock, emblematic of the firm and lasting loyalty of her people, and we feel that not only every fruit grower but every Canadian is under a debt of gratitude to your city for the many eminent men that she has produced—men who have had so much to do with the founding and up-building of this grand Dominion of ours. (Applause). We hope that your citizens will attend our sessions, feel free to take part in the discussions, and ask questions. We have men in our Society who are full of knowledge on these lines—(hear, hear)—who have grown gray in experimenting in different fruits and flowers, and who will gladly impart any information they can. We in turn expect to receive a great deal of valuable information from you, coming down here among the wise men of the east. (Laughter). Meeting in this building is suggestive that while we may give you some valuable ideas as to how to produce the berries, you in turn can teach us how to produce the cream. (Laughter and applause). The next item on the program is the President's address. It is an old time-honored custom, and I will have to confine myself to my manuscript. (See page 4.)

NEW HYBRID CANNAS IN 1896.

BY MR. H. H. GROFF, SIMCOE.

All that was promised and hoped for by the originators of these most popular of all decorative plants has been fulfilled and more. Only those who have followed the rapid advance in quality and beauty of these grand results can fully appreciate the work of the past five short years; for in that time no other plant has been equally glorified by the hybridizers' skill. To-day we stand upon the threshold of a still greater and grander future, in the results of the first distinct outcross between the perfected hybrid of standard type and species bearing flowers of Iris form. The product of this cross in Italia, Austria and Burbank give us the forerunners of a type destined to claim a first place for size and beauty of form and coloring in the flower, with increased vigor and productiveness in the plant.

As a decorative bedder, aside from the beauty and brilliancy of its flowers, the Canna has no equal for tropical effect in this climate. Planted in clumps, or as centres in bordered decoration, the banana-like foliage in varying shades of green is most attractive; while in the dark foliage varieties, the reds, bronzes and deep plum colors, bear striking contrast to surrounding growth. Planted in solid beds, the system adopted at the World's Fair, the leaves feather beautifully to the border or lawn, leaving no stalk exposed to view.

The greatest advance, however, is in the flower; from the narrow petal and meagre spike of a few years ago, we have flowers to-day from six to seven inches in diameter, with petals from one and a half to two inches broad, in the old types.

To many original colors of unrivalled brilliancy we have added numberless shades and combinations of red and yellow, from the deepest garnet to the most delicate ecru. Of course many of the newer tinted varieties are not as free flowering as the older yellows and reds, but we must not forget that color and quality of bloom fairly entitle later hybrids to recognition.

If permitted to refer to my experience during the season just past, I would say, that after discarding some one hundred named varieties, my collection of these covered about sixty-five of special merit, with the addition of an equal number in distinct and beautiful seedlings of my own originating. In the former nothing that was worth buying was omitted, the cream of all choice American collections were fairly tested, and treated on their individual merits only. From these selections I secured, by hand fertilization, several thousand seed that cannot be duplicated commercially; many of these are already growing finely, and are ready for four-inch pots. Having effected similar crosses to Italia, Austria and Burbank, it is my expectation that these forms will be duplicated in many new colors, and in dark as well as green foliage varieties.

Let me say in conclusion, that my seedlings of 1896 were the source of great pleasure and satisfaction. From thousands of spikes only a small percentage were not worth perpetuation. Many produced, in addition to numberless variations in shades of standard excellence, new forms and types; some distinct forms peculiar to green foliage varieties were transferred to those with dark. Among the most unique forms were several cases of abnormal development of the inferior petal, it greatly exceeding in size those usually classed as superior, this novel variation from the original, adding much to the orchid like appearance of the flower.

In view of these experiences it is not unreasonable to hope, and even to expect, as has been beautifully and fitly expressed by Luther Burbank:—"That having taken a few steps into the measureless fields of scientific horticulture, these will stretch out as we advance into the golden sunshine of a more complete knowledge of the forces which are to unfold all graceful forms of garden beauty, and wealth of fruit and flowers."

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THE GLADIOLUS IN 1896.

By Mr. H. H. GROFF, SIMCOE.

When we consider that previous to 1896 the Gladiolus of commerce contained the blood of only two species, or at the most, three; the further infusion of that from a fourth, may not seem to be a very rapid advance in the line of perfection. But as is the case with most hybrids, time is necessary to assure the value and fixity of a cross, in view of the natural tendency to degeneration and reversion. As claimed by me at Woodstock last year, the past five years have seen greater progress in the development of the Gladiolus than the whole preceding period of its history.

The season just closed was, in my section of the country, unequalled in memory. From early spring to the first killing frost, continuous moderate rain and showers kept the landscape fresh in June verdure without intermission. At planting time I could say that no distinct variety of Gladiolus, obtainable by favor, friendship, or sterner business methods was unsecured. All that care, science, and a favorable season could do was in their favor, and the result showed that it was appreciated. In view of this experience I can only say that past expressions on the various sections remain confirmed.

Let me note in passing, however, that greater care is used in selection from the Gandavensis section; which when given, is the most useful as known to the amateur.

The Nanceianus section excels all hybrids of Saundersonii in the regal beauty and coloring of its enormous flowers.

Had less been promised for Childsi, we might not have expected the great claims for improvement to be fulfilled. Of all sections it lacks more points necessary to reasonable perfection than any other.

The later hybrids of the Lemoine, or Large Spotted section, make it to day the most beautiful of all; no other excelling it in rich and varied coloring, and even in size comparison is favorable.

The first steps after bringing a hybrid to a reasonable degree of perfection in form, is to increase its beauty of coloring. This is only fair to the amateur buyer, who cannot yet be charged with undue impatience; and I would like to say here that this must be more than on paper. In fact I have come to the conclusion that descriptions on paper fail to convey to the mind's eye a counterpart of the form and coloring appearing later under cultivation. So firmly have I become convinced of this, that my selections for testing are often made without reading the detail of description; varieties being increased only on merits proven in my trial grounds. It is here that the system of tested selections introduced by me, stands between the amateur and disappointment. Without detailing the several sections I claim that the advance in quality is limited to too few of the high priced varieties introduced; in fact the system of "collections" in high priced novelties invariably brings disappointment, in the small percentage of actual value secured.

Having prepared for the past season's crossing such a collection of perfected hybrids, and new species, two months continuous effort of over ten hours daily produced four pounds of seed. This from an expensive stock, the cost of an assistant, and my own time, must compete with that sold at \$4 per pound. I simply mention this for the benefit of those who often ask for it in bulk. In my correspondence I am in touch with the growers of the world, and there is no place where it is possible to duplicate it, no matter how much one might be willing to pay. In proof of its value all seedlings are withdrawn from my list excepting those of 1896, and these represent a material advance in quality over those previously offered. The largest flowers with me during the past season were from my own hybrids.

A year ago, in addition to the latest work of foreign specialists, I purchased the whole of Mr. Burbank's stock of California Hybrids the product of some fifteen years' selection and hybridizing. Suitable out-crosses with these and the choicest foreign novelties, gave me a quantity of seed the value of which is difficult to estimate.

Last month I was fortunate in securing the whole surplus (half a ton) of the collection of Dr. Van Fleet, of New Jersey, America's most noted scientific hybridizer of the Gladiolus; made up of the cream of one thousand named selections from the growers of the world, called by him to the extent of fully two-thirds. In addition to the species

secured, many of which are little known and found only in botanical collections, I also got many new hybrids of Adlami, Aurantiacus, Cooperi, Cruentus, Milleri, Papilio albus, Platyphyllus, Leitchlinii, Trimaculatus and others; he retaining only some undeveloped seedlings for future amateur work, and in these I hope to participate later on. Dr. Van Fleet is resuming the practice of his profession. Referring to the first paragraph in this paper, which states that the number of species used in all the Gladioli of commerce is only four, the addition of crosses from the above new species must open a field of limitless variation.

Prof. SAUNDERS: I would like to ask Mr. Groff the names of two or three varieties which he referred to as having the lower petal very much enlarged, making it superior in size.

Mr. GROFF, Simcoe: Those are my own in name, seedlings of my own originating. Canadian hybrids you may call them.

Mr. HUGGARD: Do you find any difference between the light shades and the dark shades of the plants? Which is the most vigorous? I refer to the cannas.

Mr. GROFF: I find no difference in the vigor of the plant. The dark foliage varieties are equally vigorous with green, but they are not quite as free flowering. That is the only difference, but that is being overcome by crosses with the green varieties, the usual method for endeavoring to produce durable plants.

Mr. HUTT: I am sure many would like to hear from Mr. Groff a short account of his method of raising gladiolus.

Mr. GROFF: I suppose there is no place the size of mine in the country that has a greater diversity of soil. I have not more than two acres. On it I have sandy loam, a good heavy loam, solid clay and vegetable deposit. My habit is to grow them for one season on one block, another season on another, and so on, keeping them changed about, although when I cannot do this conveniently I usually fertilize them with hard-wood ashes, being the most convenient form of potash, and in the blooming season it is desirable to use a little bone meal. I usually plant them about four inches deep, which is the most convenient depth for the average soil, and water them during the season when it is dry. I think that having a supply of water means either success or failure. If you have not water at certain times they will not produce as good results as they would with an ample supply of water.

Mr. HUTT: How often do you flower your bulbs:

Mr. GROFF: You touch the question of degeneration, and in the Gandavensis section there are some varieties that won't bloom for more than two or three seasons, but there are some varieties that will bloom season after season. Even in the Gandavensis section there are varieties that will not produce bulblets at all, but only produce by division, and those go on and bloom year after year. I have some Gandavensis that produce no pollen, but sometimes bulblets; I received them from a specialist in Des Moines, Iowa. With him they would neither produce seed nor bulblets. The greatest difficulty in that way is in the Gandavensis section, but discarding those varieties that do fail you could get very fair results year after year, but occasionally you have to let them go without one season's blooming. As to hybrids, it is difficult to answer your question in a short time, newer hybrids, of course, possessing more variety from later crosses with species than the old inbred Gandavensis.

Prof. SAUNDERS: I have been much impressed this last season with the importance of a plentiful supply of water for Cannas, and might perhaps take the liberty of giving you the result of an experiment that has been tried at Ottawa with sub-irrigation to demonstrate this. We are not always favored with just such suitable soil as Mr. Groff has, that will hold a large amount of moisture, and in our flower-beds at Ottawa we have rather a dry, gravelly sub-soil. In order to overcome this lack of moisture natural in the beds one of our Canna beds was sub-irrigated by laying ordinary field drain tiles in one course all around the bed about 18 inches from the margin and laid perfectly level, so that water running into any one of these tiles would find its way evenly throughout the whole series. At one point there was an upright tile connecting with this lower series, and the hose was

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turned into this upright tile once a week and allowed to run for several hours, the tiles being laid from 8 to 10 inches below the surface. The result was that the water found its way out at every joint, and by capillary attraction it came upwards, and after two or three hours you could see a little moisture on the surface of the bed, and the whole substratum was so thoroughly moistened that the Cannas had all the water they wanted. The result was that when this bed was compared with another bed on similar soil without this treatment the growth was considerably more than double, the plants very much more vigorous, and the flowers very much finer, and they came into flower considerably earlier as well, showing that that is just what Cannas require—a plentiful supply of water. I do not mean to say they would grow in a swamp, but they want under-drainage, but at the same time have the soil supplied with sufficient moisture so that the roots may be kept in a very active condition and the growth thus proceed very rapidly. In regard to fertilizers, we have not had very much success with bone meal. There are different qualities of that, and some of it may contain more animal matter than others; but we have had a great deal of success in using a pound of nitrate of soda to a fifty gallon barrel of water, and using this occasionally for watering the surface, or otherwise sprinkling the nitrate of soda in fine powder over the beds occasionally before rain. We have in this way succeeded in increasing the size of the flowers quite perceptibly, and promoting the vigor and growth of the plants.

Mr. GROFF: My reference to bone meal was for Gladioli intended for seed raising, not Cannas. The Canna only requires three things and it will be successful anywhere—plenty of food, moisture and heat; if it has plenty of rich food, ample moisture during warm weather particularly, and as much heat as possible, good exposure to the sun, it is bound to succeed.

Mr. BURRELL: Don't you employ nitrogen in any form to your Gladioli?

Mr. GROFF: No.

Mr. WHYTE: Is there any difficulty in keeping over Gladioli for a second season?

Mr. GROFF: I usually wrap mine up in paper, and if the quantity be small I sometimes cover that with wax paper. My bulbets, when the quantity is not so great that I can put them in boxes by themselves, I also wrap carefully in ordinary paper and cover that with heavy wax paper to prevent drying out. That is the only difficulty—to prevent the bulb from drying out during the winter. Then they should be kept in a cool, dry place.

Prof. SAUNDERS: What do you think of the Flamingo canna? That has given us a larger lower petal than most of the cannas. How does it compare with the other varieties?

Mr. GROFF: My experience with the Flamingo was similar to that of many growers in the United States. It did not do very well with me, although in some localities I believe that it has. I consider F. R. Pearson a much better dark flower than Flamingo, and taking all points into consideration Alphonas Bohier is better than Flamingo, although not nearly so expensive. It has a much higher growth and slower growth than either of those I have spoken of, but the deeper colored one would be F. R. Pearson.

CHRYSANTHEMUMS.

Mr. H. L. HUTT, who was to have given a paper on this subject, explained that when Secretary Woolverton visited the Agricultural College this summer and saw about 120 varieties of chrysanthemums growing in the conservatories at the College, he asked the speaker for a paper for this meeting, but the latter had not been able, on account of pressure of work, to give any time to that subject, but he hoped another year to be able to give something worthy of the subject. He had been taking photographs of some of the best varieties, and these were passed around the meeting.

THE SWEET PEA.

BY R. B. WHYTE, OTTAWA.

Any observant gardener who has studied the catalogues for the last five or six years will have noticed the great increase in the varieties of sweet peas offered for sale. Dealers who listed ten or twelve kinds in 1890 now catalogue seventy or eighty varieties, and every year is adding to the number. No less than twenty new kinds were offered for sale this year for the first time. There is now considerably over one hundred named varieties on the market, and Mr. Eckford—who has originated the majority of the best new kinds—has promised several more next season, which are said to be finer than any heretofore offered.

Up to two years ago all varieties were of one type in form and habit of growth, a tall, growing vine, climbing by means of tendrils over anything that came in its way in its efforts to get as near the sun as possible, bearing flowers with a broad, rounded petal at the back called the Standard, two smaller petals called wings, which bend over as if to protect the central portion, formed by two petals joined together, called the Keel, inside of which are the essential organs of the flower, the stamens and pistil. The first departure from this type was in the so-called double sweet peas, in which the single standard is multiplied two or three times. These have not proved satisfactory, a very small percentage of the seeds produced double flowers, and there is no increase in the attractiveness of the blossom. A great beauty in the sweet pea is the straight, smooth standard which sets off so well the barred colors of the wings and keel. Any improvement must come, not from multiplying the parts—it is now perfect in shape—but from new combinations of color, more flowers on stalk, and more substance in the petals.

Another departure from the type of growth is the much advertised dwarf "Cupid," which has signally failed to justify the claims made for it. It is undeniably a dwarf, forming a mat of 12 to 18 inches diameter on the surface of the ground, and is interesting on that account, but in every other respect it is a disappointment. Four-fifths of the seeds sown in this locality were unfertile. The flowers are small and the stalks short, and in every way it is inferior to Emily Henderson or Blanche Burpee.

The causes of the great popularity of the sweet pea are not hard to seek. No other flower combines so many points of excellence. In beauty of form, beauty and variety of coloring, exquisite perfume, convenience for cutting, and durability after cutting—for they can easily be kept fresh for a week—it is unequalled, and if properly cared for the quantity that can be taken from even a small row is enormous.

A correspondent of "Garden and Forest" kept a record of the stalks pulled from a row 60 feet long, from June 11th to October 20th, when the last one was picked. The total was nearly fifty thousand beside a large number that were allowed to go to seed. From no other flower could we get the same profusion of color and fragrance.

The best soil for growing sweet peas is a good, heavy clay loam, rich and capable of retaining moisture, as it is only by keeping the roots cool and moist that we can succeed in having them in bloom the whole season. If the soil is not very rich put on a good allowance of well decomposed stable manure the previous fall, dig it deeply in and mix thoroughly with the soil, as they do not take kindly to manure in contact with the roots. If not applied till the spring bury it deeply, several inches below the seed bed. If you want to feed them extra well a dressing in the spring of a fertilizer rich in potash—or wood ashes—makes stronger and more vigorous plants.

Plant as early in the spring as the ground can be worked. They are quite hardy and will stand several degrees of frost without injury; indeed, in dry ground where water does not lie, they may be planted in the fall with perfect safety. Make a trench three inches deep, drop the seeds two inches apart, cover one inch deep at first and do not fill in the other two inches till the plants are well up above the ground. If all the seeds grow pull out every second one—or transplant to another place, if wanted, after all danger from cutworms is over—as four inches apart is close enough or the best results.

If your soil is heavy, dig a trench six inches deep, and keep the surface of the trench covered with a layer of manure or compost. This will keep the surface of the trench from becoming too hard, and will also keep the soil from becoming too dry. The soil in the trench will be supplied liberally with manure, and will not waste the soap-suds.

Some of the best varieties of sweet peas are those that it is necessary to plant in convenient trellises. The posts, firmly set in the ground, can be stretched with wire or rope.

A very handsome form of a cyclone is the Keel, which keeps it in shape. It is planted around the base of the flowers of one or two rows, and can be set up anywhere. It is as wanted each year, and is an ordinary grape.

The insect troublesome to sweet peas is the pea weevil. It is any succulent vegetable that grows along the rows, and is a great pest.

A more serious pest is the pea moth, which lays its eggs on the leaves. It first appears as small, brown, and in the evening it is known about the plants. Probably spraying with kerosene will destroy it.

A great deal of trouble is caused by the house and window flies, which are observed unless the plants are protected. The results of his persistent spraying with kerosene pump is all that can be expected.

In describing the sweet pea, it is somewhat difficult to do so, as the varieties are so intricately mixed and so numerous. In shape there are many varieties, and the rest of the flower is a good representation of the whole. It is a good representation of the whole, and is a good representation of the whole. It is a good representation of the whole, and is a good representation of the whole.

Whether you are surprised at the number of flowers, or whether you are surprised at the beauty of the flowers, it is a good representation of the whole, and is a good representation of the whole.

If your soil is light and sandy, it will be necessary to plant much deeper. Make the trench six inches deep and fill in a little at a time as the plants grow, taking care not to cover them with the earth.

The soil must never be allowed to become dry; the frequent use of a sharp rake keeps the surface open and prevents excessive evaporation, but in addition water must be supplied liberally after the middle of June, unless in unusually wet seasons. Do not waste the soap-suds on wash day; it makes one of the very best fertilizers.

Some of the new varieties grow so tall—in good soil as high as six to eight feet—that it is necessary to provide support for them not less than six feet high. The most convenient trellis material is poultry netting with a two inch mesh, fastened to stout posts, firmly set in the ground, with a top rail to keep the posts rigid so that the netting can be stretched smooth.

A very handy trellis can be made from seven or eight feet of netting, bent in the form of a cylinder and the ends twisted together, with a stout wire hoop at each end to keep it in shape. This, set on end, fastened to a stake to keep it upright, and the peas planted around the outside, makes a very pretty object in the garden, when covered with flowers of one or two varieties. A great advantage of this style of trellis is that it can be set up anywhere on a few square feet of ground, and can be shifted from place to place as wanted each season. If one is willing to take the trouble to tie the vines to wires an ordinary grape vine trellis does very well with the wires about eight inches apart.

The insect enemies of the sweet pea are few in number. Cutworms are sometimes troublesome. When numerous they may easily be poisoned by placing little bundles of any succulent weed dipped in Paris green and water and laid every two or three feet along the rows, or they may be dug out in the usual way.

A more serious evil to contend against is the blight, this is only troublesome in very light soils, or where peas have been grown several years in succession in the same place. It first appears when the plants are about a foot high, the leaves first turn yellow, then brown, and in bad cases the whole plant becomes black and dies. There is not much known about the cause or nature of the disease, or how to cure it when it appears. Probably spraying with Bordeaux mixture is as good a remedy as is available.

A great deal of what is taken for blight is really caused by that pest of the greenhouse and window garden—Red Spider. It is so insignificant in size that it is seldom observed unless looked for, even then it takes good eyesight to locate him, though the results of his presence are evident enough. Fortunately it is very easily kept in check, a vigorous spraying now and then from the waterworks hose if available, or from a spray pump is all that is necessary.

In describing varieties, shapes and colours run into one another so much that it is somewhat difficult to classify them. The colours white, red, yellow and blue are so intricately mixed and blended that any classification founded on colour is unsatisfactory. In shape there are three fairly well marked divisions; the first, from which all the newer varieties are derived has the standard somewhat wedgeshaped and bent back from the rest of the flower or reflexed as in "Painted Lady," the second, of which "Blanch Burpee" is a good representative has the standard straight and erect with the wings and keel close up to it; in the third form, as in "Lottie Eckford," the standard is inclined forward at the edge as if to envelope the wings, this is known as the hooded form. Many of the most admired new sorts belong to this class. In some cases this tendency of the standard to curve forward is carried so far as to cause a roll at each side as in Oddity, when this bending forward is carried to such an extent it may be interesting to the specialist from its oddity, but it certainly could not be called beautiful.

Whether you plant named varieties or mixed be sure to plant enough; you will be surprised at the number that can be used as cut flowers, not only in your own household but by your friends. I have yet to see the visitor to my garden that was not delighted to get a bouquet of sweet peas. Give them away freely. If you want to have an abundance of flowers all summer they must be picked frequently, never allow them to go to

seed. If you plant them mixed get the best Eckford mixtures, but it is much more satisfactory to buy named varieties, as you can then select such colors as you prefer. Most of the mixtures have too large a proportion of dark colours, for the best effect, in my opinion, not less than four fifth of a collection should be of light or medium shades.

In making a selection from the many varieties offered for sale a great deal will depend on the individual taste of the grower, what colours one prefers and also on the amount of space that is available; to grow anything of a larger collection requires a long stretch of trellis. A weak growing kind is apt to be overgrown by a stronger neighbour unless there is about five feet allowed to each kind.

Probably a collection of twelve sorts would satisfy the average grower for variety. In that number a very fair representation of the different shapes and colours can be had. Leaving out of consideration the six new kinds sent out this year by Mr. Eckford, as very few growers would care to pay the price asked for them, 2s. 6d. the package, I would recommend, as the best out of seventy varieties grown by me this season, the following twelve:

1st, "Blanche Burpee," decidedly the best white to date, of the largest size, fine form, good substance and a profuse bloomer.

2nd, "Primrose," pale primrose yellow, a very delicate and handsome flower, by some "Mr. Eckford" is considered a better yellow, but it has not done so well with me.

3rd, "Ranona," a new Californian variety sent out this year, of largest size, slightly hooded form, colour white, with faint rose pink lines on the standard, a lovely flower, strong, vigorous grower and profuse bloomer.

4th, "America," also a new one from California, the best red and white stripe, white ground with brilliant blood-red stripes. A most effective flower, either in a bouquet or on the trellis.

5th, "Princess Beatrice," pale blush and pink. An old favorite, much grown by florists for cut flowers.

6th, "Lottie Eckford," white suffused with lavender, standard and wings with a delicate blue edge, a most exquisite flower.

7th, "Countess of Radnor," standard a clear lavender, wings a little darker, good size, hooded form, the best of the lavenders.

8th, "Katherine Tracy," new last season, by far the best pink to date, of largest size, good shape. Clear rich pink all over, the most profuse bloomer in my collection, should be in every garden.

9th, "Lady Beaconsfield," salmon, pink and primrose, not of largest size but fine form and a charming combination of colour.

10th, "Lady Penzance," a cherry pink with pale carmine veining, a unique colour, good form and profuse bloomer.

11th, "Fire Fly." The best red to date, not large in size or of the best shape, but very brilliant in colour.

12th, "Boreatton." The best dark sort, an old favorite, deep velvety, maroon and claret.

Such a collection would require at least sixty feet of trellis, and if well grown should produce not less than fifty thousand trusses in the season. Do not think that that is far too many, if you have lots of friends—and what gardener has not when he has flowers to give away? You can easily dispose of a great many more than that. Of course twelve kinds does not include all that are worth growing; if you liked you could very well add another dozen to the number, every one of them desirable flowers to have. To my taste the second best dozen would be made up as follows:—"Lemon Queen," a fine white with a touch of yellow on it the first day after it opens; "Blanche Ferry," pink and white; "Daybreak," a new American variety, white and scarlet; "Mrs. Gladstone," blush and pink; "Splendor," deep pink; "Venus," salmon pink; "Princess of Wales" blue

and white stripes or blotches. Perfect it is a variety called "Duke of Clarence."

No doubt I can assure you that garden flowers of the available variety and discarding them the next few years you will have an interest in your garden to plant them.

Dr. WALKER with the extra large size, far exceeding not as good as usual climate of Manitoba the ordinary garden.

Mr. WHYTE them and water second day. They or four days all rich. This year far better than I soil was very rich any other.

Prof. SAUNDERS in Manitoba and there. Why, then, taking the season indeed on the size notice in parts of that the extra moisture the lack of sunshine as a rule, will be peculiarity is not ion with a number think they are fine is a very important color of flowers.

A DELEGATE east and west or north.

Mr. WHYTE that you get more because it is not cold.

Prof. SAUNDERS

Mr. WHYTE: plants just before when they are planted.

Prof. SAUNDERS do, I thought I the directions that I planted them very

and white striped; "Gray Friar," should be bluish gray but is often spoiled by dark stripes or blotches, inherited from "Senator," from which it has been selected; when perfect it is a very fine flower; "Stanley," purplish maroon; "Dorothy Tennant," mauve; "Duke of Clarence," dark mauve and purplish blue; "Captain of the Blues," the best blue.

No doubt some of you will think that it is all nonsense growing so many kinds, but I can assure you there is a great deal of pleasure to be derived from taking any of our garden flowers, sweet peas, asters, poppies or any other flower you prefer, growing all the available varieties of it, making a thorough study of their habits and peculiarities, and discarding the inferior sorts, retaining the kinds that please you most for future use. Then the next year take up some other flower, pursue the same course with it, and in a few years you will have acquired a knowledge of the floral kingdom, and developed an interest in your garden, such as you never dreamt of in the old days when you were content to plant the same few papers of mixed seeds year after year.

Dr. WALKER: When we were up in Manitoba this year all the visitors were struck with the extraordinary character of the sweet peas, not only beautiful in color but very large size, far exceeding in size any grown in this part of the country, where they were not as good as usual. I would like to know whether there is anything in the soil or climate of Manitoba that would give these surprising results. We noticed also that all the ordinary garden flowers there were very much brighter than those grown with us.

Mr. WHYTE: I do not think soil has any particular effect, especially if you feed them and water them well—particularly water. Sweet peas should be soaked every second day. This year I had only to water my peas once, but we had rain every three or four days all summer. In Manitoba the heat is not very great, and the soil is very rich. This year a friend of mine had the finest specimen of "Lottie Eckford" I ever saw; far better than I grew, but the reason was that he had them in some shady place and the soil was very rich and he watered them well. The flowers were 30 per cent. larger than any other.

Prof. SAUNDERS: I think there is one other element connected with the sweet peas in Manitoba and the Territories, and that is the immense amount of sunshine they have there. Why, their hours of sunshine exceed ours by from twenty-five to fifty per cent. taking the season through, and there is no doubt that that has a very important bearing indeed on the size of the flowers of the sweet pea. The same thing, however, you will notice in parts of British Columbia where they are deficient in sunshine. There it seems that the extra moisture, added to the richness of the soil, makes up to some extent for the lack of sunshine, although I do not think the sweet pea in British Columbia, taken as a rule, will be often as large as those grown in Manitoba and the Territories. That peculiarity is not confined by any means to the sweet pea. I have noticed it in connection with a number of annual plants, particularly stocks, verbenas and also asters; I think they are finer than they are with us, showing that this great amount of sunshine is a very important factor in bringing out the greatest perfection in beauty and size and color of flowers.

A DELEGATE: Did you ever find a difference in the direction of planting the rows east and west or north and south?

Mr. WHYTE: It is generally believed that north and south is the better way so that you get more sun both in the morning and the afternoon. I have not followed that because it is not convenient; I do not see any difference.

Prof. SAUNDERS: What experience have you had of planting seed in the autumn?

Mr. WHYTE: I have not had any experience, but I have a friend who regularly plants just before freezing, and he says he has his peas a week or two weeks earlier than when they are planted in the spring.

Prof. SAUNDERS: From the strong statements being made that it was an easy thing to do, I thought I would try it myself last year, and I took every precaution, following the directions that were published and there was not a solitary pea came up in the spring. I planted them very late.

The SECRETARY: Did you have the usual amount of snow?

Prof. SAUNDERS: No, we did not. It was a hard year, I must admit.

Mr. BURRELL, St. Catharines: We have usually planted them in the fall in the neighborhood of St. Catharines. I have the chicken wire drills 50 or 60 feet long and between 5 and 6 feet high, and we put them in about 5 or 6 inches deep in the fall, and we had them three weeks earlier. By planting diligently we have had flowers almost all the summer.

Prof. SAUNDERS: I suppose a good deal depends on location?

Mr. WHYTE: And something depends on soil too. If it was a very light soil frost gets in more, and they would not be so hardy. Even last year, hard as it was, there was quite a number of seeds came up that were sown the year before.

THE AMATEUR'S ROSE GARDEN.

By MR. O. G. JOHNSTON, KINGSTON.

We find mention of the rose in the earliest writings, both sacred and profane. It was undoubtedly very generally esteemed and used both for ornamentation on both public and private occasions. As an instance it may be mentioned that the Romans put it to a very significant use at some of their private dinners and feasts. A rose was placed over the principal door, and he who passed under it silently bound himself not to reveal anything that was said or done within. Hence arose the saying "Sub Rosa."

The limits of this paper will not allow me to give a history of the rose, but I will speak rather of the way to cultivate it. There have been so many papers read on the rose and so many good books printed that it is hard to say anything new, but as most of the books written and papers read have been English and suitable to an English climate, therefore they would not do for this climate and are a little confusing to the amateur. This paper is for this locality; further south you should start earlier and further north a little later.

The first requisite in the culture of the rose is the preparation of a suitable place for planting them; the best position is none too good for them. What I consider the best is facing the east, with protection on the north and west. I do not mean protected by big trees but with fences or hedges. The rose likes to have a fairly open exposure with a free circulation of air about it; but when I say that I do not mean such a circulation as would drive a forty horse power windmill. In connection with the choice of location, we must see that the roses are provided with a proper soil; they will do well in any good garden soil free from standing water. The soil of course must at first be thoroughly manured as the rose is a gross feeder. Roses that have been grown out of pots should if possible be planted while in a dormant condition in the spring as it is almost impossible to lift a rose while the sap is running and at the same time have it make a good rose. Roses that are pot-grown can be planted any time in this latitude from the 10th of May to the 10th of October, but if set out in midsummer, a little extra care will be needed in watering them.

Respecting the size of plants that should be set out, I advise those who can obtain them to put out plants of two years' growth. Do not put out bantlings—bantlings are plants sent out by mail, 20 for a dollar. Of course you get a beautiful catalogue with them and a coloured plate of roses. Look well at the picture, as it is about all the roses you will see from plants sent out by mail.

If you have a greenhouse to nurse them in for a season you may succeed with them, but one honest two year old pot-grown rose is worth fifty of the baby roses that are sent out by mail.

In planting the bed, if of more than one variety, the strongest plants should go in the centre of the bed and the weaker ones on the outside. The pruning of roses is one of

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the most important features connected with their culture. All roses that come from the open ground should be pruned immediately after planting, as the shock of transplanting must be met by a shortening of both shoots and roots.

The shoots being shortened the number of buds to draw upon the sap is reduced and a more vigorous growth is followed. Pot-grown roses will not need pruning the first year they are planted, as there is no disturbance of the roots in planting them. Plants of delicate habit should have severe pruning; do not prune till the spring as then you can better see the damage that has been done by frost. Besides pruning the plants in early spring, a summer pruning in the middle of July is helpful, in order to induce the formation of flower buds later in the season.

Just here it would be as well to say a few words about planting the rose. I will not take up your time by telling you all the ways it is done by amateurs, but I will tell you the right way.

The heaped up mound of soil that would make a pretty bed of geraniums is not the style of bed to plant roses in. You can elevate your bed above the level if you like, but it should be as nearly flat as possible on top and moderately firm, make an excavation with a trowel or any thing suitable, one inch deeper than the ball of the plant you are going to put in also two inch wider, place the plant in the centre of excavation, press the soil around the ball of roots and fill up level to the surface. Be sure you plant them firmly as more plants are lost by loose planting than by insects.

The distance to plant is about two feet apart. If planting them in a long border I would plant them eighteen inches in the rows and three feet between the rows; that with a good watering will complete the operation of planting. If you syringe well every fine bright day you will find in ordinary weather it will keep the soil moist enough.

About the 1st of June after the roses have broke freely is the time to put on a mulch of rotted manure. They will also be benefited by digging the same in after the summer crop of roses is over, and applying another mulch on top, cutting all weak growth out and shortening the flowering shoots back; if you follow this up you will be gladdened by very fine roses in September and October.

Manure, if new, should never be applied to come in contact with the roots, but may be spread on the surface of the earth as a mulch. All animal manures are useful for roses. Horse manure is much better for heavy soil than for light. Well rotted cow manure is best for light sandy or light black soils, do not use cow manure for any soils that are inclined to be wet and sticky. Before you can grow roses in a wet or sticky soil it must be under-drained. There are also other good fertilizers for the rose, such as soot, spent hops, flour of bone and bone meal. Also a dressing of lime when you dig in the winter mulch in the spring, and another dressing before you put the winter mulch on in the fall. Wood ashes are also an excellent fertilizer for the rose.

During the formation of the flower buds, which will be about the 1st of June, an application of liquid cow manure will help to swell the buds and give texture to the flower. Do not use any after the flowers buds begin to show colour.

Insects.—Just about this time keep a close watch for insects. I will now tell you the principal insects you may expect to find, for although these are not all the enemies of the rose, yet if you keep these down the others will not do much damage. The "aphis" or green fly is a small green louse about $\frac{1}{8}$ of an inch in length, when fully grown, but you should never see it that long, as it will show neglect on your part. The aphis is very prolific in breeding, so look well after it. Much the best destructive agent is tobacco, of which there are several preparations put up for use, or you can boil some tobacco stems and apply with a syringe. The right strength for use is about the color of ordinary tea. Another remedy for the aphis is quassia chips boiled in soft water. The above remedies can be applied with a syringe, or with a whisk broom for a few roses.

Mildew.—The best remedy for mildew is flower of sulphur. This should be applied the moment the disease makes its appearance. It comes in the form of a white downy

appearance on the young tender leaves. The moment that it is seen even if only one spot, sprinkle a little sulphur on the leaf. If there are a number of spots apply the sulphur with the bellows. This is an important matter, as it is a fungus growth that spreads with great rapidity. One moment to-day in applying sulphur is worth an hour to-morrow, as mildew is contagious, spreading from one plant to another very rapidly.

The rose hopper or thrip is perhaps the most troublesome pest with which the rose is afflicted in the open air. It is a small, yellowish white insect, about the one-eighth of an inch long with transparent wings. They usually prey upon the leaves from the under side and they are very destructive to the plant, making it assume a sickly yellow appearance. By syringing the under side of the leaves, and dusting on white hellebore, it will soon destroy or disperse them to some other rose bushes that are not being looked after.

Red Spider.—This is a most destructive little insect if neglected, but not much trouble in the garden, as they do not like water any better than tramps do, so by keeping your roses syringed from the under side you are not apt to be troubled with them.

I have now named the principal insects and diseases of the rose, and told you how to keep them away. If you keep your roses free from the above insects you will sure to have fine roses.

I will now say a few words in regard to varieties to plant. The twelve varieties of roses that I would recommend to plant in this latitude are not what you are apt to see recommended as the best dozen in a catalogue. It is only human nature to recommend what you have got in stock, but the twelve I recommend, I consider the cream of several best dozens. These are:—

Anne de Diesbach, Baroness Rothschild, General Jacqueminot, Mabel Morrison, Jules Margotin, Magna Charta, Louis Van Houtte, Paul Neyron, Melville de Lyon, Prince Camille de Rohan, Alfred Colomb, Marie Baumann.

The roses I have mentioned are all perfectly hardy in this latitude, and are also good autumn bloomers. They also embrace a good variety of colors. Any one who has not seen these twelve beautiful roses in bloom in the early morning, while still wet with dew has missed one of the greatest pleasures of life.

I will now say a few words about climbing roses. The three I consider the best for this climate are:—(1) Baltimore Belle, bluish white; (2) Prairie Queen, bright rosy red; (3) Seven Sisters, light blush. These varieties will bloom profusely in mid summer the following season after planting. The care they require is identical with bush roses, excepting pruning. All the pruning they require is to cut the thinnest wood out in the spring and also what is winter killed.

You can either lay them down in the fall and cover with light material or cover them up as they stand. I prefer to lay them down. Just here I would say do not be in too great a hurry to take off winter mulch. About the 1st of May will be about right for this latitude, for I find that if taken off before the sharp frosts that we sometimes get in the latter end of April it does them an injury. When you take off the roughest of the mulch and prune and fork the bed over, there is nothing further to be done except to watch out for insects and mildew, and syringe on all fine sunny days.

Just here I would say, the amateur who is likely to get the most roses and the most enjoyment from his garden is the one who will work from five minutes to fifteen minutes every day; and the one who will get the least roses is the one that will go out in the garden in the spring, throw his coat off, work all day, get tired out, and never go near the roses again till they are all mildew and eaten up with insects. This picture is not overdrawn, as I have seen it done this way myself.

To have beautiful roses you must always have them with you in mind and heart. And now, if this paper has made anyone here feel a longing to grow roses, I would earnestly recommend them to purchase a book about roses, written by Cannon Hole. This book of 322 pages is a charming compilation by a gifted writer, who, though an amateur,

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has done more to further the growing of beautiful roses than any other man. No one has written on floricultural subjects so lovingly as Canon Hole, and his book on roses no amateur or gardener can afford to be without.

Prof. SAUNDERS: I think the remedy Mr. Johnston suggests for the thrip, which is the most troublesome of all insects—the application of hellebore—would hardly be sufficient. The other remedy referred to, tobacco, is an excellent one; but the reason why hellebore is not an efficient remedy for thrip is that that insect is furnished with a beak with which it punctures the under side of the leaf and sucks the sap out. It could not possibly get enough hellebore to do it any harm, because the puncture is so small. If it could be made to eat the hellebore no doubt it would poison it, but as that class of insect does not subsist in that way it is impossible to reach it with Paris green or hellebore or any of these things that require to be eaten in order to poison the insect. It does not do to apply the tobacco syringe on the thrip when the insect is an eighth of an inch long and wings fully developed, as Mr. Johnston has well described it in the adult state; but in the young state that insect is a soft-bodied wingless insect practically in a larvæ form. We put four ounces of tobacco to a gallon of water and boil for three or four minutes, and it is better to add soft soap. The nicotine in the tobacco and the alkali in the sap penetrate the body of the thrip and poison it. There is one other insect which we find exceedingly troublesome in Ottawa, that is the leaf roller. It gets into the bud of the rose quite early in the season and very often eats out the substance of the bud before the flower has time to expand. That is very easily got rid of by soaking the plants, when the leaves begin to expand, in a preparation of a teaspoonful of Paris green to a pailful of water, and we invariably adopt that plan in Ottawa, where we have some 200 varieties of hybrid perpetuals, and we have all the varieties I think Mr. Johnston has referred to. I think Mr. Johnston has given us a great deal of information, and I feel very much indebted for his practical paper.

Mr. JOHNSTON: I do not like to recommend Paris green because my garden is not an experimental farm; it is not a rose garden to make money out of; it is an amateur garden with a man that has four or five children. I don't know what kind of children some people have, but mine will go around and smell the flowers and put them in their mouth and taste them. I should be very sorry to have roses spread with Paris green, in the smallest quantity, as it is a deadly poison. We use Paris Green, but it is in the green-houses outside of the garden. In a great many cases it is absolutely necessary to use the Bordeaux mixture, but for private gardening it is not wise. As regards the wingless insect I claim that white hellebore put on its body while in a larvæ state will kill it; and if you catch a few of them in a larvæ state at any time and roll them in hellebore they won't roll in anything else. (Laughter.)

Prof. SAUNDERS: There would not be much profit in growing roses if we had to catch each one of those larvæ and roll them in hellebore. (Laughter). That reminds me of an argument a man used with me at one time to show the utter inefficiency of Paris green. He brought me a potato bug that he had put in a bottle of Paris green and rolled in it till it was completely covered, and the insect was throwing its legs about and enjoying itself in this Paris green as well as if it would in flour or anything else.

Mr. JOHNSTON: That was a hard-shell bug, not a soft-shell bug.

Prof. SAUNDERS: I asked this gentleman what he would do if he was thrown into a barrel of Paris green—would he open his mouth and eat any of it? He thought not; he would keep it shut. Of course that was a hard-shell insect. I have tried the hellebore with the thrip in all stages of their growth, and I never found it of any material benefit. I think Mr. Johnston is too nervous on that Paris green question. Where a teaspoonful of Paris green is put in three gallons of water and stirred, and made a fine spray of, the quantity you will find on any one rose is so infinitesimal that if a child could get it all in its mouth it would only act as a very gentle tonic and never do any harm. In the old days arsenical preparations were very commonly used as tonics. I have never yet known of an instance where Paris green, which is so universally used over the civilized world, if carefully sprayed on plants or trees or shrubs, diluted to about a pound to 200

gallons of water, has ever done any harm. Farmers who were prejudiced against Paris green and afraid it would kill their cattle are now converted to the opposite side; and I think that Paris green for the roses can be used without danger at all if used in that way; but if anyone fears to use it hellebore will answer the same purpose.

Mr. JOHNSTON: I quite agree with what you say about the Paris green, but I am alluding to where you have a few roses, and where the lady of the house does not send for a quarter of an ounce of Paris green but for a quarter of a pound, it is so cheap, and you cannot get her to put on that small quantity; she thinks if a little is good a lot is better. It is all well enough around an experimental farm where everything is done just so.

Mr. BURRELL, of St. Catharines: I should like to ask Professor Saunders if it is true as stated by several entomologists that I know, that hellebore does kill by contact.

Prof. SAUNDERS: I think it has some effect upon the gooseberry saw-fly worm by contact; that is a very soft bodied larvæ. I have known them die in ten minutes by the watch after being sprayed with an application of that sort, and I think there would be hardly time enough for the hellebore to kill them by being taken into the body.

Mr. BURRELL: I have used it on the pear slug purposely for that. It has a soft and almost sticky body, and I always fancied it killed by contact, more so than Paris green. I should like to ask Mr. Johnston what is the best soil for roses.

Mr. JOHNSTON: Good firm soil is the best.

Mr. BURRELL: Light sandy soil is not good?

Mr. JOHNSTON: It is not good; it is almost impossible to make it good for roses.

Mr. BURRELL: Do you know anything about this Climbing Rambler; is it any good?

Mr. JOHNSTON: I would be very sorry to say. I have about a hundred to sell. Wait till I sell my hundred and I will tell you about it.

Mr. WHYTE: Does not the hellebore affect these insects by closing up the breathing pores and preventing them from breathing, the same as any other fine powder would?

Prof. SAUNDERS: I do not think that it very often occurs that an insect is killed by inhaling any dust like that through the breathing pores. The breathing pores of insects are covered with a very fine exquisite network to exclude all particles of dust. It is so very fine netted that while it will admit the air it will almost effectually keep out all particles of dust. The pyrethrum powder will kill insects, but that is known to be because of a poisonous element in the powder. In regard to the pear slug the hellebore is no doubt very effective on that, but I have always found the Paris green equally effective, and although the pear slug is a very soft-bodied insect I do not think it is so easily killed as the larvæ of the saw fly. Although soft, it is covered with a slimy, sticky exterior, and I was very strongly impressed with the vitality of the creature some two or three years ago. I tried some experiments to kill them with dust. I selected a leaf on which there were a number of these slugs and peppered them all over with dry sand and isolated this leaf so that I could watch them, and I found that they had all crawled out of this coat and got a new coat underneath. I tested them in a few days again and they came through the same way with a new coat on, and I gave up the experiment feeling that there was no practical value in the use of dust for killing that insect. It shows they are not killed so easily as some other insects are with slight applications.

