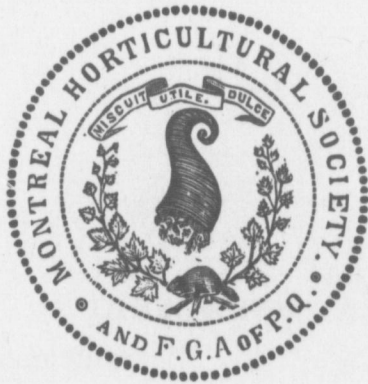


TENTH ANNUAL REPORT
OF THE
MONTREAL
HORTICULTURAL SOCIETY

AND

Fruit Growers' Association of the Province of Quebec.



1884.

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1885.

TENTH ANNUAL REPORT

MONTREAL

HORTICULTURAL SOCIETY

(The Quebec Association of the Province of Quebec)



1884

REPORT FOR THE YEAR

1884

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 Stephen, George
 Stephen, Mrs. George
 Stephens, Geo. W.
 Stephenson, W. A.
 Stevenson, P. S.
 Stevens n, Rev. Mr.
 Stevenson, R. R.
 Stewart, A. B.
 Stewart, A. Bishop
 Stewart, J. F.
 Stewart, W.
 Stimson, Chas.
 Stirling, John,
 Stroud, W. D.
 Stuart, Robt.
 Sumner, Geo.
 Superior of Seminary,
 Sutherland, Dr.

Sutton, Mrs. T.
 Tait, Melbourne,
 Taylor, J. W.
 Taylor, John,
 Tees, David
 Tees, D. J.
 Tees, Wm.
 Tempest, J. W.
 Tessier, M.
 Tester, J. W.
 Thibaudeau, J. R.
 Thomas, F. W.
 Thomas, R.
 Thompson, W. A.
 Tibbs, Percivall
 Tiffin, H. J.
 Tiffin, Jos.
 Tooke, John,
 Tooke, R. J.
 Torrance, C. E.
 Torrance, Hon. Judge
 Torrance, Jas.
 Trotter, W. C.
 Trottier, A. A.
 Trussell, G.
 Tucker, N.
 Underwood, Jos.
 Urquhart, J. B.
 Vallé, C. A.
 Vaughan, Mrs.
 Vipond, G.
 Vipond, T. S.
 Wadleigh, John.
 Wainwright, Mrs. Wm.
 Walker, A.
 Walker, J. R.
 Walker, Wm.
 Walsh, John
 Walter, Chas. H.
 Ward, Alf.
 Ward, Jos.

Ward, J. K.
 Ward, Saml.
 Warmington, R.
 Warren, W. H.
 Warrington, F. H.
 Warner, J. F.
 Watson, jr., John,
 Watson, J. C.
 Watt, Alex.
 Wayne, Mrs. John,
 Weaver, Archd.
 Webster, W. J.
 Weir, Wm.
 Weldon, Geo.
 Wells, Rev. Geo. L.
 Wheeler, Dr.
 White, Mrs. P.
 Whitney, H. D.
 Whitney, Mrs. N. S.
 Whinfield, W. A.
 Whitham, Mrs. Jas.
 Williams, Miles,
 Wilgress, Edw.
 Williamson, David
 Williamson, James
 Wilson, A. A.
 Wilson, Alf. C.
 Wilson, Danl.
 Wilson, Jas, jr.
 Wilson, J. C.
 Wilson, J. R.
 Wilson, R. C.
 Wilson, Walter
 Wiseman, Jas. L.
 Wulff, J. T.
 Wolff, R.
 Wood, Dr.
 Wood, J. B.
 Wood, O. S.
 Wright, Mrs Jas.
 Young, John M.
 Yuile, D.
 Yuile, W.
 Young, Wra.

NON-RESIDENT MEMBERS.

Abbottsford, F. G. A., Abbottsford, P.Q.

Bell, David, Forest,
 Bell, Wm., Quebec,
 Benoit, Dr. H., Napierville,
 Bordman, F. T., Vicars, Que.