Mr. WHYTE, of Ottawa: One of the most important considerations in keeping the roses free from insects is to be in plenty of time with your applications. A great many people wait till they see the insects on them; then they are too late. Begin early in the season before the leaves are formed. To save spraying with this thing and that thing I compounded all my elements and did the whole thing with one spraying; that is, I boiled the tobacco and added whale oil soap to it and the hellebore, and made one application, and it was most efficient.

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Dr. WALKER: What is the best mode of protecting roses in the winter time? I found manure ineffective and ultimately I took to covering them with earth. My experience is that that is the best mode of protecting them. I had a great deal of difficulty with hollyhocks; they completely died out and it was very difficult indeed to protect them.

PRESIDENT: I will ask Mr. Race to answer that question and also say a few words on rose culture. Mr. Race is a grower of a very large collection of varieties.

Mr. RACE: What I know about the rose is purely as an amateur. I have no roses to sell and never do sell them, although I have been frequently sold by them (laughter). I have had considerable experience in both propagating and growing the rose. In fact I have been frequently referred to as the crank of Western Ontario on the rose. I am not a crank, for a crank is a thing that requires somebody to turn it, while I have yet to meet the man or woman that has been able to turn me from my conviction that the rose is the queen among flowers (applause); that with a very little common sense and a very little labor any man or woman that has a small piece of ground can grow a beautiful rose and should do so, not only because the rose is the most beautiful flower, but I believe that its influence on the grower, on his family and his friends is such as to justify any man or woman giving a great deal of attention to it. I give a great deal of credit to the rose for the very excellent character that I have myself (laughter), and it has done a great deal in moulding my family; and I know my neighbors must love the rose because they come to my garden a very great deal in the summer time, and I do not suppose it is because they love me or come to see me (laughter). While I agree with a great deal that Mr. Johnston has said in his paper, I think he is making the matter a little bit too difficult. My whole effort in speaking on the rose is to make it just so simple as to encourage everybody to go into the cultivation of that flower. It is the easiest matter in the world to grow the rose. I have seen the rose growing in many of the States and in England, but I can show you in my own garden just as beautiful roses as they can produce anywhere. The first thing in order to produce a beautiful rose is to have that beautiful rose in your heart and mind, that is, to have the love for the rose. Love will overcome all obstacles no matter in what direction. The first thing to do is to have your ground very rich. I have my ground so immensely rich that I can produce almost any amount of wood in most varieties of roses that can be grown, and thus I overcome the difficulties of a great many of those insects because I almost defy the ravages of the green fly. I let them feast away upon my roses and yet they cannot check the growth, it is so rank; but the next best thing to deal with that green fly is the finger and thumb. I am not at all delicate in going among my roses, for I get up early in the morning, as most newspaper men do, and I take them between my finger and thumb and clean them off; that is about all I do for the green fly. The most destructive insect to my roses is the leaf roller. For that I use Paris green water. Sprinkle it on early in the season just as the leaves are coming out and just as the buds are forming. You will find that that leaf roller will roll up in the leaf and it will come out in the night time and take a bud, generally the choicest, eat a hole right in the centre and destroy the flower. Paris green is the best thing for that, and the man who is so careless about his premises as to be afraid to have Paris green on them is not going to make a great success in cultivating roses. There is a discrepancy there somewhere. I use sometimes hellebore, but I prefer Paris green because it requires such a very small quantity of it. Then with the very rich ground and plenty of sun and a little bit of attention of that kind, you can produce all the roses that you like. I produce my roses to give away, and I have more pleasure in giving them away than I do in looking at them; and I will tell you here that there is nothing in the world that will bring any person so many friends as to have a nice rose garden. I know that my friends multiply exceedingly during the rose season (laughter). I have now about 200 varieties, but I can pick out 25 or 30 varieties from any catalogue and produce more beautiful bloom than any man can from 500 varieties, because they will be assorted so that they will give much more bloom. I would recommend you to get a few standard varieties and stick to them until you want to go into larger extension. The collection that was given is a very good dozen

indeed, but I think it might be improved upon. I think the white rose, Madam Planter, was dropped off. I would not drop it off. The only objection to it is that it has a short season, but it produces a beautiful effect while it is in bloom. It is a magnificent bearer for about two weeks, and it is really worth all the trouble that there is in producing it just for the sake of these two weeks. I protect my roses almost entirely with maple leaves. I allow them to grow as high as they will grow, then bend them over and lay a stick of wood or something to keep them, and spread them over with maple leaves. Where I have them in squares I trench them right up as high as I can in the fall with soil on each side and then also cover them with leaves, but my largest patch is along a lattice fence, and I bend them down through the fence as well as I can and lay a piece of wood on them and cover them over with leaves. This is all the protection I ever give them. I bring my roses through the winter without any difficulty in any way. I do not remove that covering until pretty well on in the season, and when I uncover them I trim them back pretty short and after the blooming season I then manure my roses. With a trowel I remove the soil from the roots and put in just a little of very rich manure around about the roots and cover it over with that same soil. I can make the Magna Charat variety bloom nearly all the season by treating it in that way. In the fall I mulch my rose-buds with manure, and after that lay them down and put on the leaves. (Applause.)

The President then introduced Mr. Herrington, of Napanee Horticultural Society, which is one of the seventeen or eighteen branch societies affiliated with this Association.

NAPANEE HORTICULTURAL SOCIETY.

BY MR. W. S. HERRINGTON.

Fruit growing is neither a vocation nor an avocation of mine, and it would be the basest presumption upon my part to attempt to instruct the members present in any branch of that important industry. I might entertain you, however, were I to relate to you some of my interesting experiences in raising berry bushes. Berries, I have none. Such entertainment to a gathering like this would be profitless, so I shall desist. As a member, a charter member, and a director of the Napanee Horticultural Society, distinctions of which I am proud, I can speak authoritatively as to the progress that organization has made in Napanee, and the benefit it has been to the individual members and the town as well. Through the energy and perseverance of Mrs. Wilkison, whose vegetable and flower gardens have been the objects of envious admiration for years, we sprang into being in December, 1894. Our first praiseworthy act was to become affiliated with this Association. For this I am sure you will at least give us praise. Those of us whose gardens are limited to a few square yards in summer and a flower stand in a south window in winter need instruction and advice in the culture of the few flowers which give us so much delight and pleasure. Most of the reading matter in your annual report and in the *Horticulturist* may be interesting to the fruit grower and doubtless is relished and enjoyed by him, but can't you devote a little more attention to the grower of flowers. It may be that we overestimate our own importance, but I leave it to you to decide as to the justice of our request. I am pleased to note that this year's program is more in harmony with the wishes of the floriculturist than those of former years.

To return to the working of our own society:—In the first place we pride ourselves in being the only society that is abreast of the times in having a lady President. We have not during the two years of our existence increased our membership very much. We now number about 70, but our zeal and interest in the cultivation of flowers has multiplied a hundred fold. The funds at our disposal, about \$200, have been principally invested in the purchase of bulbs and seeds for distribution among the members, believing this method to be the surest way of inducing them to become practical. In this we have not been disappointed. A friendly competition now manifests itself on every hand. One member who had never grown a flower before he joined the society, imported this fall no less than 2,000 bulbs from Holland for his own use. The fragrance of the hyacinth now

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pervades a hundred houses, and bright blossoms adorn a hundred windows that two years ago were barren. Every member who has a few square yards about his lawn to spare has laid it out in flower beds, and now throughout the summer months gay and artistic bouquets are profusely arranged on hundreds of mantels where heretofore the cheerless bric-a-brac held sway. The contagion is not limited to individual members, but the town authorities, having a due regard for the new-born taste of the citizens for lawns and boulevards, are relaying the sidewalks nearer the centre of the street so that the driveways are narrowed, but the lawns extended. A neglected cemetery, which had degenerated into a veritable wilderness of weeds, has come in for its share of attention. It has been remodelled, all rubbish has been cleared away and what was formerly an unsightly mass of underbrush and weeds now slopes in graceful avenues to the river's edge, crossed by avenues and paths with beds of flowers on either side. The plots are being levelled and sodded, and tottering tombstones are being restored to their proper positions or new monuments taking their places.

The directors have had under consideration for some time plans for the opening of a public park in the heart of the town; which plans they hope to be able soon to carry out.

Most astonishing and satisfactory results have been produced, and a lively interest awakened in the practical study of botany among the students of the Collegiate Institute, by giving prizes for the best collections of classified and uniformly mounted wild flowers. The prize collections were donated to the Herbarium of the Institute. The first prize collection consisted of 126 neatly mounted and classified specimens.

One Sunday in the year we set apart as flower Sunday, upon which occasion we decorate every church in town, our efforts in this direction have been greatly appreciated.

Our grandest achievement was our first annual flower show held in the month of September, which proved a brilliant success. The display of flowers surpassed anything ever before seen in our town, both in merit from a purely floricultural standpoint, and in the exquisite taste manifested in the arrangement of the specimens. The show was held in the evening in the Town Hall which proved too small to accommodate the large audience. Want of room was our only draw-back. The stage was one mass of brilliant blossoms, through the centre of the hall were arranged pyramids of potted plants while every corner and unsightly projection was hidden behind a bank of flowers. From every gas jet and curtain pole hung garlands of green. The mingled fragrance of ten thousand blossoms filled the room. To a good natured audience, made doubly happy through the medium of two senses, was presented a musical program to a third. This of course entailed a great deal of work upon those who managed the undertaking, but all felt amply repaid. The words of praise and encouragement they received spurred them on to continue the good work with renewed energy and enthusiasm.

This fall we imported 5,000 bulbs from Holland which were distributed among the members in addition to a generous distribution of bulbs and seeds last spring. We have met with success in the past and our future is bright and promising. We earnestly recommend the organization of Horticultural Societies in every unrepresented town in Ontario.

The SECRETARY: This subject of flower-culture is under consideration by us, and will be brought before the directors at their first meeting, and it is quite likely that the suggestions made by Mr. Herrington will be followed up in a large measure, and we shall be able to devote a large space in the Journal to floriculture, or perhaps enlarge the Journal so as to include it, and we hope that our Horticultural Societies will themselves help to amend matters by contributing freely on this subject. They could give us their experience and help us wonderfully in making that department interesting.

FRUIT GROWING AND DAIRYING.

BY J. A. RUDDICK, DAIRY SCHOOL, KINGSTON.

When your secretary did me the honor of asking me to prepare a paper for this convention, upon the relations between fruit growing and dairying, my first resolve was to decline, for I realized my inability to do the subject justice. When I noticed, however, that he asked me to merely lead off in a discussion, it seemed to make the way easier, and I am here to do what I can. My experience in growing fruit has been very limited. I may know something about dairying, having made it my life's work so far, therefore I fear this will have to be rather a onesided discussion as far as I am concerned.

What are the relations between fruit growing and dairying? Have the two lines of work anything in common? At first glance there may not appear to be much. I do not suppose that anyone present will disagree with me when I say that I think if a man is to make a success of fruit growing he must be possessed of rather more than average intelligence, for there are many things which he has to consider calling for a high order of judgment and much study in order to make the best of his situation. I may tell you also that the successful dairyman is a man who is able to do some clear thinking, and one who must ever be ready to adopt improvements in order to keep abreast of the times.

Both lines of work demand the exercise of considerable commercial tact and judgment in order to secure the best returns at the market end of the business. Both have many things to contend with, and while the fruit grower is fighting various kinds of insects and parasites which prey upon his crops, the dairyman is contending with insects such as the horn fly and other flies too numerous to mention, to say nothing of those minute forms of life which the bacteriologist points out as being so injurious under certain conditions to dairy products in one form or another. This is the spraying age, but the fruit grower must not think that he has a monopoly of it, for kerosene emulsion is highly recommended as a remedy for the horn fly and it is applied with the ubiquitous spray pump.

It seems to me that if a man possesses those qualities which enable him to make a success of fruit farming that he is eminently fitted to become a good dairyman, providing always that he has the special knowledge which is necessary to success in either line.

Speaking of special knowledge brings me to say that this is a feature of dairy work—and I think fruit growing also—which always appears to be a most encouraging one. Men usually get paid in some way or another for special knowledge if they exercise it properly, and there are certainly no other branches of farming to-day which offer a better field for special training and skill than do these two under discussion.

Seasons like the present, with its immense crop of apples and comparatively low prices, open up the question of utilizing the surplus or inferior fruit as food for milch cows. I am informed that large quantities of apples are being fed in Western Ontario during the present season, and it is reported that the flavor of the cheese is affected thereby in some sections. Fortunately, or unfortunately, I scarcely know which, we do not have many seasons like this one from which to draw conclusions, but one thing is certain, that apples can only be fed safely to milch cows in limited quantities. A few quarts at a time at first, gradually increasing to about half a bushel per day, is as much as a cow can assimilate without causing indigestion, and consequently a derangement of the nervous system, and thereby a decrease in the flow of milk and injury to the flavor of what is given. If it is true, as I am told, that some farmers are allowing their cows to run in the orchards and gorge themselves upon the fruit, I am not surprised to hear that bad results have followed. Any food, no matter how good, unless it comes pretty near being a balanced ration, if fed in excessive quantities, will produce the same deleterious effects.

Stewart gives the composition of apples as follows: Water 83.1 per cent., ash 0.4, albuminoids 0.4, fibre 4.3, carbohydrates 11.8, fat —, and the nutritive ratio 1 to 43; so that it is clear apples are far from being a balanced ration. It is quite safe to conclude,

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FRUIT GROWERS' ASSOCIATION OF ONTARIO.

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however, that any bad effects which have resulted from the feeding of apples may be blamed to injudicious feeding rather than to the unsuitability of the food.

The feeding value of apples is considered to be about 13c. per 100 lbs. or 10c. per bushel. To this, under certain circumstances, might be added the value of the element which we call succulence, but which is not taken into account by the chemist in his analysis.

Succulence in a supplemental food has very little value when the cows are on fresh grass, but, when the basal ration is a dry one, it has a very important effect in stimulating the flow of milk.

If I were engaged in fruit-growing and wished to add a line of dairying to my business, I should certainly go in for winter dairying. A few years ago, when some of the leading dairymen began discussing the possibility of carrying on the work of the dairy during the whole year, and when, in the fall of 1891, Prof. Robertson had two cheese factories in Oxford County fitted up for the making of butter during the winter, there was much speculation as to what the result would be, and not a few of the wise-acs predicted failure for the experiment. They have been disappointed, however, for there are to-day over one hundred winter creameries in Ontario and a great many in Quebec, and the number is increasing very fast. This surely demonstrates the practicability or producing milk and making butter during the winter season.

It has been shown in many cases that cows which come in during the fall will give more milk at a profit than those which come in during the spring. This plan brings the cows dry during the time that the fruit grower would be most engaged harvesting his crop, and would enable him to distribute his work over the whole year to better advantage than any other.

With improved facilities for handling our butter so that it may be placed upon the markets of Great Britain in the best possible condition, and greater attention being paid to that branch of dairying, there is likely to be a large increase in our output for several years to come, and it may not be long before Canadians are receiving as much for their exports of butter as they do at the present time for the cheese, which constitutes such an important item in the volume of trade with the Mother Country.

The PRESIDENT: The subject is a very interesting one for the farmers of this district, and I trust it will be thoroughly discussed.

The SECRETARY: It is claimed by some people in our section that when cows eat apples freely it dries up the milk to a certain extent. You do not think that is the case in ordinary quantities?

Mr. RUDDICK: If cows are allowed to eat apples to such an extent as to cause indigestion, the flow of milk will certainly fall off. Apples must be fed in small quantities at first and increasing to not much more than half a bushel per day. Indigestion causes a falling off in quantity and also in the flavor of the milk. Turnips are fed judiciously in limited quantities without any bad results, but if they are carelessly fed, the milk is entirely ruined by giving it that particular flavor which is so perceptible in butter and cheese. Various kinds of grain, by feeding in excessive quantities, will cause indigestion. A cow can only assimilate a certain quantity of feed. The trouble about feeding apples is that we know so little about them and are apt to make mistakes. We are accustomed to feeding grain and that sort of thing, and these grains come so near being a balanced ration. Apples are a very wide ration, being 1 to 43.

Mr. BOULTER: By experiment, we found that green tomatoes fed to cows will increase the flow of milk. We have actually had our milk come back equal to what they do in June in the highest flow of milk, and they are very fond of it; but we do not allow them to eat apples, because they nearly all dried up, eating in small quantities. Will feeding turnips after the cows are milked affect them as much as feeding them before?

Mr. RUDDICK: Decidedly not. I would not like to be understood as advocating the feeding of turnips to cows in any way, as it is too dangerous a practice. I do know that

turnips are fed without bad results at times, but it must be after milking and only in limited quantities.

Mr. BOULTER: If they are fed in the natural state, the cows eat them very slowly.

Mr. RUDDICK: I don't know that it makes much difference whether they are cut or not. I think milk takes the flavor of turnips by absorbing the odor if the milk is allowed to remain any time near where the turnips are. It is not quite clear as to how much milk will absorb those odors, but it is generally believed now that milk will absorb the flavor of ensilage. In any barn where there is silo there is more or less smell—not unpleasant—from the ensilage. In the early days the feeding of the ensilage was blamed, when the real cause was leaving the milk exposed to the odor of the ensilage.

Mr. BOULTER: My theory is that cows should have a dry feed in the morning before they are milked, then the ensilage following right after, with turnips, then a dry feed before they are milked.

Mr. CASTON (Craighurst): This year I fed apples to cows, beginning in a small way and gradually increased the ration till I got to half a bushel night and morning—that is, a bushel of pulped apples, mostly Russets. We had an increase of milk. I was pleased with Mr. Ruddick's suggestion of winter dairying for fruit-growers, as we have a good deal of spare time in the winter and it would be a valuable side line.

Mr. GROFF (Simcoe): Don't you think a great deal of difficulty is caused by feeding sour and scrawny apples? I think the best authorities claim there is nothing equal to the carrot as a stimulant.

Mr. RUDDICK: It is a question of cost of production very largely. Carrots come rather expensive because you cannot get so large a crop as of some other varieties of roots. I am not able to compare the values of apples and turnips as a food. I think the apples if fed judiciously would be the cheaper food. I think the cows falling off in milk has resulted from feeding too largely at first. A farmer would think nothing of giving half a bushel of apples to the cows the first time they had any at all. That many apples given the first time would be almost sure to bring a fit of indigestion. To begin with a few quarts seems small, and the farmer would think it hardly worth while. The falling off in the flow and the injury to the flavor of the milk are both due to the same cause, I think; but I am not a practical feeder, and do not know anything of it from experience. I am not in a position to speak with any authority as to the comparative value of foods.

Mr. PATTISON (Grimsby): For the last ten years I have fed apples to cows every season, and I can corroborate Mr. Ruddick in saying that if apples are judiciously fed from the start there is no danger whatever in drying up the cows; indeed it increases the milk; but you must begin with a few quarts. I seldom feed as much as half a bushel at a time even after they have become accustomed to it.

Mr. RUDDICK: Half a bushel per day was what I gave.

Mr. BURRELL: There has been a long discussion in some States this year about feeding. Mr. Woodward suggests feeding apples in a small quantity, but they lay great stress on having them ripe and sweet. Where indigestion follows it is a good plan to give a pretty heavy ration of corn meal to counteract that.

Prof. SAUNDERS: I think the experience in Europe as well as in this country has shown that the feeding value of apples, looked on as a food pure and simple, is about the same as the feeding value of turnips; but there are other points about the feeding of roots and of fruits that have to be considered. We know ourselves that if we eat a little fruit sometimes before breakfast or dinner it gives us a better appetite for the other part of our meal, and we are able to eat and digest things to advantage that we could not do without that addition to our diet. I think it is the same with animals, and judicious feeding stimulates the appetite and promotes digestion away beyond what you would expect from the chemical constituents of those foods. That is an important point for the farmer to bear in mind; and variation in the diet of animals would no doubt help them.

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Of course it must be done judiciously. To feed a cow with half a bushel of green apples would be the same as a boy eating too much green fruit; it would result in internal disturbance and disorder. Every farmer must use his common sense and give judiciously. As to growing carrots, our crops this year at Ottawa, with those short white varieties and mammoth intermediates, have given us from twenty-eight to thirty-two tons to the acre, which is almost as large as our crops of turnips this year, and indeed larger than we generally have. I think the feeding value of carrots has been established by chemical analysis to be higher than any other root except sugar beets. At our experimental farm at Nappan they can grow thirty-five to forty tons of turnips to the acre with ease, whereas they cannot grow more than half that quantity of carrots. There turnips are the most profitable. We must all learn to think and act for ourselves and consider our localities and climatic peculiarities, and grow the best and most economical feed that we can produce, so as to bring down the cost of feeding as low as possible.

The SECRETARY: If the feeding value of apples is equal to that of turnips I think it is important for us to know it, because then we fruit growers do not need to go to the trouble of growing turnips at all, we have such a surplus of apples that are not fit to ship, and we are very glad if we can get anything like fifteen cents a bushel. I suppose that would be the value of turnips.

Prof. SAUNDERS: You would have to take about one-third of that.

The SECRETARY: If we can get even seven cents or ten cents in feeding value we ought to be satisfied.

Mr. BOULTER: The apples would not last as long as the roots would to feed.

The SECRETARY: They could be kept very well till the spring.

Mr. PATTISON: I think if they were stored in pits they would keep very well.

Mr. E. D. SMITH, Winona: It seems to me that the two branches of farming—fruit growing and dairying—are intimately connected in this way: That the fruit grower requires large quantities of manure, and that by keeping cows in the winter particularly, and utilizing them in the way that most of the work comes in the winter, by butter-making, he will divide the work up, and at the same time get manure in the cheapest way.

Prof. SAUNDERS: We know that the apple in growing the food makes a heavy draught on the soil for potash, and the cow would not utilize any part of that potash, but it would all go back to the soil for manure. That is also a point worth mentioning in maintaining the fertility of the soil of orchards.

Mr. PATTISON: The feeding of milch cows in winter would involve the growing of a great deal of bulky fodder, if not hay at all events some other form, which might be coming at a time when they would be busy in the orchard, and involve considerable difficulty in harvesting it.

Mr. CASTON: I think that would be largely solved by growing corn, of which you can grow on a small piece of ground enough to feed a great many cows during winter; and that would be a valuable way of getting manure. Where large areas are utilized for fruit growing how do they manage to get manure? I am only growing in a small way, and one of the most troublesome questions I have is to get hold of enough manure. I utilize commercial fertilizers, but it is very costly, and it is a question whether the game is worth the candle.

The SECRETARY: Fruit growers don't keep up the fertility as they ought to.

Mr. E. D. SMITH: That is so, they have not kept up the fertility. In the first place the fruit in the Niagara district is usually planted on extremely good soil. So far they have not been compelled to set it on poorer land. Ultimately they will.

The SECRETARY: The land will all get poor, under present treatment.

Mr. E. D. SMITH: No doubt it will. Of course our experience with grapes is that they require very little fertilizing if set on good land for a great number of years. No

doubt ultimately they will play out. We use large quantities of ashes. We have been able to get all the ashes we require delivered on the land for ten cents a bushel, and we consider that a very cheap means of getting potash. To produce fruit requires usually a very little nitrogen, and so far we have been able to get it. Some keep cows during the winter; others let the land go poor, and a good many are buying from Toronto this compost, mixed manure, which costs about \$1.25 a ton laid down at the station. It is quite expensive, but those who have tried it think it is more economical than the artificial fertilizers, which are rather costly, though I believe ground bone where the phosphates are required—and that is the main thing—is the cheapest available supply. I know one or two cases of vineyards that had got to that position that they grew plenty of wood but did not produce any fruit. A good strong application of bone meal in a year or two produced splendid results; the old crops came back again.

The SECRETARY: Have you noticed any special instances of the effect of using ashes on your soil in connection with any of your crops?

Mr. E. D. SMITH: The best results with ashes have always been upon sandy ground, I presume because the potash leaches quicker out of the sandy ground. The application of ashes almost always produces quick results on sandy ground, especially for peaches.

Mr. PATTISON: I have had some little experience in the matter of fertilizers and keeping up orchards. I make it a rule not to grow a great quantity of fruit, but to keep what I do grow well manured all the time. It is possible to keep up a moderate sized apple orchard without a great deal of manure. If your orchard is fenced so as to keep pigs in, and you feed the pigs besides to some extent, the pigs not only improve the orchard but they keep up the land, and a very moderate quantity of manure applied around the trees about once in three years will keep the orchard in excellent condition for years if the land is fairly fertile to begin with. In the matter of other fruits, a good way to supply nitrogen is to sow rye or clover and plow it under before coming into bloom, or when it has got considerable length of stock. That not only supplies considerable manurial elements, but keeps the land in good mechanical condition. I have tried commercial fertilizers, and found them profitable with plums.

Prof. SAUNDERS: What particular fertilizers have you tried?

Mr. PATTISON: I have chiefly tried the Smith's Falls fruit tree fertilizer, and found it a very excellent thing for plums and peaches. My soil being clay, wood ashes are not much needed, though I think an application occasionally is a good thing even on a heavy soil.

Prof. SAUNDERS: This question of the fertilizing of orchards is very important, especially in those districts where manures are hard to get. Potash can nowhere be got more cheaply than in wood ashes at ten cents a bushel. Wood ashes contains from five to six per cent. of potash besides about two per cent. of phosphate of lime. Where ashes cannot be got, kainit is a good fertilizer, containing twelve per cent, and it can be imported from Germany at reasonable rates. Phosphoric acid can be supplied from ground bones, and also from the ground phosphatic rock. There is a third source of this important element that has come to the front in late years, that is known as the odorless phosphate, or Thomas' slag, which contains a large proportion of phosphoric acid. This is a waste production in connection with iron lands. This waste is got by heating the iron ore to about 5,000° F., when a small proportion of phosphorus combines with the lime and forms phosphate of lime. This product was thrown away at the mines until it was found to contain about twelve per cent. to fifteen per cent. of phosphoric acid, and it has now become a large thing in fertilizers, and from three to five thousand tons of it are used in Germany every year in fertilizing lands, and its use in this country is increasing very much from year to year. We have tried it at the experimental farm at Ottawa and have had some perceptible results; but in the use of artificial fertilizers it is not always easy to see the results immediately. Sometimes the season is not favorable for the particular crop, and then the farmer is very apt to form a judgment adverse to the fertilizer, when probably the larger part of that fertilizer is stored in the soil awaiting use in subsequent years. It is a very difficult subject, indeed, to form any very positive conclusions about, but I

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think we have evidence enough to see that whenever potash or phosphoric acid is added to the land, if the addition is not used during the following year it is used in subsequent years, and it remains stored up in the soil, taken up by that peculiar quality which enables soil to retain potash and phosphoric acid and yield it for future use. In regard to nitrogen, which is the most expensive of all the elements to supply, I think there is no way in which the orchard can be enriched with that element so quickly as by sowing crops of clover or peas or some other leguminous plant, and plowing it under. These plants have the power of taking nitrogen from the air and storing it up in their tissues, which rye and buckwheat and others have not the power of doing. These latter plants only giving back to the soil what they take from it. (Applause).

Mr. BURRELL, St. Catharines: There is a very important feature of kainit that should be mentioned—its value as an insecticide as well as a fertilizer.

ELECTION OF OFFICERS.

The election of officers was then proceeded with, and resulted in its unanimous return of the persons whose names are given on page 2.

TREASURER'S REPORT, 1895-6.

Mr. WOOLVERTON read the Treasurer's report as follows:

RECEIPTS.		EXPENDITURES.	
	\$ c.		\$ c.
Members' fees	2,581 62	Amt. due Treasurer, Dec. 1, 1895.....	38
Government Grant	1,800 00	"Canadian Horticulturist".....	1,854 69
Advertisements	356 32	Sec.-Treasurer, Editor and Assistant	1,200 00
Binding and bound volumes	20 60	Commission	342 48
Sample copies, etc.....	6 88	Affiliated societies.....	225 63
		Plant distribution	221 04
		Directors' expenses	198 13
		Chromo lithographs	190 52
		Postage and telegrams.....	135 56
		Reporting.....	122 34
		Express and duty	99 43
		Printing and stationery.....	71 82
		Committees	39 97
		Bookbinding	30 55
		Discount	26 48
		Auditing	20 00
		Advertising	15 70
		Illustrations.....	7 95
		Care of rooms.....	3 00
		Exchanges	1 00
Amt. due Treasurer, Dec. 1, 1896	41 25		
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A lengthy discussion then took place on the above report, especially in regard to the items "Commissions," "Printing of *Horticulturist*," and "Premiums." After many suggestions had been made and opinions expressed, it was decided to appoint a committee to consider the matter and report to the Society. The committee was then appointed, consisting of Messrs. Groff, E. D. Smith and Pattison.

REPORT OF FINANCE COMMITTEE.

Mr. ORR read the report of the Finance Committee, which was adopted on his motion, seconded by Mr. A. M. Smith.

We have examined the Secretary-Treasurer's books and vouchers and found them correct, and that the expenditures are in accordance with the objects of our society.

We are highly pleased with the convenient, careful and complete manner in which the books are kept.

W. M. ORR,
A. M. SMITH.

ADDRESS BY THE NEW PRESIDENT.

President W. E. WELLINGTON was then introduced as the new President, and took the chair amid applause. He said: I think I am duly sensible of the honor you have conferred upon me in electing me President of this Association. I regard it as an institution for great good. As to the extent of good that we shall bring about, the matter is in your hands. I was very much impressed with the good which the institution has done by the optimistic paper which was read yesterday (laughter). I prefer to take it in that light, as Principal Grant did. I think that the future of the fruit grower is one that need not give him any particular concern or worry. He will have his ups and downs like other men in business. In the past it has been very easy sailing. It was simply a matter of growing the fruit and turning it into good dollars, but of course with the larger extent of planting, there has come about a revolution to a certain extent in the fruit grower's business as well as in other people's. Now, fruit growers who adapt themselves to circumstances are the men who are going to succeed just as they will in other lines of business. I think that this institution should under the altered circumstances give particular attention to the present needs of the fruit grower. I would like to see committees appointed immediately to look thoroughly into the matter of packing and placing fruit on the market. I am satisfied that that is one of the main causes of the losses that have been sustained. True, we have had an extraordinary crop in some things, but that has only added to the difficulty I have mentioned, that is, that fruit is not properly put up as a rule. You may go into Toronto and other markets and in nine times out of ten the package that you buy will be disappointing. It does not run through as it is on the top. While there are many honest packers I am satisfied that there is need for great change in this direction. I am almost persuaded that legislation is necessary to compel men to place packages on the market so that when they do not put up their fruit properly they can be traced, and those who do put up the fruit properly will get the benefit of this honest dealing (Hear, hear). I am satisfied that the honest dealer suffers because of the dishonest dealer. It drags the price of fruit down, and the honest packer becomes discouraged because he does not get the returns that he naturally should expect from his honest endeavor. Then another matter that we should take hold of and seriously consider is that of transportation. I am satisfied that we pay too much for the transport of fruit to the market. I am satisfied that there is a good market for many kinds of our fruit in the northwest, but it is prohibited simply because of the heavy cost of transportation. The same thing applies to the transport of fruit to Great Britain. Then we come to the great necessity of some radical change in the matter of the disposal of fruit after it has got to Great Britain. I am satisfied, to speak plainly, that there is a great deal of roguery and robbery committed on the shippers of fruit to Great Britain. There is too much of this "slack and wet" report, and somebody is getting the benefit of it, because I am satisfied that fruit does not always reach the market in the condition in which it is reported. There is an unlimited market in London alone, and I think Mr. Shepherd will bear me out in saying, if you can only bring your fruit before the consumer and more into his notice. At this stage, gentlemen, I do not want to take any further time, but I merely mention these points for your consideration,

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and hoping that I shall have the assistance of every member and the directors of this society in seeing if an improvement cannot be brought about by the aid of the Association (Applause).

Mr. HUGGARD: It affords me very much pleasure to move a vote of thanks to our retiring President. He has officiated over this Association for the last two years in such a way that it has been pleasing, not only to the directorate, but to the public at large. His re-election last year was a very happy reflection on his career the year previous, and there were many expressions of gratitude.

Mr. CASTON had very much pleasure in endorsing the mover's remarks and seconding the motion.

The PRESIDENT stated that he thoroughly agreed with the motion, which he conveyed to the retiring President.

PACKING AND SHIPPING OF OUR CANADIAN APPLES.

By C. H. WARTMAN, KINGSTON.

I have had an experience of sixteen years as a packer and shipper of Canadian apples to various parts of England and Scotland, and although I have gained many points of practical knowledge, still I find there is room yet to learn something of this trade, as to how to handle and when to handle this wonderful commercial product, the apple. I have crossed the Atlantic six times in pursuit of knowledge on this subject, with apples packed by my own hands, and although some of my apples have sold as high as 28s. per barrel, a very large percentage have brought very much less, and to-day, after this long experience, I find myself financially about as I started. Nevertheless I have gained a knowledge of kinds to ship and the manner in which to pack that may be of great benefit to me in years to come, and I will gladly try in this paper to impart some knowledge to my fellow packers and growers of Ontario. My experience in packing apples for the British market over 3,000 miles away, has always been in barrels, and its in the first place necessary to procure barrels that will not weigh less than 165 lbs. gross for Spy, Russet, Baldwin, as we know these are among our heavy apples. As apples are all sold by weight in England they look for this weight in a Canadian barrel. I believe we have a standard for our Canadian coopers to go by, but find the coopers that make the smallest barrel to have the largest sale—not knowing the mistake they are making. We have to cater to the wants of English consumers. In our general Canadian apple barrels the staves are too thin, the heading is too thin and the hoops too few. I strongly advise four hoops on the body of the barrel instead of two, so that if two should break there are two others left to hold the barrel in its solid position without expanding, whereas if there are only two and one breaks, it allows the barrel to expand, and after a little rolling it becomes slack.

We shippers know a little about "slack and wet," and "wet and slack." It means anything but profit. As to packing apples for export: In the first place I would have the apples picked as they come from the trees, but in barrels drawn in some airy, cool building to stand four or five days to sweat and shrink. Then pour out on a packing table or on some blanket placed on a clean bed of straw on the floor, so they will not be bruised. As one lot of men get tired of one position they can exchange positions, as the most easy position will become tedious after a few hours' work. In this way you will get more apples packed and not feel so weary at the end of your day's work. I believe in coursing the barrel two courses with average size apples—not the largest that can be found, but a good fair average. Then pour in the balance out of a good sized basket that will nicely turn in the barrel, giving after each basket, the barrel a good lumber wagon shake, if you can understand this. Never failing to do this on something solid, as this is partly the secret of tight and well packed apples. Now as to the exact fulness of the barrel to press, this would depend whether they are shrunk or

fresh off the tree, but in all cases have the barrel pressed tight enough to carry through without slackness, or one-fourth of the barrel will be disfigured with bruises which hastens decay. Although apple salesmen in England say no package is equal to the barrel, I am of the opinion before many seasons roll around a large portion of our apples will be exported in boxes, which will not need to be pressed in so tight as to make our beautiful apples look unsightly and cause decay. Some cannot understand why so large a percentage of our apples arrive slack and wet in England. The cause is largely due to the rough handling they get in transportation. While watching apples transhipped from boat to cars, I have many times been grieved to see them so roughly handled, and have devised a plan whereby labor could be saved and apples could be saved from destruction; but all my work has been in vain as yet. I claim no barrel of apples should drop one inch, as a barrel weighing 165 lbs. will not stand continual drops from gangway to dock and from carts to solid pavements. Where barrels are piled two deep on ends it is not necessary for a man to lift this barrel, but ease it down. All steamboats and freight sheds should be made by law to carry or have on hand at every transshipping place large linen sacks filled with sawdust for these barrels to fall on, where there is any likelihood of any fall whatever. This provision would cost a very little and growers and shippers would reap the benefit. Let one line of boats or railways adopt this plan and others will have to follow suit or lose their apple freight, which is of no little importance.

PICKING, GRADING AND PACKING APPLES.

BY L. WOOLVERTON, GRIMSBY.

There is no question that the fruit industry is one of the most important industries in our province. So rapidly has it developed in some sections of late that the income so derived far exceeds that from any other part of the farm. All this is in spite of the many disadvantages under which fruit-growers often labor, and it is to point out a remedy for these that I write this paper.

The first means of aiding in the development of the apple industry is by *imparting information concerning profitable varieties*. Many of our orchards are full of worthless varieties, fit only for cider. The trees occupy the same space as good varieties, and they cost as much to cultivate and prune; the fruit costs as much to harvest and market, besides glutting the markets and giving our growers a bad reputation, while the margin of profit, if any at all, is the very lowest possible. What do we constantly hear from British salesmen? "Good, sound winter apples wanted; no sale for inferior trash." Second grade apples should not be exported at all, even if of a good variety, and inferior varieties should be top-grafted to those which are most profitable. "Which are these?" is the question always coming up. In this paper I will not discuss this point. In fact, it is a wide question, for every section has varieties suited to it, varieties whose home seems to be there and which succeed nowhere else as well. Two questions, then, have to be studied—(1) the varieties most wanted for the market, and (2) the places where each will succeed.

The first of these questions can only be answered by studying the markets. For instance, this very year, in October, there came the following cable:—"Latest prices for Canadian apples at Covent Garden per barrel are: Kings, 12s. to 16s.; Greenings, 9s. to 11s.; Baldwins, 10s. to 10s. 6d.; Ribstons, 13s. to 15s.; Snows, 9s.; Twenty-ounce Pippins, 9s. to 11s.; Seeks, 9s. to 10s. 6d.; Fallwater, 10s. to 11s. 6d.; Golden Pippin, 10s. 6d.; Blenheim, 11s. to 12s. 6d." The King stands first in this report, Ribston and Blenheim second, then Twenty-ounce Pippin, Baldwin and Greening, and the Snow last.

But when you study these varieties in our orchards, you find the King a poor bearer, Twenty-ounce no bearer at all, I might say, Ribston a weak grower, and the Snow, in southern Ontario, too early in ripening. Thus the one study modifies the other. There is another apple, for instance, which is taking a front place in the British apple market—the Wealthy. This variety has been sold in Scotland for the writer at

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17s. 6d., or about \$4.30, per barrel this season, when those markets were fuller than ever they were before of Canadian apples. It is everywhere a beautiful apple, perfect in form, beautiful in color, and of excellent quality. It succeeds best in our northern sections and will succeed almost everywhere. Why should not more be grown, instead of the many unsalable varieties now being grown.

We are glad that both the Dominion experimental farm system and the Ontario fruit experiment stations are doing so much to find out the best varieties and the sections for which they are best adapted. Our Ontario Fruit Growers' Association reports will soon become a mine of wealth to every fruit grower. We do not in this paper intend to touch upon the importance of publishing reliable information to fruit growers regarding the methods of planting, cultivating, fertilizing and pruning fruit trees and plants. These are all important, but they are being well and faithfully treated by the Ontario Fruit Growers' Association through its meetings, reports, journal, lecturers, etc.

But there is room for vast improvement along other lines also which count very high in making fruit-growing profitable. First, the *gathering of the crop*. Most orchardists do not begin early enough. They will wait until October and then find one-half of their best apples on the ground before the work is done. A neighbor of mine had this year a crop of about two thousand barrels of fine Baldwins. He did not begin until October, and then leisurely picked up the fallen apples before picking from his trees. Toward the end of the month one-half of the crop was on the ground and too much bruised to ship.

In a year like this it would pay to leave all the small and inferior apples unpicked and gather only the best. I ventured this year to ship about fifty barrels of second size, but otherwise first-class, Baldwins to Edinburgh and received a cable to say that they were useless and would hardly bring expenses. Trees that bear small apples should either be cultivated and manured until they bring large fruit, or else top-grafted to large, fine varieties that would pay for handling. There is a great difference in the season of maturity on the trees of our commercial apples, and we would pick them in about the following order in southern Ontario:—Colvert and Gravenstein, 1st of September; Kings and Greenings, 20th to 30th of September; Snow, Wagener and Wealthy, 1st of October; Russet and Baldwin, 1st to 15th of October; Spy, 15th to 30th of October.

Of course it goes without saying that the fruit grower who wishes to make a name for himself must have every apple picked and handled like eggs and not like potatoes, for every tiny bruise tends to make the fruit second grade. On this account, we fear the Yankee picking machines will never answer.

The next important step in helping to develop the fruit industry is *proper methods of grading and packing*.

There is a common notion that apples should lie heating in heaps for some days before packing, but this is a mistake, for in this way they are made to ripen too fast. They should be packed as soon as picked and hurried away at once to some cold storehouse, if the best results are to be expected, so that their first crispness may be retained. My plan this season was to take my packing table out to the orchard and on it the pickers emptied their baskets as they picked, and the apples were at once packed and teamed away. In this way, one man, with a little assistance, will sort and pack for five or six pickers, and several gangs may be sent out if necessary. The ordinary first grade stock should go in barrels, and fancy apples in smaller packages, as the half barrel or the apple case. This fancy stock is picked off the packing table and sent to the packing house where women are employed to wrap in thin manilla paper and pack for a special trade. Now, if this class of apples could be stored in cold storage warehouses safely and exported just when each variety is most wanted, at the best prices, a great step would be taken toward developing the fruit industry of Canada.

Really the most deplorable ignorance exists in this *work of grading apples*, or else the utmost carelessness. "Canadian" stamped upon them is an important aid in selling many of our goods in Europe, but, unless the contents of the package is creditable, no

such stamp should appear. It is astonishing the mixtures that are sent forward as No. 1 apples. Large and small mixed together, wormy, knotty, scabbed, all in one package and sold as No. 1 grade. Sometimes even these are faced up with real fancy apples and sold accordingly to the great after-disgust of the buyers. We noticed in a Toronto paper this statement: "Dealers buy and pack the barrels themselves, so that the old country market shall not be destroyed through the offering of inferior fruit." We question whether dealers are more reliable packers than the growers. We know of some who constantly practise facing up with an entirely different grade of apple from the contents; and we know of plenty of growers who pack honestly.

But ideal packing has, as yet, been scarcely thought of in Ontario. We need to take some lessons from our California friends with whom packing is a business, and who do not hesitate to pay packing companies a certain price per package for grading and wrapping their fruit ready for distant shipment. Mr. R. J. Shepherd, of Montreal, has done something in this line with his Cochrane case, and Mr. G. E. Fisher, of Freeman, with his graded apples, but the mass of Canadian fruit growers have not begun to consider the importance of grading. Large and small apples should never go in the same package. Indeed small apples ought not to be shipped at all.

The same may be said of pears. They should always be turned out on a packing table, and the large and small sizes separated from each other. The French people put up Duchess pears in cases containing from forty to forty-eight, and these sell in Leeds, England, at from \$1 to \$1.25 per case. Of course, each sample is wrapped in manilla or tissue paper, and some packing material is used to keep the fruit from moving about in the case.

We tried separating our peaches in this manner last season, putting the large ones of uniform size in special six quart baskets made for our special use. Thirty-six filled the basket, and in the case of the very largest, half that number. The second size was packed in twelve-quart baskets. We noted the result, and found that the half-basket of No. 1 sold for exactly the same price as the large basket of No. 2.

Then transportation and cold storage facilities are needed to encourage and develop our fruit industry. I shall not say much upon these topics, because other gentlemen are present who have thought further along this line than I have done. I simply wish to draw your attention to the fact that California peaches and pears have this season been put through all the way to England, nearly 5,000 miles, and have arrived in excellent condition, and that at very low rates.

If we could have increased facilities, we could often save ourselves from disaster in years of plenty by sending our surplus pears, peaches, grapes and tomatoes to England. Our fine Red Astrachan and Duchess apples also could go forward and bring us excellent returns. And not only to England, but to much more distant countries. A neighbor of mine is trying the exporting of Canadian apples to South America, with some encouragement. I am assured that New Zealand would pay a high price for our Canadian apples, and I know from my own experience in 1895 that Australia wants Canadian apples in their spring months of October, November and December, and would pay from three to four dollars per bushel for such showy varieties as our Cranberry Pippin, providing we had some means of conveying them in cold storage chambers through the tropics. My shipment in 1895 failed on this account. I would have tried again in 1896 had I assurance of proper cold storage, but this I did not have. On the 24th ult. I received the following letter from Mr. J. S. Larke, Dominion agent at Sydney, New South Wales: "The Canadian-Australian steamers are equipped with excellent cold chambers, which they can maintain at any temperature. It is essential that the quantity shipped should be sufficient to pay for refrigerating a chamber. I fear the overland charges will be too great for the shipment of fruit from Ontario, save in exceptional seasons, but I look to its being a regular business from British Columbia in the future. The next steamer is bringing, I understand, fifteen tons of onions from Vancouver. These vegetables are worth \$60 to \$65 per ton here just now, and accordingly there is a fine profit in producing them in B.C. at such prices. Potatoes could be shipped here just now likewise. On the other hand there will be times when they will go the other way. It will be a mutual

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exchange to the advantage of both, inasmuch as it will improve the prices just when the British Columbia farmers will have an abundance to sell."