Champagne, J. B., St. Gabriel de Brandon,
 Chitty, G. L., Gatineau Mills,

Dupuis, A., St. Roch des Aulnais,

Edwards, Geo. B., Covey Hill,
 Ellicott Chas., Revington, P. Q.
 Evans, D., Chelsea,

Fisher, Sydney, Knowlton,
 Fisk, J. M., Abbottsford,

Higginson, J. H. Hawkesbury,

Lacroix, H., Coaticook,

Marsan, J. J. A., Agr. school, L'Assomption,
 Merreault, Siméon, St. Jacques d'Achigan,
 McColl, Hugh, St. Joseph du Lac,
 McColl, Alex., St. Joseph du Lac,
 McLatchie, H. M., Templeton,
 McIver, Lewis, Robinson, Que.
 Morin, John, Belle Rivière,

Paradis, Rev. F.J., St-Raphael, Co. Bellechasse,
 Pattison, W. M., Clarenceville,

Rennie, Jas., Chambly Canton,
 Reay, David, Hudson, Que.
 Roach, G., Abbottsford,
 Ryland, H., Beauport, Quebec,

Turner, Francis, St. Etienne de Beauharnois,

Wood, Dr. H. W.
 Wright, A. A., Renfrew,

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MONTREAL HORTICULTURAL SOCIETY

AND

FRUIT GROWERS' ASSOCIATION OF THE PROVINCE OF QUEBEC.

ANNUAL MEETING.

REPORTS AND ELECTION OF OFFICERS.

The annual meeting of the Horticultural Society was held on the evening of Dec. 18, in the Natural History Society's Rooms, Dr. Hunt in the chair. The minutes of the previous session were read and approved, after which the president reviewed the report, hoping that the suggestion of the establishment of a Botanic Garden might be carried out.

SECRETARY'S ANNUAL REPORT FOR THE YEAR ENDING 30TH NOVEMBER, 1884.

Another year having elapsed since the last annual general meeting of the members of this society, I beg to submit the following report of the operations of the past year, and the conditions and prospects of the association at this time.

There has not been any particular change in the programme as carried out for two or three years past. Four classes of prizes were offered the past winter for the following: Class A—Gentlemen's Private Conservatories: Class B—Conservatories kept for Commercial Purposes: Class C—Conservatories kept by Amateurs; and Class D—Window Gardens. I am not aware of any other horticultural association that has chosen this particular line in which to offer prizes, but it is none the less, in my opinion, worthy of being continued and in some respects enlarged upon, were the society more amply provided with means. The wonderful improvement so noticeable in the plants shown by amateurs at the annual show, is a matter for sincere congratulation. The same statement holds good with reference, more particularly, to the plants shown in the classes for window gardens. This year, the judges appointed found the plants so exceptionally good that they recommended extra and special prizes to be given, which recommendation was carried out by the society. The names of all the prize winners in this particular branch of the society's work, will be found at page 125 of the ninth report issued the past summer.

The society succeeded last winter, in having no less than nine different conservatories opened to the members and their friends, on various dates between the 24th January and the 29th March. Besides this, special openings were made for the benefit of strangers visiting the city during Carnival week. Those to whom the association is so much indebted are as follows:—Mr. Andrew Allen, Iononteh; Mr. H. Montague Allen, Ravenscraig; Mr. W. B. Davidson, Côte St. Paul; Mr. William Lunn, Bleury street; Mr. John Molson, Sherbrooke street; Mr. David Morrice, Redpath street; Mrs. Redpath, Terrace Bank, Sherbrooke street; Mr. George Stephen, Drummond street, and Hon. Donald A. Smith, Dorchester street. As other new and fine conservatories are being added to those already in existence, the society hopes in the near future to be able to have an even more numerous list open to the members on stated occasions during the winter. While on this subject, would it not be pertinent to ask, will not some of our wealthy men come forward and place our society in a position to have a proper botanic garden of its own? We have many monuments in this city, of the munificence of its citizens; will not some turn the channel of their liberality in this direction? It is a matter of remark, our deficiency in this respect, and there is but little doubt that if the matter was taken hold of energetically, a beginning might at least be made. Many plants would doubtless be presented by individuals and kindred societies with which to make a beginning. I suggested some years ago that something might be done with Dominion Square; but so far no steps have been taken. This spot is large and central, and if turned into a really fine garden, it would be an ornament to the city and tend to enhance the appearance of the fine buildings already erected or in course of erection in the immediate neighborhood.

Matters in connection with fruit have been quiet the past season, no special efforts having been made to get hold of any of our own native varieties, having special points of excellence. Prizes were offered for the best peck of seedling apples to be sent to the society on the 1st May, but nothing new made its appearance, and the first prize was given to a seedling already shown on one or two previous occasions. It is slow work getting people to grasp the importance of what is at first sight a trivial matter—the discovery of a good seedling apple. When you reflect that the fameuse apple pours into the pockets of the farmers and orchardists of Montreal, thousands of dollars every year, the discovery of the apple we are in search of is a matter of some importance. Who is to say that among our numerous native seedlings may not yet be found an apple, which, at a different season of the year, would be as profitable to the grower as our celebrated fameuse? I think that if the society could now lay its plans and offer, instead of three prizes, half a dozen, running from, say, twenty-five dollars down, for the best half bushel of seedling apples to be shown on 1st of May, 1886, that something more effective could be done. There would then be time for those not a few persons, to come forward, who, if they had only known about it in time, could have shown a fruit superior to anything of their neighbors, in fact, just what we are looking after so anxiously. Large prizes would stimulate and they need not be awarded if the fruit was not of special merit.

As some members expressed a wish to have monthly meetings of the society for the

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purpose of discussion and reading papers, the board of directors arranged to hold four, one on the 15th February, one on the 21st March, one on the 18th April and on the 16th May. Our President Dr. Hunt, and Prof. Penhallow, went to a great deal of trouble in preparing papers. The attendance of members, however, was far from encouraging to these gentlemen. Few horticultural societies have the good fortune to have among their directors, those who are so well qualified to give information and instruction in a pleasing and popular manner. It is, therefore, a matter of regret that so few members avail themselves of their privileges. The most experienced cultivator of the soil would probably find that he had something to learn, and that there were some very simple facts in nature, the cause of which he had been heretofore in complete ignorance of, though simple enough when explained.

The library of the Society, containing several hundred books, is not appreciated by the members as it should be. Arrangements were made the past year with the caretaker of the Natural History Society's building, to deliver books to members during each day, and also to keep the room open on each Friday evening during the winter. The reports of the different Horticultural and Fruit Growers' Associations, which comprise a large proportion of the library, contain a vast amount of information from the experience and observation of the most practical growers and cultivators on the continent. Many of these men have the same difficulties of climate to contend against that we have in this Province, and their experience should be of service.

The object, however, in which the interest of most of the members centres, is the annual show, and though it is a pretty difficult matter to make one show differ very much from another, to the casual visitor, as far as general arrangement goes, even this was accomplished the past year. Owing to the Victoria Rink having been leased for the summer season, it was not possible to obtain it on the usual liberal terms. In view of this fact, the directors having failed to come to terms with the lessee, endeavored to find some other suitable place in which to hold their show. No building sufficiently large being obtainable, the lot of ground, corner of St. Catherine and City Councillors streets, was selected as being the most suitable. A deputation of the Society was appointed to call upon the gentlemen representing the Canadian Pacific Railway, the owners of the property. In view of the difficulty the Society has in finding the necessary means to carry on its operations, their liberality and consideration is well deserving of the thanks of the Association. As it was impossible to procure tents in this country sufficiently large to accommodate so considerable an exhibition, some 500 feet of shedding was erected around the outer sides of the property. The tents were reserved for the plants shown in the gardeners' class; hot house grapes, peaches, plums, etc. The apples, outdoor grapes, vegetables, cut bloom and plants shown in the amateur department, found accommodation in the sheds, which, as well as the tents, were completely filled. The exhibition was lighted by means of 26 electric lights, furnished by the Royal Electric Light Co., of this city. The effect of this fine light on the plants was very beautiful without being injurious, and the whole grounds were rendered as light as day. Most visitors were highly pleased with the change, as the weather was for the most part favorable, and it has been demonstrated that it is possible to hold a horticultural show without having a permanent building. In fact, with the facilities we now have for lighting large open

spaces, ranges of open sheds built side by side, and whose principal shelter would be the roof, would probably be the best adapted of all for horticultural exhibitions. Certainly, the plants shown this year were less injured than ever before. Some might object that sufficient protection was not afforded from theft and loss of valuable plants in such buildings. When police, however, are constantly on duty day and night, as they are at the society's and other shows, very little danger need be apprehended on this score. The society's exhibitions are only frequented, for the most part, by the better class of the community. A considerable quantity of fruit was growing in the lots adjoining the exhibition grounds this year, but none was touched, though the lots were actually part of the same property. On the first evening of the exhibition, the electric light suddenly went out, through some slight accident to the machinery; but though some 1,500 to 2,000 people were present, not even a plate of fruit was disturbed. The audience deserve not a little credit for their coolness and presence of mind in remaining where they stood, and thus avoiding what might have led to an accident. Mr. Lavigne, the leader of the city band who was present on the occasion, should not be forgotten, as his action in causing his band to play a lively air, tended to re-assure the people. The exhibition as a whole, was probably, as far as the plants were concerned, the best ever held. A very fine exhibit of palms was made by H. Mattock, gardener to Mr. R. B. Angus, for which a special prize was awarded. They occupied a large table near the entrance, and were a very attractive feature. The palms exhibited by Mr. Doyle from the conservatory of Mr. Elmenhurst, were also very fine, and in that particular class the exhibition was much ahead of anything shown here before. A magnificent collection of plants was also shown by Mr. Betrix, gardener to Mr. Andrew Allan. Among the other large exhibitors may be named Mr. Laughton, gardener to Mr. Mackay; Mr. Spriggings, Mount Royal Cemetery Co., Mount Royal Park; Mr. Pinoteau, gardener to Mr. O'Hara, and Mr. Trussell, gardener to Mr. H. R. Molson. Mr. Colin Campbell had a large exhibit of bouquets, floral designs, etc., and carried off several first prizes. The table on which all the bouquets, floral designs, etc., were exhibited was, as it always is, a most attractive feature of the exhibition. The introduction this year of prizes for six party and six corsage bouquets, produced a larger number of bouquets than usual. The tendency of the times is to spend large amounts of money on floral decorations, and very large prizes are offered at leading exhibitions in the United States in this particular line. The result is that some large and really magnificent specimens of the florist's art are produced, worthy of being a leading feature in any show. A tempting prize in this line might produce something very much finer than has yet been exhibited in Montreal. Among the plants shown by the amateurs this year, might be found some really fine specimens, those shown by Mr. F. W. Burdon being specially worthy of note; he having obtained no less than twenty-two first prizes, carrying off the largest amount of prize money in the amateur class.