Perhaps we may get safe carriage to Sydney, via London, yet, on such terms as to make Sydney one of our apple markets.

Now is the time for us to give our best attention to the subject of cold storage, because the Minister of Agriculture for the Dominion is prepared to do anything in reason for our advantage along this line, providing we can formulate some sensible and practical scheme of operation. In proof of them, I have received the following letter from Mr. J. W. Robertson, dairy commissioner, Ottawa, and which you will see refers to another letter from an experienced fruit grower:—

"The plan proposed by the Minister of Agriculture to arrange for cold storage service for perishable food products from the producers in Canada to the consumers in Great Britain includes a desire and intention to do something towards providing necessary cold storage warehouses for the preservation of fruits.

"It is believed that the period of consumption and of profitable market demand might be extended for two or three weeks in the case of many of the perishable summer fruits, and that large fruits for consumption during the winter and spring months could be kept in better condition with less loss, in suitable warehouses than when stored in haphazard places, as is too often now the case.

"Do you think it probable that a number of fruit growers in several different districts would form themselves into joint stock companies, for the purpose of erecting and operating district cold storage warehouses for fruit? I think a building sufficient to hold 25 car-loads could be erected and equipped with the requisite mechanical refrigerating plant at a cost of between \$5,000 and \$6,000. The charges for the storage of the fruit, when the warehouses were at all largely used, would yield a revenue sufficient to pay the operating expenses and a fair interest on the investment.

"Would a guarantee by the Government of say 5 per cent on the cost of the cold storage warehouses for three years, in case they did not earn enough to pay 5 per cent. dividend, be a sufficient inducement?

"Do you think help by the Government can be given in any more effective way, so as to bring about the erection and operation of these warehouses? I shall be very glad to receive your opinions and suggestions on the matter; and, if you think it desirable, you might call for an expression of opinion from leading fruit-growers through the columns of 'The Horticulturist.'"

You will also be interested in the opinion of one of our leading fruit growers and shippers in southern Ontario. I wrote Mr. E. D. Smith, Winona, placing the matter before him and asking his opinion, and have received the following reply:

"Your esteemed favor to hand asking if the Government should further a scheme for the transportation of fruit in cold storage to Britain, would a stock company, with a capital of \$5,000 or \$6,000 be likely to be formed at Winona, if guaranteed interest at 5 per cent. for three years. I scarcely think so until the success of placing our perishable fruits on the English market has been more fully tested. My idea is this, if suitable storage warehouses were erected in Hamilton, and possibly another at St. Catharines and tests made for two or three years to see if the British market will take our fruits at profitable prices, whether they can be landed there in sound condition by this system, then, if successful, there will be no difficulty in having storerooms built at Winona, and, I fancy, almost every station along the line, if necessary, but for purposes of experiment, it seems to me that the fresh fruit could be loaded directly into the cars at the stations. It seems to me that the essential point is to get proper dry cold storage between here and Montreal and between Montreal and the port of debarkation and again immediately it is landed there with as quick change as possible from cars to boat and from boat to storage house. Growers would not care to put money into anything of that nature when a test could be made without this money being put in. I have every faith that we can grow in this Province of Ontario thousands of barrels of Bartlett pears, Anjou pears, and, I believe, Clapp's Favorite pears, and put them on the British market with cold storage and get handsome returns, but the system must be perfect. There would be no trouble in putting it on the cars in perfect condition. As for grapes, all they require is cool, ventilated chambers, perfectly dry, with a temperature of about 40 degrees, although I am satisfied that they will carry perfectly in a temperature of about 50 or 60 degrees, if there is a good circulation of pure air, and I still have faith that, if persisted in, our black Roger grapes especially will find a good market in Britain, and these varieties can be grown almost, if not quite, as readily as any other sorts. I see no reason why, with proper cold storage, too, our peaches could not be landed there and compete with California peaches. Trusting something may come of this scheme, I am, yours truly, E. D. SMITH."

One more important means of developing the fruit industry to be brought before us by gentlemen present, and that is the establishment of a fruit depot in London, England, for the sale of high-grade Canadian fruit. This should be inspected by a Government Inspector, and duly branded "Grade 1," with an object of creating confidence in Canadian apples and other fruits. I shall not trespass upon the important theme, but leave it for others more experienced to bring it before the meeting in an intelligible and practical manner. Hoping these hints may lead to some results favorable to the development of one of the most important of Canadian industries, I will close this rambling paper.

THE PRESIDENT: Now you have heard read these two important papers and I hope that we shall have a discussion on them that will bring out points of interest to the

Hon. Mr. Fisher, Minister of Agriculture, who is present, that he may see the wants of the fruit growers regarding the shipment of fruit to the old country. Certainly one of the most important points that we have now under consideration is the placing of our fruit in a perfect condition on the British market, which is practically unlimited.

Mr. W. E. FISHER: I would like to ask the writer of that paper if he has had any experience of wrapping apples in paper and shipping them to the old country. I did that and received very little encouragement. The best that we obtained for apples beyond what we obtained for them without paper was from 3d to 6d for 50 lb boxes. They wrote me that was the best they could possibly do, and that won't pay us.

The SECRETARY: Certainly that would not pay, because it is worth 3c. a box to do the wrapping, and the paper I suppose would cost as much more; but all that I have shipped have been wrapped. I shipped 500 cases last year and the same this year wrapped, and I put in about a dozen this year unwrapped just to compare notes.

Mr. W. E. FISHER: What does it cost to put this California fruit on the British market?

The SECRETARY: I cannot give you what it costs, but they get very low rates, probably very nearly as low as we do.

Mr. HUGGARD: I do not think it is of much importance that we should wrap our fruit in tissue paper to get it to England, in fact I feel rather opposed to it on account of certain changes that take place in the atmosphere during the voyage across; but if we had cold storage, that is, an even temperature to retain the air during the voyage across the Atlantic, our goods packed in our ordinary barrels, or perhaps in barrels made a little better, they could be laid down in the European markets just as perfectly as they leave the Canadian shores. I have had some little experience in that line. I sent some down to Florida by rail on two different occasions to a relative, and they arrived there in just as good condition as he ever saw them here, no damage whatever. On one occasion they were some four weeks on the road. I am satisfied that if our transportation companies were to reduce their rates a little, perhaps put on fast steamers and give us cold storage, that we could place our goods to compete with any nation in the world, in the European markets, and get better returns than we have been receiving for our crops heretofore.

The SECRETARY: The advantage of wrapping is that if there is one spot of decay that might be in contact with another apple, the wrapping would save that contagion.

Mr. DALY: What is the Secretary's experience as to the prevention of wounds, bruises, etc., in the handling? Does the wrapping protect them in the handling better than those unwrapped?

The SECRETARY: I don't know that it would very much. The great point is to get them snug so that they won't move in the cases. I presume that could be accomplished without wrapping.

Mr. CASTON: There must be a good deal in the temperature while they are on the Atlantic steamers. If the Australians can bring them through the tropics, a much greater distance, and land them in the old country, surely we ought to be able to do it. Where does the difference lie? We came across a steamship agent coming on the train, and he said the steamship companies were altogether independent of the apple trade this year. Is there sufficient competition? If there is, they will compete for this trade. Then another admission he made to us was, that if there was a great rush of freight, they were in the habit of putting it down in the hold, and placing it near the engine and boiler, where it was very warm. There must be something radically wrong with the placing of the fruit on the way across the Atlantic. Fruit that is grown in a dry climate will certainly travel better than in a moist country like ours. The blame is generally laid on the packer, but surely it is not all owing to bad packing, and what we want to get at, is how to remedy the evil in the best way.

Mr. WARTON: Apples, and I was picking up apples, could not say, but in so tight. W. sacks.

Mr. DEMPSEY: Woolverton. I do not know. slacks was about

The PRESIDENT: which you pack.

Mr. DEMPSEY: pack and ship in winter through t

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Mr. WARTMAN: Two years ago I was on a steamer on which I had 3,400 barrels of apples, and I was very anxious to see them unloaded down into the steamer. I saw several picking up apples and throwing them into salt sacks, and where the salt sacks went I could not say, but they could not get them back in the barrels again because we put them in so tight. When they burst open and run all over the decks they throw them into salt sacks.

Mr. DEMPSEY: I have not had as great experience in shipping probably as Mr. Woolverton. I have been successful so far; whether it was successful packing or what, I do not know. They have turned out well. During last winter the largest number of slacks was about 5 barrels to the car.

The PRESIDENT: Probably you could throw out some suggestion as to the way in which you pack.

Mr. DEMPSEY: I think I pack about the same as Mr. Woolverton, only I do not pack and ship in the fall. My packing is nearly all done in barrels, and I ship the whole winter through to March, with the exception of December and January.

The SECRETARY: You store your apples and ship them through the winter as the different varieties are wanted?

Mr. DEMPSEY: Yes, I ship all the early fruit off before December, and the other fruit I hold till after the holidays and ship it the last of March, and the last of March shipment has always been the best.

The SECRETARY: At what temperature do you keep your apples?

Mr. DEMPSEY: I try to hold them at 26° to 30°.

Mr. JONES: How do you hold the temperature down in the fall?

Mr. DEMPSEY: I cannot till the frost comes.

The SECRETARY: Would it be any advantage to you if you could put them in cold storage in the fall?

Mr. DEMPSEY: Judging from the way the Spys kept during the past winter I could not say it would make any difference had they been in cold storage in October.

The SECRETARY: In what order do you ship your apples?

Mr. DEMPSEY: The last I shipped was Ben Davis. The first variety was Wealthy. I shipped them the 20th of September; then the last of September I shipped Snows, making about three shipments of Snows, and then Kings.

W. E. FISHER: I would like to know what it costs to store fruit in cold storage in cities in the old country, because if we can get cold storage there at a low rate, I think it will be better to ship our fruit promptly, put it in cold storage and hold it there for a late market, than hold it here and ship it after the new year; it would carry better.

The PRESIDENT: We were to have had a paper from the Honourable Mr. Sanford, of Hamilton, on establishing a Canadian Food Depot in London, England, and Mr. Jones, of Toronto, was to have given us a paper on storage, but neither of the gentlemen is present.

Mr. BOULTER: I have always taken exception to growers packing their apples and then complaining of the results. My experience is that a man can pack apples for his neighbor first rate, but as soon as he begins to pack his own crop, they never turn out well. Let a man put his name on every package of goods that he packs, and if a customer buys one poor article it is his fault if he buys a second. We have a law that if a man puts up canned goods and does not put on his name, he is liable to \$2 fine for every can without his name, and the retailer is liable to \$2 fine by the poor consumer that gets hold of him. I believe that the unfortunate prices of fruit to-day result from careless packing. I would like to see a fast steamship freight service. There are more cold storage houses in Ontario than there were ten years ago. In our county, Prince Edward, the amount of apples being stored and shipped by refrigerator cars in winter time is wonderful. I doubt

if you could succeed with cold storage in England. Keep the apples here until the better market is obtained in England. Last year I shipped 700 barrels to Prince Edward Island. I said to the largest wholesaler in Charlottetown: "You can get all the apples you wish from Annapolis Valley; they grow the finest Gravensteins in the world." He said, "Yes, but no apples are like the Ontario Spys and Baldwins, and other fine varieties, and they always command a better price, but I want you to put all the big ones by themselves, and if you send small ones, put the small ones by themselves." (Laughter.) The finest apples today that this world produces can be grown in Ontario. (Hear, hear and applause.) We, who are shippers, know that Ontario apples bring better prices when they are right, than any other apples grown on this continent; and I would like to see our apple industry fostered and looked after, and shippers impressed with the necessity of putting up only first-class goods.

Mr. DEMPSEY, Picton: I am sorry that Mr. Boulter has found so many poor farmers down in his section. In our section it is quite different. Some farmers were induced by a prominent apple shipper to have his men put up the apples and they would pay 25 cents a barrel for the putting up. One neighbor had his done up, some 26 barrels, by these packers and he got 29 cents. Another neighbor that I have a little influence over, put up his own apples and shipped them through on the same boat to England and he got \$1.10. (Laughter.) A shipper in our own vicinity was telling me the other night that he sent west and bought a lot of apples and he sent his own packers up there to pack them and he bought a lot of apples packed by farmers in our section and the men who examined them in Montreal rejected those put up by his own packers and took those the farmer packed and sent them on. (Laughter and applause.)

Mr. M. PEITIT, Winona: I cannot agree with Mr. Boulter that the fault lies with the packer. Dozens of barrels of the choicest apples have this year been packed in the most careful and systematic way and sent to the old country that have scarcely paid expenses. I believe the fault lies in the way they are stored on ship or at the other end. I don't believe the grower is to blame for poor prices that are very frequently got over there.

ADDRESS BY THE DOMINION MINISTER OF AGRICULTURE.

Hon. Mr. FISHER, who was received with applause, said: I am a farmer, it is true, and I grow some fruit for my own use, but I can't pretend for a moment to compare with those whom I am addressing in regard to the knowledge of fruit growing either in the growing of it or in the packing or marketing of it. Therefore it is rather hard for me to get up and undertake to say anything to this audience. However I have the courage which is inspired in me from the fact that I have not come here in any sense to teach you anything, but to try and learn something from you.

In my position as Dominion Minister of Agriculture, the onus has been thrown upon me to provide something in the nature of cold storage which is going to facilitate the export and the carriage of our perishable fruit products from Canada to the English market, and it is of the utmost importance to me that I should get all the information I can in regard to the trade in those products. Apart from the pleasure of meeting the men who have made Ontario fruit what it is and have earned for it the reputation it has the world over, I have come here simply and solely to try and find how I could facilitate and aid your trade and your business. (Applause.) This fruit business is of a peculiar nature, I think a good deal different in many ways from the dairy products, and the sale of those in the home market, with which I am most familiar and in regard to fruit I find some little difficulties which I wish to learn from you how to overcome. The other day in Nova Scotia I attended a meeting of fruit growers of what is here known as the Annapolis Valley—a name which has been extended to apply to the whole region extending fifty or sixty miles from the Basin of Minas to the Annapolis Basin; by "Annapolis Valley" as the Cornwalis Annapolis Valley wide cold storage in the English market best do to reach in Halifax—there could store there age accommoda think, as my own considerable amount trading there. the English show finding the account ket is ready to grower are to trains from every day the fruit is at the present time that when they will rush up just which I think is too quickly put right off the tree quickly as possible heated in the home men who are fruit with the cold storage rel for a short time centre of that basin they are put into packing their produce down there that made in the pack will have to be stored inside so as to market quickly and Ontario you have port of Montreal season. It will take to send fruit from season to be able over the whole market required to the understand quite our season there would be practical packed to the greatest, or whether it cold storage warehouse—when I say shipping the railroads to the upon which I want great fruit growing until such time as point on which I w

polish Basin; but in Wolfville and Kentville we are taken to task for using the term "Annapolis Valley" by the people who live in that section, which should be known as the Cornwallis Valley. I find the same difficulties among the producers of fruit in the Annapolis Valley and the Cornwallis Valley that I find among you. I was asked to provide cold storage for them so that they might be able to place their apples especially in the English market to advantage. I asked them, as I am asking you, what I could best do to reach that end. The answer there was, in the first place, provide a warehouse in Halifax—the shipping point for the large proportion of their apples—where they could store them until the market was fit to ship to, and secondly, to provide cold storage accommodation on the vessels from Halifax to the English market. They seem to think, as my own information led me to think, that in England to-day there is a considerable amount of cold storage accommodation, perhaps sufficient for the purpose of our trading there. That is to say, that if our apples or other perishable products can reach the English shores in the proper condition there would be no great difficulty there in finding the accommodation to keep them and maintain them until such time as the market is ready to take them. The difficulties that now meet you and the Nova Scotia fruit growers are probably about the same. They find in the first place that the railroad trains from even their short distance from the sea rather hurt the fruit. In a hot autumn day the fruit is heated, and they find again that in the ships as they go across the Atlantic at the present time the fruit heats, and it is not an unfrequent thing for them to find that when the hold if opened where there are a large number of apples the steam will rush up just as though the whole place below was full of steam. This is a thing which I think shows one of two things. My impression is that the fruit down there is too quickly put into the barrels. I am told that it is there a practice to take the apples right off the trees and put them straight into the barrels and ship them off to the sea as quickly as possible, and it looks as though these same apples steamed and sweated and heated in the hold of the vessels, and created this heat which injured them. You gentlemen who are fruit growers can tell me if I am correct in that idea or not. Then again, with the cold storage provided for these apples the question arises whether in a tight barrel for a short time all the cold of the cold-storage chambers will penetrate into the centre of that barrel sufficiently completely to keep the apples in proper condition, if they are put into cold storage in the kind of package which they are in the habit of packing their products. I have been warned by those who have dealt with this matter down there that the probability is that for cold storage purposes a change will have to be made in the package, and that the tight flour barrel, or apple barrel of the present day will have to be supplanted by something of a more open character, and perhaps smaller inside so as to make sure that the cold atmosphere in which the fruit is placed will penetrate quickly and evenly to the whole of the fruit contained in the packages. Here in Ontario you have a much larger railroad journey to the sea whether you ship from the port of Montreal or the port of Quebec or from St. John or Halifax according to the season. It will therefore be necessary that you should have refrigerator cars in which to send fruit from here to the sea-board, and I might say that I propose and expect next season to be able to arrange for a complete system of refrigerator cars which would go over the whole lines of the country, carrying our perishable food products as may be required to the centres where they may be kept in cold storage. (Applause.) I can understand quite well that this is a pretty large undertaking, and if at any one period in our season there should have to be moved several hundred thousand barrels of apples, it would be practically impossible that they should all be moved immediately after they are packed to the great centres; and therefore I want to ask whether it would be wise or best, or whether it would be necessary in the interests of the trade, that you should have cold storage warehouses in the great fruit centres as well as in the great shipping centres—when I say shipping centres I mean the parts where the goods would be transferred from the railroads to the ships to be carried across the ocean. That is one of the questions upon which I want your opinion and your views—whether it will be necessary in the great fruit growing centres to have cold storage warehouses where the fruit can be kept until such time as it will be possible or advisable to ship to the shipping ports. Another point on which I wish your suggestions is as to what extent these cold storage warehouses

will be required in the fruit growing centres ; what would be the likely amount of fruit to be exported in cold storage, that is to say, what the demands of the fruit growers of Ontario will be upon the cold storage that it is proposed to create ; and next I want to ask you about what length of time and what period of the year will be the greatest demand for this cold storage on the part of the fruit growers of Ontario. I may say that in my proposed arrangements in regard to cold storage the dairy interests require a large quantity of space during the latter part of the summer and winter. Will that be the time during which you too will be asking for space? During the early part of the summer they will require comparatively little cold storage, because it has been found by several years' experience that the time when the price of butter especially in England tempts our people to ship to England is about July and from that on. Our poultry at the same time will in a general way be exported towards the fall of the year or in the early winter. The egg trade will probably go through the whole of the year more or less. I can understand, of course, that your large trade in apples is the great export of Canada in fruit, and if you attempt to export peaches or any of the larger fruits or grapes all these must be necessarily in the fall of the year ; but I would like to ask you to give me some idea as to how long during the year after your fruit is ripe you will be able to extend this export so as not to require too great an accommodation at one time of the year and none at all at another. I ask you to give me your views as much as you can on this present occasion, or to send to me later on your information and knowledge. Something was said a few minutes ago with regard to the glut of fruit and the fact that the steamers did not care whether they had apples this fall or not. The fact is that the fruit conditions on the St. Lawrence this year were very peculiar. In the early part of the season you could have abundant space for all you wanted, but just about the end of the season there was a great out-rush of our products, and though the ship owners raised the price of fruit they still had the whole thing in their hands, the call for freight was so great. It has been years and years since that condition has existed before, and it will be years before it will happen again, because the high rates of freight will tempt a larger number of vessels than before to come to the St. Lawrence, and the result will be a lower rate of freight than existed in Montreal this year. It was a mere temporary condition of affairs and one not likely easily or equally again. A remark was made as to refrigerator cars in winter and the shipment of freight in winter in refrigerator cars. This brings me to a point on which also I wish information—whether you will want refrigerator cars and refrigerator accommodation during the cold weather? The general impression has been that the refrigerator accommodation for our traffic would only be required during the short summer months, and that when the cold weather comes in, in the fall, they would be no longer needed. My own belief is that when cold storage is once adopted, and the people begin to avail themselves of it and take advantage of it, it will be required even during the cold weather, because the uniformity and even temperature without danger of frosts as well as without danger of extreme heat will be wanted for those perishable products, and that after a few years, if not immediately, cold storage will be asked for even in the winter season. I regret extremely that in the course of the discussion there was not more information elicited, that there was not more of what almost was diversity of opinion, because then you know a good argument will arise and we will be able to find out the exact truth of the matter from different points of view. I want before sitting down to so express my extreme pleasure at being here to meet the fruit growers of Ontario. I find a number of gentlemen whom I have had the privilege of meeting before on various occasions. I am glad to meet them again, and I trust that in the course of this meeting we will have a very thorough discussion of these matters and an abundance of information given me. It is my first visit to Kingston or to this neighborhood. In my former experience I have been about a little in the different parts of the country, but my wanderings have not brought me to this city. I am sure that the occasion of this meeting is a very opportune one to me. It is especially interesting to me in my capacity as Minister of Agriculture, charged with the interests in which I pride myself I am interested, that industry which is my own industry and my own business. (Applause.) It is also an extreme source of gratification to me to meet with the men who are engaged in fruit growing in the Province of Ontario. I think without

flattery I may say is not only of the best quality and applause, into a neighborhood of the highest and the highest and I am very glad to meet you as having done partly because of conditions—partly intelligent, and most marvellous coming from a Province and partly charge of the industry with the people before, but whom many opportunities obtaining that on that industry

The PRESIDENT Agriculture for that purpose that I proper manner. if you do not lay addition to that I justified in appointing before the Hon. Mr. Fisher, and Mr. the Hon. Mr. Fisher case which will give indeed to hear an interest or benefit

Prof. SAUNDERS because I appreciate fully in all classes attention to the measures that can products of which the difficulties well result in disappointing and the experience to bring under notice Colonial exhibition conversant with the steamers then run brought together, the finest collections of real There was not once in this storage refrigerator car could flow, and as simply to present the large exhibition

flattery I may say that fruit and its kindred employments is one of those industries which is not only of the utmost importance to the country, but it is one which develops about the best qualities in the individuals who are interested and engaged in it. (Hear, hear, and applause.) Wherever I have gone and mixed with the people, wherever I have come into a neighborhood where fruit growing is largely engaged in, I found men and women of the highest culture, whose tastes are always in the direction of the highest ambitions and the highest ideals of cultured people, and for this reason if for no other I am extremely glad to meet the fruit growers of Ontario. We of the Province of Quebec look to you as having done much more and gone much farther than we have in this industry, partly because of your better climate, and in some places the richer soil and suitable conditions—partly because, I am fain to think, you people of Ontario are energetic, active, intelligent, and that whatever you take hold of you seem to be able to succeed in, in the most marvellous way. I do not say this from any flattery; I say this because, as one coming from a neighboring Province, as one who is to-day not only belonging to that Province and presiding over the interests of agriculture in that Province, but who has charge of the interests of agriculture for the whole Dominion, I am glad indeed to meet with the people over the whole country who have not had opportunities of meeting with me before, but whom during the time I occupy the position I at present have I hope to have many opportunities of meeting with and discussing their interests and my interests and obtaining that assistance by which only I shall be able to assist that industry and push on that industry in which we are all concerned. (Applause)

The PRESIDENT: I am sure that we are very thankful to the Hon. the Minister of Agriculture for the practical address with which he has just favored us. He has brought out points that I hope will now enable us to take up this question and discuss it in a proper manner. He has given you the invitation to do so, and it will be your own fault if you do not lay before the Minister the wants of your calling at the present time. In addition to that I think that the matter is of such importance that this society will be justified in appointing a committee who shall go into the matter thoroughly and lay before the Hon. Minister the information which he has asked for in his address, and for that purpose I will now appoint a committee to be composed of the Secretary, Mr. Orr, Mr. Fisher, and Mr. A. H. Pettit, and will ask this committee to present in writing to the Hon. Mr. Fisher at the earliest possible moment a full and complete statement of the case which will give him all the information that is desired. I should be very pleased indeed to hear any gentleman now who could give any information that will be of interest or benefit to the Minister.

Prof. SAUNDERS: I wish to say a few words on this subject of cold storage of fruit, because I apprehend there will be many difficulties in carrying out this project successfully in all classes of fruit. There is no doubt in the minds of any that have paid any attention to the question of cold storage, that cold storage is one of the most important measures that can be adopted at this time for the preservation of those perishable fruit products of which we produce so largely in Canada, and it is well at the outset to look at the difficulties well in the face so that we may provide against what otherwise might result in disappointment. Experience is always of great advantage in all these things, and the experience we have had in the preservation of Canadian fruits it might be well to bring under notice. The first experience we had was at the time of the Indian and Colonial exhibition, and as I had charge of the shipment of fruits at that time I am conversant with the particulars. Cold storage apartments were built up in one or two steamers then running from Montreal to London, and a large collection of fruits was brought together, largely by the help of the members of this Association—one of the finest collections of Canadian fruits that was ever made—and this was shipped to Montreal. There was no storage accommodation in the cars at that time, but it was placed at once in this storage refrigerator which is built on the plan of the Hanrahan cold storage refrigerator, that is, with ice overhead and a large apartment where the chilled air could flow, and circulation also was provided for in the interior. The object there was simply to preserve the fruit long enough to take it across the ocean and exhibit it at the large exhibition that was to be held at that time in the halls of the Royal Horticultural

tural Society. That experiment was eminently successful, and some five or six thousand plates of Canadian fruit were displayed to the amazement of the English people, carried there in a very good condition. The next experimental test made was at the time of the Chicago Exposition. There we had to face the difficulty of preserving these fruits for six months. A very excellent collection was got together through the liberality and energy of the Provincial Government by the agents they appointed. Mr. Pettit and others brought together a large collection of Ontario fruits. A large collection was also made in Nova Scotia and the Maritime Provinces, and another in Quebec. These were nearly all packed in light packages and shipped to Chicago rather late in the season when there was not much danger of injury from exposure to heat, and placed at once in a large cold storage building there. We supposed that everything was all right, but about mid-winter I wrote to the cold storage people and asked them to examine the packages of fruit and endeavor to ascertain what condition they were in. They replied that they were in bad condition when the packages were opened, although they had been preserved in a uniform temperature. A large number of specimens were wholly or partly decayed, and the people who had charge of the storage work recommended that we have all the packages opened and have them repacked, rejecting that which was unsound and packing up only sound specimens. They further told us at that time that it was a mistake to put the fruit in tight packages; that if barrels had a number of holes bored in them, or if the fruit had been put in packages made with slats, that they might have been preserved better. They also objected to the wrapping of fruits—I believe it was wrapped mostly in pieces of newspaper. You know that the fruit wrapped in tissue paper by the California people and shipped in cold storage is kept very well, and I apprehend that the shipping that was objected to by the cold storage people in Chicago was more on account of the character of the paper, and if the fruit had been wrapped in tissue paper, which is very porous, there would have been the same rejection. We adopted their suggestion and repacked the fruit, and some of it came out in excellent condition in the spring and a proportion, especially the earlier ripened fruits, were found to have very few good sound specimens when they were taken out. I think this difficulty arises from the fact that chemical changes are going on in the early ripening of the fruit at the time they are put in the cold storage chamber, and here is where difficulty is likely to arise in connection with the preserving of fruit. In the preserving of dairy products any deterioration in that, at least from butter, begins from the outside, and the firmings which arise in cheese are of that character which are easily controlled by the low temperature than the changes that occur in the ripening of apples and pears. There when the change occurs the skin which is not easily permeated by the changes of temperature and this chemical change which is not very well understood, is accompanied by the evolution of heat, so that when the ripening period has arrived and changes begin in the apples we have a difficult state of things to control in cold storage; and my reason for bringing this point before the Association is to urge upon them to endeavor to overcome this difficulty by having the fruit go into cold storage when it is firm and sufficiently unripe to be sure that these chemical changes have not already set in and considerably advanced. I think that these difficulties we had in connection with the Chicago Exposition arose from the fact that the changes were already occurring in those early ripening fruits before they were put into packages to put into cold storage, and these having started were not easily controlled by any temperature that could be brought to bear on them in a cold storage warehouse. It is well to look those difficulties in the face and endeavor to overcome them by proper action at the proper season. The Canadian climate no doubt is of great advantage to the Canadian people. We have in this section of the country a climate where apples and pears of the very highest quality can be produced, possessing flavor superior to the apples produced anywhere south of us, and which if we take the fullest advantage of and endeavor to get these to the consumer in the condition in which they leave the producer, if they can be so carried without deterioration, I am sure there is a great future for the fruit trade in Canada. In any remarks I have made I would not be understood as throwing any difficulties in the way of cold storage. We should, I think, in all these cases endeavor to gain what we can from the

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experience of the past and thus add to the probabilities of successful management and great continued success in a great enterprise like this.

Prof CRAIG : Since the Hon. Mr. Fisher spoke one of our largest shippers came into the room, and I would suggest that the name of Mr. E. D. Smith be added to the committee. I think he could give a great deal of valuable information.

The PRESIDENT : I think so myself, and will add his name to the committee.

Prof SAUNDERS : Mr. Craig has carried on some experiments, and I thought that perhaps he would follow me and give the Association the benefit of the experiments that he tried last year in cold storage in Montreal, which was just along that line.

The PRESIDENT : We should be very glad indeed to hear from you on that line.

Prof. CRAIG : I think that the results of those experiments have already been given to the society, and they have been put in possession through the means of our annual report and through my own remarks at the last meeting at Woodstock. They are practically in line with the remarks already given by Dr. Saunders and simply emphasise the fact that if we would be successful in the preservation of our perishable fruits we must begin to put them into cold storage before any distraction or breaking down of the actions which the ferments preceding the process of ripening begets. The process of ripening, the process of maturing, is in reality a process of decay, and although at the beginning we may not recognize it as such, it goes on gradually from step to step from the time the apples is green till the time it is in a perfect state of maturity, and later on when it is past that step and has begun to decay. So that it is absolutely necessary that we should recognize this fact and this principle, and in storing fruit put it in a storage before any actions consequent upon the beginnings of ferment commence. In this connection I might say that I was very glad to know the day before yesterday in passing through Detroit on my way to the meeting if the Michigan Horticultural Society that Canadian fruit growers had already begun to take advantage of the cold storage system not only in Canada but on the other side. In visiting the large cold storage house of Webb Bros. in Detroit I found several hundred barrels of Canadian Snows in storage that were later on to be placed on the Chicago market. When I got to Grand Rapids, at the meeting I found still further evidence of the enterprise of Canadians, and the Michigan fruit growers are awakening to the fact the Canadian apples are forcing themselves on the American markets by reason of their better quality ; and this just brings us back to the statement made by Dr. Saunders that we have a climate here that produces not only the finest pears but the finest apples in the world.

The SECRETARY : I believe if we could take advantage of cold storage warehouses for our pears, for instance, that it would be a great thing for the fruit growers of Ontario. During the last season and a year ago also I stored Bartlett pears both in Montreal and Toronto in cold storage warehouses. At that time they were selling at very low prices indeed. During this season, as you all know, Bartlett pears were down to twenty-five and thirty cents a basket, and there was nothing in them, and I took advantage of this warehouse, for I knew they would be kept at a low temperature, and I kept them for a month or six weeks until after the crop was harvested and the glut was stopped. Now you know there is no pear that will sell when you can get a Bartlett, and the price rose last year from seventy-five cents to one dollar a basket, so you will see it was a fine step in advance for me to take advantage of that opportunity of storing those pears. If the Canadian Bartlett could be kept almost indefinitely in cold storage warehouses it would find sale at all seasons of the year, and it would be the pear for dessert purposes. The same thing can be said with regard to our Canadian Snow apple—no other dessert apple would be wanted if we could keep that apple in perfect condition throughout the season. So I think there is a great argument in favor of the establishment of such institutions.

Mr. PATTON : I would like to ask Mr. Secretary if he stored any baskets. I understood the baskets did not answer very well in cold storage.

The SECRETARY : I stored in baskets. I think the cold storage men objected because the baskets took so much room.

Prof. CRAIG : The baskets are not suitable for cold storage. They would be stored in the same space but the cold storage warehouse cannot be made rat-proof, and while these might not eat a great deal they damage a great deal, and I think the box package is capable of being packed easier and more safely.

Mr. FISHER : Professor Craig, do you find that while you have been able to preserve the appearance of fruit by cold storage you can hold the flavor ?

Prof. CRAIG : In the case of apples and pears I did not find that there was very much loss of flavor. Of course there is always in stored fruits a certain loss of this fine aroma that we detect and so well appreciate when the fruit is just at its prime condition. You know it is Grindon, that fine old writer on English fruit, who says "There is just one hour when the peach is in its best condition. That hour passed, 'tis afternoon." In the case of stored fruits, it is frequently afternoon, although we may not recognize it when we eat them ; but if we compare them with the same fruits in their highest quality when they are just ripe from the tree we will recognise it. In the matter of stone fruits there is a greater loss of flavor than in the case of apples and pears, particularly in peaches. Peaches after being stored for five weeks have a fair appearance, and on being cut do not show much discoloration, yet on being eaten there was a distinct and very observable difference in the flavor. Stone fruits sometimes show signs of decay from the stone ; the decomposition sets in from the middle and works outward, like some of our pears do when they are ripening naturally.

Mr. FISHER : How long did those pears keep their flavor ?

Prof. CRAIG : I put them on the market December 15th, they had been in cold storage since the first week in September.

Mr. FISHER : Did you ever keep Bartletts twelve months ?

Prof. CRAIG : No, but I think they can be if you could be absolutely sure of your temperature and sure you could hold it just at the degree you wanted it.

Mr. FISHER : I have held the Pomme Grise twelve months. It was just as bright at the end of the year as when we put it into cold storage, but it had no flavor at all.

Prof. CRAIG : I tasted peaches yesterday in Detroit in the warehouse. Of course that is not very unusual as we may have some Smock peaches in ordinary warehouses. These were Crawford's. Their flavor was somewhat off, but they were good in appearance, and I think they were ahead of California peaches at any time.

Mr. ORR : Would not there be a decided advantage in putting fruit into cold storage at the point of production ? After being carried they would be more or less bruised.

Prof. SAUNDERS : If they could be carried in refrigerator cars it seems to me that would be as good as placing them in cold storage warehouses at the point of production. What you want to do is to keep the temperature low and to ensure that the condition of the fruit, whatever it may be at the time when it goes into cold storage, will not deteriorate. That is, if it is possible to keep it from any further fermentation that it will not deteriorate until it reaches the consumer.

The PRESIDENT : Have you any experience, Mr. Smith ?

Mr. E. D. SMITH : No, but one of the most important things in this connection is, how long will the pears keep after being taken out ?

Prof. CRAIG : It depends on their condition when put in. If they are put in before they have reached full maturity and kept at low enough temperature I anticipate—and my own experience leads me to say this—they won't keep a shorter time than they would originally in natural conditions ; but if they have ripened up to a certain point and then are put into cold storage and held there, they go down very rapidly after being taken out. With regard to the district cold storage warehouses I do not know that I am competent to say anything, but I may just throw out a suggestion, that it seems to me it would be of great advantage to growers if they could put their fruit in the district cold

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Mr. ORR: I picked certain varieties of grapes and put them away in a basket and they were good till May. I sent them to customers and they put them away in the same way as I had, and they did not keep till January. That is my reason for asking the question.

Hon. Mr. FISHER: Is that due to the journey?

Mr. ORR: I think so; I think it is due to the shaking on the stem and the pressing in the package.

Mr. DALY: I have been experimenting a little for the last five years on a small scale with a small refrigerator, keeping early apples, and plums and pears, and I have kept early apples such as the Transparent, Astrachan and such varieties for about six weeks, but after they strike the air and are removed from the refrigerator they are gone in twenty four hours, and you must do away with them. I have found that, while they come out of the refrigerator perfectly sound apparently, the flavor is nearly or in some cases entirely gone. My experience with pears has been that they will not keep as long as an apple. The best apple that I have found to keep in storage is the Yellow Transparent, of the early varieties, but I think you must be cautious in handling your fruit after it comes out of the cold storage; it has got to be handled very quickly, because it will stand no air. After it has been in cold storage for any length of time the moment it strikes the warm air it will go down.

The PRESIDENT: This question arises at once: under what condition or how well matured should your fruit be when you put it in?

Mr. DALY: I have experimented in that case. I have picked it quite green and put them in quite green, and it made very little difference.

Prof. CRAIG: What temperature did you have?

Mr. DALY: Well, I don't know just on the rule of hand. I kept ice in it; I never let it get empty of ice for a moment.

Prof. CRAIG: But the ripening process had been going on all the time, the temperature was not low enough and the fruit was nearly ready to go down when you took it out of the storage.

Mr. DALY: Yes.

Mr. ROBERTSON: I had an opportunity of going through a cold storage under one of the arches of the Brooklyn bridge, the most perfect storage ever I was in. In the office they have the temperature of every room in the building, and I saw pears about the 1st of March in perfect order. Of course when they come out of the cold storage these men have two rooms and they just take a basket or two baskets every day or two. They spoil very rapidly after they come out of the cold storage. The fruit men take them out as they want them.

Mr. CASTON: In keeping apples in a pit I notice they will keep perfectly well as long as you do not open the pit, but just as soon as you expose them to the air they will go very quickly. We often lose sight of the fact that a great deal of the fruit is not picked at the right time. The fruit is like a man going up hill; you want to take the apple just before you come to the summit. If you take an apple too much on the green side, it is insipid, but there is just a certain point where it should be picked, before the ripening process is complete.

Mr. E. D. SMITH: Is not there a great difference in the methods of cold storage as to keeping the fruit after it comes out? Will an apple or any fruit keep in ice storage as well as one taken from a chemical cold storage warehouse?

Prof. CRAIG: I think you are quite right that it will not, but at the same time I do not think we have full information on that point. All storage authorities are now agreed upon the mechanical or chemical refrigeration; and that kind of mechanical refrigeration

which gives not the dry air but as dry air as is consistent with keeping fruit without shrinkage, is best. Every cold storage manager that I have talked with advocates the best kind of mechanical refrigerator, that which is called the direct expansion, and gives dry air which is frequently changed by a perfect system of circulation.

Mr. PATTISON : I would like to ask if it would not work differently having a system whereby fruits when taken out of the cold storage would be introduced into a room that while warmer than the cold storage room would be colder than the outside atmosphere, and there kept for some time, on the same principle as people recovering from illness are kept as convalescents for a period before they go into the full enjoyment of their health.

Prof. CRAIG : I think Mr. Pattison has stated his case, and it does not need any further bolstering up on my part. Fruit growers have noticed that if they put unripe fruit into a cold atmosphere there is immediately condensation on the surface and a collection of moisture which induces decay on the part of the fruit; and when you bring it from the cold to a warm atmosphere the fruit being cold causes condensation, and if you can do it gradually so much the better so as to get rid of this condensation.

Mr. PETTIT : The Hon. Mr. Fisher put some questions that I thought he would like to hear discussed somewhat this afternoon. One was whether it would be desirable to build cold storage warehouses at the places of shipment? I think if the meeting would discuss them for a few minutes it would not be out of place. In my opinion the carrying of fruit to the Old Country, testing our ability to market there by shipping in cold storage, could be done without these buildings, by placing the fruit at once in refrigerator cars and shipping it from the neighborhood where it is grown.

Mr. CASTON : In regard to building these houses at the point of shipment, I think that should be left largely to private enterprise. If there is any cold storage it would require to be at the ports of shipment; that is if there is any delay to occur between the shipment and the loading on the steamer, or the grower decides to hold it for a better market. The great thing is in the passage across the Atlantic and on the train. If we can get cold storage in transportation I think the matter of cold storage in the country will be largely a matter of private enterprise and will regulate itself. It is while in transportation that the fruit gets damaged.

The PRESIDENT : It occurs to me that there should be cold storage at the points where the growing is done, so that the fruit may be held there and sent forward in refrigerator cars and then in refrigerator steamers at the proper time, just when the English market would justify it.

Hon. Mr. FISHER : How soon after the apples are picked would it be necessary to put them into the cold storage?

Prof. CRAIG : I should think they ought to go into cold storage almost immediately after coming from the orchard.

The SECRETARY : I should think it would depend very much upon the variety. If they were summer apples, such as the Astrachan and Duchess, it would, but with the winter apples there would not be any necessity of hurrying.

Mr. E. D. SMITH : I quite agree that there should be cold warehouses at the stations ultimately if it is found to be necessary. The growers would not think it worth while to expend money, and I do not think the Government would be justified in erecting warehouses until after one or two season's test. Then I think it would be essential to have warehouses at the various stations.

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CHAIRMAN'S ADDRESS.

BY PRINCIPAL GRANT, QUEEN'S UNIVERSITY, KINGSTON.

I have been asked to take the chair this evening, and I do so with great pleasure, because I am not only interested in your objects, but have listened yesterday and to-day with great pleasure to your discussions. I listened with very great pleasure yesterday afternoon to Prof. Short's address, in which he pointed out, in a way that I think was new to some of us, the connection of gardening with the development of civilization. I really began to think after listening to him that he has touched a genuine point, because I remember when I was in Scotland for years there was no class of men that seemed to me to combine so fully the advantages of industry and culture as the gardeners of that country, and I was very much struck with the remark that was made to me once in Scotland, that the gardeners were the only class that did not furnish any contributions to the criminal class of the country. (Laughter and applause.) It seemed that every other profession had contributed, some more and some less, but that the gardeners were marked with a white stone in that respect; and that is what we might expect when we remember that we are told at the very outset of Revelation that man was made in God's image, and further that for the development of man he placed him in a garden to dress it and keep it, indicating surely that in this way man's character would be most fully and beautifully developed to all its rightful issues; and that surely is the great object that we should look up to in dealing with this or any other question. It is surely a higher aim than even the more economical consideration, for sometimes we have at these discussions remarks made that seem to indicate that the country is to be judged by the amount of money that its people make. Now we know that men are not merely human bees or ants or beavers, but that they are the children of God, and that they are to be developed to all the rightful issues and to the very highest point of culture. We therefore feel that it is an object worthy the consideration of the statesman and the patriot and the true man, and so we are all interested in the work of your association. It is pleasing, therefore, to see that both the Dominion and the Provincial Governments recognize this, and that we have distinguished representatives of both Governments present at your meeting. (Applause.) I rejoice much in this, because I think it is the right course for Governments to take. I am pleased to think from what we have seen and heard that we have in the Hon. Mr. Fisher and the Hon. Mr. Dryden the right men in the right places. (Applause.) I think it is only right to say, however, that I believe that Mr. Fisher's predecessor was also a most suitable man for the position. He was not a farmer, and some people used to think, therefore, that he was not a good man for the position of Minister of Agriculture. I quite differ from that opinion. I think it is no more necessary to have a farmer in that position than it is to have a banker as Minister of Finance. What you need first of all is a man of good sense, and I have met even some farmers that were not blessed with that quality. (Laughter.) In fact it might even be said that it is a somewhat rare quality. You need a man, above everything else, with the power of judging men, so that he may get right officials, and then with that large common sense which, when he has obtained the right officials, will know how to trust them, to give them as free a hand as possible, this being a very big country, and it being quite impossible for a Minister to watch a man travelling over thousands of miles. And a man is needed who will know how to occupy the golden mean between paternalism on the one hand and *laissez faire* on the other. Governments are not for the purpose of superceding private enterprise; in fact Governments may stimulate certain departments of private enterprise too much; but it is their duty to discern the real basal capacities and industries of a country and then to afford opportunities for continuous scientific experimentation along the line of those basal industries, because that is the great war in which modern society is engaged, and therefore more required by governments now-a-days than even the departments of the army and the navy—a war against ignorance, a war

against those ceaseless pests and enemies that pray not only on our industries but upon our health. I saw only to-day in a newspaper the statement that the minute insects in the United States afflict the fruit crop to the extent of some three millions of dollars a year; and so there is perpetual need of scientific experimentation to detect these and fight against them; and there can be no discharge in this war, for as soon as one enemy has been vanquished another is sure to crop up. That gets an illustration from what we had in connection with the Dairy School in whose hall we are now met. Before the School was established the cheese of this district was far inferior to the other districts of Canada; but one of the highest dairying authorities stated that the school had raised the price of cheese in this district about half a cent a pound. I made a calculation and found that that meant \$10,000 or \$12,000 in one year; and as the Dairy School is managed at a cost of about \$3,000, even in the very lowest consideration of the case there is a return of three or four hundred per cent. But there are more students from other counties than from this county; more students from all over eastern Ontario. They have sent out over one hundred men educated in the industry every year, taught habits of cleanliness and order, and these carry with them into their several localities those habits and are a benefit to the country in various other ways. And now that the institution is taken over by the Hon. Mr. Dryden, he does not mean to let it stop where it is. He will tell you that he intends to introduce great improvements and extensions; because it is quite clear we need in conjunction with it a chemical and bacteriological laboratory, and there is no place where you can have such at so cheap a rate as when you are in the neighborhood of a university, where, instead of having to pay a professor \$1,500 you can get a tutor for one-tenth of the amount. It is a case in which you see the advantage to our common country of us all working together. It is quite clear that not only does Canada now raise very little more than enough wheat for her own consumption, but that any country that has virgin soil can raise wheat—the Hindoo ryot, the Russian moujik, the exile on the Pampas of Argentina, can raise wheat and sell it cheaper than we can; but these men cannot make good cheese nor good butter, nor raise the higher quality of Fameuse apples nor of Bartlett pears. A country is not measured in its greatness by its wealth; that is surely a most contemptible standard to judge any country by. The wealthiest countries of antiquity contributed nothing to the greatness of humanity; but little Athens, little Judea, what have they done? They have been the schoolmasters of the race—the one to the brain, the other to the heart and soul. And so we look not merely at the amount of wealth, but at the kind of men that the country is to produce, and the kind of men are determined chiefly by the industries in which they engage. It is no wonder, therefore, that we are all interested in your work.