The show of vegetables was good, and in some classes the number of entries was large and the competition keen. The show of honey was small; and it is somewhat strange that a larger number of exhibits do not enter for the prizes offered by the Society, if only with a view of bringing this important product before the attention of buyers in the largest market in the Dominion.

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The exhibit of fruit was magnificent, in fact, much larger than might have been expected, owing to the early date at which the exhibition took place, viz., the 9th, 10th and 11th September. To show how great is the progress made in this direction within the last few years, I give the following analysis of the outdoor fruit shown, prepared by Mr. Charles Gibb:—

“An analysis, which has been made of the exhibit of fruit at the late exhibition of the Montreal Horticultural Society, is interesting as showing the steadily increasing interest and care taken in fruit culture in this province. The collection was a remarkably fine one considering the early period at which it was held. Of apples, 1,033 plates were displayed, the largest exhibit in any one year since 1858, when the prize list was first opened, and that in two sections, to county competition. From Huntingdon, Rouville, Chateauguay and Brome counties, 412 plates of apples were entered, containing many good varieties not grown in Montreal, and of 213 plates entered in the competition for the best collection, only 74 plates were from the vicinity of this city. Of the 625 plates in the above mentioned collections, but 74 plates were grown on the Island of Montreal. Of the remaining 408 plates, assuming that one-half were grown on the island, the distribution of the whole collection would be 278 plates grown on the island, 755 in the counties beyond.

“The collection of out-door grapes numbered 196 plates, of which 97 were contributed by Wm. M. Pattison, of Clarenceville, whose large collection contained no less than fifty varieties, including all the new varieties worthy of trial. From the above it will appear how little has been done, comparatively, by the Island of Montreal, and how meagre would have been the collection, but for the help given by the counties of Huntingdon, Rouville, Chateauguay, Brome, Vaudreuil and Two Mountains. The county collections of apples contained many new varieties. Early Russian kinds, like Yellow Transparent and Charlottenthaler, which ripen on 25th July, Kellogg Russet, a seedling of Golden, but hardier and better in tree, Grand Duke Constantine, of Alexander type, and crabs larger in size than some of the apples, and of first quality as dessert fruits.”

Whatever may be the future of this society, it has for some years past done a useful work. There is still ample scope for its continuation, and, with an association so sound and so well established, its future years should be still more full of promise.

A less pleasing part of the Secretary's duty, is to explain the financial position of the Association. Owing to the heavy outlay of the Society for some years past, the present directors, on assuming office, decided to curtail the prize list somewhat; but, owing to the very full exhibition, there has actually been between \$30 and \$40 more money paid out in prizes than last year, the figures being—1883, \$1,339.31; 1884, \$1,370.38. In both the years 1882 and 1883, there was also what might be called an extraordinary income, viz.: in 1882 \$150 grant from the Citizens Committee, and in 1883 \$200 grant from the Provincial Government, in aid of publishing the annual report. There has been no revenue from either of these sources the past year. As a general thing, when the Dominion Exhibition is held in Montreal, the receipts of this society at the door are very much larger than when there is

none. The receipts from this source in 1875 were \$1,435, in 1880 \$1,002, in 1881 \$668, in 1882 \$663, and in 1884 only \$467. Undoubtedly there were not so many visitors as usual in Montreal this year, and the receipts from the door were from \$150 to \$200 less than was expected. Unfortunately, too, though nothing was paid for the use of the Exhibition Grounds, the expenses attending the fitting up of the exhibition was more than usual. The work was done at a slightly less expense than would have been incurred had the rink been leased, without allowing anything for decoration, on which it has been customary to spend from \$100 to \$150; but \$585.16, the total cost, is a large item. The exhibition at the Mile End being open at night, and the dog show being also open, doubtless contributed to reduce the receipts in a degree. To meet the deficiency, it was thought better to borrow the sum of \$300, rather than sell any of the bank stock held by the Society. Half this amount has been already paid back, leaving \$150 still to be provided for out of this year's income. If the receipts at the door had been up to even the least of former years, when a Dominion Exhibition was held here, and a building had been obtainable at the usual cost, there would, in all probability, have been a gain, instead of a loss, on the year's transactions.

The amount of fees collected from members was \$1,693, an amount never before equalled till last year, when the receipts from the same source amounted to \$80 more. Everything connected with the management of the Society has been done as economically as possible. The expenses of the report continue to be a heavy burden, there having been paid on this account alone, the sum of \$293.50 during the year. The printing of the ninth report has not yet been paid for; but it is hoped that some arrangement may be made with the Government by which they will bear this expense, as is done in Ontario. It will be the duty of the incoming directors to devise some means of equalizing the expenditure by either raising more money or decreasing the amount paid out. The labor involved in working the Society so as to make ends meet, is very great and falls on a few. More money is absolutely necessary if the Association is to carry on its work as it should be done. The large provincial exhibitions have generous grants placed at their disposal to meet any deficiency in the receipts from the public. We have nothing of this sort; and when the directors feel that a mere change in the weather, over which they certainly have no control, may place the Society in a position of inability to meet its engagements, some means should be devised to free them from any such annoyance. Mr. Cheney again continued his handsome prize for the best bunch of hot-house grapes, and Mr. Alex. Armour was the fortunate winner. Mr. E. J. Maxwell also offered some prizes for plants grown and shown by children. Miss Jack, of Chateauguay Basin, has also intimated her intention of offering two prizes, open to children, for the two best roses shown at the next year's exhibition. Mr. J. B. Cartwright also proposes to offer a prize of \$5 to \$10 for the best kept front garden plot, the rental of the house not to exceed \$160 per annum. Perhaps other members might be induced to follow this good example, and thereby aid the Society. It is very many years since a mid-summer show was held. Perhaps such an exhibition would be in accord with the wishes of the members of the Society, instead of the regular fall show. The prize

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list of such a show need not be nearly so large, and it would at least have the charm of novelty.

His Excellency the Governor-General paid a hurried visit to the show late in the afternoon of the first day. He was accompanied also by several members of the Provincial Government. Owing to the non-receipt of the letter announcing his intended visit, the directors were not present to receive him. However, accompanied by your secretary, he made a hurried examination of the exhibits and expressed himself as much pleased, especially with the fruits. It was unfortunate, though unavoidable, that so good an opportunity of explaining the work of the Society was lost. Mr. G. Cheney and Mr. Chas. Gibb, two of the gentlemen elected by the Board at the last annual meeting, resigned during the season, and Messrs. G. L. Marler and D. J. Descarries were elected to fill their places. Mr. Cheney was elected vice-president, and on his retiring, the late Mr. G. L. Marler was elected to the vacant position. The Society have to regret the loss of several very old members by death during the past year. Few men, however, took so great an interest in the object of this and kindred societies as our late vice-president, and we, in common with other associations, in his removal have sustained the loss of an active and very useful member, whose place will not be very easily filled.

It has been suggested by a member of the Society that it would be well to offer some gold medals to be competed for annually, but not to become the property of the exhibitor until won two or three times. If accompanied by a small money prize, to be paid the winner each year, the suggestion might be worthy of consideration.

The books of the Society have been audited and found correct by Messrs. J. M. M. Duff and Jas. McGregor. The balance on hand is \$54.16, exclusive of about \$100, members' fees, collected on account of the year 1885.

The Society again brought a number of their judges from a distance, and as the gentlemen selected were well qualified for their position, the awards made have, with few exceptions, given complete satisfaction. The judges in the apple and outdoor grape department, were very much aided by the appointment of a committee of our local fruit growers to examine the fruit shown, in order to guard against improper naming, and the exhibition in collections of more than one plate of fruit of the same variety but under a different name. This plan is so admirable that it should be continued, and adds another to the long list of excellent suggestions received from Mr. Chas. Gibb.