ADDRESS BY HON. JOHN DRYDEN.

I am very glad to be permitted to meet the prominent fruit growers of this Province in convention assembled, and to bring you the greetings of the Government which I have the honor to represent here. I have not come to undertake to instruct the men whom I see before me in the proper methods for bringing about the superior production of fruit of any kind growing in this country. It would never do for me to undertake to teach experts in this business, men who have for many years been giving their time and thought to this particular question, but I am here rather, to use a scriptural phrase, to stir up their pure minds by way of remembrance; and if my presence here will add anything of inspiration or enthusiasm to their work I am sure I will be very glad indeed. I ask the members of this Association to remember that they represent one of the greatest and most important industries of this Province, an industry which, if you will allow me to say it, is just in its infancy. It has made considerable progress, as you men know, but I venture to say that few of us realize what is before this industry in this Province of Ontario. (Hear, hear). I ask you to remember also that whether this industry shall be developed along right lines depends very much upon the efforts which will be put forth by this Fruit Growers' Association, and the future success will depend very largely upon

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the foundations which will be laid now. I ask you also to remember that the efforts which you are now putting forth do not touch merely the present, but must inevitably reach forward far into the future. I shall never forget a remark made by an old man reaching nearly seventy years who was rebuked for planting a new orchard and asked what he expected at his time of life to reap from it. His answer was, "Well, if those that come after me will take as much pleasure and satisfaction in partaking of the fruit of these trees as I do in planting them I will be well satisfied." (Applause.) So I think the members of this Association should be stimulated in their work when they remember it is not merely for the present, but reaches far into the future, and that the next generation will receive benefit and blessing because of the work which is being done now.

When we remember all these things, and that the eyes of all the people of this Province are upon this Association—the people who furnish the aid to help to carry on the work in which you are engaged—and think of all the possibilities of this great industry, it is no wonder that we see in connection with this Association new life, new energy, new enthusiasm and new enterprises being manifested year after year. I am very glad that it is so, because it is undoubtedly true that there is very great danger, in all these organizations which depend largely upon public aid, that individual effort will be dwarfed on account of having a guaranteed income: but I wish to point out that the public aid to these organizations is given rather in order that we may by doing so stimulate and encourage the efforts of individual members of the Association to do better, greater and higher things than could be possibly accomplished without this aid. All the people are interested in the aid which is given to these various organizations, and it is given by those who are its guardians because they believe that all the people are directly or indirectly interested in the particular industry represented. The Legislature gives these grants cheerfully and willingly because they believe that spending it in this way will bring a better revenue and a greater return to all the people. If this is not accomplished there is no defence for the grant, which should then be curtailed or withheld altogether. The grants in recent years have been increased because those who had the authority to give them believed that thereby they would increase the revenue and the annual income of the people as a whole, and because they have faith in the future of this industry.

I do not know whether any of us fully comprehend what is to take place twenty-five years hence in connection with the fruit industry of the Province of Ontario. Commence if you will in the western end of the Province, on the fertile and rich soils of the newer counties of Essex and the sister county Kent, where they are able to astonish us by the production of the finest peaches and grapes as well as other fruits; go up along the shores of Lake Huron and around Georgian Bay and examine the quality of the fruits in all those districts; come across the country inland, taking in the old Niagara peninsula, about which everybody knows, and then come on down through, past the city of Toronto and along the shores of Lake Ontario until you get away into this eastern country, you have a territory with natural conditions adapted to produce a finer quality of fruit than you can find on any other piece of territory on this American continent. (Hear, hear.) There is no doubt of it. We have it here stated by gentlemen who ought to know better than I know—and I know myself what are the possibilities of superior production—but, as to the enormous quantities, we have territory enough and can produce quality sufficient to supply millions of people with the very finest of fruits when we have learned to produce them. Some of you gentlemen know perfectly well how to produce them; but my difficulty is that we have all over the country thousands and thousands of people undertaking to do what you are doing and failing in the attempt simply because they do not know how. It is to reach these people that this organization is brought together (hear, hear); it is to carry the instruction and information that you gentlemen possess; it is to carry the average of our product to a higher plane, that we give all these grants. (Applause.)

If I read correctly the report of your meeting, some gentlemen connected with this Association are ready to stop and say we do not want any more develop-

ment of the fruit industry; we are producing too much already. (Laughter). Producing too much already? I am afraid that I will scarcely be able to assent to that proposition. I ask the gentlemen who have that view to remember that the year 1896 in the first place was a very exceptional year. The like of it perhaps none of us remember. Perhaps we have never had in other years such an extraordinary production in all parts of Canada, or at least in this Province; we have had an extraordinary production in all the fruit districts apparently of this North American continent, and it does not matter seemingly what particular variety of fruit—apples or pears or anything else—it seems that all along the line we have had a very abundant production; but with all this production, if we had been supplied with proper facilities to handle it, you would have found very little difficulty and you would not have had to exclaim “too much” at all. (Hear, hear.) But I am willing to admit, if you will, that we are producing too much of that which is inferior. (Hear, hear.) This is a pet theory of mine and I am always pounding at it, and I intend to so long as I have any power to pound at anything. This country does produce too much inferior fruits to-day. Many of our orchards were planted long years ago, when very little attention was paid to the variety of fruit, and the fruit that grows upon those orchards is altogether out of date and out of place. Those orchards were filled up, many of them, with soft and inferior apples that are not fit to ship across the ocean; yet the attempt is made to ship them. Unfortunately all of them have to be marketed at the same time, and what is more, they have to be consumed all within a short period and the result is that naturally when you undertake to do this you have at one season or another what you call a glut in the market; and the inferior stuff—I ask you to remember this—the inferior fruit always stands in the way of that which is superior. (Hear, hear.) Somehow or another you cannot push it aside and leave the other to take its place. There it is in your way all the time; and though you have that which is superior yet the price which you will get for it is affected because you have that which is inferior thrust upon the people at the same time. The same thing is true of our dairy products. What did I find years ago? How is it about butter? I found stacks of it, warehouses of it, car-loads of it, tub after tub, tier after tier, piled up, and when you asked the gentlemen, “What are you going to do?” he would reply, “What can we do with it? we can make nothing but waggon grease out of it.” But yet it was butter, it was in the market, and it was standing in the way; and this always works in the reduction of price of that which is superior. So it may be, and I am willing to admit, that we are producing too much of that which is inferior, but we are not producing too much of that which is superior in this country. Did we not hear the Secretary of this Association reading the quotations? You and I have read them, and they sent across on the wires from the Old Land, “To much of that which is inferior; send us your superior apples, and there is plenty of room for those in the market, but we do not want any rubbish.” And there it goes on from week to week, the same thing being stated; so then I say there is room for development of this industry along those lines, and as long as we are willing to undertake a better production we shall find room somewhere, because I believe in the theory of my good old Scotch friend who, when I suggested that the price of one of his animals was very high, and that he would not be able to sell it, replied “Aye, but it is a good one, and the man is born somewhere that is going to buy it!” (Laughter). So I believe that people are born somewhere that will consume that which is superior, but will refuse to take that which is inferior, though you offer it to them at a much less price. After all, will it not be the survival of the fittest? (Hear, hear). It is true that in this Canada of ours there are some portions of the country where you cannot satisfactorily produce fruit; there are other portions of it where we have admirable natural advantages for this purpose. Well, now, if I produce an inferior quality of plums I shall just have to stand out off the way for some of my friends up about Owen Sound or in that direction, and let them have the market. If I can only produce a quality of grape which is very inferior I shall be before long crowded out of the market, and I will have to quit it and produce something that I can produce to advantage. So many of the trees that are now declared useless will have to be dug up by the roots, as I am digging up some on my own farm that my

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father took care of for many years. He did not know that they were useless when he was taking care of them, and he had to go over the orchard again and put in new grafts because he had been deceived in the sale of the trees, which were a different quality from what he had expected. I am digging them up by the roots, and propose that their place shall be taken by something superior such as you see on this table. That is what we shall have done all over this country, and then we shall find that our products will hold their place and occupy the front position wherever they are put upon the market.

I congratulate the fruit growers of this country and the members of this Association on the fact that we are coming to better days, because we find in recent years that the gentlemen who are placed in authority in the public positions in our country are beginning to understand that it is one of their duties and one of their ultimate functions to undertake to help those who are following industrial pursuits; and so we have listened to the discussion which you had here to day and to the words of the Hon. Mr. Fisher when he addressed you, when he told you that he had undertaken to provide better transportation facilities, and that he has proposed that there shall be a better supervision over these perishable products en route to the best markets of the world. Now this is all needed—this assistance to the men who are thus producing these articles. It is certainly very discouraging to a man after he has spent a year's labor and skill and has produced a very fine article such as you see upon this table to find that it is destroyed on its way to market because of improper facilities being afforded. It is a very discouraging thing, and one that certainly ought not to exist if there is any way of providing a remedy. Unfortunately too many people in shipping their fruit have been simply providing freight for the railways and steamships; these have got all they ask out of it; but the poor fellows who have labored and toiled for the production of it have had nothing out of it yet; sometimes they have something to pay as a bonus to the steamships and railways that carried it for them. This is unfortunate. Sometimes it is their own mistakes. Perhaps they have not paid proper attention to the production in the first place. There are some of our farmers who belong, I am afraid, to that class who are not too much gifted with what you call common sense, who when you bring instruction right to their very doors and thrust it in upon them will refuse to take it, will refuse to believe there is anything in it. And there are portions of this country where it is absolutely necessary that those who produce the best fruit should pay attention to spraying their trees with the proper article and at the proper time; but they say, "Oh, my father never did this, why should I do this? this is a great deal of trouble and bother; if we can get the fruit without that I guess we will let it go!" And it is only when you hammer away, and give them line upon line and precept upon precept, and give them object lesson after object lesson that they will undertake this work. Now, it may be in some places where there has not been the proper return that they have not paid proper attention and there has not been proper handling and all that; but I venture to say that in a good many cases it has been because of improper handling by the employees of the various railway companies and steamship companies who handle those goods. (Hear, hear and applause.) And I would like to say in the presence of Hon. Mr. Fisher that I will not be satisfied unless he undertakes somehow to get at these people. I do not believe that the Allans, for instances, who control one of our prominent steamship lines, and I do not believe that the gentlemen who are controlling these railways corporations, really desire that their employees should undertake the destruction of our property; and yet that is what they do, like a man who takes a trunk off a train, as if he was determined to smash it if he could. Yet it is so, judging from what we have heard here this afternoon. I believe if the attention of those who control these railway and steamship companies were drawn to the matter they would insist upon their employees paying proper attention; and I will expect that the Hon. Mr. Fisher in dealing with these men will draw their attention to the fact that this property is really destroyed because it is put in an improper position and in an improper place in the ship in the first place, and because when it is dumped out with such force it is all smashed to pieces.

I want to reiterate what I suggested in my remarks before this Association a year ago. I think it is high time that we should undertake to teach the fruit growers themselves—and

I am saying this, knowing that there are some gentlemen within sound of my voice who will not perhaps agree with me—that it is their business to act independently from start to finish in the choice of their trees, independent in the planting and caring of them, and in the picking and packing of their fruit. Let these men be taught how it ought to be done. Let your system be of such a character that the work well done will be at a premium; let it be of such a character that the men who undertakes to deceive, who undertakes to fraudently pack his fruit and palm it off for what it is not, that suspicion will always rest upon him, and that it will be impossible without a good reputation in this regard that proper returns should be received by any of those men. I am as confident as that I am speaking to you just now that this is the correct principle. What do we find in many of our districts? We find farmers depending utterly and entirely on the dealers to pack their fruit; and what happens in the season when the dealers are anxious to buy? They buy a great deal more ordinarily than what they can properly handle within the time limited, and so it comes to pass that the fruit is picked, laid on the ground under the trees, the chickens run over it, the birds pick it, the rain comes, sometimes the snow, and covers it over, and still the packers are not there to put it away. What can you expect under the circumstances? I think that ought not to be, and I think that we should encourage those who grow the fruit to pack it, and if necessary do as Mr. Boulter does, put his name on it. If I packed fruit I should not be ashamed to say that I packed it; and if I did not do it correctly I ought to be told, and understand that I am going to suffer loss when I did not do it well. What I want is a premium on the work that is well done in this regard.

Then another thing: if there is one thing more than another we need in this country it is discrimination in the purchase of agricultural produce. What I mean by that is, let the quality tell the price. I remember perfectly well in my young days, when sent by my father to the market, when wheat was taken just at the same price, it did not make any difference what kind of wheat or how many times it had been run through the fanning mill. I remember when the great demand was made for barley in the early days that some men took barley from the thrasher without running through the mill at all; and when I insisted upon mine being cleaned the men said, Mr. So and So takes his just from the thrasher, he never looks at the bags. All that has been changed; and if you will undertake to obtain the first price you have got to have the first grade. That is good sound doctrine. I believe in it; and sometimes you and I as farmers fail to produce the first grade and we feel aggrieved by it; but we cannot complain if we get the price according to the grade we submit to the buyer. It is just the same in regard to our live stock products. Some of us know that a particular class of animal on the English market will bring considerably more per pound than another class, and when the drover comes around and asks what we want he says, "I cannot afford to pay you any more than I pay Mr. Jones, because he will be offended." "But won't you acknowledge that this animal is worth more than the other—that this animal will bring almost twice per pound than the other will?" "Yes, but I have to take them on the average, and I have to make up on one what I lose on the other." I would like to ask if that is fair to the producer? I would like to ask if you are going to encourage superior production? You are really encouraging inferior production; and we want to have men in this country independent enough to discriminate, and let us give a premium for that which is best. If we are to have any real progress, any really development in this industry, you must consent to put a premium upon quality. Some of you may remember that not very long ago, in speaking to another Association, I related an incident which occurred in the North-West, when the British Farm delegates were paying a visit to this country. One of them, a Welshman, whom I learned to know very well, gave me this himself. He was taking his dinner at one of the hotels in our North-West country, and he naturally asked for a piece of beefsteak. The poor man, as he told me, labored with this beefsteak and labored with it; he tried his knife on both sides, lest he had got the wrong side the first time; he took the piece of steak at all corners and all angles; he turned it over on the other side and tried it again, and utterly failed to get a piece off at all or to make any impression upon it. (Laughter.) In the dilemma he beckoned for the waiter. "I

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would like to ask you whether you people in this western country grade your beef the same as you grade your wheat?" The waiter said, "Beg your pardon; I do not know what you mean." "Why, I mean just what I say. I want to know if you grade your beef in this country the same as you grade your wheat; because if you do I should grade this beef that you have brought me as Number One Hard." (Laughter.) Well, number one hard beef is not wanted anywhere; it will not sell anywhere. I would like to know how much beef the worthy chairman would take at a hotel if he had any experience of that kind. As he says, that is the kind of beef that lasts a very long time, and if the landlord can palm it off on those who visit his hotel it is all very well, but the ordinary man will not put up with that sort of thing. But I want to say that number one hard apples, such as we can grow in this Province of Ontario, will find their way, if you will give them a chance, into the place where you will find the very best markets. The best markets in the world demand quality. There are people in Great Britain and New York State who have got sufficient income to say, "Give me the best you have got; I don't mind the price, but I want the best," (hear, hear); and when he knows where he is to get the best he will have the means to find it. I was very glad, indeed, to hear Prof. Craig saying that the people of the United States had begun to realize that the little Province of Ontario—a frozen bleak region in Canada that some of those people talk so much about—was producing fruit that excelled in quality that which they prothemselves; and they will begin to study what kind of a wall they can put up to keep us out; but may I suggest, Mr. Chairman, that the wall won't keep it out if it is better? (hear, hear). We want more of that which is best and less of that which is worst. Let us keep this before us all the time, and you cannot keep the people from buying it. What we want in England is a better reputation. We have got a reputation for our cheese, and if I am permitted to do anything I am going to try and see if we cannot hold this reputation, for people are trying to get it away from us, and trying to get ahead of us. We have no reputation as yet for our butter, and we have no reputation in England for apples as we ought to have, because you load up the market with that which is inferior and which never ought to go. What we want is a system that will give a premium on quality, and that will help the man who produces to realize that only in this way will he find the best returns.

I believe that this country received one of the best advertisements that we could receive anywhere in the world that we did at the World's Fair at Chicago. (Hear, hear). The Province of Ontario spent a lot of money on that occasion, and there is no industry that has received greater benefit from what they spent there than the fruit industry. We exhibited our fruit in competition with the best fruit-growing States of the American Union, and the judgment of those who compared those fruits week after week and month after month was that ours was superior. But it is not enough thus to present it on the table. What we want to do is to see that we have a marketable commodity of that quality, and to show the people of Great Britain that we have any quantity of that same quality, and we want to keep it before them, and then there will be no doubt about the market we will have. Now what I am pleading for especially is that in all this I want the producer to get the benefit when he produces a quality that the market demands. There are some dealers here, and they will excuse me if I say I am not particularly interested in their welfare at all; they are perfectly able to look after themselves (laughter); but I do plead, and I am always pleading for the producer. That is the man after all who is really creating the wealth of this country, and he is the man who ought to receive the assistance now. I believe the man who has labored and toiled in the fields of our country is really adding to the wealth of our country, and the man who goes into the mine and into the forest—those are the people alone who are really making the additional wealth which our country has, and therefore these men ought to be aided and protected. The man who is bearing the burden and heat of the day and patiently receiving what Providence gives him, whether it is of storm or calm or heat or cold; who, when he has success is grateful and rejoices in it, but who, when he fails, pluckily tries it again, always going on with his work hoping for something better

in the future—these men who are at the very foundation of our prosperity, are the men who deserve our sympathy and who need and ought to receive our help. It is one of the legitimate functions of this Association to bring help to these men under these circumstances. There is a cry all over country for information for these men. Let the information be given freely and cheerfully and heartily, and even let it be given where it is not asked for, because the more information you can give and the more light you throw on this question, the less of that which is inferior will be presented on the market in competition with that which is superior, and so in that way we shall bring the greatest benefit to the greatest number of people in our country. I am aware that this work is very responsible and that the officers controlling this Association, if they rightly view it, will feel the responsibility which rests upon them; but is it not full of interest and encouragement and hope as well? The Government which I represent bids you God speed in this work. The country on the whole cheerfully pays the money that is required to aid you in this work; and I am sure there is no man listening to my voice, who has had to do with this work during these long years, who can look back and realize that they have had a hand in bringing about this development, without a feeling of intense pleasure and satisfaction. I congratulate you on the success which has resulted from your labors, and trust that this success will be in the future beyond even what it has been in the past. (Applause.)

ADDRESS BY HON. SYDNEY FISHER, MINISTER OF AGRICULTURE
FOR THE DOMINION.

Hon. Mr. FISHER said he had not come expecting to speak this evening. He expressed great gratification at seeing such a large meeting, and said he felt it his duty to meet the people whose interests he was set to serve, so that he might the better perform his official duties in relation to them. He proceeded: You said, Mr. Chairman, a few minutes ago, something in regard to the position of Minister of Agriculture, and you implied that while it was not essential that the Minister of Agriculture should be a farmer, I do not think you undertook, at all events, to say that he should not be a farmer—(Hear, hear and laughter)—and I confess that I do not agree with you in your expressions that he should be anything but a farmer. (Hear, hear.) I confess, sir, that if to-day I am the Minister of Agriculture of the Dominion of Canada, it is because I am a farmer, because the chieftain and the leader of the Government of the day thought that it was due to the great farming interests of this country that one who had studied that business practically should have charge of those interests. (Hear, hear.) But taking a little broader view, after all, you would not suggest that anyone but a lawyer should be the Minister of Justice. (Hear, hear.) You would not suggest that anybody, perhaps, but a merchant, or somebody who has engaged in and understands trade, should be the Minister of Commerce or the Controller of Customs; and therefore I think it is but right that the Minister who is in charge of the great agricultural interests in this country should be one who is engaged in that business, and has, therefore, a better opportunity of understanding its wants (Hear, hear and applause.) But in this respect I can take you a little nearer to your own home, because you have had the example and the experience in the great Province of Ontario of a practical Minister of Agriculture who is himself a farmer, and who has proved conclusively, I believe, to the whole people of this Province, and I believe to the people in the other parts of the Dominion, that a Minister of Agriculture ought to be a farmer, and that a farmer makes the best Minister of Agriculture possible. (Applause.)

Now, I have been asked to say a few words about cold storage, a subject to which the minds of the people of this country are looking largely for improvement and benefit to the great business of our food production in Canada, and I may not arrogate too much when I say that to-day the hope of our whole country is in the improved conditions by which the food of this country can be sent to those great markets in the European lands that wish that food and are willing to pay the price for it. To-day the exports from Canada of food products are the largest of any one export from our country.

If we can in better price in into the coffe every class of storage, by im those food pro they make the make to those enquiries I hav of the cold stor English marke charge on the t measurable to improvement I congratulate this and kindr grants and inst Ontario occupi No better educ in the last few in the sphere o Dominion auth hope that in th can work hand that of the oth government ha Ottawa or by r governments th ment can do; s doing that wor Minister of Agr that work. Th the commerce, of the Dominion in the commer grain export. has been spok ment, and I can be, with the int (Hear, hear.) regret to say th this. I have h volve millions schemes which v other work. It of the people al but it is the peo country, and wh and commerce. is absolutely nec fact that Englan to anything her and it is because fight their battle their own vigor. Canada a popula

If we can in any way bring about the fact that those products shall have a slightly better price in the home markets of England and the Empire, we will bring more money into the coffers of the great producing classes of this country, and in that way enrich every class of the community. This end may be brought about by arrangement of cold storage, by improvements in transport and in methods of handling our products. To-day those food products, even though placed in the English market at the low prices that they make there, are the dependence of our people; and any addition which we can make to those prices will be almost entirely and wholly an additional profit. From enquiries I have made, and from what I can find in regard to the matter, the actual cost of the cold storage arrangements which may be necessary to place our products in the English markets in good condition is very, very slight indeed, and that the additional charge on the transportation of our food produce would be so small as to be hardly measurable to each individual pound or package of freight or butter or cheese. The improvement will redound almost entirely to the profit of the producers of this country. I congratulate this Association on the noble work it has done, and I consider that to this and kindred associations, aided so generously by the Ontario Government, through grants and institutes and the work of trained specialists, is due the proud position Ontario occupies in the agriculture of this continent and the whole world. (Applause.) No better educational work has ever been done by the Government than has been done in the last few years by the Government of the Province of Ontario. But while that is in the sphere of the local authorities, there is a sphere and there is a way in which the Dominion authorities also can aid in the work of the development of our country, and I hope that in the future more than ever, the Dominion authorities and the local authorities can work hand in hand, so that the sphere of the one will not overlap and interfere with that of the other. It seems to me that it would be folly that what Mr. Dryden and his government have been and are doing so well should be attempted by the government at Ottawa or by myself. It seems to me that outside of the proper sphere of the local governments there is an abundance of scope and of work which the Dominion Government can do; and I can assure you that the present government is entirely desirous of doing that work to the utmost extent possible—(applause)—and that in my position as Minister of Agriculture I shall devote my whole time and attention to the furtherance of that work. This work, it seems to me, is especially that connected with the trade and the commerce, which under our constitution come naturally and properly within the sphere of the Dominion powers, and it is right and proper that the Dominion should try to assist in the commercial aspect of the questions of fruit growing, dairying, live stock and grain export. Two or three questions naturally come up. One in regard to freight rates has been spoken of. It is one that is especially in the sphere of the Dominion Government, and I can assure you that in the future this question will be dealt with as it should be, with the interests of the agriculturist and producer thoroughly and well considered. (Hear, hear.) There is another part of it, and that is connected with cold storage. I regret to say that in some instances people have got very, very large ideas in regard to this. I have had schemes put before me in regard to cold storage that would involve millions and millions of dollars. I have been asked to subvert and subsidize schemes which would involve such large sums as would handicap the government in its other work. It should be remembered that governments are not made to do the work of the people altogether; governments are made to do the work of governing the country, but it is the people themselves who should undertake to do the especial work of the country, and who should themselves undertake the responsibilities especially of trade and commerce. Competition is necessary, and when the government meddles more than is absolutely necessary I believe that it does harm rather than good. (Applause.) The fact that England stands to-day at the head, commercially, of the whole world is not due to anything her government has ever done; it is due to the enterprise of her citizens, and it is because they have been willing and able to go out into the whole world and fight their battles on their own merits and in the self-confidence of their own strength and their own vigor. I believe the same is true of Canada. I believe that we have to-day in Canada a population that are well able to manage their own affairs, well able to conduct

their own business ; and I think that the government should do as little as they can possibly do with to interfere with that business. But I fully appreciate and understand that there are experimental suggestions of certain new things in which it is proper and right that the property at large should bear the burden of the experiment, and that no private individual should be asked to run the risk of that experiment—(hear, hear)—and to that extent and in this way I feel it my duty as a minister of the Crown, as a minister and a servant of the people of the country, to try and do that for them which they cannot be fairly asked individually to do for themselves. I am satisfied, however, that to accomplish this work of cold storage so that it will be a permanent success it is necessary that it should not be overburdened by too large an expenditure of money. If we were to go to work and establish enormous warehouses all over the country, and have every steamship that went out of Canada fitted with cold storage compartments, and if at the end of next season it was found that those warehouses had not been utilized, and that many of those ships had gone away with only a half or a quarter of their cold storage accommodation utilized, the result would be to throw discredit on the whole scheme, and the freight would be burdened with the enormous expenditure, the profits of which would have to be borne by the trade. I want to see that at the end of next season the people of this country will be so appreciative of the cold storage which may be supplied, and so satisfied of its success, that they will call for more instead of saying that we have had too much. I am satisfied that this is the way in which we ought to act, and this is the line which I ought to keep before me all the time ; and I am sure that the true interests of the trade would be much better and more largely supplied in that way than they would be to launch out extravagantly and largely at the first inception, and then find that we had made a mistake and gone too far. For what has been said in this convention at the meetings I attended of fruit growers of the Annapolis and Cornwallis Valleys, there is evidently some little doubt as to the way in which this cold storage can be best utilized or arranged for. Let us then proceed slowly and in an experimental way until we know exactly what we can do to the profit and advantage of the whole trade. When we have found that out by careful experiment, then let us launch out to the utmost extent that may be necessary in the interests of the trade of the whole country, and do it on a firm footing ; but if we go into it in the meantime and make a mistake of any kind we will throw more of a damper on the trade, so to speak, in the future. Before closing I wish to congratulate you on this splendid convention. The fruit growers of Ontario are more favorably situated judging from your success in exporting, than even many of the States to the south ; and as the quality of the Canadian product is on the average better than that of the more southern product, I do not see why you should not have a good market even in the American States for a good deal of your production, situated as you are so close to the enormous consuming centres in the American Republic. The Province of Ontario probably will have to supply for a number of years to come the large bulk of the home market of Canada. The great North West is opening up, and you ought to send fruit there provided the freight rates are such that you can. In Manitoba and North-West they cannot produce such fruit as you have, owing to climatic conditions, and till you get to the point where the British Columbia fruit would come eastward as yours was going westward you ought to have a large market. We cannot get that market there until we get the people into the country ; and the best way to develop the country is to show in the old lands that such things as these can be produced here—the delicate and the best productions of the earth—and that we have a people who show by their skill and intelligence that they can produce these things. I am a farmer, and whenever I address farmers I try to impress upon them that what they should do is to use their brains instead of their hands. It has been the general impression—and the farmers of the country have lent color to it—that any fool could be a farmer ; but in my experience of twenty-five years on the farm and in going about the country I have learned by experience and observation that there is no business or profession in life in which a man who succeeds and does his duty by himself and his country requires such a high intellectual culture as a man who cultivates the soil and succeeds in that cultivation. (Applause.) The young men who are rising up among us

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and going to school and college, and who have to choose a career in life, need not for a moment turn aside from the cultivation of the soil, from farming and gardening, from dairying and fruit orcharding, because they are afraid that they will not in those careers find a large enough and good enough scope for their intellectual activity as well as for the exercise of their muscles and their hands. On the contrary, they will find as large a scope, if not larger, than they can in any of the other professions or walks of life. I trust these things are better understood, and as our young people are growing up and finding what they can do and how than can turn their best energies and intellects to these developments, we may find the brightest and best of our young people, boys and girls both, stay on the land, working on that land, and showing that in that work they can be the best of citizens and do the best for their common country.

Principal GRANT: I think that after hearing this impromptu address of the Hon. Mr. Fisher we will all be unanimous in the opinion that he is not only a farmer but that he is something else—(laughter)—and we rejoice that we have such farmers as he and Mr. Dryden; and depend upon it, as long as the country produces such as these we will be at no loss for getting Ministers of Agriculture. It was also a great pleasure to me to bear witness to the excellent work of his predecessor, and also with that official of his with whom we came most in contact here—Prof. Robertson—to whom we all have a very grateful feeling for the interest he has always taken in our work.

ORGANIC EVOLUTION

Prof. KNIGHT then gave his lecture on "Organic Evolution," which does not appear here, as this report deals only with practical fruit-growing.

REPORT OF SPECIAL COMMITTEE ON FINANCES.

Mr. E. D. SMITH read the report of the Special Committee appointed to consider the financial position of the Association, as follows:

Your committee beg leave to report as follows:

1. We think the annual statement should show the assets and liabilities as well as the expenditure and receipts for the year.
2. That the auditors might look carefully into the figures presented each year not only as to their accuracy, but also to suggest any economies that they may think might be effected if any.
3. With regard to the item of \$1,834 for printing *Horticulturist* for 1896, we find about \$1,450 only was the cost of printing, or about three cents per copy, or \$120 per edition of 4,000 copies of forty pages, the balance being for sundry items in connection with printing and distribution. We are unable to say whether \$120 for printing each edition is excessive or not, but beg to suggest that tenders should be invited from a considerable number of printing establishments, including some country towns, with a view of getting the lowest price without, however, in any way impairing the quality or style of the publication.
4. We note that of late fewer chromo-lithographs are used, which are expensive, and their place taken by photo-engravings, which are not only much more economical, but are more accurate representations, many of the lithographs being but exaggerated imitations of the natural fruit.

Lastly, we would suggest that whatever economies may be effected, if any, go towards enlarging and improving the *Horticulturist* complaints being made by members of affiliated societies that not enough space is given to amateur gardening and floriculture, and on the other hand practical growers cannot easily be induced, even by the prospect of getting a free plant, to part with their hard dollars in exchange for twelve numbers of the

paper, saying that they can get better value elsewhere. While we would not dare to say extensive improvements can be made with present receipts, we would respectfully suggest that a fruit journal equal to any in America ought to receive and we think would receive an enormously increased circulation, especially if accompanied, as the *Horticulturist* is, with a number of enticing side lines.

Mr. SMITH added that he would like to see a journal, if possible, with such a large scope that the members would be glad to pay a dollar for it. While the free plant distribution is not considered of very much value by many practical growers, yet without it it had been considered more difficult to get subscribers than at present.

The PRESIDENT stated that the Directors last night passed a resolution to take steps to reduce, if possible, the cost of the publication.

On motion of Mr. SCARFF, seconded by Mr. CASTON, the report was adopted.

REPORT ON FRUIT EXHIBIT.

Mr. RACE reported on the fruit exhibit and on motion of Mr. Huggard, seconded by Mr. Orr, the report was adopted as follows:

Having examined the fruit exhibit of the tables before us we have pleasure in reporting it one of the largest and finest in the history of the Association. Among the largest individual collections is one shown by Messrs. Stone & Wellington, consisting of about fifty varieties. Among the varieties worthy of special mention we find Wine Sap, Rubicon, Swazie Pomme Grise, Lawver, Sutton's Beauty, Boiken—thought to be a coming popular apple—Gano, and many other new sorts not yet in general cultivation.

A. E. Sherrington, of Walkerton, shows a collection of only fair samples of several well known varieties.

Mr. A. M. Smith, of St. Catharines, shows a collection consisting of Ohampion Quince, D'Anjou, Josephine, Lawrence and President Drouard pears; also a red apple, seedling of the Ribston pippin, with flavor of parent, and a longer keeper, but not otherwise equal to it.

Mr. Dempsey, of Trenton, exhibits a collection of about fifty varieties of apples, among them a very fine sample of Ontario, Seek-no-Further, Ben Davis in several sizes and shapes, Stark, Newtown Pippin, Hubbardson's Non-such, Reinette, Grise—a favorite in France—two seedlings from the Spy and Russet, and another fine red fall apple without name. Mr. Dempsey also shows a seedling pear, a cross between Josephine and Duchess de Bordeaux, size medium, early winter and of extra fine quality. We recommend it strongly as worthy of propagation and general cultivation.

Mr. J. S. Scarff, of Woodstock, shows about twenty-five varieties of apples, the collection containing a very fine Blenheim Orange, Fallawater, Ontario and Spy.

Mr. Beall, of Lindsay, shows an Ontario and another variety without name resembling Ribston pippin somewhat, but without its flavor.

Mr. E. H. Wartman, of Kingston, shows a very superior Spy, Baldwin, Snow and Ben Davis.

Secretary Woolverton shows a collection of about sixteen varieties of apples, among them Princess Louise, King, Wagener, Spy, Cranberry pippin and Cooper's Market.

Mr. Harold Jones, of Maitland, shows the handsome Scarlet Pippin, Pewaukee, Alexander, Blue Pearmain, Yellowe Billflower and Canada Red.

Mr. Huggard, of Whitby, exhibits a collection of twenty-six kinds, among them the Canada Red, Cayuga Redstreak, Duchess and several well known sorts. He also

shows an assortment of specimens.

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REPORT ON

Prof. CRAI

I am pleased in bringing these features of usef In continuation have been received in detail and so without hesitation was given by th

In this connection, the necessary cardboard box, sender and that without anything This leads to corresponding mailing boxes v Farm, Ottawa, fruits for examination they may be dis

shows an assortment of pears from his cold storage, consisting of about a dozen specimens.

Mr. R. W. Sheppard, of Montreal, shows a new seedling named Rochelle, an apple of medium size, good appearance, yellow splashed with red and of fair quality.

A seedling of the Fameuse family, good size, dark red in color, shown by Mr. Nichol, of Cataragui, is an apple of very attractive appearance, but not up to the mark in quality.

A seedling known as Oliver's Seedling, shown by T. H. Race, of Mitchell, is an apple of large size, nicely splashed with red, looks like a good keeper and good shipper, and is of good quality as a cooking apple. Mr. Race also shows an apple supposed to be Plum's Cider; another, the Walbridge; and another, the Bottle Greening.

Mr. W. S. Turner, of Cornwall, shows a fine collection of about fifteen varieties, among them the Gideon, La Rue, a very superior McIntosh red, Wealthy, Wolf River, Red Beitigheimer, Talman Sweet, Princess Louise, a new variety called Stone, and several other well-known sorts.

Special claims are made for the following: 1. Wismer's dessert, by Mr. J. H. Wismer, of Port Elgin. It is a fair size, yellow splashed with red, very fine texture and choice quality for a dessert apple. 2. The Scarlet Pippin shown by Mr. H. Jones, in our opinion a rival of the Snow as a handsome dessert apple, and promises to become a favorite. 3. A seedling shown by Mr. W. C. Reid, of Belleville, much resembling the Snow and, in some features, the McIntosh Red. It is an apple of considerable promise, as an attractive dessert apple.

Extra fine specimens of the Pewaukee are shown by Mr. A. W. Peart, of Freeman.

Mr. M. Pettit, of Winona, shows a fine collection of grapes, among them the Catawba, Salem and Herbert.

Mr. W. M. Orr also shows a very choice lot of Vergennes.

T. H. RACE,
H. L. HUTT,
E. MORRIS.

REPORT OF COMMITTEE ON NEW FRUITS AND SEEDLING APPLES.

Prof. CRAIG read the following report on behalf of the Committee:

I am pleased to report an increased interest on the part of owners of seedling apples in bringing these apples to public notice for the purpose of ascertaining their particular features of usefulness with a view of introducing them if thought sufficiently valuable. In continuation of the work begun two years ago, a considerable number of varieties have been received and examined this year; where thought worthy they were described in detail and scions were asked for. In most instances growers have furnished these without hesitation, always being assured that their distribution would, until permission was given by the grower, be restricted to the various experimental stations.

In this connection I may be allowed to urge upon persons sending these seedling fruits, the necessity of wrapping each specimen in paper and enclosing them in a strong cardboard box, together with a history and description of the tree, the name of the sender and that of the owner or introducer. A number of packages have been received without anything but the post mark to identify them by, and sometimes minus that. This leads to confusion and enhances the labor of recording the necessary data. Suitable mailing boxes will be furnished by the Horticultural Division, Central Experimental Farm, Ottawa, on application, to those who wish to forward samples of seedling or other fruits for examination. It is also desirable to send six specimens in each case, so that they may be distributed to the three members of the Committee on New Fruits. Infor-

mation regarding the fruits received is given in condensed form in the following tabular statement. Where thought worthy a fuller description is appended :

SEEDLING APPLES.

Sender.		Remarks
Province.	Name.	
*Prince Edward Island..	Gill, John H., Little York...	Medium to large; yellow; flesh juicy, with peculiar quince flavor.
Prince Edward Island..	Ward, W. M., Uptown	Three distinct seedlings; not valuable.
Nova Scotia, C. B.....	Paint, Miss M., Port Hawkesbury	Crab; not equal to others in cultivation.
New Brunswick	Williams, B., Long Reach	Medium size; round; yellow; winter
*Quebec.....	Dart, Rev. W. J., St. Lambert.	Northern Spy seedling; much resembles parent in appearance and quality; winter, Small size; round; red; winter.
Quebec.....	Frazer, John, Coaticooke	"Herrick"; good for cooking only; keeps well; mid-winter.
*Quebec.....	Herrick, J. E. K., Abbotsford.	"Bangle"; medium size; handsome; fair quality; early winter.
Quebec.....	La Trappe, Oka	No. 1; medium size; poor quality.
Quebec.....	La Trappe, Oka	No. 2; small; crimson; winter.
Quebec.....	La Trappe, Oka	No. 3; small; yellow; long keeper; cooking.
*Ontario	Allan, A. McD., Goderich	"Williams"; small; compact; acid, juicy; late winter.
*Ontario	Burgess, Amos, Bala	Crab; good size; handsome; September.
*Ontario	Clare, R. P., Rideau Centre	Medium size; yellow; firm; good; winter.
Ontario	Fisher, M. J., Maxville.....	"Sir Oliver"; red; juicy; fair; resembles "Gravenstein" in appearance and season; medium size.
Ontario	Graham, J. J., Vandeleur	Medium to large; green; firm; acid; winter.
Ontario	Graham, J. J., Vandeleur.....	Medium size; red; poor quality; autumn.
Ontario	Greenfield, S., Ottawa East	Large; red; poor quality.
Ontario	Greenfield, S., Ottawa East	No. 2; small; yellow; good winter.
*Ontario	Greenfield, S., Ottawa East	No. 4; medium; yellow; good winter.
Ontario	Greenfield, S., Ottawa East	Medium; yellow; poor quality; winter.
Ontario	Herriman, Dr. W. L.....	Autumn; quality medium to poor.
Ontario	Kerr, W. J., Renfrew.....	"Knight's Russet"; a small, sweet, white fleshed russet; may be locally valuable; autumn.
Ontario	Kerr, W. J. Renfrew	"Knight's No. 1"; resembles St. Lawrence; two or three weeks later; handsome; fair quality; autumn.
Ontario	Kerr, W. J., Renfrew.....	"Fraser's No. 1"; small; poor quality; autumn.
Ontario	Kerr, W. J., Renfrew.....	Seedling; Blue Pearmain type; worthless.
Ontario	Kittermaster, A. R., Orillia..	Medium size and quality; early.
Ontario	Leef, W. H., Orillia	Large; green; poor quality.
Ontario	Lowery, E. D., St. Davids...	Small; said to be a crab; September.
*Ontario	Morse, S. P., Milton.....	Medium to large; yellow; quality best; promising; probably a seedling of Early Harvest; early summer.
*Ontario	Morse, S. P., Milton	Medium to large; oblate; red; sweet; late winter.
Ontario	McConnell, H. L., Grovesend.	Medium size; crimson; good quality; winter.
*Ontario	Ramer, John H., Markham..	Medium size; yellow; good quality; not attractive; good keeper.
Ontario	Roberts, C. H., Paris	"Ridgemount"; medium size; sweet; summer; not good enough to compete with "Duchess."
Ontario	Roberts, C. H., Paris	"Allan Ridgemount"; medium; yellow; fair; mid-winter.
Ontario	Williamson, W. P., Port Nelson	Small; oblate; yellow; good; mid-winter.

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PLUMS.

*Nova Scotia.....	McFarlane, D. H., Pictou....	Seedling of White Magnum Bonum; good quality; season, late September.
Nova Scotia.....	McFarlane, D. H., Pictou....	Seedling of White Magnum Bonum; blue; nearly free; fair quality.
Ontario	Ruth, S., Ridgetown ..	Blue; size of Lombard; cling; late August.
*Ontario	Smith, A. M., St. Catharines.	"Smith's October"; medium size; nearly black; cling; fair quality; October.
Ontario	Stephens, C. L., Orillia	Seedling; native red; good quality.
Manitoba	Bell, James, Minette	9 samples Native Manitoba plum; Nos. 1 to 3 worthy of propagation in Manitoba.

PEACHES.

*Ontario	Bruner, M. G., Olinda.....	"Corlett"; medium; pink; yellow; free, end of July.
Ontario	Whaley, M., Olinda.....	"Ermine"; medium; partially free; pit large; ripe first week in August.

GOOSEBERRIES.

Ontario	Stephens, C. L., Orillia	Medium size; white; fair quality; July 10th.
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CURRENTS.

Ontario	Stephens, C. L., Orillia.....	Red Dutch type, but sweeter; July 10th.
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GRAPES.

Ontario	Gordon, J. K., Whitby.....	Large; black; juicy; acid; thin skin; late.
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APPLES*

Seedling Apple. From W. J. WILLIAMSON, Port Nelson, Ont., Jan. 20th, 1896.—Small, oblate, yellow ground nearly covered with crimson stripes and splashes. Cavity, deep and russeted. Stem, slender. Basin, shallow, eye open. Flesh, yellow, crisp, breaking, very juicy, pleasant. Size of this apple rather against it, otherwise, promising; worthy of further trial. Season, midwinter.

Seedling No. 4, Greenfield. March 4th, 1896.—Medium size, conical, yellow ground with light red striping. Flesh, yellow, firm, juicy, sprightly sub-acid, good, with Roxbury, Russet flavor, Large mellow core. A keeper. Worthy of further trial.