The ninth report made its appearance in due course during the summer, and the Society is again under obligation to the Report Committee and its painstaking secretary, Mr. R. W. Shepherd, Jr., for their admirable work.

An effort was made to have the society represented at the New Orleans Exhibition, by sending there a collection of our apples. The Dominion Government was approached on the subject, but failing to obtain a grant of money to do the work properly, the project had to be abandoned.

The society is again greatly indebted to the press of Montreal for their friendly

aid in helping forward the society's objects, recognizing that we aim at the advancement of our common country. The directors had the pleasure of meeting the representatives of most of the city newspapers at the Judges' Lunch, on the opening of the show. I venture to hope that we may have the pleasure of meeting them on some future occasion, and that a better opportunity may be afforded of explaining to them the working of the association.

I thank the members for their kind consideration of myself in a somewhat arduous position, and I beg to assure them that in everything I have done, I have striven to advance the well-being of the association.

HENRY S. EVANS,
Secretary-Treasurer.

On motion of Mr. Gunning, seconded by Mr. J. Torrance, the report was adopted. Messrs. Jack and Torrance were appointed scrutineers for the election of directors, when the following gentlemen were chosen:—Professor Penballow, Dr. T. S. Hunt, R. W. Shepherd, Jr., J. Beatrix, Charles Gibb, William Evans, R. Brodie, E. J. Maxwell, J. Doyle.

The Report Committee was also elected—C. Gibb, Professor Penballow, R. W. Shepherd, Dr. J. B. Edwards, J. McKenna, J. Doyle, R. Brodie, Jr.

Library Committee—Charles Gibb, Dr. Andres, Professor Penballow, H. S. Evans.

A meeting of the Board of Directors was held immediately after adjournment for the election of officers, with the following result:—

President.—Dr. T. Sterry Hunt.

Vice-President.—Professor Penballow.

Secretary and Treasurer.—H. S. Evans.

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 BOTANIC GARDENS, †

BY PROF. PENHALLOW.

Among those who are fortunate enough to know our fair city, either by personal acquaintance or through indirect channels, Montreal enjoys a deservedly high reputation for her many attractions, not the least of which is our unequalled Mount Royal Park. It now appears that initiative steps have been taken in a movement which, if successful, will augment these attractions in a most important manner by the establishment of a botanic garden with suitable conservatories. The scheme is a most comprehensive one, and is of such importance, not only to the city but to the Dominion at large, that we feel it desirable to lay it before our readers in all its aspects.

It has long been felt by the Horticultural Society that Canada was placed at a great disadvantage among other nations, in not having a suitable garden where plants could be tested in their climatic adaptations, and their economic value accurately determined. This found expression in the annual report of the Secretary for 1880; and in his report for 1884, submitted at the annual meeting in December last, he again called attention to the necessities of the case, and hoped that action might be taken at some future date. At an early meeting of the directors, it was decided that the question was one of such importance, and the necessities so obvious, that it was deemed desirable to at once take decisive steps. A plan was therefore elaborated for the establishment of a botanic garden and arboretum, which, while distinct as to locality, should, in a measure, at least, be under the same general management. Negotiations were at once opened with the proper authorities, looking to the establishment of a garden for herbaceous plants, together with proper conservatories and propagating houses, in a central location. These negotiations are now pending, and the results will be announced in due season.*

Within a few days the city authorities have been approached with reference to establishing the arboretum on Mount Royal, as a feature of the Park, and it was then learned that a garden was contemplated in the original park plan, but that its realization has been delayed for want of funds to meet the expense. The proposition of the Society, however, met with such favor that a special committee from the Board

† These articles were originally contributed as editorials to the *Daily Star*, and appeared in that paper during the month of March, 1885.

*Since this was written the plan has been somewhat modified, and the intention now is to combine both garden and arboretum in one, within the limits of the Park.

of Directors was invited to meet the Park Committee of the City Council on the afternoon of February 12th. A general statement of the proposed plans was presented, and important facts were cited to show the great value of such an institution both to the city and the Dominion. The Society was represented by Dr. T. Sterry Hunt, President; Prof. Penhallow, Vice-President, and David R. McCord, Esq. As the meeting was a preliminary one, no definite results were reached, but the interchange of views led to the subject being referred for more careful consideration at an early date, when it is to be hoped decided measures may be adopted for the proper execution of this most desirable scheme. The general features of the plan for the establishment of an arboretum are as follows:—

As the name indicates, it is designed to utilize a certain tract of land—we will say ten acres or more as necessity may require—for the growth of trees and shrubs, not only from all parts of the Dominion but from other parts of the world. The arrangement of all the different species and varieties introduced, should be such as to exhibit in the best manner, the natural relationships, and if, in addition to this, each tree and shrub has a suitable label, the whole garden will be a most valuable source of instruction to a very large class of citizens who could obtain the information in no other way. As a means of popular instruction, then, the arboretum would be invaluable, while it should also admit of very substantial advantages being derived by the various educational institutions of the city for the benefit of their students, since it is designed that the grounds shall be free to the public, as are other parts of the Park.