Seedling Apple. From J. H. RAMER, Markham, Ont., April 30th, 1896.—Above medium; roundish, oblate, tapering rapidly towards calyx. Skin, rough, golden yellow, russet dots, blushed with light red towards cavity. Cavity of medium size. Stem $\frac{1}{2}$ to $\frac{3}{4}$ inch long, smooth. Basin, small, almost wanting, calyx closed. Flesh, white, flaky, juicy, mild sub-acid. Quality good at this season, April 30. Fruit not very attractive, but regular in form, and otherwise desirable. Forwarded by Dr. Beadle. Mr. Ramer says:—"The tree was planted in 1823 and is now 73 years old. My father, Peter Ramer, planted nearly 300, all seedlings, on about five acres, and there were not two trees that bore apples alike—all different. I think he brought the seed from the States. They are

* A named English variety.

generally good keepers, and we usually have some until June. I have kept some odd ones until September. The tree has had a number of the limbs broken off by ice storms these last few years. The tree bears every year and is very full of buds again."

Seedling Apple. From S. P. MORSE, Milton, Ont. August 14th, 1896.—Large, round regular, clear yellow skin, smooth, glossy, with more or less indistinct black dots. Cavity, broad, sloping rapidly. Stem, medium length. Basin, small, round, smooth, eye open. Flesh, white, tender, melting, buttery and juicy, with a peculiar pear-like flavor and aroma. Said to be a seedling of Early Harvest. Very fine, promising and worth propagating, if tree is vigorous. Mr. Morse says:—"I take it to be a chance seedling of the old Yellow Harvest, because the tree sprang up not far from one of that variety which it very much resembles in many points, but is more vigorous. The fruit is much larger, finer in texture, better form and exempt from fuscladium. It is here pronounced the 'best of all harvest apples.'"

Seedling Apple. From A. L. MCCONNELL, Grovesend, Ont., Sept. 15, 1896.—Fruit medium, round, remarkably regular in form, entirely covered with crimson and thickly dotted with large whitish specks, very handsome. Cavity, almost wanting. Stem 1-16 to $\frac{1}{2}$ inch long. Calyx, open. Basin, small, shallow, only a slight depression. Flesh, white tinged with red near calyx, juicy, mild sub-acid, melting; quality good. Said by Mr. McConnell to be a keeper, but in good eating condition, September 22nd, 1896. Mr. McConnell says:—"Small and imperfect specimens of seedling grown by myself. The tree is a remarkably strong symmetrical grower, and an annual bearer. Fruit not subject to scab, very uniform in size and shape. The enclosed specimens are culls, the best having been used."

Seedling Apple. From F. P. CLARE, Rideau Centre, Ont., Oct. 10th, 1896.—Medium to large, round, sloping to calyx. Skin, yellow, partly covered with a bright red blush. Cavity entirely wanting in some specimens. Stem, large, 1 inch long, very obtrusive; except for this the apple would be valuable. Calyx closed, set in a deep narrow basin. Flesh, white, firm, crisp, juicy, peculiarly melting, rather acid. Season, midwinter. Mr. Clare says:—"The seedling originated on the farm of a Mr. Pattie, between L'Orignal and Vankleek Hill, about sixty miles east of Ottawa, and is commonly known as the Joe Pattie apple. The tree is a fair bearer, bearing every year; a very thrifty grower, perfectly hardy, but its chief point of merit is its keeping qualities. In our cellar, it keeps perfectly until April or May, when apples are worth from \$1.00 to \$1.25 per bushel. So convinced am I of its worth, that I have been grafting from it for the past two springs. It and the Canada Red are the two best keeping apples that I have found for this climate."

Seedling Apple No. 3. From S. P. MORSE, Milton, Ont., Oct. 29th, 1896.—Tree resembling Spy. Fruit slightly above medium, flat and oblate, conic towards eye, regular. Skin, smooth, green, well covered with dark red, suffused or in stripes, numerous small dots. Cavity, smooth, broad, sloping and deep. Stem, $\frac{5}{8}$ to 1 inch long, fairly stout. Basin small, shallow. Calyx, small, open or partly closed. Flesh, white, crisp, juicy sweet, very pleasant and melting. Not ripe at this date. Core small. Seeds large, plump. Appears to be a valuable sweet winter apple. Mr. Morse says:—"Tree like the Spy finely fastigate, very vigorous. It has no marked excess of those small spray-like twigs that infest the growth of the Spy and produce most of its worthless fruit. The crop is produced, mainly, on the wood of the last year's growth, and being large weighs down in weeping form the branches with its uniformly large bright copiae, an emblem of humility in the midst of luxury. Holds well to the tree."

Seedling Apple. From J. H. GILL, Little York, P.E.I., Nov. 11th, 1896.—Above medium, oblong, slightly conic obscurely five-sided. Skin, green, glossy with pinkish blush on one side. Cavity broad, moderately deep. Stem $\frac{3}{4}$ to 1 inch long, stout, thickened at base, curve. Basin shallow, wrinkled. Calyx large, closed. Flesh white, juicy, but not melting, with a quince-like flavor, decidedly peculiar but pleasant. Core large open. Very nice. Worth propagation on account of its flavor and keeping properties. Prof. Jas. Fletcher says it reminds him of the Quince Pippin of England.

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Apple Seedling, "Bangle."—From J. E. K. HERRICK, Abbotsford, Que., Nov. 16th, 1896.—Large or above medium, oblate, regular, smooth.—Skin greenish yellow, mostly covered with light red stripings and blotchings. Cavity, broad and deep, sometimes russeted. Stem, slender, $\frac{1}{2}$ to $\frac{3}{4}$ inch long. Basin, small, round. Calyx partly closed. Flesh yellowish white with a distinct St. Lawrence flavor, rather mealy, slightly lacking in juice at this date; kept in a rather dry place; fair in January. A chance seedling which came up in the garden and was allowed to grow. Tree about 25 years of age, roundish top hardy; a heavy alternate bearer. Probably a seedling of St. Lawrence. Named after the owner of the farm. Worthy of further trial.

Apple Seedling (of Northern Spy). From Rev. W. J. DART, St. Lambert, Que., Nov. 16th, 1896.—Medium or under, Northern Spy in shape, with the same ribbings more or less distinct. Color solid dark crimson. Cavity broad and deep. Stem, long, stout. Basin small, shallow. Flesh yellow, firm crisp, almost identical with Northern Spy in flavor. Specimens received have been too much dried. They were also affected by skin spot. Season, midwinter. Tree about 15 years of age, hardy. Mr. Dart says:—"At our annual horticultural exhibition we had a plate of apples shown which seem worthy of notice. These apples were shown by Mr John Duckworth, G.T.R. Bridge Inspector. He says that ten or eleven years ago he planted some seeds from a Northern Spy apple. One of the trees, never grafted, has borne this year and the fruit is very like Northern Spy in color, shape, and is very firm and heavy. The tree is quite hardy here at St. Lambert, and has never been winter killed. The garden where it stands is about half a mile from the bank of the St. Lawrence and is rather sheltered. They look as if they would be good keepers and prove a valuable winter apple for the Province of Quebec."

Williams Apple. From A. McD. ALLAN, Goderich, Ont., Nov. 16th, 1896.—Small, roundish, conic; yellow skin with pinkish stripes on one side. Cavity, very shallow, Stem short, $\frac{3}{8}$ to $\frac{1}{2}$ inch, with prominent terminal knot. Basin shallow with slight ribbing. Flesh, yellowish white, firm, crisp, very juicy, acid and aromatic. Core small, open. Rather promising on account of compactness of form, and pleasant acidity of flesh. Should be valuable as a winter kitchen apple. Season, late winter.

CRAB APPLES.

Seedling Crab. From J. P. COCKBURN, Gravenhurst, Ont. Grown by Amos Burgess, Bala, Ont.—Medium size, round, regular, bright scarlet. Skin, smooth, shiny, red Siberian type. Stem long. Flesh crisp, juicy, firm, slightly astringent. Probably a good jelly variety. Season, end of August. Promising on account of beauty and fair quality.

PEACHES.

Corlett Seedling. From M. G. BRUNER, Olinda, Ont., July 27th, 1896.—Size, 2 inches longitudinally, $2\frac{1}{2}$ inches laterally; smooth and regular, nearly round. Suture, shallow extending half round. Stem set in a deep cavity. Skin greenish yellow when fully ripe, fairly well colored with a pink blush towards stem end. Flesh pale yellow without red markings, quite free, moderately firm, very juicy and sweet. Seems to be a promising early variety. Mr. Bruner says:—"I send sample of seedling peach for inspection. The producer says it is a free stone seedling, of good flavor, and grows evenly distributed on the tree. Please call it Corlett's seedling, which is the name of the producer. The trees grow much the same shape as the Amsden June."

PLUMS.

Smith's October. From A. M. SMITH, St. Catharines, Ont., Oct. 4th, 1896.—Medium size, $1\frac{3}{8}$ inches each way, nearly black when fully ripe; slightly one-sided. Suture obscure; blue bloom, with some mottling. Flesh brownish yellow, clings to stone. Stone globular, with deep hollow alongside a very thick margin. Mr. Allan does not think that

other varieties of the same season are fully as valuable. He says:—"There are many seedlings in this section of this class, but owing to the fact that they are like this, under size, and not possessing any distinguishing points to recommend them specially, I have never brought them to notice. Besides being late, they seem to be past the time when a demand exists generally for the plum. Coe is as late as I have found value for a plum, and I would be inclined to pass anything late unless it was large and a good cooking plum with free stone, if possible. There might be some money in such an one. It is undoubtedly a good cooker."

Plum. Seedling of White Magnum Bonum. From D. H. McFARLANE, Pictou, N.S., Sept. 28th, 1896.—Medium to large, egg-shaped, tapering towards stem. Suture plainly marked, but not deep. Stem fairly stout, $1\frac{1}{2}$ inches long. Skin, greenish yellow with light lilac bloom. Flesh yellow, firm, good quality, closely adherent to stone. Stone, small, flat, one sided, hollow near wing. Somewhat one sided. Season, last week of September or 1st of October; in best condition probably in the middle of September. Mr. McFarlane says the samples are undersized.

Mr. A. McD. Allan says:—"The plum, seedling of White Magnum Bonum (Yellow Egg,) strongly resembles Coe's in form, only smoother in skin. The mottle, which is distinct, resembles Imperial Gage. The pit has a close similarity to the parent, quality good. With us it would scarcely have a place for introduction, owing to the fact that it is about the same season as Coe's and scarcely as large. But it may be valuable for other sections if the tree has hardiness to recommend it. Doubtless bearing quality will be all right, and flavor is good for cooking; the sprightly sub-acid tinge almost makes it desirable for eating, being distinctly a variance from the heavier flavor of Yellow Gage. It has also more juice and finer grain, Pity it is a cling."

SUPPLEMENTARY REPORT.

The following supplementary pages were added by the Secretary:—

During the past season a good many new fruits have been brought under the notice of your Secretary, some of them scarcely worthy of notice, while others seem to give promise of considerable value. Among them are the following:—

APPLES.

Morse's Harvest Apple. Received on August 13th from S. P. MORSE, of Milton, Ontario.—It is larger in size than the Early Harvest and is free from scab. It resembles the Early Harvest in color and form, except that it is somewhat conical. It is later by about two weeks. The quality is very good, the flesh, white, tender, juicy and aromatic.

Morse's Seedling No. 3. Samples of this apple were received on October 30th, from S. P. MORSE, of Milton. Size, above medium, oblate, slightly conical; color, yellowish green, striped and shaded with light and dark shades of pinkish red, with a greyish bloom, and numerous obscure light green dots. Stem broken, set in a narrow, deep cavity; calyx closed in a corrugated basin, with five crowns. Flesh, white, juicy, meaty, crisp; flavor, rich, agreeable, excellent. Concerning this apple, Mr. Morse writes:—"The specimen sent is a fair average; indeed there are no small fruits ever produced, all large and usually better colored than the sample which was gathered prematurely. The habit of the tree is fastigate, like the Spy, equally vigorous, with fewer small spraylike twigs producing imperfectly developed fruit. Crop is borne chiefly on the last year's wood."

Mountain Seedling. Found growing by the Secretary on the side of the mountain on his farm at Grimsby.—It has several interesting peculiarities. 1st, a wonderfully heavy bloom, 2nd flesh deeply stained with red all the way through, 3rd, skin abnormally thick and tough

Rochelle.

on the 19th of except that it is large, unequal, set in a narrow deep, abrupt, of dark shades of

Scarlet Pigeon.

ville, and below most valuable of apple is given by Mr. Oraig.

Whaley's Favorite.

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Smith's Giant.

St. Catharines.— Growers' Association Smiths claims for it at Simcoe Fruit respects it much

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Rochelle. A sample of this apple came to hand from R. W. SHEPHERD, of Montreal on the 19th of November.—It somewhat resembles the Cranberry Pippin externally, except that it is more oblate, and has a peculiarly, large, deep and abrupt basin. Fruit, large, unequal, roundish oblate, somewhat uneven, obscurely ribbed; stem broken in sample, set in a narrow, deep cavity with prominent fleshy lip on one side; calyx open in a large, deep, abrupt, uneven basin; color, yellowish green, shaded and striped with light and dark shades of bright red.

Scarlet Pippin. This apple originated on the farm of HAROLD JONES, near Brockville, and belongs to the same family as the Snow, McIntosh and several others of our most valuable dessert apples. It has been described by Mr. Craig, and a section of the apple is given herewith. The description is omitted, because it has already been given by Mr. Craig.

PEACHES.

Whaley's Favorite. A seedling peach raised by MARK WHALEY, of Olinda, Esf. Co., Ontario.—Samples of this peach were sent in to the Secretary during the first week in August, and they are claimed by the originator to be in season about two weeks in advance of the Crawford. The peach is yellow in flesh, of attractive appearance, of fair size and almost a freestone. Apparently well worthy of testing.

PEARS.

Sapiega. Scions received from JAROSLAV NIEMETZ, of Russia. Fruited by L. Woolverton, Grimsby: matured, August 13th. Size, medium, oblate, beautiful color, yellow with reddish fawn cheek; flesh, somewhat firm, juicy, agreeable, not equal to the Olapp's Favorite of the same season.

PLUMS.

Early Blue. From A. M. SMITH, St. Catharines.—Very early plum about the size of Lombard, but of much better quality. The samples were sent in about the 15th of July. Its earliness was its chief point of recommendation.

Native Red. From W. N. SNELLING, of Ottawa. The plum has already been reported upon by Professor Craig. It is of fair size, bright red and very attractive.

SMALL FRUITS.

Smith's Giant Black Cap. This raspberry is a seedling raised by A. M. SMITH, of St. Catharines.—On the 8th of July it was visited by the Secretary of the Ontario Fruit Growers' Association who reports that it was carrying a very large load of fruit. Mr. Smith's claims for its hardiness and productiveness, and Mr. G. C. Caston, who has tested it at Simcoe Fruit Experiment Station, reports that it is hardy at that place. In other respects it much resembles the Gregg.

FRUIT GROWING IN THE MIDLAND DISTRICT.

BY MR. JAMES DALY.

MR. DALY prefaced his paper by remarking that by the Midland District he meant the vicinity immediately surrounding Kingston.

Fruit growing in the Midland District in the past has been a series of experiments, many of which have been disastrous failures on account of want of knowledge of what varieties were best adapted to our soil and climate; but enough have been successful to prove to us that most, if not all the fruits grown in this Province except

peaches can be grown here to great perfection. Twenty years ago the greater portion of fruit consumed in the city of Kingston was brought from Niagara district or the United States, but to-day we are independent of the western part of the Province or the States. As far as the growing of apples is concerned we stand at the head of the list of competitors for the last ten years at our own great exhibition, namely, Montreal Provincial, open to the world, and Central Canada exhibition at Ottawa, also open to the world. This being the fact should we not ask ourselves the question, what is to be done in this great industry in the future? Are we to stop contented with what we have accomplished, or shall we not persevere and develop the large resources within our reach? There is no part of the Province that has so much land as we have bordering on the River St. Lawrence and Lake Ontario which is particularly adapted to the growing of apples to great perfection; and although we have not a very large portion of country adapted to the growing of pears and grapes, still we have enough to supply our own market and some to spare. Cherries, plums and most of the small fruits can be grown in the Midland district to perfection, and when we consider the great demand for fruit and the increased consumption owing to the new markets opened up to us, we can easily see that this industry is but in its infancy, and if we carefully improve the advantage we enjoy fruit growing will become a source of income to this part of the Province.

The question of how best to accomplish this object, or how to make fruit growing pay is one that should deeply interest us all, but I do not consider myself competent to answer all of those questions. Still I may be able to offer a few suggestions that may be of some value in the future. I remarked in the beginning that many of us have had great failures caused by planting the wrong varieties, but now this need not occur again if we only become members of the Fruit-Growers' Association, and profit by their experience and observations, and remember not to plant too many varieties of fruit unless there is a demand in the market for them. I would strongly recommend growers in the future to plant only apples of a commercial character, that is to say, apples that can be shipped to both our local and foreign markets, and when those are planted they should be carefully looked after and fed in order to make them pay. The day is fast coming when nothing but first-class fruit will pay, and in order to accomplish this result we must give strict attention not only to planting and cultivating but also to the destruction of all insect pests and the prevention of fungous diseases which our fruits are subject to. In putting up fruit for market there has also to be a great change. I think we might very profitably take a lesson from our western neighbors in the Grimsby and Niagara districts. If it pays them to wrap carefully their fruit in paper and pack it in nice boxes, why would it not pay us? I feel assured it will not be long until our choice apples will be wrapped and sent in cold storage to the markets of Europe, and we all hail the happy day when fruit growers can send their fruits across the ocean at all seasons of the year. But I need not dwell upon this matter as the Fruit-Growers' Association has this project under consideration and I most sincerely regret that in the wise deliberations of your association in the past you have not seen fit to establish an experiment station in the Midland District, but I still cherish the hope that before bringing to a close the business of your session you may see your way clear to grant to us this small concession which would stimulate the business of fruit growing and become an everlasting boon to the residents of the Midland District.

The SECRETARY read a letter from Messrs. Hart and Tuckwell calling attention to an apple called the Longevity, also a letter from Mr. Shuttleworth, of Brantford, regretting his absence on account of illness.

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FRUIT SPRAYING, INSECTS AND OTHER ENEMIES OF THE
FRUIT GROWER.

BY MR. W. M. ORR, SUPERINTENDENT OF SPRAYING EXPERIMENTS.

In conducting the experimental spraying of apple trees carried on by the Department of Agriculture in Ontario, we experimented at twenty-nine points, covering the territory from London to Winchester, a distance of about four hundred miles.

The year 1896 has in many respects been unique in apple culture. It has given us the largest crop of apples that we have ever had. In some sections insect enemies were numerous. In a few orchards there were scarcely any to be found.

The principal insect enemies that we had to contend with were the canker worm, codling moth, tent caterpillar and bud moth.

Most orchards were infested with one or more of these, and some with all of them. The farther north and east we went the fewer insects we found. The opinion was expressed by growers that the frost of June, 1895, had been destructive to insect life, and in this way they accounted for their immunity or partial immunity from their ravages. Others think that on account of the short crop of fruit, they could not propagate as in former years. The canker worm has appeared in many orchards this year where it was unknown before, and some orchards where they have been for years, particularly in the Counties of Wentworth and Brant, have been almost entirely defoliated, many trees being as bare of foliage in July as they are in January. Of course the crop was lost for this year, the trees stunted and no prospect of a crop for next year. There are orchards in which they are allowed to do their work of destruction from year to year, thus perpetuating and extending the evil. It is a question whether we should not have legislation compelling owners of infested orchards to spray them, which, if properly done, will effectually end the trouble and thus benefit the owner and save his neighbors from the pest.

Neither this year nor last were favorable to fungus growth, the seasons being dry, but in some sections where we did experimental work this year there was an abundance of rain and a good deal of close hot weather which caused a considerable development of fungus and did serious damage to fruit and foliage where the trees had not been sprayed.

It appears to be beyond question that to grow apples successfully we must spray, indeed I believe it to be as important as trimming, fertilizing or cultivation. The land occupied by the trees is the same whether the fruit is clean or otherwise, and it costs about twice as much to handle a crop of apples when half of them are defective as it does when they are all clean, not only is the labor lost, but in many cases half the fruit which if clean would be clear profit. Thus it appears that the loss on scabbed and wormy fruit is considerable to the individual and to the Province it is enormous.

It may be asked by some, can insect enemies and fungus be profitably controlled by spraying so that we may have clean fruit? We answer yes, and will give you a few instances of results of our work this year in confirmation.

In the orchard of Mr. Jacob B. Shantz, of Waterloo, which had never been sprayed before this year, the results were as follows:

Snow apples sprayed six times in experimental work, 82 per cent. clean.

Snow apples sprayed twice by Mr. Shantz 21 per cent. clean.

Snow apples unsprayed, 5 per cent. clean.

Newton pippins sprayed six times in experimental work, 67 per cent. clean.

Newton pippins sprayed twice by Mr. Shantz, 50 per cent. clean.

Newton pippins unsprayed, 5 per cent. clean.

Swaar apples sprayed six times in experimental work, 68 per cent. clean.

Swaar apples unsprayed, 4 per cent. clean.

The results would probably have been more marked in favor of the six applications had it been possible to have made them just at the proper time and on a fine

dry day. But the work had to be performed on the dates announced and as a consequence the first and third applications were followed by rain within a few hours.

In the orchard of Mr. A. Pay, of St. Catharines, where the experimental spraying for the County of Lincoln was conducted, six applications of Bordeaux mixture and Paris green were given to the experimental plot and three applications to the remainder of the orchard. This orchard had never been sprayed before, and Mr. Pay says that in former years more than one-half of the crop has been wormy and spotted. The following results were obtained :

In Fall pippins which had been sprayed, five barrels of bright clean fruit free from worms, and less than half a bushel of culls, rejected for size, were taken from a tree.

In Fall pippins which had not been sprayed, from one tree, three barrels of fruit were packed. There were not so bright or free from spot as the No. 1 sprayed, and two barrels were culled for worm and spot.

In Greenings which had been sprayed, five men packed 125 barrels in a day and there were less than five barrels of culls. These culls were not spotted or wormy but undersize. This lot of fruit sold in Glasgow on Oct. 9th at eleven shillings per barrel, the consignee writing that they were very fine.

In Greenings which had not been sprayed, the same gang did not pack more than half as many barrels in a day, although they handled as many apples, so many having to be rejected as imperfect.

In Snow apples the result was very marked. Three trees, which were sprayed three times, gave eighteen barrels of beautiful fruit, free from worm or spot. Mr. Pay says that these trees have borne crops for seven or eight years, but that they have never been fit to pack before. He also considers that the foliage on the sprayed trees appeared more healthy than that on the unsprayed trees.

Mr. W. H. Heard, of St. Thomas, has sprayed his orchard six times this season, and has made a most careful and accurate calculation as to the cost and result.

Paying for a man's time 10 cents, for a boy's 5 cents and for a horse 5 cents per hour. For copper sulphate 6 cents per pound, for lime one-half cent per pound, and for Paris green 16 cents per pound, he has found the cost of the six applications to be 11.43 cents per tree, or one cent and nine mills for a single application.

The chief item of expense is labor, which amounts to two-thirds of the total cost. Without labor six applications cost 4.14 cents per tree, or rather less than seven mills per tree for a single application.

The experiments were made in an orchard of 400 trees ; 125 of which were twenty-nine years old, and 275 of which were eighteen years old.

The result of spraying the orchard of W. H. Heard six times during 1896, cost as above, was as follows :

Name.	Total.	1st quality.	Of firsts.	2nd and 3rd.	Of 2nd & 3rd.
	Bbls.	Bbls.	Per cent.	Bbls.	Per cent.
Greenings	236	216	91.53	20	8.47
Kings	73½	66	89.80	7½	10.20
Baldwin's	118½	111	93.68	7½	6.32
Ripson Pippin	7½	6	80.00	1½	20.
Twenty-Ounce Pippin	22	21	95.46	1	4.54
Blenheim	48	42	87.50	6	12.50
Wealthy	16	15	93.75	1	6.25
Snow	25½	24	94.22	1½	5.88
Spys	19½	18	92.31	1½	7.69
Grimes' Golden	32	27	84.38	5	15.62
Romanite	13	9	69.24	4	30.76
Wagner	27	21	77.78	6	22.22
Russett	140	120	85.72	20	14.28
Total	778½	696	Av. 89.5 %	Av. 82½	Av. 10.5 %

Although Science is coming Year by year Chicago and the consumers of our storage by winter time for disposal boat in cold storage fruit grower in
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Although the price of apples has been low this year, it is no time to be discouraged. Science is coming to our aid, enabling us to control the natural enemies of our fruit. Year by year our fruit is taking a higher stand in the European markets, also in Chicago and the western and southern States they no doubt will eventually become large consumers of our apples, and we are likely at an early date to have a system of cold storage by which we will be able to hold our fruit safely and cheaply until a favorable time for disposing of it. This, together with provision for its shipment by rail and boat in cold storage to England and other distant markets, will materially assist the fruit grower in disposing of his fruit advantageously.

This has been the people's year, a year of advertising. Fruits of all kinds have been abundant, we may not have as large a crop again for a decade. Good clean fruit properly handled has brought fair prices in the English market this year, when it was consigned to honest dealers.

But, unfortunately, the curse pronounced upon man for sin is not the only one or the greatest that the fruit grower labors under, and has to contend with. Express and freight rates are too high, and the careless handling of fruit in transit has rendered many valuable consignments almost worthless. But towering over and above all the rest is the dishonest commission merchant who fails to make honest returns, and at a favorable time for himself fails altogether, but does not fail to lay aside for himself the mammon of unrighteousness, and at the beginning of another fruit season he bobs serenely up, scatters his cards and his smiles broadcast, and is ready for another season's plundering of fruit growers. The loss to growers from this source is great, and there is no remedy in sight. Cursing, which is freely and frequently applied, does not cure them, and spraying would not kill them, burning is the only cure and that cannot be applied in time to help the fruit grower.

Mr. HUGGARD: Have you found any evil results from the Bordeaux mixture in spotting the apples that otherwise would have been clean?

Mr. ORR: I have not seen anything or heard of such.

Mr. HUGGARD: I have a tree of Swaar apples and another of Baldwin, both of which were rusted some, and the apples to considerable extent, not injuring the fruit or the productiveness of the tree at all, but rather injuring the outside coating as a perfect apple. My attention was drawn to it by a discussion that took place on this subject in the State of Missouri, showing that the Bordeaux mixture if it was too strong with coppers and not enough lime was liable to affect the skin of the apple or spoil the beautiful glossy effects that the apple produces.

Mr. ORR: I think your statement would probably be correct if the mixture was applied too strong, but we do not apply it too strong. Last year there was a great deal of that rusting on both the apple and the pear, but I have not seen any results of it in our orchards, and we have been spraying for fourteen years. Do I understand that all the trees sprayed were affected?

Mr. HUGGARD: No, only two or three.

Mr. ORR: Perhaps you got it on too strong on those trees.

Mr. PATTISON: Is there any danger to the eyes in the use of this copper sulphate? A case came under my notice in which a young man has almost lost the use of his eyes, it is claimed, from using this copper sulphate.

Mr. ORR: I have not heard any complaints. I think that a sprayer should be careful and get on the windward side of the tree as much as possible, and avoid getting spray in his eyes. I fancy it is the Paris green that does the principal harm. More than that, I think the horse ought to be covered. I have heard of it being injurious to horses where the spray fell on them to any extent. Some old blanket can be thrown over them, and save both horse and harness from the material.

Prof. SAUNDERS: I think it is important that every hint from every quarter in regard to marketing the large quantities of fruit now being grown should be ventilated, so that fruit growers may govern themselves accordingly. A few weeks ago, when I was

in Winnipeg, there was a great glut of grapes pushed in there from Ontario, and the larger dealers universally complained of sending grapes in baskets, as far as Winnipeg was concerned. They said they rarely ever got there in good condition. I would suggest that packagas be used similar to those that are sent from California. The price realized from them would be very much larger. I saw some of these baskets of fruit which had been subjected to the jolting for 1,400 miles in a fruit car, and they were not at all in a good condition; they were mused up and berries more or less broken, and altogether different from the fruit that comes into the Ontario market from California, a much larger distance, packed in a different way. I have no doubt that the ingenuity of fruit growers will soon devise means for overcoming these obstacles, but some attention should be paid to it next year by the Association or by some fruit growers, so that the package might be varied to suit the market.

The SECRETARY: Did Mr. Orr use the Bordeaux mixture all summer?

Mr. ORR: Yes.

The SECRETARY: In a season like this it would not have been necessary to use much more than Paris green, because there was no fungus.

Mr. ORR: In some sections there was not, but in others there was considerable.

Mr. CASTON: In 1895 I used the Bordeaux mixture according to the formula given in the bulletins issued by the Experimental Farm, and by the stations on the other side, and to insure making it right I used cyanide of potassium itself. There was a long spell of dry weather, and during that time the trees were continually covered with the Bordeaux mixture, and the leaves of the Russett trees were dry and fell off, while those on the Spy were not affected at all. Did you notice any injury to any particular varieties? It seems to me that some varieties are more liable to injury in the foliage than others.

Mr. ORR: The men who did the spraying kept an accurate account of the foliage at each of the six sprayings. We have not a case reported but was in favor of spraying—no intimation of any damage being done to the foliage on any of the trees.

Mr. M. PETTIT: Does. I don't understand whether what Mr. Orr calls "clean" in his percentages simply cover the apples that are clean from the fungus, or the codling moth.

Mr. ORR: Both from the fungus and codling moth—perfectly clean, sound apples.

Mr. PETTIT: That does not prove to us yet that spraying has destroyed the codling moth. While I am free to admit from my own experience there is no difficulty in keeping the fungus in check, I cannot say that I have ever seen very great results in destroying the codling moth.

Mr. ORR: In Mr. Pay's orchard at St. Catharines the principal loss was from codling moth. Over one-half of his apples were affected by the moth in the part not sprayed; in the other there were about twelve per cent.

Mr. CASTON: Entomologists tell us that the egg of the codling moth will hatch out in about eight days, so it is very important to get the spraying on the end of the young apple during that time, and unless it gets poisoned when it begins to bore into the apple it is no use at all. I think the greatest damage is from the second brood.

Mr. PATTISON (Grimsby): I believe most of the damage is done by the second brood, and I think for the second brood the spraying has no effect at all. The season before last, having some leisure time in August, and my apple crop being remarkably clean up till that time, I took the trouble to spray thoroughly with Paris green about the 12th or 13th of August, having observed the second brood beginning to work. I examined the trees afterwards for some time and found that the Paris green had produced almost no effect whatever on the codling moth at that time; but I think it does produce a very considerable effect just after the blossoms are set upon the first crop. I think that it considerably reduced the number of insects available for producing a second crop, and in that way does a lot of good, but I do not think it has any effect at all upon the second crop when it is sprayed directly on these insects.

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Mr. OASTON: Is there any mixture that will be so disagreeable as to keep those insects away?

Prof. SAUNDERS: I think not. Insects will stand almost anything in the way of disagreeable odors or anything of that sort as long as they are not poisoned. They persist generally in carrying out their office for which they have been designed in nature, and the only way to overcome them is to kill them. A great many of such devices have been tried at different times without much result.

Mr. HUGGARD: I think one application of the Bordeaux mixture previous to the buds expanding is of more value than any two you might apply afterwards. We make a point of spraying—I don't do it by way of experiment particularly, for I have so much faith in spraying the trees abundantly and effectually that I don't leave a bud in my apples but what is sprayed several times per annum, some four times and some three—and I did not see any perceptible difference when I sprayed after the blossoms had fallen and once before than I did when I sprayed three times after the blossoms fell. Out of some two hundred barrels of apples that we grew this year there was not half a barrel of wormy apples all told, and no scab whatever.

Mr. ORR: I would like to ask Prof. Saunders to give us some information in reference to the second brood of the codling moth and their treatment.

Prof. SAUNDERS: You mean as to the dates?

Mr. ORR: Yes.

Prof. SAUNDERS: I cannot give these just from memory, but the second brood vary somewhat in their habits from what the first brood do, that is in the position in which the eggs are deposited. It is not always that they are deposited in the calyx end of the fruit. I think it is the case with the first brood. The spray falls more or less into this calyx, and the egg being deposited there and hatched in that calyx the young larvæ that issues from the egg has to eat his way through the skin and in that way eats part of the Paris green, and that destroys it. In the second brood the eggs are laid on the side of the fruit, and it is not so easy to cover, and the second brood is not so easy to manage on that account. We find more complaints about injury from the second brood, as a rule, from year to year, than we do from the first brood. Indeed, as Mr. Pattison has remarked, the first brood is not a matter of so much account because the apples that are affected usually fall from the tree when they are only partially grown. It is the second brood that does most of the mischief, but I think that Paris green should be used at least with the second application of the solution, and possibly with the third application, in order to overcome the injury that might afterwards result from the second brood. The dates have been carefully worked out, but that branch has not come under my attention for the last ten years, and I am not able to carry the exact particulars in my memory.

SMALL FRUITS.

By MR. J. L. HAYCOCK, M.P.P.

It is with a great deal of diffidence that I undertake to read anything before the gentlemen who are present here from the western part of the Province of Ontario. In this section of the country we are not so favorably situated for the growth of fruits as they are in the west, and consequently our progress has been somewhat limited as compared with theirs. After travelling through parts of Western Ontario, notably through the Niagara district and through the Counties of Essex, Kent and Elgin, and seeing the extent to which fruit growing has been carried on in that section, it makes me feel almost as though I do not want to say anything with regard to fruit growing in the presence of the gentlemen who come from that section. However, we have here to-day a number of farmers from the County of Frontenac, and we find in various parts of the country that the methods of cultivation and the varieties in cultivation that are suitable in one

section are not suitable in another, so that my remarks relate to my experience in this immediate vicinity and are more applicable to this section than perhaps to the Province as a whole, but the paper I shall read contains simply some boiled-down conclusions that I have arrived at after a limited experience in growing small fruits.

It is not necessary to dwell at any length on the importance of the growth of small fruits—at the present time nearly everybody uses more or less—and the consumption is increasing very rapidly. The most important reasons for the increased consumption are, no doubt, first, the lower price of sugar, and second, the improved methods of home preservation. Many of us can remember the days when everything was preserved by the "lb. to lb." method, and when sugar was sold at from 10 to 12 cents per lb. "Making preserves" was a very expensive process and a luxury only to be indulged in by the wealthy. But to-day by the invention of "self-sealing" jars, the fruit can be kept in a more natural and wholesome condition by the use of about $\frac{1}{4}$ the quantity of sugar then required, and then the decreased cost of sugar to less than one-half the former price, makes it possible to preserve eight or ten times the quantity of fruit for the same amount of money as formerly, thus bringing its use within the reach of all classes—sugar used per capita in 1868 was 19.77 lbs.; in 1892 it was 70.50 lbs. The increased consumption of canned fruits has, no doubt, to a very marked extent decreased the local demand for winter apples. No housewife is likely to pay fancy prices for apples so long as she has a good supply of canned fruits of various kinds in her cellar.

A continuation of the low price of sugar and a reduction of the duty on glass jars, would, no doubt, result in a still further increase in the demand for small fruits.

The best location for the growth of small fruits is in the immediate vicinity of a large town or a canning factory. This, however, is not of so much importance as formerly, as, on account of the increased facilities and improved system of transportation, the leading markets are now within the reach of nearly the whole province.

Regarding soil, it is safe to say that any soil that will produce a first-class crop of corn will with proper cultivation produce profitable crops of currants, gooseberries, raspberries and strawberries.

In preparing the ground for a plantation the land should be clean and well fertilized. This is more particularly true with regard to currants, gooseberries and raspberries than with strawberries, as the plantation will last longer and it is very difficult to apply fertilizers after the bushes are set.

One of the best, if not the best, manures that can be applied is unleached ashes. The bushes should be set not less than six feet each way. The first year a row of carrots, mangels or beans may be grown between each row. The best varieties of gooseberries I find for this section is "Downing's," of black currants, "Black Naples," of red currants, "London Red," of white, "White Grape." Of red raspberries "Cuthbert" and "Shaffer's Colossal" are the hardiest and most profitable. Of strawberries the old reliable "Wilson" seems to give as general satisfaction as any.

Now there may be many other varieties very much better than any of these, but my advice would be to go slow with *miraculous* varieties, and thoroughly test on a small scale before planting largely of any new varieties, no matter how highly they may be recommended nor how prolific they may have proven in some other section of the country. Of course it is absolutely necessary to prune raspberries—at least to cut out the old wood and cut back the new; but it is a question whether it pays to trim currants and gooseberries. It is thought by some that it is cheaper and pays better in the end to set a new plantation every five or six years than to expend time and labor pruning an old one. One thing is certain, you will get a much better sample of fruit from young thrifty bushes than from older plants.

Growers of red and white currants and gooseberries will find an enemy in what is commonly known as the "currant worm." These, however, are easily destroyed if proper means are taken. After twenty years of careful observation I find that the currant worm

hatches out about the same time as the bud into the gooseberry bud perforated with the side of these at this stage the and $\frac{2}{3}$ sulphur found effective fungous growth

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Mr. HUTT rants and goose those fruits tha we could plant He rightly say certainly would coming on you

hatches out just about the time wild plum trees are in full bloom. It appears to take about the same amount of heat and moisture to develop the worm as it does to develop the bud into a blossom. If on the first appearance of wild plum blossoms the currant and gooseberry bushes are examined carefully, there will be found near the centre a few leaves perforated with a number of holes about the size of a pin. On examining the under side of these leaves the worms will be found about an eighth of an inch in length. At this stage they are much more easily killed than later on. A mixture of $\frac{1}{4}$ hellebore and $\frac{2}{3}$ sulphur applied dry with a sulphur bellows while the dew is on the bushes will be found effectual. This preparation not only destroys the worm, but seems to destroy all fungous growth, thus preventing mildew on gooseberries.

There are usually two broods of these worms in a season, the second one appearing just about the time the fruit is maturing. Many neglect their bushes at this period, some through fear of injuring the fruit and others who think that, now that the fruit is about matured, it will not hurt the bushes if the leaves are taken off. This is a sad mistake. The blossom buds for the next year's crop are formed during the month of September, and if the worms are allowed to strip the bushes in July, the sap of the tush, instead of developing fruit-bud, will be exhausted in forming a new set of leaves. On bushes treated in this way very little if any fruit need be looked for the following year.

Let me say a few words with regard to the importance of growing small fruits in the vicinity of Kingston. After making careful enquiry and after an observation of many years I find we do not grow enough small fruits here to supply the local demands of the citizens of Kingston. Last year after making as careful an estimate as possible I found that we imported into this city from outside growers, that is from Prince Edward county and points from twenty-five to forty miles away from here, small fruits amounting in the neighborhood of 200,000 or 300,000 quarts representing a value of from \$15,000 to \$20,000. Now every quart of that fruit should have been grown and every dollar of that money kept within a radius of twenty miles of this city. We have a soil as suitable as there is in any other section; we have the intelligence, and we have the market here at our own door, and there is no reason why every bit of that fruit that is imported and sold on the market in this city should not have been produced within a ten or fifteen miles radius. Our growers have the soil and intellect and the industry and everything necessary except the enterprise and the knowledge of the growth. I hope they will supply themselves with the knowledge and bring into use the enterprise necessary to produce all the fruit necessary for local supply. This would be a benefit in more ways than one. All the money paid for fruit imported is expended in other towns and cities, while every dollar's worth that is grown in the immediate vicinity of Kingston and the money handed over to those living in this locality who do their business in this city would be expended here. Now I am very pleased that the Fruit Growers' Association have come to this section, and to see so many residents of our locality present, and I am sure if the Association should visit us again they would find a larger turn-out than we have at present. (Applause)

The PRESIDENT: I am very glad that our meeting has awakened such an interest in small fruit growing in this vicinity and will probably bring about the result that Mr. Haycock desires, that the local market shall be in a great measure supplied at home, although I fear it will so greatly add to the woes of some of our western friends as expressed here, that they may even condemn us as a society. However, I think these things will all work out for good in the end. We should be glad to hear experience of local men and others on this subject.

Mr. HURT: I wish to take exception to Mr. Haycock's remarks as to pruning currants and gooseberries. I think there is no doubt in the minds of those who are growing those fruits that it does pay to prune them. No doubt it would pay the nursery men if we could plant out a new lot every five years, but I don't think it would pay the grower. He rightly says you get better fruit on the young bushes than you do on the old. You certainly would if they are not pruned, but if you prune carefully and have new wood coming on you would get better results with old bushes and probably more fruit than

with young bushes. Our plan of pruning is to start with the young bush and leave about six branches to form the bush, and then we carry on a sort of renewal pruning on that. Every year we cut out two of the oldest branches and let two of the stronger branches coming up take their place so that we always have young and thrifty bearing wood that would give large fruit.

Mr. PATTISON: What time of the year do you do that?

Mr. HUTT: We usually prune them in the spring. Of course it may be done in the fall.

Mr. CASTON: Does the one estimate apply equally to red and blackberries.

Mr. HUTT: It is better to simplify the matter to say yes, although probably when you come to grow them you will soon find out for yourself that the black will not answer with the same pruning as the red. You want the strong young shoots of the black kept renewed to get good fruit.

Mr. FISHER: What about pruning red currants; is it not necessary to cut red currants back?

Mr. HUTT: The system often adopted is to shorten it back about one-third or one-half. You get a nicer shaped bush that way to work around; and still others recommend, instead of letting new wood come out, to keep cutting it all back and grow about six long canes. In this way you can pick in one-half the time.

Mr. FISHER (Burlington): I have found it necessary to cut red currants back. One reason is that after the branches are allowed to grow long the weight of the crop will bring them down to the ground and the fruit will be covered with soil in case of storm, and another reason is that if these shrubs are stiff, the weight of the crop being so far from the point of junction with the main stock, these long branches are broken off.

A. M. SMITH (St. Catharines): I understood Mr. Haycock to say that any soil that was adapted to corn growing would be suitable for small fruit, but I think there is a good deal of low ground that is high enough for corn growing and would produce usually a good crop of corn, that would not be at all adapted to small fruits on account of being too wet in winter. Fruit plants, like human plants, do not like wet feet.

The SECRETARY: I would like to corroborate Mr. Hutt as to the lengthening of the currant's productiveness by cutting the bushes well back and cutting out the shoots, and encouraging the growth of young suckers from the roots. I have a plantation that has been out for twenty years, and is just as productive as ever because of this method of treatment, so I think we can prolong the productiveness and the profit of a plantation of currants in that way almost indefinitely.

Mr. WHYTE: I would put the London Red at the bottom of the list as the poorest currant that grows in the country. If we are going as a Society to advise the cultivation of any particular kind of fruit it should be a good one. Anyone that has had experience with Fay or Wilder or Moore's Ruby will admit it is very inferior fruit. It is small, it is very acid, almost acrid; it is a good bearer, but no better than either of those I have mentioned. With regard to the application of hellebore, it seems to me a great waste of time and money to apply hellebore at all in the spring; Paris green is so much cheaper and efficacious and perfectly safe at that time of the year that it is not worth while to apply hellebore. The application of Paris green about the 20th May is perfectly efficacious. For the second brood I would never think of applying the material dry. By applying it wet with a spray pump you get over your work in a quarter of the time and at about a quarter of the expense for material, so it is a great mistake to use hellebore dry under any circumstances, and either dry or wet in the spring.

The SECRETARY: I think it is the best way after the currant worm has made some expensive ravages and is rather abundant on the bushes to spray, because you must spray your whole plantation; but if you begin early, before the worm has begun to make extensive ravages you can work in the simpler and quicker way. They begin

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Mr. HAYC sively was the are liable to English gooseb reason why I a hellebore with quently, and i reason for putt I believe the s ferent kinds in remarks; I sai one of those th is that if you h tilizer to it unl in with a cart that if you get gooseberries or tion on a new p less expense th now of doing it when you tak are planted alt ground throug great deal more I think it is mo

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Mr. HAYC Well, I have tri man against wh country. The Cherry currant trees I got from when sold in th ing is concerned that we could o

work at the interior of the bush and there you will find those holes that indicate their ravages. If you begin early in the season you can take a tumbler with netting for the top of it, and dust the bushes with hellebore and go over your plantation much more quickly and with much less cost than if you have to draw a great quantity of water and mix a great quantity of material and go about it with a spray pump.