In its practical aspects, it is contemplated to make the arboretum a place where the climatic adaptations and economic values of plants may be accurately determined, and this at once displays a very large field of usefulness in which the whole of Canada has an interest, since by such means it will be possible to avail ourselves at comparatively short notice, and upon the basis of reliable and authoritative information, of numbers of trees and shrubs from other parts of the world which may prove of great value here as elsewhere.

Other directions of usefulness suggest themselves, and if in the future it should be found desirable to extend the functions of the arboretum beyond those indicated, it will be very easy to increase its usefulness by following somewhat in the same lines pursued by older establishments of a similar kind, such as those found all over Europe and in the Arnold Arboretum at Brookline, Mass. The distribution of seeds; the distribution of authoritative information as to the care of trees, the proper method of pruning, transplanting, etc., etc.; dissemination of information concerning improved methods of arboriculture; popular instruction in subjects relating to general horticulture; and as a repository of information for the benefit of gardeners, who could feel sure of gaining authoritative information on subjects connected with their calling; all these are directions in which an enlarged and legitimate, as well as very important field of usefulness may be found.

The history of similar institutions elsewhere, shows that their usefulness in all these directions is meeting with greater recognition and appreciation every year, and their importance as a means of popular instruction to a very large class of

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people, who neither have the time nor money to spend in special education, is very great, and, as in the case of the Kew Gardens, is gaining greater recognition from this particular class.

The gardens at Kew, England, are without doubt the largest and most fully equipped in the world, and both in this and in the amount and character of the work performed, may be taken as the type which other gardens may well follow; we shall, therefore, in our endeavors to show good and substantial reasons for the establishment of a similar institution here, have frequent occasion to cite the results which are now being obtained at Kew; not, however, that we aspire to surpassing or even equalling them, but that so far as the special needs of this country and climate are concerned, efforts should always be directed towards them as the standard which it might be possible to realize.

The question of maintenance is a very important one in this connection. An establishment of this character requires to be independent, while at the same time the interests of the public demand that the grounds should be open to all without restriction, and that there should be no necessity for resorting to the sale of produce for a revenue. It is very essential that there should be nothing of the nature of a commercial enterprise, and whatever material is distributed to other gardens or to the city, should be in the nature of exchanges, and this would bring ample compensation in new material for planting. To secure this, it is essential that a fund should be provided, from which a reliable and adequate revenue could be drawn.

GARDENS OF THE WORLD.

The first question which naturally arises in dealing with a problem of this kind is, is there a trustworthy precedent? The answer is to be found in the example which most of the civilized nations of the earth have already set us, and in which ample justification will be found for all that is contemplated in the plan now proposed for Canada. From the most trustworthy information at hand, the various countries of the world have been classified according to the botanic gardens which they support, as follows:

1. Germany, 32; II. Italy, 24; III. France, 22; IV. Austria, British Islands and immediate dependencies, Russia, 12 each; V. British India, 9; VI. Belgium, 6; VII. Switzerland, 5; VIII. Australia, Cape Colony and Natal, Holland, Scandinavia, West Indies, 4 each; IX. Portugal, United States, 3 each; X. Algeria, French Indies, Roumania, Spain, 2 each; XI. Brazil, British Guiana, Canary Islands, Chili, Denmark, Dutch Indies, Egypt, Equador, Guatemala, Greece, Hong Kong, Japan, Mauritius, New Zealand, Peru, Philippines, Servia, Siberia, Tasmania, 1 each; XII. Argentine Republic, Canada, Colombia, Mexico, Paraguay, Turkey, Uruguay, Venezuela, none.

It is thus seen in the first place, that Canada is placed in a most unenviable position as compared with the other progressive nations, since she is forced into the list with those nations of least enterprise and in the lower scale of civilization. She even stands lower than Japan.