Mr. BEALL: I understood Mr. Haycock to say he would recommend the Downing above all other gooseberries to grow. I would like to ask if he has ever grown the Pearl or Whitesmith, or any other of the English gooseberries. If he had he would scarcely have said that the Downing was the most profitable. For some years past the Downing and even the Pearl would scarcely pay for picking where there is a very large quantity grown; this year the Whitesmith would sell for nearly three times the price of any other variety in our market at all events. In regard to spraying I must disagree entirely with our friend, Secretary Woolverton. I never spray my gooseberries and currants but once in the season, and that is when I find the first sign of the pin holes in the berries; but then I go over them thoroughly; there is not a leaf left; the spray is forced into the berries from every side, and that is all that is done for the season.

The SECRETARY: I never dust them but once.

Mr. DALY: There must be a difference in the habits of the saw fly in your neighborhood and in ours.

Mr. HAYCOCK: I have tried the Whitesmith, and the first berry I ever tried extensively was the Smith's Improved. We find it and all others in this section of country are liable to mildew. I would not put out a plantation of Smith's Improved or any English gooseberry in this section of the country if you would give them to me. The reason why I adopt the dry system of spraying was to save time. I have put on hellebore with a bellows on 600 well-grown bushes before breakfast in the morning frequently, and it would take me half a day with a watering-can or a sprayer. Another reason for putting on the hellebore is that I always mixed the sulphur with it, because I believe the sulphur is a good thing to prevent fungous growth on the foliage of different kinds in a bush anyway. In regard to pruning I was not very rigid in my remarks; I said some thought that it would be better not to prune. For my part I am one of those that think it does not do to prune currants or gooseberries. My experience is that if you have got a plantation set out and growing it is very difficult to apply fertilizer to it unless you go to the labor of wheeling it in with a wheelbarrow. If you go in with a cart or wagon you are liable to break your bushes down. I therefore think that if you get a piece of ground in a high state of cultivation, put on a plantation of gooseberries or currants, run that for five or six years, you can then set out a new plantation on a new piece of land properly prepared and have them come into bearing with far less expense than to turn up your old plantation and put it into shape. I am speaking now of doing it on an economical basis, and I believe there can be more money made, when you take the cost of labor into consideration, out of currants or gooseberries that are planted alternately in patches for five or six years and then rooted out and the ground thoroughly cleaned and manured again and a new plantation put out. It is a great deal more labor to make a plantation clean and free from weeds, and on the whole I think it is more profitable to set up a new plantation every five or six years.

The PRESIDENT: Has anyone something to say on varieties?

Mr. HAYCOCK: Mr. Whyte, of Ottawa, placed the London Red last in the list. Well, I have tried the Red Cherry and I would not advise anybody, unless it was some man against whom I had some spite, to set out Red Cherry currants in this section of the country. The weight of the snow in the winter here is liable to break them down, as the Cherry currant is very brittle. The London Red may not be properly named, but the trees I got from Messrs. Leslie & Co. grow a large long bunch filling clear to the end, and when sold in the market is almost equal in size to the Cherry currant, and so far as bearing is concerned we can always get double the number of quarts off a London Red bush that we could off the Cherry. I have never had experience with Fay's Prolific.

Mr. DALY: What is Mr. Hutt's opinion about shortening the gooseberries during growing season?

Prof. HUTT: I cannot say I have had experience of that; I never thought there was anything to be gained by that.

Mr. RACE: It seems clear to me that Mr. Haycock has not got the London Red. From the description of the berry he has given us I would say it is more like the Versailles. His description does not meet the London Red at all. I have grown it, and I would not have it on the premises if I could get the Cherry or Fay's Prolific. I would even prefer Moore's Ruby. I have grown the Whitesmith for a number of years and also the Pearl, and I consider that I could get one-third more berries off the Pearl than the one he named, but in my opinion the Whitesmith is the most profitable of all the gooseberries. It is a rank grower, a heavy bearer, and can be kept clear of mildew with very little difficulty.

Mr. WHYTE: A very important consideration is the character of the soil. If there is a light sandy soil there is no use in trying gooseberries, but if you have the right kind of soil you will get more fruit from the Whitesmith than any other berry. We have very little trouble with mildew, practically none.

Mr. DALY: Of all the red currants that are grown to-day in Canada, I think Fay's Prolific heads the list. I think it is the finest quality, and it is an annual bearer, and taken on the whole, you will get better currants and better crops than from any other.

The PRESIDENT: I would like to hear from Prof. Craig.

Prof. CRAIG (Ottawa): If you are going to grow for market I would not recommend Moore's Ruby or Wilder; they are fine in quality but do not produce, except possibly under the favorable circumstances that Mr. Whyte is able to give them in his garden, as much as other varieties such as Cherry or Grape. That is my experience. With regard to black currants, we have one or two saplings that have been fruiting for one of two years, that are more attractive than any named varieties that we have on trial. We hope in the near future to have these sufficiently decided so as to give some plants to the Association. One of these has already been sent out and favorably reported on by Mr. Young, of Cornwall, in the Horticulturist under the name "Success." Mr. Young happened to recommend the variety when he was visiting the farm some time ago, and to call the attention to the fact that he had a plant, but did not know where it had come from, and I found it came to him by way of the Society from the Experimental Farm. My experience coincides with what has been given, that the Pearl heads the list of American varieties for productiveness, and general vigor of plant and as a commercial variety. With regard to the European sorts, of which we might take the Whitesmith as a type, we should plant them with our minds made up that they need special conditions. In the first place if we are not prepared to spray them perseveringly, and every year we need not plant them; and in the second place they require a clay soil, not wet, but still rather damp, and I find that they do best if you can so arrange your plantation as to give them partial shade. Our hot eastern and Ontario suns here induce a powdery mildew that attacks the fruit; still if one has right conditions and is near a good market I would recommend him planting the Whitesmith, and Keepsake is another variety that has done well with us.

Mr. MORRIS (Welland): Mr. Haycock, I dare say, would like to have a tariff against outsiders coming into Kingston. As it is impossible for him to have that he gives advice that points in that way—recommends a poor kind of currant; but I believe that he is rather honest in that after all, because I believe the currant he speaks of is not the London Red. From his description of it it is the Prince Albert. (Laughter). I think he is certainly wrong in not trimming his bushes, for even if he renews every five or six years it is a great deal of trouble to dig out the bushes. One of the best fertilizers for currants is the muck out of swamps. Put it in the ground in the fall or winter season and it will give you great satisfaction.

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REPORT OF COMMITTEE ON SCORE CARDS.

The following report of Committee on Score Cards, was presented by Mr. T. H. RACE:

Your committee met at the office of the secretary, and after carefully considering the whole matter concluded that the cards first proposed were too cumbersome, and that a simpler form would be more practicable. The following forms were agreed upon for use in collections:

SCORE CARD FOR APPLES AND PEARS.

POINTS.	VALUE.
Color	
Size	
Quality	
Commercial Value	
Total.....	

N. B.—Maximum of Points for each plate, 10.

SCORE CARD FOR GRAPES.

POINTS.	VALUE.
Color	
Size of Bunch and Berry	
Form of Bunch	
Flavor.....	
Total.....	

N. B.—Maximum of Points for each Plate, 10.

The committee recommend that this card be furnished the secretary's of the principal fairs for use in 1897.

Mr. RACE, for the committee, said that the board of directors thought that the score card arranged a year ago was too cumbersome hence it had been simplified as now produced (specimens distributed). As to the utility of score cards there is quite a variety of opinion. Even with this simpler form of card I find it very difficult to go over a large collection of apples at the agricultural fairs, because no agricultural society would pay you for the trouble of going over their fruit list and laying these score cards upon them. The object of these cards is to judge the fruit on points—color, size, quality and commercial value. It is considerable trouble to do this, and although it is the better way, and the only real way to arrive at a proper judgment, yet to carry out this plan the societies will have to pay the judge for the time occupied in it. Instead of using these cards at London last time I had a clerk with me who took note of my points. There were twenty-two exhibits of ten varieties for family use—one summer, one later summer, two fall, and so on spread over the whole season. The first thing I did was to run over

and see if they properly covered the season, and if they did not I ruled them out. I went over the others and called out to the clerk the points that were given by this board as published in our magazine. The highest is forty points, and they are to be judged by the color, by uniformity in size and by perfect specimen of apples. In that way I can go over a large number of collections in a very short time. Of the twenty-two varieties in London I had eight ties, so I had to go over all those in the same way. A mistake exhibitors often make is to place a large specimen apple on top, fancying that he is going to bring his specimen up in quality, but the judge has to reduce the score on account of lack of uniformity. Now, if I were to use these score cards in a matter of that kind to make them all out it would take me much longer time, and there are very few societies that are willing to pay a man for doing that. However, the score cards are before you and we wish to know what you think about them.

On motion the report was received and ordered to be printed in the annual report.

DOMINION FRUIT EXPERIMENTAL STATIONS.

The PRESIDENT proposed a discussion on the question in the question drawer "Should we have a Dominion Fruit Experimental Station in Southern Ontario; if so, for what purpose and where?"

Mr. E. D. SMITH: It seems to be very desirable that there should be a fruit experimental station in Southern Ontario, for that is where most fruit is grown. Hitherto most of the experiments have been conducted in Northern Ontario, originally at Guelph, latterly at Ottawa, where the experiments are of very little use for growers in the southern part.

Mr. M. PETTIT thought it would be desirable if we could have one established. He supposed it would be in a manner connected with the Central Experimental Farm at Ottawa, a sort of branch for them for testing more tender fruit that they cannot succeed with there.

The PRESIDENT called upon Prof. Saunders to speak on the subject, remarking that evidently not much consideration had been given to it, mainly from the fact, he presumed, that the Ontario Government had taken up experimental work at so many different points which will cover nearly every latitude in Ontario.

Prof. SAUNDERS said: I have no suggestions to make at all. It was the suggestion of the Secretary that I should stay over and hear the discussion that might arise in connection with this subject. I may say that for the past four or five years petitions have come in mainly from different parts of the Niagara peninsula, and presented to the Minister of Agriculture requesting that a fruit station be established for the purpose of testing fruits in the Niagara peninsula, fruits that cannot be tested at Ottawa, and urging that it would be of great value to the fruit growers of that part of the country. I think myself, now that the Ontario Government has taken it up, that the ground is fairly well covered, and under the plan which has been established it admits of the testing of all varieties of fruits—of peaches, for instances, in one district most favorable for that fruit, pears in another district where pears are known to be grown with very great success, and so on through the whole series, and it does not appear that there is any special need for the establishment of a fruit station by the Dominion Government under these circumstances. As long as the fruit growers of the Niagara peninsula are satisfied with the existing arrangements there is no disposition on the part of any one at Ottawa to open up the question. I am very glad indeed to find that members of the Association are satisfied with the existing arrangements, and I hope the experimental stations conducted by the Provincial Government will be eminently successful and meet the views of the fruit growers in the different parts of the country. At Ottawa we shall be glad to do all we can to assist the experimental stations at the different points of Ontario with any scions or plants of anything we may have that it is desirable to test in those parts of the country.

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Mr. SHEPPARD : I take the view that it is very necessary for us to have an experimental station in the Niagara District, because I claim that the experiments carried on by the Ontario Government do not fill the bill. As I understand, it is simply to test new fruits, but the scientific treatment and study of the diseases affecting fruits is being entirely overlooked, and I think a station that would take up this view of the subject, as well as the practical experiments of fruits, would be of great advantage. I do not think the fruit growers need so much new fruits as the cultivation of the fruits we already have, and the bringing of those fruits to perfection and saving them from the ravages of different insects and fungous diseases that are attacking them at the present time.

The PRESIDENT : I wish to correct an error into which Mr. Sheppard has fallen regarding the work of the experimental stations already established by the Provincial Government. It is not altogether for the testing of new varieties ; in fact the experimenters were chosen in most instances where they had already a good supply of the older varieties under cultivation upon which we could operate and get reports immediately. Of course as new varieties come out they were added to the collection, but in each instance in the district in which we have established an experimental station we have selected men who have taken a deep interest in the matter, who have already quite extensive orchards, and who have been able to give us, as you will see when the next report is published, valuable information and reports on the older varieties, and in some cases many new varieties of fruits. Then as regards disease, both insect and fungous, that is a matter that is under contemplation ; we intend to take it up just as fast as it is possible to do so. The spraying operations have been conducted on quite an extensive scale and much valuable information and that which has been very instructive to the fruit grower has been the result, and these we believe it is contemplated to carry out very extensively each year.

Mr. E. D. SMITH : I am sure there is no apathy on the part of the fruit growers of the Niagara peninsula in regard to these experimental stations. It is not apathy that makes us say so little about it, but it is rather the desire to give the present Ontario Fruit Experiment Stations an opportunity to show what they intend to do. We feel of course they have begun on a small scale, but we expect and fully believe that they will extend as time goes on, and that the experiments will include not only those you have mentioned but all experiments in connection with the growing of fruit. If we thought otherwise we would be up in arms at once to ask the Dominion Government or any other Government that would assist us to have an Experimental Station there, because we have felt for years past the great necessity of that, and we were so delighted when these were established that we feel like letting them have a good chance to show what they can do towards filling the bill. Each fruit grower has been conducting experiments on his own plantation at an expensive rate in times past that could have been conducted a hundred times more economically at an experimental station.

Mr. ORR . I feel it very desirable indeed that we should have an Experimental Station in Southern Ontario. I am satisfied that there are many varieties of fruit that we ought to grow that ought to be tested here. When I was collecting fruit for Chicago I found figs at Niagara in a full state of perfection and picked them and sent them there. Now that was a surprise to many of us. I think we ought to have an experimental station, and I think it ought to be located somewhere about Fruitland, which is the freest from frost that I know of in the country. Our flowers were blooming there up to last week, and along the mountain side are blooming still. My vineyard has been there for over 30 years and we have never lost a crop from frost either spring or fall.

Mr. A. M. SMITH said ; I have not been present to hear the arguments advanced, still I would agree with Mr. Orr that there is a necessity for a larger work than is being done by the Ontario Government or is likely to be done for many a day. In mentioning figs he forgot to mention some other things that are perhaps not at Fruitland but in the vicinity of St. Catharines. (Laughter.) English walnuts and almonds and the like of them. That is a line that I have. The matter of nuts alone it is an important one even to the commerce of this country. (Hear, hear.) I am not in possession of the amount

imported, but it must be a very considerable amount, and I think that the Southern portion of Ontario would be able to produce large quantities of nuts such as the English walnut and filbert and perhaps some variety of almond. It has occurred to me that a fruit growing station in connection with the testing of some of the tender varieties of grains and vegetables and such products that cannot be grown in some of the cultured portions of the country might be conducted there. Those of us who are engaged in fruit growing in our section know that it is becoming a difficult matter to obtain fertilizers, and I think it would be a great help to us if we could obtain assistance in the matter of testing fertilizers, of which we shall soon need large quantities for producing fruit. I have always asked for an experimental station in the Niagara District. I am not particular where it is located—at Vineland or St. Catharines or even in Essex.

Mr. HUGGARD: Unless we purpose going into lemons and oranges and figs, etc.. I do not see where another Experiment Station is going to be of any advantage to the general growing of fruits in Ontario. The number of fruits that have already been grown and tested in that district are well known, and when they get outside of that particular district we know that they will not succeed so well. I think it would be a large expense for very little profit inasmuch as a small area of our great country could possibly produce what could be produced in the Niagara peninsula, and therefore it would be only servicable for the southern portion of the Province to establish anything in the shape of tender fruits that we have already under cultivation in that district.

Mr. WHYTE (of Ottawa): I think it is notorious that our present system of experimental farms are very much hampered for the want of funds, and it would be a great mistake to fritter away any funds that are appropriated for that purpose until the present work is brought to a better state of efficiency. There is an immense amount of work that could be done at the present stations, that applies to the whole country. That work is not done as well as it would be if we had more funds. It would be an advantage to the Niagara section to establish an experimental station, but that would be of very little benefit to the whole country. I think we had better wait to see how our present system works before we think of establishing another one.

Mr. BURRELL (St. Catharines): Perhaps it is in order for me to speak, who am supposed to represent an experiment station. The Board of Control have given me to plant this year to a considerable extent apricots, nectarines, Japanese chestnuts, mulberries, and although they have not got into figs, lemons and so on there is no knowing what they may ask me to take up later on. (Laughter.) I have taken up probably a good many varieties that there will never be any money in for me, probably never any money in for anybody, because I do not think we can get into the banana trade with a great rush in Ontario. (Laughter.) At the same time I feel like Mr. Smith if this thing were not to develop it is hardly worth establishing at all, and if it were not to I should be in favor of establishing an educational station at once and work for it and have it thoroughly developed; but it certainly must develop if it is to be of any value at all. We feel that we should not only test new varieties but carry on experiments with fertilizers and insect and fungous diseases to a considerable extent. I look upon fungi and insects as the most important things we have to contend with. We have done something with them already, but with the help we expect to get we should hope to go into it far more extensively in the future.

Mr. SHEPPARD: The experimenters themselves are practical fruit growers, men who are making a living out of this business, and probably have given a great deal of study to particular lines, but not to the particular scientific lines of fruit growing. In a great many cases they are not able, from their training, to take up this matter in a scientific way. I know if we want any information in our section in regard to a great many troubles we have there, we have to send down to the Experimental Farm at Ottawa to Prof. Craig or Prof. Fletcher or some of the other gentlemen there for information, while in a great many cases I know they have made trips up here. Prof. Fletcher was at my place and on my neighbor's place two or three times examining into a little borer that is troubling us with the peach trees. We have not been able to get any remedy for

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that, and the trouble is we are not able to give these gentlemen the information that they require when they come. We will be asked when this borer does so and so; when we saw it and when we did not see it, and when it lays its eggs and when it hatches out. Now, what ordinary practical fruit grower can give that information to Prof. Fletcher when he asks? I cannot, and I have given this matter a good deal of attention, and I feel that there are hundreds of others that know the practical result of the borer, but cannot give the scientific information that is necessary for these gentlemen before they can deal in a practical manner with this subject. That is only one subject, and these things are very common with all fruit growers. I do not think it would be necessary to have a more expensive experimental station, but some man there devoting his whole time, some man trained for this very work. At present I do not think that we pretend to experiment in testing varieties, spraying, etc. I feel very grateful to the Government, and am quite anxious to assist the present stations to do what they can do, but I do not think they fill the bill.

Hon. Mr. FISHER: Perhaps it is not quite right that I should take part in such a discussion as this, but I confess that the tenor of it has been of the greatest value to me and will be in guiding me in the future. There are just one or two points to which I would like to draw the attention of those who have taken part in this discussion. In the first place, the request is for a station at a particular locality for a particular purpose. I may say that in addition to the demands from that section for a particular station there are large numbers of other demands from other parts of the country for other purposes just similar to this. The other day, the Nova Scotia fruit growers earnestly demanded that I should have an experimental station there for fruit growing, and so on. I have no doubt that in a very short time other demands of a similar nature will be received from other parts of the country, and it certainly would be the case were this demand to be seriously entertained. I therefore wish to point out in the first place that the present votes for the purpose of carrying on experimental farms would not be sufficient to add this serious undertaking, because though Mr. Sheppard said it would be a very small one in this particular instance, it will immediately develop into a very large one when you take into consideration the other parts of the country whose demands would have to be met. The Department of Agriculture at Ottawa is the Department which has charge not only of the Province of Ontario and of the Niagara Peninsula, but of the whole Dominion, and if we established a branch experimental station in the Niagara peninsula we would find it very difficult indeed to refuse other sections of the country similar branch experimental stations. So far the demand for such branch stations has not been great, but I confess that I should be loth to start out on such a journey with very little knowledge of where it was going to lead me to. Further, I would like to point out that while the Dominion Government is doing a certain work and the Ontario Government is doing a certain work, the money that goes to pay for that work all comes out of the pockets of the people; it matters very little whether it goes through the hands of the Dominion Government or the Ontario Government; and it seems to me very unfortunate indeed that the same kind of work should be paid for twice over, and that experiments should be carried on twice over by two sets of people but all paid for by the same people. I think the people of the country would rebel against that, and that they would say that it was unbusinesslike and an unpractical way of conducting the affairs of the country—not the particular affairs of the Government at Ottawa, not the particular affairs of the Government of Ontario, but the affairs of the people of Canada, which is really what the Governments at Toronto and Ottawa are trying to do. If we multiply our stations it means that the people of the country are going to have to pay in many instances for double work being done at two different places. I think it would be unfortunate that the powers at Ottawa and Toronto would be overlapping one another in the fields which they undertook to do, and knowing Mr. Dryden as well as I do I think there is no danger whatever but that he and myself, as far as matters connected with Ontario are concerned, can come to a thorough understanding as to what work each of us will be able to do to the best advantage of the people of Ontario. As to experiments in fertilizers, it seems to me they would be just as valuable for the

people in St. Catharines or in the Niagara peninsula if conducted at Ottawa as they would be if conducted in the Niagara District itself. Wherever fertilizers are tested there is almost a certain amount of result due to the particular land on which they are tested, and we know perfectly well that the fertilizer which will succeed well on one farm may not succeed on the farm immediately adjoining it, let alone in a different country or a different section of the country, and the result of fertilizers in any place are not absolutely sure in regard to any other place; but I am satisfied that the results of tests of fertilizers on the four or five Dominion experimental farms which are now being carried on will give a fairly good idea of the value of the various fertilizers that are tested. I wish to point out that the tests of fertilizers on the Dominion experimental farms have been conducted now for a series of years and are of great value in regard to all the fertilizers that are on the market at the present time in this country. I just wished to express these views, although I feel already by the expression of members who have spoken that these matters have evidently received some attention and I do not fear at all that unreasonable demands will be made upon my Department. (Applause.)

The SECRETARY read a letter from Senator Sanford and said that he hoped that we would have had time to discuss the question the Senator had introduced as to the establishment of a Canadian fruit depot in England. If, after providing cold storage and transportation, carefully inspected stock could be placed in a depot in London, England, and sold there, it would be the greatest advertisement for Canadian fruit that could be possible and would serve to create a demand for the stock which might be forwarded in other ways by this country to Great Britain.

Mr. M. PETTIT: Would it be out of order to refer that subject to the committee appointed to confer with the Hon. Minister in regard to the subject of cold storage.

The PRESIDENT: I think that the suggestion is very good, and that the matter might be referred to that committee.

ORCHARD COVER CROPS.

By JOHN CRAIG, HORTICULTURIST, CENTRAL EXPERIMENTAL FARM, OTTAWA.

Suitable cover crops to protect orchards are of great importance in all fruit growing sections. In northern regions, the practice of sowing a crop after cultivation ceases that will at once enrich the soil and protect the feeding roots of the trees is one of the essentials towards success and an item in the annual programme of orchard management that should never be omitted. The late P. C. Dempsey, of Trenton, recognized the truth of these statements years ago, and frequently expressed himself to the effect that a cover crop of weeds in the autumn was far better, considered in the light of what was best for the trees, than no cover crop at all. The healthy and profitable orchard of apples and pears which he left and now managed by his worthy son W. H. Dempsey, of Trenton, furnishes ample proof of the benefits of the system.

What the meaning of Cover Crop is.—In brief, it means sowing in an orchard after cultivation ceases in summer, such a crop that will protect the roots of the trees by preventing at once alternating freezing and thawing and deep freezing and thus mitigating the injurious effect arising therefrom; that will add something—the more the better—to the fertility of the soil when turned under; that will improve its tilth or mechanical condition; and lastly, that will occupy the ground to the exclusion of such plants as may wander out of place—weeds. When soils, especially those of a clayey nature, are

constantly covered by producing for the protection contain may perhaps the tective influence frosts to trees says:—

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constantly cultivated without being subjected to the ameliorating influences induced by producing some kind of vegetation, not only do they become mechanically unfitted for the production of healthy and vigorous plant growth, but the food which they contain may take on forms not readily assimilable to plants. In northern sections, perhaps the strongest reason that can be urged in favour of the practice is the protective influences cover crops exert against the often severe root injury wrought by sharp frosts to trees growing upon bare soil. Speaking of injury of this kind, Professor Hartig says:—

“Roots of all young trees, even forest trees, may be killed if severe and long continued frost finds the lighter classes of soil unprotected by snow or any other covering. The periderm of the roots is thinner than on the stems and consequently the former are less protected and, moreover, growth is active for a longer period in roots, when, in mild climates, it continues till the middle of winter, so that when frost occurs the tissues are not in the inert condition which assists them to resist cold. Such plants burst their buds in spring, but wither up whenever transpiration from the delicate young shoots has exhausted the stock of water.” An occurrence of this kind may wipe out in a single winter what was a promising young orchard. As the trees grow older and become deeper rooted, the danger naturally lessens. Certain portions of the Central Experimental Farm cherry and apple orchards upon light soils under clean cultivation were almost totally destroyed in this way last winter. The temperature fell and remained at or about 20 degrees below zero for some days towards the end of December when the ground was entirely unprotected by snow. The cherries were mainly root grafted or budded on Mahaleb stock, the apples were budded and grafted on French crab stock. The character or variety of stock seemed to have less to do with the extent of the injury than the nature of the soil. In those portions of the orchard where a hard and impervious sub-soil approaches the surface the injury was greatest. The twigs and branches retained their plumpness till the commencement of vegetative process; the flower buds, with which the trees were thickly covered, opened or partly opened, as the case might be, and in some instances fruit set; the leaf buds usually made an attempt to do their duty, but failed to more than half develop leaves. By this time the twigs were much shrivelled, and the store of food having become exhausted the trees gave up the struggle and died. On digging them up, it was found that in nearly every instance the upper system of roots was entirely killed, and while the lower or tap roots were alive towards their lower extremities, the superior portions were entirely killed. A lesson of this kind need only be learned once, and strongly emphasizes the desirability—if not necessity—of protection from that standpoint.

Cover Crops Tried.—In 1895 a number of plants were tried with a view of ascertaining some facts regarding the advantages of each in this climate. Half an acre each of the following fodder plants were sown on with a light seeding of rye at the rate of one and a quarter bushels per acre.

No. 1 Crimson Clover	20 lbs. per acre.
No. 2 Mammoth Clover	12 lbs. per acre.
No. 3 Alsike Clover	12 lbs. per acre.
No. 4 Alfalfa	15 lbs. per acre.
No. 5 Common Red Clover	12 lbs. per acre.
No. 6 White Clover and Orchard Grass	
No. 7 Common Clover and Orchard Grass	
No. 8 Pease	2 bushels per acre.

The following notes show the condition of these late in the autumn and early in the spring :

Plant.	Condition.		Remarks.
	Fall, 1895.	Spring, 1896.	
1. Crimson Clover	2 to 4 ins. high; smothered by rye; light covering by first frost.	Entirely killed out; no plants to be seen May 12th.	Smothered by rye.
2. Mammoth Red Clover	2 to 3 ins. high; weakly; ground fairly covered by rye.	Light cover; best where unprotected by rye.	Fairly good.
3. Alsike Clover	2 ins.; very light covering; poor catch.	Wintered well; fair cover where alone.	Fairly good.
4. Alfalfa	6 to 8 ins.; good catch, showing well through rye; tops killed by first black frost.	Wintered well on low ground; killed out on knolls.	Good.
5. Common Red Clover	Very weak; nearly crowded out by rye.	Badly killed; very light cover; patchy.	Too weak.
6. White Clover and Orchard Grass ...	No improvement over last.	Killed out.....	Too weak.
7. Alsike Clover and Orchard Grass...	Better than last; cover light but fairly even.	Light crop on low ground.	Too weak.
8. Crimson Clover and Orchard Grass..	Crimson Clover weak; Orchard makes good showing.	No clover; Orchard Grass makes some show.	Too weak.
9. Field Pease.....	Nearly crowded out by rye.	Only rye left	Smothered by rye.

Summing up the conclusions, I would say, 1) Rye sown at the rate of one and a quarter bushels per acre proved too heavy a seeding for most of the clovers and prevented their full development; at the same time it furnished a certain amount of protection. (2) The seeding down took place about one month too late to secure the best results in the locality of Ottawa (3) The best cover obtained was given by (a) alfalfa, (b) mammoth red clover, (c) alsike clover and orchard grass.

Cover Crops Tried, 1896: Upon the same piece of orchard soil as that used in 1895, one acre each of the following crops were sown on July 13th, 1896. These were seeded alone and were lightly harrowed and rolled :

Crimson Clover.....	20 lbs. per acre.
Mammoth Clover.....	15 lbs. " "
Alfalfa Clover.....	15 lbs. " "
Common Red.....	12 lbs. " "
Soja Beans.....	60 lbs. " "
Cow Peas.....	2 bushels per acre.

Crimson Clover : Appeared in five days, even, fairly strong. August 12th, three inches high, covering ground fairly well; strongest in partial shade. October 14th, strongest plants fifteen to eighteen inches. On lighter and poorer parts plants rather weak.

Mammoth Clover : Appeared rather sparsely in six days, August 12th, growth moderate, weeds principally "purslane." Taking possession October 14th. Strong, even growth throughout; average twelve inches high, giving a close, heavy covering.

Alfalfa : eight to ten inches high; uniform. Gro

Common : inches high; g thin here and t

Soja Bean : eight to twelve first frost; gro

Cow Peas : making strong ground. Octo

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Alfalfa: Came up in five days, remarkably even and strong catch. August 12th, eight to ten inches high, completely covering the ground. October 14th, knee high, very uniform. Growth, strong, even on light sand.

Common Red: Appeared unevenly in six or seven days. August 12th, two to three inches high; ground partially covered. October 14th, six to ten inches high; rather thin here and there. Not heavy enough.

Soja Beans: Appeared promptly and evenly in five days. August 12th, plants eight to twelve inches high, vigorous. October 14th, quite black and leafless; killed by first frost; ground practically unprotected.

Cow Peas: Germinated evenly in five or six days. About right as to quantity; making strong growth. August 12th, plants ten to twelve inches high, nearly shading ground. October 14th, exactly the same condition as soja beans.

The information to be gained by the condition which the different crops came through this winter is necessary in order to arrive at satisfactory conclusions. From present appearances, the mammoth clover seems to furnish a cover which, if not ideal, yet appears to be such as to place it among the most useful of the available plants for this purpose. Alfalfa has certainly done well and I believe could be used with advantage on sandy or gravelly soils. Crimson clover grows rapidly and forms an excellent cover, but our experience shows that it is unreliable, and this experience is corroborated by that of the best fruit growers in the oldest portions of Ontario. As for cow pease and soja beans, they are not equal in the colder sections for cover crop purposes to common field pease,

Why Plants belonging to the Pea and Bean Family should be used: A deep rooting plant, with a leafy habit of growth, owing to the necessities of the case is desirable. Also a plant that will add to the fertility of the soil when turned under. The beneficial effects of green manuring is clearly explained by the chemist of the Experimental Farms in the following language, (Report 1895, page 210):

"By the acid exuded from the rootlets, by the carbonic acid of the atmosphere, and by other means, plants are enabled to make use of much of the mineral matter of the soil. This is stored within their tissues, together with water and organic matter, the latter being derived in the gaseous form from the atmosphere, and elaborated by the leaves. The turning under of a green crop, therefore, supplies for succeeding crops a store of readily digested plant food—of potash, phosphoric acid, and nitrogen. In addition to these essential elements of fertility, the decaying organic matter from the turned-under crops acts beneficially in conserving the soil's moisture, a most important matter for light and gravelly soils. Further, the presence of this organic matter serves to regulate the soil's temperature, and its decay brings about the solution of inert forms of plant food already present.

"Buckwheat, rye and clover are the principal crops used for green manuring. Buckwheat has been found very useful, as a growth may be obtained on comparatively poor soils, soils that in the first instance would not support a growth of clover, and undoubtedly both it and winter rye when turned while green vastly improve many soils. The legumes (clover, pease, beans, etc.), however, are still more valuable, inasmuch as they not only furnish a supply of readily digestible food obtained from the soil, but add a store of nitrogen derived from the atmosphere. It is owing to this power of atmospheric nitrogen-assimilation (which takes place by the agency of certain micro-organisms in the tubercles on the rootlets) that the legumes have been termed 'nitrogen collectors' in contradistinction to all other plants, which are classed as 'nitrogen consumers' The legumes appear to be richest in this element at the period of flowering, a fact which suggests this time as the best for ploughing under the crop. Since nitrogen is the most expensive of all plant foods, the knowledge of the amount of this element added to the soil per acre by manuring with clover, will prove of interest and value to our readers."

Michigan practice is: Crimson clover seeded with oats, middle of August, gives good results. Oats furnish protection for clover, help to catch snow. Rye not always turned under early enough in spring to prevent injury to trees.

The following table shows the calculated amount of leaves and stems of crimson, mammoth, common red and Alfalfa clovers per acre upon the surface of the ground just before the period of killing frosts in the autumn. The calculation is based upon the yield of a square yard of each variety.

Plant.	Weight, green material in lbs. per acre.	Weight of roots per acre.	Per cent. of water in green material in stems of leaves.	Per cent. of dry matter in stems and leaves.	Lbs. of nitrogen per acre estimated at .5 of green material.
Crimson Clover.....	22,234	6,201	83.	17.	111.
Alfalfa Clover.....	11,192	10,587	72.	28.	56.
Mammoth Red.....	13,310	7,260	79.	21.	66.
Common Red.....	9,528	5,445	76.	24.	47.

It will be seen that crimson clover gave the remarkably heavy yield of eleven tons of green material per acre. It will, however, also be noticed that the percentage of water is considerably higher in the green material of this variety than in that of any other. Calculating the nitrogen upon the basis of the total yield of green material therefore distinctly favors this variety. Among other striking points which may be noticed is the large weight of root material furnished by the Alfalfa, and the comparatively small percentage of water contained in its tissues.

There is little to be said in favor of soja beans or cow pease as cover crops for northern localities. They grow rapidly, produce a considerable amount of foliage and vine, but are cut down by the first light frosts. Apart from their office as collectors of nitrogen, they do not seem to furnish as much surface protection as buckwheat or rye, and certainly not as much as field pease.

Examining the values of the four clovers from the standpoint of the approximate amount of nitrogen returned to the soil per acre, we find by assuming that 74 pounds or two-thirds of the nitrogen in the crimson clover came from the air, at 15 cents per pound it would have a fertilizing value from this source alone of \$11.20. This from the green material alone. The tops and leaves of Alfalfa would give about half that amount, but the difference would in part be made up by the relatively larger amount of root material, as well as dry matter in stems and leaves. Common red clover would yield \$4.65 worth, but a slightly larger amount of root material and about one-third more dry matter in the stems and leaves. Mammoth clover would stand next to the crimson clover in value of nitrogen from the leaves and stems, with \$6.60 to its credit, and slightly ahead of it in quantity of dry matter.

Alfalfa clover is a plant of slender, upright growth and does not branch much the first season if uncut. It does not, therefore, furnish as much leafy covering to the surface of the soil as is afforded by the same number of plants of mammoth clover, which stool out better and are naturally more branching in habit of growth than the upright alfalfa. This plant does very well on sandy soils and seems able to penetrate the hardest subsoils and maintain itself where crimson clover would starve.

Crimson clover will, I fear, in this locality serve only one of the ends for which it is sown, viz., that of keeping down weeds and adding to the fertility of the soil without protecting it very much during the winter. It is possible that selected strains of northern bred seed may be produced that will give plants capable of withstanding the severity of our northern winter. A desirable field for patient and painstaking work presents itself in this connection. On light and poor sandy soil this variety makes a very weak growth.

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Common red : This possesses no advantage over the mammoth red in any respect, and is a weaker grower.

Mammoth : I am of the opinion that this will prove the most satisfactory cover crop for all the apple and pear growing sections. It germinates promptly, soon takes and holds possession of the ground to the exclusion of weeds; is fairly deep rooted; covers the ground with a good mat of foliage in the autumn, and begins to grow at a moderately low temperature in the spring. A block of six acres of this clover, sown July 10th, in one of the apple orchards had produced an ideal protective covering when growth ceased this autumn.

Mr. PATTISON : At the request of a neighbor I sowed crimson clover on his orchard, while warning him that I considered it was sown too late. The clover failed to stand the winter; but from other experiments I have seen in the neighborhood I think that on surface soils if sown early enough the crimson clover will do fairly well. Alfalfa has not been fairly tried. I would like to ask Prof. Craig whether crimson clover would be better sown broadcast about the beginning of August in our neighborhood, or whether he would consider it better to drill it in with oats or barley or light seeding of rye?

Prof. CRAIG : If I were anxious to return as much nitrogen to the soil as possible, I should sow crimson clover just as soon as you thought it was safe to cease cultivating your orchard—say the 1st of August, and by so doing I think if the season were at all favorable in matter of moisture you would get a good strong growth in the fall and possibly you might winter the crimson clover quite successfully. On the other hand if you were not so anxious about returning nitrogen to the soil, but wished to get a general protective crop and one that would give you some humus as well as nitrogen, then I would try the oats and crimson clover combination sown later in the season. I do not think, however, it would be safe to sow it later than the 20th of August in Ontario if you expect any kind of results at all.

Mr. MORRIS : What quantity of oats would you sow?

Prof. CRAIG : About a half a bushel—very light seeding.

Mr. PATTISON : You said twenty pounds I think.

Prof. CRAIG : In the case of the combination you need not sow as much crimson clover as that; twelve pounds to the acre is quite sufficient.

Mr. PATTISON : One of the difficulties in the case of an orchard that has a heavy crop is that in many cases we find it convenient to make use of horses to take that crop out. I consider that would be a very serious objection to the growth of the clover. Would there be any way to meet that?

Prof. CRAIG : That question came up at the Michigan meeting, and those who sow the oats and crimson clover combination say they get along pretty well. Of course there was a certain amount of tramping down through the orchard while the fruit was being picked, but on the whole it did not seem to kill it out very much.

Mr. SHEPPARD, (Queenston) : In the peach orchard we suffer severely from drouth. If we can get two or three rains just as the peaches begin to swell we get a much better crop. If we sow crimson clover the first of August we would have to cease cultivation at that time, and we would have that crop growing on the ground during the time that our peaches were at what you might call the most critical stage in regard to dampness. Now if we sow that crop would not we be taking very great risks in that respect?

Prof. CRAIG : That is a very important point. There is one way of getting over that difficulty: you can sow the crimson clover in drills far enough apart to cultivate with a narrow horse cultivator for a certain length of time, and afterwards you can sow oats between the drills and fill up—sow oats with your last cultivation, for instance. That is a practice that has been carried on considerably in the south where they fear drouths—sow the last crop such as oats or barley or something of that kind.

Mr. JONES, (Maitland) : Could not a person sow buckwheat a'one about the 20th August or the 1st September for a cover crop?

Prof. CRAIG : I am not very much of an admirer of buckwheat in the orchard, it gives you so little in return. It loosens up the soil and has good mechanical effect, but it does not give very much to the soil. It grows very rapidly, but it is cut down with the very first frost, and it is not equal to field peas in that respect.

Mr. JONES : It is the latest thing you can sow with success.

Prof. CRAIG : Except peas ; peas will grow at lower temperatures.

Mr. SHEPPARD : The present Postmaster-General dropped a hint one day in my orchard that corn would cover the ground for the winter and would hold the snow and the frost. It occurs to me that I should have tried Mr. Mulock's hint and planted corn.

Prof. CRAIG : I do not know that it would be much better ; I do not think it would be of any more value from a manurial standpoint than the rye. It perhaps might help to catch the snow more ; it stands up more and offers more resistance, it has not such a smooth surface ; but I do not see why it should be better than oats or even barley.

Mr. HUTT : Legumes add a great deal by what they take from the moisture, but still during the warm weather in summer a great deal of nitrogen compound is being constantly formed in the soil by the decomposition of vegetable matter. Now unless we have some crop going on there that will take up those nitrates a great part of them will be washed out by the heavy fall rains, and they will be carried off in drainage. Therefore some crop is wanted that will grow as late in the fall as possible and take up those nitrates in the roots and store it so that when they root down they will return again to the soil, and possibly in the spring, when they become decayed entirely, the trees are ready to take up those again. I think we can save a great deal even by the cereal crops—oats, rye and those things that grow late on in the season. Although they take no nitrogen from the atmosphere they save what is in the soil.

Mr. MORRIS : I think the objection to the corn will be that it will not grow greatly in the fall, and there is nothing that the frost will cut down as quickly as corn. You have to sow it in the middle of summer almost to get any growth at all that would be of use.

Mr. BURRELL : The suggestion that Prof. Craig thre wout about testing crimson clover grown from the seed we plant in our own neighborhood is an excellent one, if we can thereby increase the sturdiness of the plant. I tried it in 1895, and sowed about four acres at different seasons, from the middle of July till early in September. Although the season was very favorable and they came on very well, the plants did not develop any vigor, and it practically was a failure. This year I sowed about twenty pounds to the acre on an old strawberry bed, plowed under, harrowed over well, and sowed on July 27th, then lightly harrowed in. That clover came up very thickly and thrived from the first, and early in November it was from eight to twelve inches high and a perfect mass all over the ground, so much so that I thought it was too heavy and I was not in a position to pasture it off, so I mowed part of it off and left a piece for experiment purposes to see whether it would not suffocate out by being so very heavy, by having the top killed off in winter. I would like to ask, supposing clover is killed off in the winter, and in my case where it had grown nine or ten inches in the fall, has it not already secured a valuable amount of nitrogen even if it is killed off?

Prof. CRAIG : Certainly.

Mr. BURRELL : Then I consider, even if it is winter killed, it is an exceedingly valuable crop for us to grow.

Mr. GILDERSLEEVE (Kingston) : Did Mr. Craig find that Alfalfa had any advantage over the others in withdrawing from the soil phosphoric acid and potash from the sub soil and elments ? Of course the nitrogen is there to a large extent, but it gets these in addition. How does that compare with other grain crops ?

Prof. CRAIG : I could not say as to figures.

Mr. GILDERSLEEVE : Would it be accounted for by the extreme depths to which its roots extend ?

Prof. CRAIG : Yes.

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Mr. GILDERSLEEVE : I have been told that it grows so much deeper than the roots of the trees that it brings to it those elements, and that when it is turned in the trees get the benefit which they would not have done in its natural state.

Prof. CRAIG : I think one of the chief benefits is the mechanical effect it had on the soil. Whenever a root grows there is planted a little line of humus to that rooted tube, as it were, and these so thoroughly planted all over the solid have a very beneficial effect. I found in our orchard, where the rock shale approached the surface, that it even penetrated the crevices, of that rock where the strata were perpendicular, and when I was digging up the roots I found them tightly glued into the little crevices of the rock. * That is an illustration of its great penetrative power.

Mr. CASTON : Crimson clover is one of the most valuable things we can get hold of from the point of furnishing nitrogen to the soil. It is one of the most expensive elements of plant food. When you consider the area that is planted in this Province with fruit it stands to reason that without clover crop they are not properly fertilized—that the ordinary sources of manure are altogether inadequate. I would be pleased if we could get a variety of crimson clover that would prove sufficiently hardy for the different sections of this country.

Mr. HAY (Kingston): My orchard was planted about fifteen years, and since planting I have made a habit of plowing it every fall and banking my trees a certain height about the roots, but not in general. This last year I sowed common red clover about the middle of July and had a very fair crop all over my orchard. I let it remain there, and the result is that my Ben Davis trees are entirely dead, with very few exceptions—some small branches coming up in one or two trees. There were no other trees so affected, except some Grimes' Golden.

Prof. CRAIG : The Ben Davis in northern sections is a notoriously uncertain variety. I have known it to die after bearing three or four crops—being very healthy for seven, eight or nine years, then bearing two or three crops, and then when we got such a test season as last one, nearly twenty degrees below zero without any snow protection on the ground, the Ben Davis steals silently away nearly always. All through this section it is tender. The top governs the root not only as to the form of it and the way it grows, but probably the constitution.

Mr. HAY : I would say that they bore very heavy last year, and the fruit held on, and the foliage was very good. I attributed that largely to spraying. I sprayed for the first time last year, and sprayed it continually for six times I think. Through all the storms we had my Ben Davis stood better than any other.

Prof. CRAIG : No doubt the heavy crop to some extent weakened the tree.

Mr. MORRIS : I am glad to see that Prof. Craig has come to the conclusion that the top has influence on the roots. We know that when the soil is very dry the frost goes down below the roots, those trees are very apt to winter kill. We notice that frequently in the case of peaches. The clover being sown in Mr. Hay's orchard may have taken out the moisture so that the frost would have more effect.

Mr. ORR : Twenty years ago, when I commenced the fruit business, it was my lot to get on a farm where the land was exhausted, and I commenced treating it with everything in sight—chips and leaves and fertilizer of every kind, from whatever source I could get it. I sowed buckwheat in the spring, plowed that under, and then sowed rye, and put everything I could back on it except the fruit, which I commenced very soon to get. I have great faith in rye. All you have to do is to show it the ground and it will grow. Let them come in contact and the rye is bound to grow. We can sow it at Fruitland up till the middle of November and have an excellent crop. The rye I took the award on in Chicago was sowed on the 14th November. We sowed it intending to plow under, but it just so happened that we let it remain, and it grew over six feet high. I would not like to sow corn in orchards to leave it, on account of the mice. They are very bad just about the foot of the mountain, where they have the run among the rocks and stones. I found I was losing considerable fertilizer from the winds sweeping off the leaves from the vineyard, and after some study I succeeded in trapping all those leaves, by running furrows down the vineyard, as soon as they fill with leaves I make another furrow, and so trap and save all the leaves to feed the land.

REPORT OF COMMITTEE ON RESOLUTIONS

Mr. BEALL read the report of the Committee on Resolutions, and moved its adoption, seconded by Mr. A. M. SMITH.

Moved by A. M. SMITH, seconded by Thos. BEALL, "That the thanks of this Association are justly due and are hereby heartily tendered to :

"The Mayor and corporation of this city of Kingston, and to the Kingston District Society, for their kindness in providing the necessary accomodation for the transaction of its business :—

"To the Reverend Principal Grant, of Queen's University, for so ably presiding over deliberations on Thursday evening :

"To Professors Short, Fowler and Knight also from the University, and to Prof. Ruddick of the Dairy School for their excellent papers and addresses given from time to time during this our annual meeting, also to the local press for excellent reports, and to the Board of Governors for the use of the Building." Carried.

Kingston, 5th December, 1896.

FRUIT AND THE TARIFF COMMISSION.

Mr. BURRELL: As most of you are aware, the tariff commissioners are going through the country to ascertain the views of the people on the tariff. The people of Hamilton have had the opportunity of appearing, and it has been thought well ; that the fruit growers should officially give expression to their opinion in the matter, and I have therefore much pleasure in moving this following resolution :

Moved by Mr. BURRELL, seconded by E. D. SMITH, "That for the guidance of the committed appointed to appear before the Tariff Commission, this meeting is of opinion that the present import duties upon fruit be maintained as they are with the following changes only, viz. : the advalorem duty upon pears and plums of twenty per cent, and twenty five per cent. respectively, be changed to specific duty of one cent per pound, and that the duty upon evaporated peaches be increased to 2 cent per pound."

Mr. RACE asked that the resolution be read again, which was done, and the resolution on being put was carried unanimously.

Mr. E. D. SMITH. I have a resolution that might fairly come from this meeting, in connection with nursery stock. It is well known that at the present time the nurserymen in the northern States are being driven to the wall and ruined by the unfair competition of nurserymen from the south. If the Tariff Commissioners should take the duty off trees as they at present exist the nurserymen of Canada would be ruined in just the same way as they are in the northern States to-day. The consequence of that would be that this country would be flooded with trees grown in the south. Now, those who are conversant at all with the growing of trees will know that a tree can be grown in the south at about half the cost of what it can here. The season is twice as long, labor costs about half, and land less than half, and if they have free entry into Canada the consequence will be to ruin Canadian nurserymen as well as in the northern States, as they have done to-day. The consequence to the fruit growers would be that instead of getting northern-grown trees, hardy and suitable for this climate, they would get almost entirely southern-grown trees. These would be bought by dealers and brought north by dealers who might perhaps make a pretence of growing northern trees and selling them to the farmers and fruit growers of Canada. There are a great many other reasons why this stock should be kept out, but that, I think, is a sufficient reason to induce every fruit grower of Canada to urge upon the Government to maintain a sufficient duty upon trees to enable the Canadian nurserymen to live. For that reason I beg to move the following resolution :

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Moved By E. D. SMITH, seconded by MURRAY PETTIT, "That as it is extremely important to prevent the utter ruin of Canadian nurserymen by unfair competition of United States nurserymen—driven to sell their stock at a frightful loss by the enormous production of southern nurserymen; and as, in consequence of such ruin of Canadian nurserymen this country would be flooded by southern grown stock, which though firm in appearance is not at all suited for planting in this country—therefore this meeting is of the opinion that the present duties should be maintained.

Mr. CASTON: What are the duties at present?

Mr. E. D. SMITH: The duties upon everything at present except apple, pear, plum, peach and cherry trees is twenty per cent. That is extremely low. The duty upon those trees is a specific duty of three cents each.

Mr. M. PETTIT: I would second that motion, and in doing so would like to say that I have had some experience in purchasing nursery stock. Some years ago I purchased 600 peach trees, 300 of them from our own director, Mr. A. M. Smith, in the nursery, he was then conducting near Grimsby. The other 300 came from a nurseryman who represented himself as being from near Rochester. The 300 trees I bought at Grimsby were every one true to name and in good condition, and all lived. The 300 trees that came from the United States were very dry when I received them. They had just the same care and cultivation as the others. One hundred of them were not true to name, and in those trees I had a very large loss, though I cannot give you the number. Not only that, but in many of the 300 that came from the other side, the yellows broke out, and I lost my whole orchard just when it was in the prime—for in those days we did not know what the yellows were and did not commence to destroy it; and I firmly believe that would have been money in pocket had I paid Mr. A. M. Smith \$5 apiece for another 300 trees instead of getting those 300 as I did from the other side. I have had other similar experiences, which it is not necessary to take up the time of this Association in discussing, and I believe it is in the interests of the fruit growers of this Province that the duty remains to encourage our home-grown trees, which we all know are truer to name and are better suited to our climate.

Mr. CASTON: In speaking of southern-grown trees do you mean from the southern States or from Rochester?

Mr. E. D. SMITH: Southern States; such as Georgia and Alabama.

Mr. CASTON: Would you include Ohio?

Mr. SMITH: Southern Ohio would be pretty tender. Northern Ohio would be all right.

Mr. PATTISON: I would like to say a word in support of this motion. From my view of over-planting I think that this duty should decidedly be kept as it is now.

Mr. PETTIT: Raise it.

Mr. PATTISON: We are suffering at the present moment sufficient from the amount of trees we are induced to plant by the home nurserymen. (Laughter). I think that fruit growers have suffered very badly from varieties not being true to name, and from countless other causes; but if any rogue be encouraged at all I think it is better to encourage the home rogue than the foreign rogue—(laughter)—and on those grounds I would have much pleasure in supporting this resolution.

The motion was then put and carried unanimously.

The convention closed at 12.15 p.m.

In the afternoon the delegates were driven to the Rockwood Asylum and the Provincial Penitentiary, the workings of which institutions they inspected with interest.

The Anderson Force Pump of Aylmer, Ont., and the Spramotor of London, Ont., were on exhibition in the hall of the Dairy School during the sessions of the convention.

FRUIT AS FOOD AND MEDICINE.

BY REV. GEORGE BELL, QUEEN'S UNIVERSITY, KINGSTON.

The Fruit Growers' Association is doing much to awaken the people of Ontario to the importance of the cultivation, production and improvement of fruit, and to its value both in domestic economy, and as a factor in commercial and national wealth. By many, fruit is looked upon as a luxury, and little as an integral part of daily food, still less as a continually needed medicine. But for both food and medicine, fruit is important everywhere, and peculiarly so in this Province, first from the necessity of its use, and secondly from the comparative ease with which it can be obtained. The climate of Ontario is often spoken of as glorious, and justly so; but yet it has some peculiarities which require attention if we are to enjoy a full measure of health. The sudden changes of temperature, the rapid growth and decay of vegetation, and many consequences of the opening up and settling of a new country produce results, malarial or otherwise, which need to be guarded against. This requires attention both to a properly regulated diet and to the surrounding influences of heat, cold, dampness, purity or impurity of air, etc. While foods consist mainly of two classes of substances—flesh-forming, as meat, cheese, gluten, etc.; and heat-producing, as grains, roots, etc., having starch and sugar as constituents for perfect development and health of the human body, these are not sufficient. There have to be added substances of varied chemical composition, both to aid the assimilation of the food and to eliminate injurious substances. One series of derangements arises from influences, malarial and otherwise, which may act injuriously, either organically or functionally on the liver or alimentary canal, producing enteric effects of a serious nature, or congestions of various kinds. These congestions are commonly spoken of as colds, or a person is said to have taken a bad cold. I am not aware that any cold, so called, is a good one, but I am convinced that cold is not the cause of any such ailment. When the system is developing such an ailment, exposure to cold may determine the particular kind of congestion produced, or the organ chiefly affected, being thus an incidental influence, but not, in any proper sense, the cause of the disease. The cause seems to be a deteriorated state of the blood, arising in most cases from defective alimentation, from the use of food of difficult digestion or unhealthy nature. The result will naturally be a supply to the blood of unhealthy nutriment, followed by injurious results to the heart, lungs, liver and kidneys, and congestions of the weaker parts of the system. Another series of complaints arises from the depositing in the tissues of calcareous or other mineral substances, generally urates of various kinds. In hot weather animal food sometimes develops forms of alkaloids which are highly poisonous, known as ptomaines. From this cause canned meats are sometimes found to be poisonous without apparent cause. Now the same process may take place in the intestines, giving rise to diarrhœa, dysentery, and other dangerous affections. For all these classes of complaints nature has furnished a preventative and a cure in fruit. Ripe fruit is in such cases a corrective and also an opportune article of food.

Sweet fruits, such as bananas, are important additions to our list of foods, but are less important in a sanitary view than fruits containing acids. We may notice incidentally the general value of oranges for indigestion, and lemons and tamarinds in fevers, but these cannot be so important to us as native fruits, as they can never fill the place of these, and cannot be so generally used. To be generally useful to the whole people of this Province, or of the Dominion, fruits must be easily accessible in all localities, and sufficiently cheap to be obtainable by all. Peaches are a most valuable fruit, but from their limited area of production and perishable nature, they can only be a luxury to most of our people. Practically apples and grapes must be our great dependence for most of the year, with cherries and berries to fill the season, when the others are not obtainable. For a large part of Ontario apples, grapes, plums, cherries and berries will practically fill the year.

Ripe fruit is highly valuable as an article of diet. While a large part of its bulk is water, it contains most valuable elements of nutrition. The required albuminous and nitrogenous compounds essential to the fullest alimentation and health of the human

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body are there provided. As nature shows by the growth of infants that the mother's milk is the most complete combination of food elements, it is interesting to notice that grape juice is almost identical in its nutritive elements, though with an addition of acids and their chemical combinations. It has therefore been suggested to substitute bread or other farinaceous substances and grape juice for bread and milk as a part of infants' and young children's food. I have no doubt that this is a valuable suggestion, especially in warm weather.

As most of these fruits contain a considerable amount of acids, malic, tartaric, citric, etc., this may appear an objection on the score of health. But these acids are combined with alkaline bases, which fact materially changes their action. One of the most common of these is potassium, which in these combinations is very efficient in eliminating noxious matter from the system. Thus tomatoes are of much value in liver, kidney and gastric complaints. Apples, besides malate of potassium, lime and other salts, contain phosphorous in sufficient quantity to act as a restorative to the brain and nerves; even sour apples will reduce a tendency to acidity in the stomach. Baked apples form one of the most agreeable, digestible and healthy items of food we possess. The writer has used them ordinarily at both the morning and evening meal for ten or eleven months of the year for many years, and he is convinced that this practice has been an important factor in the good health enjoyed in old age, better than he had thirty or forty years ago. The usefulness of the apple, no doubt, gave rise to the old Scandinavian idea that apples constituted the food of the gods; although we suppose that these old time gods did not have Rhode Island Greenings, Kings or Spies; nor, as the Fruit Growers' Association and Linus Woolverton had not yet arrived, the Princess Louise. At the season when apples become scarce, strawberries come in and supply one of the most valuable, perhaps the most valuable of all fruits in a medicinal point of view. Other berries follow and keep up a supply until apples again come in. The use of fruit is important in fevers, indigestion, liver complaints, rheumatism and gout. The grape cure is largely resorted to in France and Germany, where patients consume grapes beginning with a pound or two daily, and increasing to six pounds and in some instances to twelve pounds a day. Such treatment is beneficial in two ways: both for dissolving calculous deposits, and for washing out the tissues. As a general summing up, fruit may be described as beautiful (to the sight), delicious (to the taste), odorous (to the sense of smell), and healthful (to the body). In an old number of the "Horticulturist," September, 1880, Mr. A. Hood, Barrie, relates some remarkable cures of chronic diarrhoea and piles from the use of fruit, especially strawberries; and also of the cure of weakness and pain in the eyes by means of cream tartar; and he suggests the use of grapes for complaints of the eyes, as they contain a considerable quantity of this chemical. A medical opinion or two may here be in place. One doctor has said that farmers have no need for doctors when fruit is freely used. Another says: "Nothing does more to rid us of patients than the daily use of fruit. It clears the organs of every impurity." Certainly we have no ill will to the gentlemen of the medical profession, but in the general struggle for existence it will be better to invest money in apples or grapes than in doctors' bills.

For breakfast it would be much better for the general health of the community, if animal food were abolished, and, along with grain foods, to use fresh fruit when obtainable, or baked apples. For a light meal or lunch, Graham bread and fruit will be found satisfactory. For school children's lunch many articles are used, some of them very queer. Some of their baskets are supplied with pie, consisting principally of a sodden mass of combined grease and flour, and sometimes with villainous pickles as a relish. I understand that in England a common practice is to put in the child's lunch basket bread and cheese, and an apple. This is surely more rational, as well as being free from the charge of cruelty to children. The athletes of Greece are said to have been fed on figs, nuts, cheese and bread; the Moorish porters on brown bread and grapes.

While fresh fruits should be freely used when obtainable, there are many prepared sorts which may be useful, when the fresh form cannot be had. Grape juice may be prepared by heating to the boiling point and bottling hot, either sweetened or not. It should

not be allowed to boil, if the fine flavour is to be retained, and it should be kept in a dark place. Condensed must, or juice evaporated to the consistency of a syrup, and catsup or sauce, which may be spiced in various ways, are found worthy of trial. The ordinary mode of canning fruit is familiar to all. For this purpose glass jars are much better than tin cans. The old-fashioned apple butter, the manufacture of which, I fear, is becoming a lost art, should have its use revived. A variation of this may be suggested, in the cooking of apples with grape or other fruit juice, instead of cider.

Although not immediately connected with the subject of this paper, it may be mentioned that fruit is a valuable food for stock. Apples have been tried successfully with horses, keeping them in a healthy and vigorous condition; also with cows and young cattle. It has been found that the quality of butter has been much improved by supplying the cows with apples as part of their daily food. This may be a matter of importance to farmers, when they shall be induced to raise apples in large quantities.

What lessons then are we to learn from the foregoing? Certainly this, that every farmer should engage largely in the raising of fruit; and that every one who cultivates a garden should make fruit growing a leading interest. I am aware that the situation about Kingston is unfavourable. The soil is hard and cold, and the climate is not like that west and south of Hamilton. The ground needs a kind and amount of preparation which will involve an amount of expense and work beyond the requirements of more favourable localities. Still I am convinced that the results to be reasonably hoped for will justify the expense. I have sometimes been told that a farmer can buy fruit more cheaply than he can raise it. I fear that there is a misapprehension here. A farmer may annually drive into a city and buy a large supply of apples, for example, for a number of years at less expense than he can plant and care for an orchard; but this covers only part of the question. He cannot go daily in summer to a market for a supply of the small fruits which are essential for the health of himself and his family. And the cost of the orchard, which at first yielded no return, will diminish, while its returns will be increasing. No constant supply of fruit for the whole year can be satisfactorily provided in any other way than by home production for the bulk of it. Without actual experience no one can understand either the quantity and variety of fruits which can be grown on a comparatively small area of land, or the satisfaction and enjoyment derived from tending them, and watching their progress. As an encouragement for amateurs, I may mention my experience at Niagara Falls on about half an acre of hard clay soil on the Niagara limestone. There were several bearing apple trees already on the ground, and the only apple tree I planted was a large crab (Montreal Beauty). I had part of the ground trenched two spades deep, and well manured at first, and annually cultivated and manured afterwards. I planted and succeeded fairly well with most of the following varieties: 15 dwarf pears, 4 plum, 4 peach (on plum stocks), 3 cherry, 1 apricot, 10 grape, 3 currant, 4 gooseberry, 7 raspberry, 1 blackberry, 2 strawberry. Besides these, from want of knowledge at the time, I attempted to grow European grapes in the open air, which entirely failed. By experience I learned that some sorts were not so suitable as others. For example, the red Antwerp raspberry produced delicious fruit, but the canes suffered in winter, and were so large and brittle that they could not be laid down for protection. The new Rochelle blackberry, which was vigorous and healthy for two or three years, afterwards appeared to be tender.

To stick trees or plants into a hard soil as if they were stakes, and then leave them to grow or die as may happen, will not be successful; but with the selection of suitable varieties, proper preparation of soil, cultivation and care, I believe that fruit growing will be both enjoyable and profitable in any part of Ontario. But the local conditions vary so much that extensive experimenting will be necessary in order to cultivate varieties adapted to these conditions. I would advise every one who can control any amount of land, large or small, if not already a member of the Fruit Growers' Association, to become one without delay; to study carefully its researches, and to become an experimenter himself, so as to be able to decide intelligently on varieties adapted to local circumstances, and to assist in extending the area and the quantity of fruit grown throughout our country.

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SOME CAUSES OF FAILURE IN APPLE CULTURE.

By L. WOOLVERTON, SECRETARY, GRIMSBY.

Property cared for, the apple orchard is, comparatively speaking, one of the most valuable portions of the farm, even if it is only large enough for home uses. Situated as some farmers are, at a long distance from a railway station, or a good market, the expenses of teaming the crop might make the odds against growing a commercial orchard, but otherwise, taking one year with another, I believe the apple crop can be made to pay twice as well, acre for acre, as a grain crop, all things considered.

I am aware that I am courting opposition on this point, and grant that facts, in many instances, are against me. Even in the Niagara district, in the very centre of fruit culture, in the very best of soil and location, apple orchards just in their prime, beautiful, thrifty trees of the best varieties, are being mercilessly cut down and sacrificed on each side of me. The owners declare that they are unprofitable. They say that the trees will not bear, that the apples of late are smaller than they used to be, that the worms destroy the most of them, and that the small proportion remaining for the owner to harvest bring no price in the markets. They have therefore resolved to cut down their orchards, and dig them out by the roots, in order to devote their ground to the growing of grain and root crops, which they claim will pay them better.

I grant them honesty in their statements; I myself have observed the unproductiveness of the orchards, which are no doubt duplicated in every part of Ontario, and I venture to say that one of all of the following causes will explain the unfortunate conditions of affairs.

1. THE LOCATION OF THE ORCHARD.

A common notion is that any place will answer for the apple trees, and therefore very often a stoney corner that cannot be worked, or a very heavy clay which one does not want to work up, is set out to an apple orchard. That such an orchard would never be a success goes without proving.

But a more common fault for the location is a wet soil left without underdraining. Trees in such situations may grow well in summer, but are almost sure to become winter killed, or at least so injured by the cold in winter that they become enfeebled and unproductive. The remedy is plain. A thorough system of underdraining is of the first importance.

Another evil of the situation is exposure to high winds. Those who have had almost their whole crop strewed upon the ground in the autumn by wind storms know how to appreciate the favoring protection of a dense woods of deciduous and evergreen trees. This cannot be quickly remedied, but a windbreak of a double row of Norway spruce trees will, in twenty years, be of inestimate value in this respect.

2. LACK OF CULTIVATION.

The second cause of failure, one of the most common, is lack of cultivation. Some how or other the idea has got abroad that the apple orchard needs no cultivation. True, there is no growth of wood, the fruit is small, and imperfect of its kind, but it never seems to occur to the owner that the trees would grow any better for being cultivated, or if he does believe in it, he does not sufficiently value his apple crop to give it the same attention as he would his corn or potatoes. There is need of a general waking up in question. I must confess to having been once of this opinion myself, but I have been converted. I have found that where the orchard is in an unthrifty condition, so that the leaves are of a light green or yellowish tint and ripen early, and the fruit is scant and poor, cultivation is the surest and speediest cure, and will accomplish what pruning and manure will utterly fail in doing without it. Cultivation of the soil so exposes it to the action of the air as to make available the plant food which is already there in store, and besides, has a most important influence in counteracting the serious drouths to which our country is of late so subject.

One of my orchards which had been planted some twenty-five years was in the condition above described. It had been left seeded down for about ten years, and had become unthrifty and unfruitful. In the summer of 1886 I broke up thoroughly one-half of it, applied wood ashes and pruned it carefully, while the other half was pruned and manured, but not cultivated. The same treatment was continued during 1887, and the result was plain enough to the most casual observer. The cultivated portion resisted the drouth of that year completely. Its dark green foliage was a remarkable contrast to the light sickly green of the other part, and, more important still, the cultivated trees are laden to the very ground with such a load of fine Baldwins, Greenings and Golden Russets, as cannot be equalled by any other orchard on my fruit farm.

3. LACK OF MANURE.

Who ever thinks of giving his apple orchard an annual dressing of manure? All the manure is put on the field crops; no farmer would think of growing fine potatoes or a paying crop of grain without a heavy coat of manure, but the apple orchard must shift for itself, without either cultivation or manure, and then if it does not yield a paying crop it is condemned as worthless, and ought to be cut down because it does not pay. Is it the fault of the orchard or of the orchardist? Why should it be expected to do what no other farm crop could possibly? Why, the farm was perhaps cropped for years before the orchard was planted, and the fertility of the soil well nigh exhausted; trees have been drawing on the soil for years, and now are blamed for unproductiveness. Is this reasonable, I ask?

But says one, "I cannot spare the manure from my other crops." Very well. You must put it where it will pay best, but I claim that place is the orchard.

I find that farmers generally in Canada quite under estimate one of the most valuable of orchard fertilizers, and either let it waste or sell it for a mere song. I refer to our wood ashes, which are so undervalued in Canada that Canada ashes have become an article of export to enrich the fruit farms of our Yankee neighbors who purchase them by the car load.

The following is an advertisement clipped from an American paper:—"Canada Hardwood Unleached Ashes, by rail in carload lots furnished on short notice. Ashes guaranteed to be of best quality, and are especially adapted for all grass and fruits. Pamphlets and prices sent on application, Munroe, Judson & Stroup, Oswego, N.Y." This is only one of many. Such quantities have been imported from Canada into the United States that a special bulletin has been published by the Connecticut State Experimental Station, showing the analysis of the various brands. The market value is twenty-five cents a bushel, although their real value is much higher.

The following table shows the value of wood ashes compared with stable manure and with a commercial fertilizer which we may call a complete manure:

COMPARATIVE VALUE OF WOOD ASHES.

In 1,000 pounds of wood ashes there are, say,

60 lbs. of potash at 7 cents per lb.....	\$4 20
20 lbs. of phosphoric acid at 5 cents.....	1 00
700 lbs. of carbonate of lime	5 20

About one-half cent per pound. The remainder consists of magnesia, insoluble matter and moisture.

One bushel weighs about sixty pounds and is, therefore, worth from 30c. to 60c.

In 1,000 pounds of complete manure there are:

70 lbs. nitrogen at 20 cents	\$14 00
30 " potash at 7 cents	2 10
60 " phosphoric acid at 5 cents	3 00

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Or nearly two cents a pound.

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In 1,000 pounds of stable manure there are :

5 lbs. nitrogen at 20 cents	\$1 00
6 " potash at 7 cents	42
2½ " phosphoric acid at 5 cents	12
	\$1 54

Or one-seventh cent a pound.

Leached and unleached Canada ashes have approximately the following percentage composition :

	Unleached ashes.	Leached ashes.
Sand, earth and charcoal	13.0	13.0
Moisture	12.0	30.0
Carbonate with some hydrate of lime	61.0	51.0
Potash (chiefly as carbonate)	5.5	1.1
Phosphoric acid	1.9	1.4
Other matters by difference	6.6	3.5
	100.0	100.0

It appears from this statement that more than half the weight of both leached and unleached ashes consists of lime, partly as hydrate but chiefly as carbonate; the same material chemically as chalk or limestone, but finer and so likely to be quicker in its action.

Now, potash is a most important fertilizer for the orchard, (1) it promotes growth, (2) it improves the flavor of the fruit by causing an increase of sugar and a decreasing of acid, (3) it improves the color of the fruit, and this is very important in apples intended for the market. Apples draw heavily on the soil, and especially upon this element. It has been stated on very good authority that 100 barrels of apples draw more heavily on the soil than a crop of fifty bushels of wheat.

By reference to a table showing the constituents of the apple, the reason will be obvious.

ANALYSIS OF THE APPLE CONSTITUENTS.

1-1000 parts of apple contains :

Water	831.	Lime .....	.1
Nitrogen .....	.06	Magnesia .....	.2
Ash	2.2	Phosphoric acid .....	.3
Potash .....	.8	Sulphuric acid .....	.1
Soda .....	.6	Silicic acid .....	.1

From all this it is evident that two of the most important elements, as potash and phosphoric acid, are supplied in wood ashes.

With regard to the action of ashes upon the soil, it is important to notice that a heavy application of unleached wood ashes to a heavy soil is damaging to its texture, rendering it heavier still, more tenacious, and inclined to be cloddy. But for this reason its action on light soils is highly beneficial, rendering it more compact, filling up the pores and keeping it moist. It also tends to correct "sourness" in the soil by precipitating the soluble iron salts which are sometimes over abundant.

Another benefit is that it promotes nitrification, or the process by which nitrogenous matters in the soil are rendered available for the tree growth. It is thus evident that ashes have more value than simply for the amount of potash and phosphoric acid they contain, on account of their mechanical action, especially for light soils.

I have a hundred acres in orchard, and was almost in despair about fertilizing it properly, until I found I could buy ashes from farmers all about me for a mere song, and as much as I wanted. And now every winter I keep my team engaged collecting ashes for miles around and apply it to my orchard. The results are evident—apples in abundance and of such a size as astonished those who saw them; Baldwins are often as large as Kings.

My soil is chiefly a sandy loam, and consequently of just the character to be most benefited by wood ashes.

The quantity applied is about one-half to one ton per acre, or about one-half a bushel to a bushel per tree.

5. THE RAVAGES OF INSECTS.

The ravages of insects is no less important a factor in producing failure in apple growing for profit than the others I have mentioned. The man who neglects to spray his apple orchard in June with Paris green must expect his crop to be thinned out one-half by the Codling moth in September.

Some people even yet need to be convinced of the importance of this, but those who have given it careful trial agree in its benefits. I have tried spraying for the Codling moth for ten successive years, and where carefully done, and repeated if washed by rains, I have found a great saving of my apples and a general improvement in their quality.

Few of us growers are exact enough with our experiments to say precisely what proportion of the crop is saved by spraying. A careful experiment was made on one occasion at the Geneva Experiment Station, N.Y. The trees were mostly Fall Pippins, and every alternate tree was treated twice in the month of June, first about the 3rd, and then again about the middle. The total number of apples was carefully counted, also the total number of sound and of wormy apples, and the percentage of wormy apples was carefully estimated for both sets of trees. The result showed 13 per cent. of wormy apples on the sprayed trees and 35 per cent. of those not sprayed. This would amount to twenty-two barrels out of a hundred saved by spraying, and estimating the value at \$1 per barrel, the gain would be somewhere about \$22 per acre of orchard.

Judging from my own experience I do not believe that this estimate is too high.

While packing my apples and pears last season I was more than ever convinced of the great benefit of spraying with Paris green. In some portions inaccessible to the waggon, this treatment was neglected, and as a result, an immense crop of codling moths was harvested, and innumerable apples wasted; while those trees carefully treated were almost free from this mischief-maker. And that is not the only benefit; indeed, quite as important is the perfection of form of the sprayed fruit. A Duchess apple tree always bore knotty fruit previously, but since being treated to Paris green its fruit has been perfect.

The codling moth also attacks the pear, and therefore the pear orchard should also be sprayed in the same way as the apple for its destruction. The Bartlett pear is especially subject to produce knotty specimens, due to the work of the curculio, and other insects. Indeed, fully half the crop has to be thrown out for seconds on this account. But for two seasons now, I have sprayed them carefully, and as a result, have had comparatively few knotty pears. The editor of *The Country Gentleman*, in a recent number, gives his experience in spraying Bartlett pears, and it corresponds with my own as given above. I copy from the journal outlines of two specimens, showing the effect of the treatment as described above, but with us the disfigurement has averaged greater than is here represented.

But the advantages of spraying for insect pests having been once proved it did not take long to find that it was of almost universal application. Our experiment stations soon discovered the benefit of copper sulphate for destroying fungi and of kerosene emulsion for such insects as did not eat the foliage but only sucked their nourishment from the leaves. These discoveries are creating a revolution in fruit growing and making possible the highest success for those fruit growers who will use to the best advantage the prescribed remedies. I will read a few lines by Prof. Bailey, of Cornell, on spraying trees, on this point; he says, spraying is of some value every year on apples, pears, plums and quinces. Nearly all the sprayed orchards are carrying a better foliage than those which are untreated, and where the codling moth, bud-moth, case-bearer and other insects are plenty, it has been of decided benefit. So, wholly aside from the idea of insuring against risk, it is advisable to spray for those insects which are

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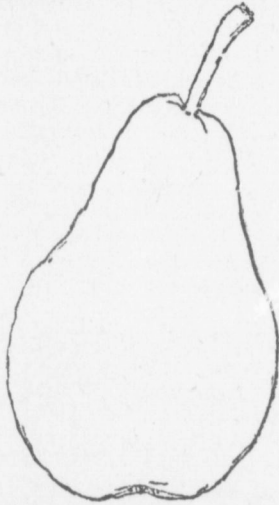
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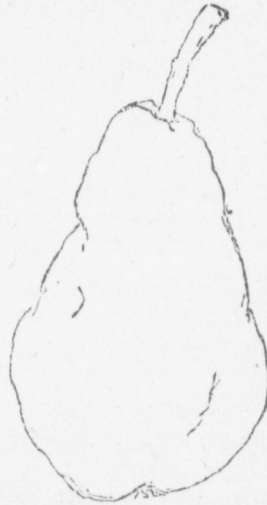
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Borer, *Chrysoboth*
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more or less abundant every year. Some insects and diseases appear late in the season, so that the spray may be needed at some epoch in the season.

Spray thoroughly, or not at all. I should say that fully half the spraying which I have seen in western New York in the last two or three years is a waste of time and material. Squirting a few quarts of water at a tree as you hurry past it, is not spraying. A tree is thoroughly and honestly sprayed when it is wet all over, on all the branches and on both sides of all the leaves. An insect or a fungus is not killed until the poison is placed where the pest is. Bugs do not search for the poison, in order that they may accommodate the orchardist by committing suicide. The one spot which is not sprayed may be the



Sprayed Bartlett, $\frac{2}{3}$ of natural diameter.



Unsprayed Bartlett, $\frac{2}{3}$ of natural diameter.

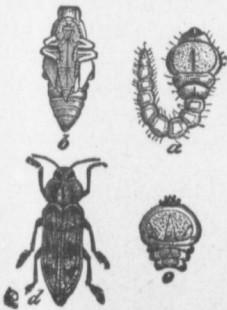
very place where a bud-moth is getting his dinner. On the other hand, there are many fruit growers who spray with the greatest thoroughness and accuracy, and they are the ones who, in the long run, will get the fruit.

Prof. Pantou, of the O. A. C., Guelph, has issued a most convenient spraying calendar which every fruit grower should have, and which may be had on application to the Department of Agriculture, Toronto. He has also published a small book on "Insect Foes and How to Destroy them."

The Flatheaded Apple tree Borer is a most formidable enemy to the apple orchard. The months of June and July are the season when the parent beetle is most active in

her search for a favorable place under the scaly bark, or in the crevices of the trunks of the apple trees. When an orchard is growing vigorously the young larva seems to be outwitted by the rapid growth of the wood, but when an orchard is grass bound and growing very slowly, the trees are almost sure to suffer, and oftentimes, if neglected, will be wholly destroyed.

The beetle is about half an inch long, of a shining greenish black above, and like burnished copper underneath, and will be readily recognized from the engraving. It is said to sometimes attack the pear and plum trees, but we have never been troubled with it except in our apple trees, where it was trouble enough until we knew how to fight against it. The presence of the larva may be detected by the rough, dark, and sometimes cracked state of the bark, usually on the north or north-west side of the trunk, or by the fine chips which



Flat Headed Apple Tree Borer, *Chrysobothris femorata* Fabr: a, larva; b, beetle.

they exude from their holes when quite young. A sharp pointed knife will soon discover the hateful intruder, which will be at once seen to be truthfully represented in fig. —b, with its great flat head, which is altogether out of proportion to its body. Washing the trunks of the trees at this season with some alkaline solution is the easiest way of saving our orchards from this borer, as for instance with soft soap reduced with a solution of washing soda and water, the latter in the proportion of a quarter of a pound to a gallon.

Another formula is—Take one quart of soft soap boiled in two gallons of water, and while hot stir in one pint of Carbolic acid.

The *Oyster Shell Barklouse* is insignificant in size, but terrible by reason of its numbers.

Very few have any idea how common a pest this is in our Canadian orchards. Many people are wondering why their orchards are so unfruitful, and why they are so stunted in growth, and look so sickly, when the whole trouble is due to this pernicious little louse, which, unnoticed by them, is preying upon the bark of their apple trees in immense numbers, sucking out their strength and life.

Last summer toward the end of May a neighbor brought in to the writer a branch of a young tree from his orchard asking, "What is the matter with this tree?" The tree would not grow, and he had discovered that the bark was curiously rough with numerous tiny scales about one-sixth of an inch in length, as shewn in fig. 1. Upon lifting one of these scales and using a hand glass the question was soon solved. To his astonishment, there were revealed nearly one hundred wee little lice, too small to be readily seen by the naked eye, and which ran about with the greatest speed over the bark as if delighted at their liberation from the confinement of the maternal shell. No wonder the tree was stunted!



Oyster Shell Bark Louse.

This louse belongs to the genus *Coccidae*, and is allied to the aphid, bed bug, and body-louse. It was introduced into this country some eighty years ago from Europe, and although the female cannot fly, and hence migrates slowly, it has now become more or less distributed throughout our whole country.

The time to destroy these bark lice is early in the month of June, because at that time the young brood escape from under the scales where they hibernate, and which are actually the dead bodies of the mother lice. The loose bark should first be scraped off with a hoe, because the cunning youngsters hide away carefully beneath it, as if they were trying to escape discovery.

Then the trunks and large limbs must be washed with a strong solution of soft soap and washing soda, with enough water to enable one to apply it with a paint brush, or scrubbing brush. If the lice have spread over the limbs, the whole tree must be sprayed with a solution of washing soda and water in the proportion of half a pound to a pailful, or potash and water, two pounds to seven quarts. Caustic soda and water is recommended as still more effective.

There are several insects which prey upon the bark louse, as also some insectivorous birds, but unfortunately this hateful insect increases out of all proportion to the number of its destroyers, and unless vigorous remedial measures are employed, some of our best orchards will die of premature old age.

6. BAD HARVESTING.

Even presuming that the orchard has been properly cultivated, pruned and enriched, there are many who yet fail to handle the fruit to the best advantage. In the first place, it is a common mistake to leave the fruit hanging too long on the trees before picking, and in consequence they become too ripe to keep well, and a large pro-

portion is spent gathering more of it. At but the high rule. The attained full reached maturity to grow and returns a good are of parsnips potatoes, or so leave market a wire hook

Most orchards case is back upon the bar custom has been in the bottom ing table for I know of, fruit without moving to another.

Many in marketable apple Well, if he has small lots of some reliable Gravensteins London, England course these

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Perhaps you have those varieties mysterious, but old trees a method number of *The* readers the following

"The following percentage of failure and, in the case Last year we were with the Kieffer the stem to be

portion is spoiled by falling to the ground. My experience has led me to begin gathering much earlier than formerly, and indeed before my neighbors seem to think of it. At one time it was my rule to begin gathering them about the 9th of October, but the high winds of that month made such havoc with them that I soon changed that rule. The 20th of September is none too soon to begin with such kinds as have attained full size and color, and if by that time all the apples upon a tree have not reached maturity, it will pay to make two pickings, leaving the greener and smaller ones to grow and color up. Attention to the details of preparing fruit for market always returns a good profit and must not be grudged. Careful handling and careful sorting are of paramount importance. Many throw apples into the basket as if they were potatoes, or squeeze them with thumb and finger as if they were made of stone, and so leave marks which spoil their beauty. Round swing-handle baskets, attached with a wire hook to the rounds of the ladders, are the best for apple packing.

Most orchardists empty their apples in piles upon the ground, but sorting in that case is back-breaking work, and every rain delays it. Some empty them in heaps upon the barn floor, but in a large orchard this means much labor in carting. My custom has been to empty into barrels in the orchard, the heads of which are left in the bottom, and store under cover; and then in packing empty them out on a packing table for sorting. For young orchards and scattered varieties this is the best plan I know of, for the important work of packing can then be done in a clean, dry place without moving about with nails and mallets and press from one part of the orchard to another.

Many inquiries are received concerning the best plan for a farmer to dispose of his marketable apples—whether he should sell them at home or ship to a foreign market. Well, if he has a very large orchard, so that he can ship by the carload, or if he has small lots of one special kind, such as the Gravenstein or King, I would say ship to some reliable English wholesale house. As I can show from my account sales, my Gravensteins and Kings, in some ordinary seasons, have sold in Covent Garden Market, London, England, as high as \$6 per barrel, which I consider paid me very well. Of course these apples were extra selected, all No. 1 grade, and highly colored.

But with mixed lots, less than carloads, it is better to take \$1, or even 75 cents per barrel for the fruit at home, than risk a possible loss by shipping so far.

But at even \$1 a barrel, I ask what farm crop pays better. Take for example an acre planted entirely with Baldwins and Greenings, and what will it pay you at those prices? Suppose you only get 100 barrels a year on an average from it, what other crop would give you \$75 or \$100 per acre with less labor.

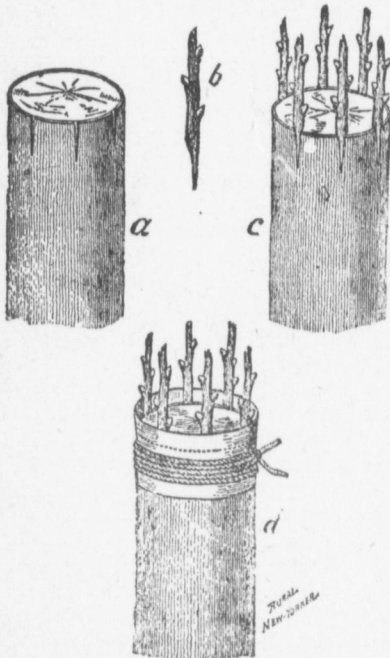
Of course it is expensive work planting and raising an apple orchard, a heavy investment; but I am not urging the planting of new orchards so much as the better care of those we have.

7. POOR VARIETIES.

Perhaps you have not the most profitable kinds; then top graft and you will soon have those varieties which are proved most desirable. The work is not difficult or mysterious, but quite practicable by anyone who can handle his knife skilfully; but for old trees a method known as crown grafting is very well adapted, as figured in a recent number of *The Rural New Yorker*, and by favor of the editor we are enabled to give our readers the following description of it with an excellent illustration:

"The following is an easy and effective method of grafting old trees. By it the percentage of failure is reduced to a minimum, and branches at least six inches in diameter, and, in the case of pear trees seventy-five years old, may be worked with assured success. Last year we mentioned the case of such a pear having been grafted two years before with the Kieffer, that gave a full crop last fall. Saw off the branch at right angles to the stem to be grafted as at Fig. —a. Then cut a clean slit in the bark through to the

wood, as shown—a slit the same as in budding. Separate the bark from the wood and insert the cion *b*, one for each slit. The number of slits for each stock will be determined



Cut of Crown Grafting.

adapts our Province, and then establish a reputation for first-class honest packages of selected high-grade fruit, and our fruit growers will be the most successful class of people in Canada.

by its size. We will suppose the stock illustrated to be six inches in diameter, and that six cions are to be inserted. The stock after receiving the six cions is shown at *c*. Grafting wax is not needed. A thick paper may be wound about the top of the stock extending about one inch above it and securely tied with a strong twine, as shown at *d*. The space above the stock encircled by the inch of paper may then be filled to the top of the paper with a puddle of soil and water, made so thin that it can be readily poured from any suitable vessel. This mud protects the surface of the wood of the stock, and excludes the air from the insertions. It gives every advantage of wax without its objections. Of course, stocks of any size may be worked in this way. One, two, or any number of cions may be inserted according to the size of the stock.

I have now given an outline of the chief causes of failure in apple growing in Ontario, and at the same time indicated how they may be overcome. I believe in the future of apple growing in Ontario, for we can grow the finest apples in the world, and our fruit is wanted. Let us grow it in that perfection to which our soil and climate so well

PEAR GROWING.

By R. L. HUGGARD, WHITBY.

The pear was a very common fruit many centuries ago. In the earliest records of the Roman nation pears were an article of commerce, and were quite common in Syria, Italy and Greece. Theophrastus speaks of the productiveness of the old pear trees, and Pliny describes the varieties as exceedingly numerous, and names many varieties, but the same authority aptly remarks, that all pears whatsoever, are but a heavy meat unless they are well boiled or baked, therefore we may fairly conclude those ancients did not have any of the Bartlets or Seckels of the present day.

In planting a pear orchard there are a few very important things to be considered: (1) The location should be (in this country) on a southern or western slope, if possible, and not on a northern or north-eastern exposure, for most varieties. (2) The soil. The best soil to grow pears on is a pretty heavy clay loam, or a loamy top with a good clay sub-soil, and as the average pear is a strong, rampant grower, a strong clay sub soil is of great importance, but the land should be thoroughly underdrained for a pear orchard as well as for any other orchard. (3) In planting, I prefer two year old trees in free growers, and three year old from the bud, for the slower growing varieties, such as Lawrence, Beurre d' Anjou, Tres Druard and others. The land should be well worked one year at least before planting, and the holes for the trees considerably larger than what is neces-

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sary to receive the roots. When planting, I always prune the roots, first cutting back to the sound wood, then set the tree in place, throw in a few shovels of loose top soil, shake the tree up and down a few times, then add a few more shovels of earth till the roots are covered, then tramp all very solid. This is just where many planters make a serious mistake in not packing the earth firmly enough when planting. If planting in spring, the pruning should be done as soon as planted and every branch should be cut away except two or three at most, and these should be cut back to a few buds of the last year's growth. Some people seem to think that when they get their trees into the ground that their work is done and in a year or two every tree should be loaded with luscious fruit, and if not, that unscrupulous agent has cheated them. They never take into account the number of hours, or even days, the trees were lying in the driving barn or woodshed before planting; or if planted immediately, the work was left to the hired man or the boys, who perhaps never helped to plant a tree of any kind. I have known many instances where a few trees were purchased for garden planting, and the ladies had to do the planting themselves or it would not have been done till all the trees would have been dried up. In a young orchard the land should be regularly kept cultivated; I usually plant a crop of corn the first year, this serves a double purpose. First, it gives the cultivation necessary to get a good crop of corn, requires thorough stirring of the ground, and second, the corn protects or shades the young trees from the sun during the hot summer. We, in Ontario, usually have held, I believe, that the ground in all young orchards should be kept cultivated for at least the first seven or eight years. Hoe crops can be grown without injury to the trees for several years after planting, provided that the land receives a good coating of manure each alternate year. The young pear trees should be kept well pruned till they get into full bearing, after which they require very little pruning of any kind.

I do not propose to speak very dogmatical on varieties, but there are certainly some kinds more hardy than others, some of which I would not be afraid to plant in suitable soil in the county of Frontenac, such as Bartlett, Beurre d'Anjou, Lawrence, Keiffer and Seckel, and make money out of them; but there are others I have tested that I would plant sparingly, viz.: Clapp's Favorite, Howell, Flemish Beauty, and some others that grow very rapidly, but do not always ripen their wood, the scions thereby becoming blighted from frozen sap. But here, Mr. President, I must close, as I suppose the rule here applies, as at the Missouri Convention, that was passed there, viz.: "Be it resolved that at this convention no discussion will be permitted on religion, politics or pear blight." Many people imagine that the pear is a short-lived tree, and conclude it's not worth the trouble to set them out, but I will give you a few facts which I think will convince the most sceptical. The pear in its wild state is more hardy and longer lived than the apple. Mr. Box mentions several that are known to be over 400 years old. One pear tree in Herefordshire, England, Loudon says, in 1805 covered more than half an acre of land, and from the fruit of it, on more than one occasion, there were fifteen hogsheads of perry made, in a single year. Another remarkable pear tree grown in Illinois, which at forty years old measured round the trunk six and one-half feet nine feet from the ground; it yielded in 1834, 184 bushels pears, and in 1840, 140 bushels.

Also along the Detroit River, on both the Canadian and the American sides, are found many very old large trees still growing and bearing fruit of quite as good quality as some of more modern origin.

You have only to ask the schoolboy of to-day, or the schoolgirl either, what is the best fruit of to-day, and they will tell you at once the pear.

"For it keeps well, it eats well, it is juicy all the year;
No other fruit compares with it, the rich, the luscious pear."

CURRANTS, AND HOW TO GROW THEM.

By R. B. WHYTE, OTTAWA.

Of all fruits that can be grown in this country the currant gives the greatest return for the labor expended. No matter how poor the soil or how careless the cultivation you can expect a crop of currants, though the difference between a box of currants such as is generally offered for sale, and a box of, say "Moore's Ruby," such as I have grown, every bunch with twenty to twenty-four berries on it, is very great, and the difference in quality is even greater. There is no fruit that responds so readily to good feeding and careful cultivation.

The best soil is a good sandy loam, which should be deeply spaded and well manured before planting, as the roots grow very close to the surface and should be interfered with as little as possible after planting.

All varieties grow freely from cuttings of the present year's growth, which do best planted in August, though very well any time before frost or in the following spring.

Make cuttings about six inches long, plant in rows a foot apart, inclining the cuttings at an angle of forty-five degrees, so that the lower end won't be too far below the surface, leaving one inch above ground; mulch with light manure or sawdust to keep the earth moist, and by the end of the following summer ninety per cent. of them will be good strong plants ready to be set out in their permanent quarters. Give them plenty of room—about six feet each way is little enough; after planting, mulch with well-rotted manure. Of course a year can be saved by buying your plants from a nurseryman, and they are sold so low now, that when only a few are wanted for home use it is the better way.

All the cultivation that is necessary the first year is to keep down weeds and pinch out the tip of any shoot that is growing too fast for the rest.

The second year there will be a few bunches of fruit, the third year enough to pay expenses, and a full crop every year after for ten or twelve years, when it is better to start a new plantation, as the finest fruit is got from bushes three to six or seven years old. Pruning after the second year consists in cutting out all surplus canes from the centre of the bush, and all that tend to lie on or close to the ground. The best season for pruning is in August after the fruit is off and wood growth has ceased.

If you want to grow the largest berries possible, in June when the new wood is about six inches long pinch out the ends of every shoot. By so doing you check wood growth and throw the energies of the plant into the fruit, and also very much reduce the amount of pruning necessary in August. Good feeding requires a mulch of three or four inches of stable manure every fall, two to three feet on each side of the row, which should be supplemented by a dressing of bone dust and a good potash fertilizer, at the rate of one and one-half pounds of the mixture to each bush in the spring. The winter mulch may be forked in *very lightly* in the spring, or may, if not objected to on the ground of untidiness, be left on all summer. The less the earth is disturbed within three feet of the stem the better, as the roots being near the surface a great deal of mischief is done by deep cultivation, even with a digging fork. A spade should never be used near currants. If the soil is very light a mulch of straw or marsh hay is very useful in conserving moisture in a dry season; but if water is available and the rake is industriously used to keep the surface friable, a mulch is not necessary.

The great enemy of the red and white currant is the "currant worm," which works such havoc in May, if not checked, destroying in a few days every leaf on the bush, and with the leaves goes the crop for that season. The first brood is hatched out in this locality about the 20th to 24th of May. As soon as they begin eating the leaves apply Paris green, one teaspoonful to a wooden pail of water, with a whisk, or better, a spray pump, being careful to get it well into the centre of the bush when the worms begin their work. One application, as a rule is enough for the season, but some years a second brood

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appears as the fruit ripens. It is not safe to use Paris green then, but a good substitute is white hellebore, about one ounce to a wood pail of water, applied in the same way as the Paris green.

The only other enemy of the currant worth considering is the currant stem borer. The parent insect lays her eggs near the buds; when hatched the larva eats into the centre of the stem, travelling up and down living upon the pith. Their presence may be detected by the sickly look of the leaves and small size of the fruit. The only remedy is to cut out the afflicted canes and burn them.

In black currants, *Leés Prolific* is a good variety, much superior in size and flavor to *Black Naples* or *Black English*. *Champion* and *Prince of Wales* are said to be good kinds, but I have not fruited them yet. The *Crandell* so industriously puffed by some nurserymen is nothing but the old *Ribes Aureum* or *Golden Currant* of old gardens, a very pretty flowering shrub but as a fruit it is utterly worthless. The crop is so small as not to be worth picking and the quality so poor that I have never met anyone that would eat a second one.

In whites, by far the most extensively grown is "*White Grape*," long considered the finest flavored of all currants. Unfortunately it is rather small in size and has a bad habit of dropping the end berries of the bunch. Last summer I fruited for the first time "*White Gondoin*" and was very much pleased with it. Though rather more acid than *White Grape* it is so much larger in bunch and berry that it will prove a formidable rival to that old favorite.

Among the reds "*Moore's Ruby*" is decidedly the best variety I know of—an upright, strong grower; bunch long—frequently twenty-two long berries in the raceme; berry large; a prolific bearer, and quality the very best, sweeter and finer flavored even than *White Grape*. I have grown it for ten years and have yet to find a fault in it.

An excellent variety is "*Wilder Red*," not so sweet as *Moore's Ruby* but very desirable, as large in bunch and berry as "*Fay*" and a much stronger grower. The weak growth of the "*Fay*" is its greatest defect; one of the largest berries, good bunch, good quality and a heavy bearer, but it is such a straggly grower and so prone to split in the forks when loaded with fruit that it will always be a short-lived bush.

A new variety much advertised, "*North Star*," does not justify the claims made for it. Though a strong grower and apparently going to be a heavy cropper, neither in size or quality is it the equal of any of those mentioned above.

"*Raby Castle*" and "*Victoria*" are two old sorts that if not the same are so nearly alike that there is no use growing both of them, heavy bearers, but only medium in size and quality.

The "*Cherry*," though a large showy berry, is too shy a bearer to be a good market variety, and too acid to be suitable for home use.

"*London Red*," though a very heavy bearer, one of the heaviest with me, is too small and too acid to be desirable.

"*Red Dutch*," though better in quality, is too small to be profitable.

SOME GOOD HERBACEOUS PERENNIALS.

By R. B. WHYTE, OTTAWA.

Herbaceous perennials are those plants whose roots remain in the ground from year to year, the foliage dying down to the surface of the ground every autumn to grow up with renewed vigor in the spring. As most plants of this class do best if their roots are not disturbed for several years, it is necessary in preparing a perennial border to dig deeply and fertilize well before planting. Though many of them are perfectly hardy without protection all are the better of a coating of four or five inches of strawy manure in the fall. Leave it on as late as possible in the spring so that the rain may wash out

the soluble plant food. As soon as growth begins rake off and remove the surplus straw and rake or very lightly fork over the surface, being careful not to disturb the roots. Never use a spade in the perennial border.

A very frequent objection to the free planting of herbaceous perennials in the garden border is that it costs too much to buy the plants. There may be some truth in this if one wants to get all the novelties as they are sent out at high prices; but there are many of them that cost little more than geraniums or other bedding plants that have to be renewed each season, and with this great advantage in favor of perennials, that they increase in vigor and beauty every year, and after the third season most of them can be divided and multiplied as much as desired; while if one is willing to wait a year many of them can be grown from seed at a very small expense.

All of the following are well tested sorts, quite hardy even in this cold section of Ontario, and vary in flowering season from the first week in May till the snow falls:

ICELAND POPPY, *Papaver Nudicaule*.—This dainty little poppy, [one of our most valued perennials, opened its first flowers on May 4th last season, and was more or less in bloom till the last of October. The flowers, in white, yellow and orange-red, of which yellow is the commonest, are somewhat cup-shaped, one and one-half to two and one-half inches across, on long, wiry stems about twelve inches above the leaves, are well adapted for cutting—if cut in the morning early after opening, they last for several days. It is easily grown from seed, and will bloom the first year if sown in April or early in May. It, like all poppies, does not take kindly to transplanting and should be sown where it is to remain. They are easily wintered, even as far north as Ottawa, if covered in the fall with straw or cedar brush.

ORIENTAL POPPY, *Papaver Orientale*.—A great contrast to the dainty little Iceland is the gorgeous Oriental Poppy, one of our most striking and showy garden flowers. The great flowers, six to eight inches across, dark scarlet in color, are held well up above the leaves on long, leafy stalks. Unfortunately the flowering season is short—only two or three weeks in June—and their glory is gone, though some years they show an old bloom during the summer. They also can easily be grown from seed and are quite hardy.

TALL LEOPARD'S BANE, *Doronicum*.—A very desirable perennial, that is not as well known as it should be is the Tall Leopard's Bane, *Doronicum plantagineum excelsum*, a very early-blooming yellow composite, coming into flower early in May, and lasting two to three months. The large flowers, about four inches across, are borne on sparsely leafy branching, stems three to four feet high, rising from a large cluster of heart-shaped leaves on long petioles, decidedly the best yellow composite. Another Leopard's Bane is *D. Caucasicum*, not so large in plant or flower, but otherwise much like it. Both are usually propagated by division in spring or fall.

DOUBLE SUNFLOWER, *Helianthus Multiflorus fl.pl.*—A deservedly popular autumn flowering yellow perennial is the Double Sunflower, rather rough in leaf and stalk to make a good cutting flower, but very effective in the garden. The flowers are from three to four inches across, a good rich yellow, perfectly double, and last a long time after opening. In bloom from August till frost comes. It has not proved perfectly hardy here, and requires the protection of a good mulch of manure during the winter.

CHINESE BELL FLOWER, *Platycodon Grandiflorum*.—This is the best blue perennial we have, and grows from two to three feet high, and is covered from middle of July till October with deep blue bell-shaped flowers, from two to three inches in diameter, perfectly hardy and easily grown from seed. If planted in May will flower abundantly the following year. There is a white form that is not so desirable, as a slight tinge of blue gives it a faded look.

The genus *Spiraea* furnishes some of our very best perennials. Among the shrubby species Van Houtti, Bumalda and many others are well worth growing where space will permit. The best of the herbaceous species are the following:—

DOUBLE-WHITE MEADOWSWEET, *Spiraea Ulmaria fl.pl.*—From a dense cluster of root leaves rise leafy stalks about three feet high, covered on the top with a solid mass of creamy-white fluffy flowers, from about July 1st to August 15th. The foliage is quite

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ornamental before and after flowering, if the flower stalks are cut out after blooming. It is propagated by division in spring or fall, and should be shifted every three or four years, as it increases so rapidly that it is apt to die in the centre of the clump if left too long in the one place.

QUEEN OF THE PRAIRIE, *S. Venusta*.—A weaker growing species. Does not make such a bushy clump as *Ulmaria*, but grows about a foot higher. The clusters of flowers are more elongated and are a bright pink in color. Season about a week later—decidedly the showiest of the herbaceous *Spiraeas*.

S. palmata elegans.—A very graceful plant, about three feet high, with flattish clusters of pink and white flowers, lighter and more delicate in growth than *Ulmaria*. Though somewhat of the same habit, it is upon the whole the most beautiful and desirable of the genus.

Phlox decussata.—The new varieties of the old-fashioned perennial *Phlox* have raised it from the position of a very common place flower, limited in color and small in size, to that of one of our most valuable perennials. From no other can we get such a mass of color in the border or such a variety of shades. One English house catalogue, 145 varieties ranging from white through all shades of pink to dark red, and from the palest violet to dark purple. Their season of bloom is from July till fall, some varieties flowering earlier than others. The first clusters are the largest and finest, but if the tops are cut off some of the shoots as soon as the buds form, they branch out and produce fine heads of flowers late in the season.

A good half dozen varieties are :

The Pearl, white.

Sir Richard Wallace, large white with violet eye.

La Soleil, lilac-rose.

Isabay, orange salmon.

August Riviere, fiery-red shaded violet.

Frau Von Spiemen, salmon pink ; a very fine sort, flowers one and one-half inches across, slightly curled inwards at the edge.

GAS PLANT, *Dictamnus Fraxinella*.—A very showy and interesting plant that should be more widely known. It increases so slowly, often growing for years without any apparent increase in size, so that it has not been very widely disseminated, very few gardens being so fortunate as to possess a good specimen. It grows about two feet high, a well established plant, being about as much in diameter, each stalk terminated by a spike of rosy flowers eight or ten inches long, at their best for a month after May 20th. The leaves resemble those of the Ash and if gently pressed emit a perfume like lemon peel, but if bruised the odour is balsamic and somewhat strong for most tastes. The volatile oil that produces this odour is secreted so freely that if a match is applied to a newly-opened flower on a hot day a slight explosion ensues.

D. F. alba is a very handsome variety with pure white flowers.

MONEYWORT OR CREEPING JENNIE, *Lysimachia Mummularia*.—If you have any place too much shaded by house or trees for any of the ordinary flowering plants, or even grass, to grow, but which you would like to have covered, try *Lysimachia Mummularia*, Money Root or Creeping Jennie, by far the best creeping perennial we have for that purpose. It spreads rapidly, rooting at the joints and throwing out lots of side branches, but as it does not produce underground shoots it is easily kept within bounds. The leaves are oval in shape, about twelve inches long, of a rich dark green color, and are produced so freely as to completely cover the ground. The flowers, bright yellow, cup-shaped, about three-fourths of an inch across, are in great abundance during June and July.

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APPENDIX I.

OUR AFFILIATED HORTICULTURAL SOCIETIES.

All members of affiliated societies receive free the *Canadian Horticulturist* (monthly), recently enlarged to include floriculture; the Annual Report of the Fruit Growers' Association of Ontario; some new flowering or fruiting plant from that Association; and a lecture at the society hall by some competent horticulturist, sent by the Ontario Association.

BELLEVILLE.

OFFICERS FOR 1897.—*President*, W. C. Reid; *1st Vice-President*, S. J. Wadden; *2nd Vice President*, William Kemp; *Secretary-Treasurer*, W. Jeffers Diamond. *Directors*.—A. M. Ketcheson, John Aris, Dr. Tracy, John Harris, James Copeland, William Connors, J. W. London, F. Davey Diamond, W. Jeffers Diamond. *Auditors*—J. W. Butterfield, William Rodburn, James A. Conger.

BRAMPTON.

OFFICERS FOR 1897.—*President*, Dr. C. Y. Moore; *1st Vice-President*, Henry Dale; *2nd Vice-President*, John Jeffers; *Secretary-Treasurer*, Henry Roberts.

BURLINGTON.

OFFICERS FOR 1897.—*President*, Geo. E. Fisher; *Vice-President*, J. S. Freeman; *Secretary Treasurer*, A. W. Peart; *Assistant-Secretary*, Geo. N. Peer. *Directors*.—Apples, E. Peart; grapes, Chas. Dynes; pears, W. V. Hopkins; peaches, John Ireland; plums, W. F. W. Fisher; cherries, T. Foster; vegetables, J. W. Bridgeman; shipping, Joseph Lindley, J. S. Freeman, O. T. Springer. *Auditors*.—J. R. Blanchard and F. Parsons. *Executive Committee*.—Dr. Husband, Alex. Reach, S. W. T. Glover.

Reports on the various fruits for the year were made by Geo. S. Fisher, on apples; A. W. Peart, grapes; H. T. Foster, small fruits; W. V. Hopkins, pears; W. F. W. Fisher, plums, and J. S. Freeman, shipping.

The President, Geo. E. Fisher, in his annual address, referred to the usefulness of the Association in promoting mutual sympathies and co-operation among its members, and in affording opportunities for the interchange of knowledge and experience. The unusual apple twig and pear blight was one of the striking features of the past season. He believed that better times were ahead of us, and that we might expect higher prices in the future than those that prevailed during the past season. The time had come, he thought, when more attention should be paid to quality and marketing. He also spoke of the possibilities of cold storage as applied to our more perishable fruits, and considered that when it was an accomplished fact, large quantities of pears and grapes, as well as tomatoes, would be shipped to Great Britain.

We are able to report another successful year for our Society. Our numbers are gaining year by year, and a deep studious interest in all pertaining to fruit-growing pervades our Association. Three regular meetings, several special ones, and the annual have been held.

At each of these, valuable information has been given. The acreage is still increasing, more particularly in the direction of smaller fruits. We believe, however, that the conditions affecting our business demand for the future *intensive* rather than *extensive* fruit culture, that we should take better care of the trees we already have rather than plant out more, and thus improve the quality and quantity per acre.

In common with the rest of the Province we had a very heavy crop of apples. Most of our members packed their own apples and sent them to the Old Country. Early in the season the twig blight did some damage to such apples as the Holland Pippin, the Ribston, the Pewaukee, Gravenstein and Snow. Pear blight too, did a good deal of mischief. Fungous diseases cut little if any figure here last season. Apples were clean, and grapes were without mildew. Of insects the Codling moth did the most damage.

During the year papers or addresses were given by Messrs. O. T. Springer on "Apples"; W. F. W. Fisher, on "Currants"; the Secretary, on "Horticultural Education"; and Mr. Beadle, of Toronto, on "Insect and Fungus Pests."

DURHAM.

OFFICERS FOR 1897.—*President*, Christopher Firth; *1st Vice-President*, G. McKech-nie; *2nd Vice-President*, Robt. McFarlane; *Secretary*, Wm. Gorsline; *Directors*, D. Jackson, Henry Parker, N. H. Campbell, Thos. Brown, Dr. James Gun, Jas. Birt, C. L. Grant, Geo. Bennie, John H. Kilmer, John Kelly.

GRIMSBY.

The annual meeting was held on the date fixed by law, and the following officers elected: *President*, Mrs. E. J. Palmer; *Vice-President*, L. Woolverton; *Second Vice-President*, Mrs. A. Pettit; *Secretary-Treasurer*, E. H. Reid; *Directors*, Mesdames D. V. Lucas, H. Smith, J. W. G. Nelles, and Messrs. A. Terryberry, W. Gibson, C. W. Van-Duzer, John Grout, A. Pettit, E. H. Reid,

It was resolved to make a distribution of potted chrysanthemums in early summer, and have a chrysanthemum show in November.

At the spring meeting, in 1896, the following paper was read:

HINTS ON THE CULTIVATION OF THE CANNA, TUBEROUS BEGONIA, SWEET PEA, AND CHRYSANTHEMUM.

BY L. WOOLVERTON.

CANNA.—I do not think cannas have yet been grown very much about Grimsby, and yet they are one of the best plants for the lawn. Massed in the rear of the pleasure ground, their tropical appearance and stately habit of growth, with their tall spikes of fiery bloom, they have a very fine effect. I am glad our Society is being the means of introducing this excellent plant into more general cultivation, and, as a result of the little packages being distributed to-night, I hope to see many lawns and gardens in Grimsby made attractive with magnificent beds of cannas.

Cannas are easy of cultivation. The great points to be observed are rich soil, moisture and sunlight. Like the dahlia, they need to be started early in March or April in the house or in a hot-bed, and then when all danger from frost is over, they may be planted out in the open ground. Plant in rich soil, working in plenty of manure first. Be sure there is no shade, and keep the soil well stirred up. If the season is dry, give a liberal quantity of water in the evening, and you will be rewarded with a brilliant show of bloom.

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The flowers of the canna have been much improved of late through the efforts of M. Crozy, the French hybridist. The variety named after him is still one of the best, some of the blooms reaching a diameter of six inches. Other good varieties are Star of 1891, and Crown Jewel. The varieties distributed this year by the Ontario Fruit Growers' Association are unnamed hybrids, many of them being hybrids of Madame Crozy. These will do well for our first experience with cannas, and another year we should try some named varieties.

The canna may also be grown in the window garden. For this purpose it should be started in the fall in six-inch pots in a warm, sunny window, with plenty of water. When pot-bound, remove to ten-inch pots, in which they will bloom freely. In the spring, plant them in the open ground and they will recover their vigor and be ready for blooming next winter.

TUBEROUS BEGONIA. I have had no success with this flower as yet, but I hope that I have learned enough from past failure to succeed during the coming season. The bulbs should be planted in pots one-half inch larger all around than the bulb itself, and scarcely deep enough to be out of sight. They should be then kept in a warm dark place until the roots have formed, and then afterwards brought to the light in a temperature of about sixty degrees. In about six weeks after the tubers start to grow, they should be shifted into five-inch pots and left in them to bloom, giving plenty of water and shading them from the hot sun. Bulbs of this flower were distributed by our Society a year ago, and very many members reported failure through mismanagement. If there are any who had success, we hope they will report to-night and describe the treatment they gave them.

SWEET PEA. The sweet pea is one of the popular flowers of the present day, and very appropriately has been placed in the list distributed among the members of our progressive society. It is not a new flower. About two hundred years ago it was introduced into England from Sicily, but in those days there were only two varieties, known as the White Sweet Pea and the Painted Lady. Though much prized for its perfume and beauty, it is only of late years that it has become a special favorite, and its present popularity is largely due to that sweet pea specialist, Mr. Henry Eckford, of Shropshire, England, who has given the world a large number of improved varieties. The greatest American sweet pea genius is Mr. W. T. Hutchins, who wrote "All about Sweet Peas," and the largest grower in the world is Mr. W. C. Moore, of California, whose sweet pea garden covers 250 acres. I take it none of us will ever want to grow so many as that, but if every member succeeds with his or her ounce of seeds, the sweet pea will be the flower in Grimsby in 1896. How shall we succeed best then?

1. By choosing a *suitable place*, not too prominent. It is a modest flower, and will be best planted at the side or rear of the house and allowed to ramble about upon chicken wire fence, over bushes, or, if you choose to take the trouble, a neat wire trellis may be built on purpose for its accommodation. Under favorable conditions it will often climb up as high as four or five feet, or sometimes more.

2. *Your soil must be rich and moist.* Thin dry soil, such as many of us have tried them on, the writer among the number, is unsuitable and will produce only failure. Such soils must have plenty of manure and plenty of water to give any good results at all.

3. *Cultivate well* until blooming time. Then, if sown thickly, thin the plants to six or seven inches apart.

4. *Plant deep.* Make drills from four to six inches deep and after sowing cover the seeds with about an inch of soil, drawing in the earth as they grow until the furrows are full.

5. *Sow early.* Any time in April will do in this latitude. Like garden peas, they are very hardy and may be given an early start with perfect safety.

6. *Pick pods* as soon as formed, or rather keep the flowers picked so closely that no pods will form.

As to varieties, Professor Bailey recommends the following as the six best: Blanch Ferry, Apple Blossom, Emily Henderson, Mrs. Gladstone, Butterfly and Countess of Radnor.

CHRYSANTHEMUMS. Since we have two named varieties of chrysanthemums on our distribution list, it is important that we consider how to plant them to obtain the best results. Any one who has attended the chrysanthemum shows, brilliant with their profusion of magnificent blooms of immense size and peculiar character, such as have been held in our cities during the past few years, will be full of enthusiasm over the possibilities in store before us in entering upon the growing of chrysanthemums, and will unite with me in the hope that our society will be able to attempt a chrysanthemum show of our own on a small scale in the autumn of 1897, if not before.

The little plants now given you should be planted at once in three-inch pots in good rich soil. Rotten sod enriched with one-third manure makes the best kind of potting soil. Be sure to firm the earth well about the roots of the plants, water and then fill up with loose earth. Set them in the shade for a few days and afterwards bring them to a sunny window. From the first to last the chrysanthemum needs an abundance of water and plenty of sunshine. As soon as the roots of the plant reaches the sides of the pot, shift to a pot six inches in diameter. This transplanting can be done without any shock to the growth of the plant, because a ball of earth will remain attached.

Sometime in June when conditions are favorable to growth, the plants may be set in the open ground for the summer, and lifted into larger pots, say nine inches in diameter, sometime in September in which they may be left to bloom. Another plan is to shift them into larger sized pots in the month of June, instead of planting them in the open ground, and to set these pots in a bed of coal ashes, where they may remain until about the first of October when they should be housed. If rain is lacking, water them frequently and never allow them to remain dry.

If you want fine blooms, one important point is thinning the buds. The enormous specimens which we see at chrysanthemum shows have been produced by removing all buds except the one which is to produce the exhibition bloom, and thus the whole strength of the plant is thrown into the one bloom. But for ordinary purposes, this method is not desirable. A better plan is simply to pinch back the leading shoot so as to secure free branching, then allow one terminal bud on each branch to mature a bloom. It is better to do this than to allow all the buds in a cluster to produce flowers.

After blooming is over, cut down the stem to within six inches of the ground and winter in the cellar. The name of the variety may be written on the pot.

I have thus attempted to give you a few brief directions for the cultivation of these flowers which we are distributing during the present season, directions which I am sure will be of as much value to myself as to any other member of this society. We hope to learn much by reading, by experience and by comparing notes with each other at our meetings, and trust that, as a result, greater skill in the production of beautiful flowers will be attained by the members of our society.

KINGARDINE.

President, A. O. Washburn; *First Vice-President*, George Sturgeon; *Second Vice-President*, Mathew McCreath; *Secretary-Treasurer*, Joseph Barker.

Directors:—W. M. Dack, E. Miller, Dr. Jno. McCrimmon, S. H. Perry, R. Malcolm, N. McPherson, A. Campbell, P. S. I., Jno. Ruettel and A. Lutterell; *Auditors*, Andrew Malcolm and John H. Leongall.

LINDSAY.

OFFICERS FOR 1896: *President*, W. M. Robson; *Vice-President*, Alex. Oathro; *Second Vice-President*, E. Chambers; *Secretary-Treasurer*, I. J. Frampton.

Directors:—W. King, Jos. Cooper, Alex. Skinner, T. Bryant, Jos. Rickaby, Thos. Connolly, T. Harrington, W. H. Stevens, J. H. Knight.

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OFFICERS FOR 1896: *President*, Oscar Boden, Esq.; *First Vice-President*, Chas. Ellis, Esq.; *Second Vice-President*, Capt. Geo. Sutherland; *Secretary-Treasurer*, A. McK. Cameron; *Auditors*, F. Abbott, Esq. and C. H. Jay, Esq.

Directors.—D. A. Ferguson, A. Tait, T. Plunkett, G. G. Albery, Jas. Trout, N. Snider, W. T. Moon, A. Gifford, and Innes Stewart.

NIAGARA FALLS.

OFFICERS FOR 1897:—*President*, W. P. Lyon; *Vice-President*, Roderick Cameron; *Second Vice-President*, Thomas Berriman; *Secretary*, E. Morden; *Treasurer*, J. G. Cadham. *Directors*, Mrs. A. Land, Mrs. James Neilson, Mrs. McNally, Miss Willox, George A. Pyper, George Law, Rev. Canon Bull.

This active flourishing society numbered over 100 members in 1896, and over fifty members already for 1897.

On March 10th, 1896, a show of house plants was made. A. McNeill, of Windsor, James Sheppard, of Queenstown, and T. Greiner, of LaSalle, N.Y., delivered instructive addresses, and a large audience heard them.

On June 18th, the Society, with many excursionists, visited Guelph. On August 27th a very fine exhibition, in which Begonias much abounded, was held. An orchestra in the evening was much appreciated; many members exhibited plants and flowers. Pomegranates, Wild Grapes and some very fine Japan Plums figured among the fruits. In November the Society gave a very fine Chrysanthemum exhibition to all comers, free of cost. The Society holds business meetings on the second Monday of each month. On the third Monday they hold open meetings to which all members and their friends are invited. Essays, lectures and discussions are in order. Fruit and flowers for name are brought to the meetings. A small flower show is often an attractive feature.

PORT DOVER.

President, James Symington; *1st Vice-President*, H. Holden; *2nd Vice-President*, Wm. Stamp; *Secretary-Treasurer*, W. J. Carpenter. *Directors*, D. Woolley, Wm. Duncan, B. Bowlby, Wm. Corbett, C. Fairchild, R. Fleming, George C. Ryerse, A. G. Rose and W. J. Carpenter; *Auditors*, L. G. Morgan and S. Maneer.

A touching tribute of respect for the memory of the first Vice-President, the late Mr. C. C. Olds, was paid by several members present, and the Secretary was instructed to forward a letter of condolence to the relatives of the deceased.

The Society was inaugurated last February (1896) with only about a dozen members. Since then, owing to the activity of its officers and members, it has now the full complement required by the law to entitle it to the Government bonus of \$100, which will help not a little to increase the efficiency and influence of the organization during the coming year. Its members comprise a good many of the most prominent and influential fruit growers and others in the district, and if the present interest in it is kept up it will prove of great value to the community. All members are entitled to a copy of the *Canadian Horticulturist*, recently enlarged and improved; also to a copy of the annual report of the Ontario Fruit Growers' Association, and a choice of one of the following: 1. New Japan Lilac; 2. Liliun Speciosum Roseum; 3. Conrath Raspberry; 4. Dempsey Pear, which is a cross between a Bartlett and a Duchess.

PICTON.

OFFICERS FOR 1897:—*President*, Thomas Bog; *1st Vice-President*, H. T. Hopkins; *2nd Vice-President*, Mrs. A. M. Terrill; *Secretary-Treasurer*, Walter T. Ross. *Directors*, John Richards, Wellington Boulter, Mrs. George W. McMullen, Mrs. H. W. Branscombe, John Davis; *Auditors*, J. F. Gillespie, Alex. McDonald.

The present number of members is sixty-six.

PORT COLBORNE.

President, E. O. Boyle; *1st Vice-President*, W. W. Knisley; *2nd Vice-President*, Rev. J. M. Smith; *Secretary-Treasurer*, A. E. Augustine. *Directors*, J. O. McRae, S. J. McCoppen, Fred Hoshcke, D. W. McKay, J. H. Smith, A. E. Augustine, Mrs. J. Steele, Mrs. Peter Welsh and Mrs. Menno Moyer; *Auditors*, Messrs. S. J. Hopkins and E. B. Milliken.

There was a gloom cast over the meeting, as one of the most active and influential members has passed away in the person of Mr. L. G. Carter who died on December 30th, at his residence "Rose Lawn." It was through Mr. Carter's efforts, that a Horticultural Society was organized here in 1895, and he was *1st Vice-President* at the time of his death.

The following resolution of sympathy to Mrs. Carter was moved by Mr. W. W. Knisley, and seconded by Mr. E. B. Milliken.

Resolved, that this society desires to place on record its sincere sorrow for the loss of Mr. L. G. Carter, who for so many years took a prominent and public spirited part in all undertakings tending to promote the progress and welfare of this community, and whose name is honorably indented with the history of this locality during the greater portion of his long and useful life and promoter of this society. That a copy of this resolution be extended to Mrs. Carter and the bereaved family and also published in the *Canadian Horticulturist* and *Welland Tribune and Telegraph*.

PORT HOPE.

OFFICERS FOR 1897:—H. H. Burnham, *President*; Wm. Craig, *1st Vice-President*; P. Brown, *2nd Vice-President*; A. W. Pringle, *Secretary-Treasurer*. *Directors*, John Smart, W. W. Renwick, T. G. Watson, Thos. Wickett and Samuel Purser. The following ladies were appointed Sub-Directors and Advisory Board:—Mrs. T. M. Benson, Mrs. H. H. Burnham, Mrs. James Robertson, Mrs. H. M. Rose, Miss Choate, Miss Evans.

SMITH'S FALLS.

OFFICERS FOR 1897:—*President*, J. S. McCallum, M.D.; *1st Vice-President*, Elliott Ballantyne; *2nd Vice-President*, Mr. Geo. Steele. *Directors*—Mrs. J. S. Foster, Mrs. W. M. Richey, Mrs. G. F. McKinnon, Miss. Alice Gould, J. M. Clark, J. A. Houston, John Rabb, R. Milliken, John Clark.

SIMCOE.

OFFICERS FOR 1897:—*President*, Rev Canon Young; *1st Vice-President*, J. H. Ansley; *2nd Vice-President*, H. H. Groff; *Secretary-Treasurer*, Henry Johnson; *Directors*—Henry Johnson, Albert Gilbert, Joseph S. Wychoff, Daniel Matthews, W. E. Tisdale, John A. Campbell, Harry A. Carter, Geo. J. McKill, Thos. Hodddow; *Auditors*—H. B. Donly, W. D. Boyd.

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WATERLOO.

The second annual meeting of the Waterloo Horticultural Society was held on Wednesday evening, January 13th, in the old Council chamber. There was a good attendance, including a number of ladies. Mr. J. Lockie, the president, occupied the chair. The Secretary read the minutes of the previous meeting, which were confirmed. The Directors' report, which is subjoined, was read by the President, and the financial statement by the Secretary. The reports were adopted.

The following office-bearers were elected for the ensuing year:—*President*, James Lockie, *1st Vice-President*, Chas. Moogk; *2nd Vice-President*, Mrs. P. Hohmeier. *Directors*—Mrs. Dr. Webb, Miss M. Bruce, Mrs. P. Gleiser, Messrs. George Bolduc, C. M. Taylor, J. H. Ross, W. A. Raymo, A. Weidenhammer; *Secretary-Treasurer*, J. H. Winkler; *Auditors*, Geo. Davidson and L. W. Shuh.

Directors' Report.

Your Directors, in making their second annual report, have much pleasure in congratulating the members on the continued success of this Society, our membership having increased to 125 the past year, each of whom received *The Canadian Horticulturist* and bound report, and we distributed in premiums 61 cherry trees, 61 plum trees, 61 pear trees, 23 spireas, 23 roses, 23 clematis, 96 cannas, 32 Dahlias, 320 gladioli, 312 house plants and 1,500 hyacinth bulbs.

The open meetings for discussion and talks on plants, fruits and flowers, have been kept up during the year, and we believe have been profitable.

On the 17th of March last the Fruit Growers' Association sent Mr. D. W. Beadle, the well known horticulturist, here who delivered an excellent lecture on "The Garden" in the Town Hall to a good audience, who showed their appreciation and interest in the subject by a number of questions at the close of the lecture.

On the 20th and 21st August the annual free exhibition of flowers, fruit and vegetables, was held in the Town Hall, and was in every respect a success. At exhibitions, where prizes are given, each class must be arranged together for comparison, but in this all were placed for effect; flowers were arranged with foliage and decorative plants, so that the beauties of all were brought out in the best manner. The arrangement of these by the ladies was admired by all, and we do not think could have been improved on.

The season having been more favorable, the exhibition of fruits and vegetables was greatly in advance of the previous year.

We found that keeping the exhibition open for two days instead of one as heretofore was a great gain, giving more time and opportunity to examine and discuss the exhibits.

The second afternoon was specially children's day, as your Directors feel that to interest the young in such things is the best guarantee of future interest and improved taste in this direction. On both evenings the hall was crowded with interested and delighted visitors. Your Directors feel that this manner of conducting the affairs of this Society (as advised by Mr. Beall) at its organization, by having its exhibitions free in every respect, no prizes, nor admission fee, but open to all is altogether the best plan, and fully carries out the intention of the Government in assisting these societies. Where prizes are given or admission charged only a few are benefited, but in this way it is made a public benefit and a practical educator.

Your Directors have much pleasure in stating that the annual meeting of the Ontario Fruit Growers' Association will be held in the Town Hall here in December next, to discuss the important question of "How to make fruit growing profitable." The leading fruit growers of Canada will be present and take part, and we trust each member of this Society will use every influence to insure a large attendance during the three days' session, and especially try and induce the farmers to attend, as the information in regard to fruit growing is certain to be of great value to all.

The reports of the Secretary-Treasurer and Auditors are before you, and we trust our successors now to be elected, and our citizens generally, will continue as hitherto to support and assist in the good work of the Waterloo Horticultural Society.

By order of the Board,

JAS. LOCKIE, President.

WATERLOO, Jan. 13th, 1897.

Financial Report.

RECEIPTS.		EXPENDITURE.	
Balance on hand from 1895.....	\$97 85	D. W. Beadle	\$1 00
Members' fees.....	125 00	Freight	1 86
Sale of bulbs	5 00	H. H. Groff.....	12 00
Government grant.....	94 00	Grimsby Nursery	49 38
		Webster Bros.....	15 04
		Fruit Growers' Association.....	25 00
		Exchange	80
		J. Lockie, bulbs	64 13
		Hoffman and others	6 45
		Printing	15 00
		Fruit Growers' Association.....	75 00
		Exchange	25
		Bricker & Diebel, cotton bags.....	2 87
		Balance on hand.....	53 07
Total	\$321 00	Total	\$321 85

WOODSTOCK.

OFFICERS FOR 1897 :—*President*, D. W. Karn ; *1st Vice-President*, G. R. Pattullo ; *2nd Vice-President*, W. H. Van Ingen ; *Treasurer*, J. S. Scarff ; *Secretary*, R. B. Thornton ; *Directors*—E. Hersee, Frank Harris, J. Silcox, F. Mitchell, Fred. Dunn, E. W. Snelgrove, M. S. Schell, T. H. Parker and W. Newton ; *Auditors*—J. Pike and T. L. Clarkson.

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CONSTITUTION AND BY-LAWS OF THE ASSOCIATION.

CONSTITUTION.

Art. I. This Association shall be called "The Fruit Growers' Association of Ontario."

Art. II. Its object shall be the advancement of the science and art of fruit culture by holding meetings for the exhibition of fruit and for the discussion of all questions relative to fruit culture, by collecting, arranging, and disseminating useful information, and by such other means as may from time to time seem advisable.

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

Art. IV. The officers of the Association shall be composed of a President, Vice-President, a Secretary, or Secretary-Treasurer, and thirteen Directors.

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

Art. VI. This Constitution may be amended by a vote of the majority of the members present at any regular meeting, notice of the proposed amendments having been given at the previous meeting.

Art. VII. The said Officers and Directors shall prepare and present at the annual meeting of the Association, a report of their proceedings during the year, in which shall be stated the names of all the members of the Association, the places of meeting during the year, and such information as the Association shall have been able to obtain on the subject of fruit culture in the Province during the year. There shall also be presented at the said annual meeting a detailed statement of the receipts and disbursements of the President during the year, which report and statement shall be entered in the journal and signed by the President as being a correct copy; and a true copy thereof, certified by the Secretary for the time being, shall be sent to the Minister of Agriculture within forty days after the holding of such annual meeting.

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

BY-LAWS.

1. The President, Vice-President and Secretary-Treasurer shall be *ex-officio* members of all committees.
2. The Directors may offer premiums to any person originating or introducing any new fruit adapted to the climate of the Province which shall possess such distinctive excellence as shall, in their opinion, render the same of special value; also for essays upon such subjects connected with fruit growing as they may designate, under such rules and regulations as they may prescribe.
3. The Secretary shall prepare an annual report containing the minutes of the proceedings of meetings during the year; a detailed statement of receipts and expenditure, the reports upon fruits received from different localities, and all essays to which prizes have been awarded, and such other information in regard to fruit culture as may have been received during the year, and submit the same to the Directors or any Committee of Directors appointed for this purpose, and, with their sanction, after presenting the same at the annual meeting, cause the same to be printed by and through the Publication Committee, and send a copy thereof to each member of the Association and to the Minister of Agriculture.
4. Seven Directors shall constitute a quorum, and if at any meeting of Directors there shall not be a quorum, the members present may adjourn the meeting from time to time until a quorum shall be obtained.
5. The annual subscription shall be due in advance at the annual meeting.
6. The President (or in case of his disability, the Vice-President), may convene special meetings at such times and places as he may deem advisable; and he shall convene such special meetings as shall be requested in writing by five members.
7. The President may deliver an address on some subject relating to the objects of the Association.
8. The Treasurer shall receive all moneys belonging to the Association, keep a correct account thereof and submit the same to the Directors at any legal meeting of such Directors, five days' notice having been previously given for that purpose.
9. The Directors shall audit and pass all accounts, which, when approved of by the President's signature, shall be submitted to and paid by the Treasurer.
10. It shall be the duty of the Secretary to keep a correct record of the proceedings of the Association, conduct the correspondence, give not less than ten days' notice of all meetings to the members, and specify the business of special meetings.
11. The Directors, touching the conduct of the Association, shall at all times have absolute power and control of the funds and property of the Association, subject however to the meaning and construction of the Constitution.
12. At special meetings no business shall be transacted except that stated in the Secretary's circular.

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13. The order of business shall be: (1) Reading of the minutes; (2) Reading of the Directors' Report; (3) Reading of the Treasurer's Report; (4) Reading of the prize essays; (5) President's Address; (6) Election of officers, and (7) Miscellaneous business.

14. These By-laws may be amended at any general meeting by a vote of two-thirds of the members present.

15. Each member of the Fruit Committee shall be charged with the duty of accumulating information touching the state of the fruit crop, the introduction of new varieties, the market value of fruits in his particular section of the country, together with such other general and useful information touching fruit interests as may be desirable, and report in writing to the Secretary of the Association on or before the fifteenth day of September in each year.

The President, Vice-President and Secretary shall be *ex-officio* members of the Board of Directors and of all Committees. The reasonable and necessary expenses of Directors and officers in attending meetings of the Board of Directors and of Committees shall be provided from the funds of the Association.

Local Fruit Growers' Association.

16. It shall be the duty of the officers and directors of the Fruit Growers' Association of Ontario to encourage the formation of local fruit growers' horticultural societies in affiliation with the Ontario Association.

17. Any one may become a member of such local society for one year upon payment into its treasury of a minimum sum of one dollar; and a compliance with clause 18 of these by-laws shall constitute him also a member of the Ontario Association for the same term.

18. On the receipt of the names of such members, with the required fees, the secretary of such local affiliated society may transmit their names and post office addresses, together with the sum of eighty cents for each to the Secretary of the Fruit Growers' Association of Ontario, who will enter their names as members of that society, entitled to all its privileges, providing the initial number of such names be not less than ten.

19. Each local society so affiliating, with a membership of not less than twenty-five, shall be entitled to a visit from some member of the board of directors or other prominent horticulturist, once a year, at their own request; it being understood that the railway expenses of such speaker shall be paid by the Ontario Society, and the entertainment provided by the local society.

20. The proceedings of such local fruit growers' horticultural societies shall, on or before the 1st day of December of each year, to be forwarded to the secretary of the Ontario Society, who may cull out such portions for the Annual Report to the Minister of Agriculture for the province, as may seem to him of general interest and value.

21. These local societies, if formed in cities, towns or incorporated villages, may be formed under the Agriculture and Arts Act (see sections 37, 46 and 47) and receive their due share of the Electoral District grant for the support of such societies.

22. Each local affiliated society is further expected to send at least one delegate to the annual meeting of the Fruit Growers' Association.

The Director of the Fruit Growers' Association of Ontario of the Agricultural District in which such society is formed, shall be *ex-officio*, a member of the executive committee of such local society and receive notices of all its meetings.

AGRICULTURAL DIVISIONS.

1. Stormont, Dundas, Glengarry, Prescott, and Cornwall.
2. Lanark North, Lanark South, Renfrew North, Renfrew South, Carleton, Russell, and the city of Ottawa.
3. Frontenac, city of Kingston, Leeds and Grenville North, Leeds South, Grenville South, and Brockville.
4. Hastings East, Hastings North, Hastings West, Addington, Lennox, and Prince Edward.
5. Durham East, Durham West, Northumberland East, Northumberland West, Peterborough East, Peterborough West, Victoria North (including Haliburton), and Victoria South.
6. York East, York North, York West, Ontario North, Ontario South, Peel, Cardwell, and city of Toronto.
7. Wellington Centre, Wellington South, Wellington West, Waterloo North, Waterloo South, Wentworth North, Wentworth South, Dufferin, Halton, and city of Hamilton.
8. Lincoln, Niagara, Welland, Haldimand, and Monck.
9. Elgin East, Elgin West, Brant North, Brant South, Oxford North, Oxford South, Norfolk North, and Norfolk South.
10. Huron East, Huron South, Huron West, Bruce North, Bruce South, Grey East, Grey North and Grey South.
11. Perth North, Perth South, Middlesex East, Middlesex North, Middlesex West, and city of London.
12. Essex North, Essex South, Kent East, Kent West, Lambton East, and Lambton West.
13. Algoma East, Algoma West, Simcoe East, Simcoe South, Simcoe West, Muskoka, Parry Sound East, Parry Sound West, Nipissing East, Nipissing West, and Manitoulin.

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