In the long list of gardens—one hundred and eighty-seven in all—here given, there is abundant evidence that they must serve a most useful purpose, and what their value is, we shall see later on. But it is interesting to note that in Germany, the country which leads the world in science, there are not less than thirty-two gardens, or 17.1 per cent. of the whole number, and there must be very substantial reasons indeed, reasons which are not based upon sentimental views, to lead such an eminently practical people to maintain so many similar establishments at a large annual outlay. In Europe, these gardens are divided between educational institutions—chiefly universities—and the State. In the former case they are maintained because of their value in technical education; in the second case they are supported to promote special industrial interests, and in both cases they serve a most important purpose as a means of popular education and as mere ornamental grounds. In the United States, of the very meagre number of properly established botanic gardens there found, one is maintained at Washington by the Central Government, for experimental and ornamental purposes, while the other two, the garden at Cambridge and the arboretum at Brookline, belong to Harvard University; and they serve a most important purpose, not only in technical education of a high order, but in the diffusion of knowledge of the greatest practical value to the country at large. In other countries, as in the tropics, the gardens are not generally connected with educational institutions, and their functions are of a more practical nature, since they are designed chiefly to test the economic values, and determine the characteristics of the plants growing in that region, thus permitting the acquisition of exact knowledge in much shorter time and with greater reliability than would be possible otherwise.

As one of the largest of the British colonies, occupying a very important geographical position, and with most important and extensive resources which demand an accurate knowledge of plants with reference to climatic adaptations and economic value, Canada should at least be on a par with the other colonies, and should be able to effect interchange of desirable vegetable growths with all other countries where similar climatic conditions obtain, but as the case actually stands, she is to-day behind even the most remote colony of Oceanica, and cannot claim equality with Japan, a country which is generally considered to have been half civilized until within a very few years, but which, notwithstanding, maintained a botanic garden for a number of years before the present European contact. It may be urged in this connection that no other colony has an equally severe climate, and this we are disposed to grant, but as will appear later, this fact does not constitute an actual obstacle. To be sure, we cannot adopt the same methods or reap the same advantages as in tropical countries where vegetation is more spontaneous, nor can we expect so rich a collection as would be possible in England, but the character of the vegetation, as well as its distribution in Canada, most conclusively show that a botanic garden would have as legitimate purpose and definite value for the necessities of this country and climate, as elsewhere. Indeed, it may with reason be urged that the necessity of a garden is fully as great, if not greater, as we proceed farther north into those latitudes where the range of desirable species is more limited, and in consequence of which it becomes important to secure as many valuable exotics from similar climates as possible.

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Another argument which might very properly be brought forward in this connection, is to be found in the relations between institutions of this character and the advancement of a people in culture and all the higher elements of an advanced civilization. The influence which springs from the habitual contemplation of and reflection upon natural objects is well defined and is known to be a most important factor in individual education; and where beauty is one of the chief elements in the object, the effect must be of a high order. Thus, through the individual, the national character is directly effected in a way and with a strength which legislation would be powerless to accomplish, and if we push this argument to its logical conclusion, we at once see that, other things being equal, the number of gardens and similar institutions supported by a people becomes a direct index of their degree of civilization. An examination of the classification given makes this obvious, as also does the history, both ancient and modern, of those nations which have at various times led the world.

From the facts and statements here presented, therefore, it is obvious that in justice to herself, Canada can hardly afford to do less than those nations over whom she claims superiority, while her interests actually demand that she should be among the foremost of nations in her maintenance of such gardens.

EDUCATIONAL VALUE.

Of the one hundred and eighty-seven gardens of the world, it appears that at least fifty-eight, or 31 per cent. of the whole number, are directly connected with and maintained by educational institutions, most of which rank as Universities. This may be taken, therefore, as a direct measure of their value and importance in higher education. Of the remaining sixty-nine per cent., however, we must bear in mind that, while maintained chiefly for practical results, many of them undoubtedly afford valuable means of instruction to students of those colleges and smaller institutions, which could not maintain gardens for themselves, so that we may reasonably consider their value in this direction more properly represented by a much higher percentage.

The requirements of the present day necessitate a broad and liberal foundation in education, no matter in what particular direction a man's tastes or circumstances may afterwards lead him in the choice of a profession, and now that we are slowly beginning to recognize the superior advantages of more practical methods in education, and of that system which, through its practical methods, will best fit a man to cope with the general problems of life, we have to admit the natural sciences as most important features of our system. For the general student, no less than the future specialist, a botanic garden thus becomes a most important element in liberal culture. By its collections from various parts of the world, it gives the student a new insight into nature and tends to most healthy mental expansion. To the intending specialist, it is the source of material which could be obtained elsewhere only with great difficulty, if at all.

Aside from their more special value for the education of students, they are indirectly of great service to the public at large, through the opportunities which they afford for gardeners of all kinds to gain fresh and valuable information concerning their occu-

pation. They are repositories of reliable information and advanced methods, and an intelligent gardener is sure to derive great benefit from them, not only from observation of the plants grown and their particular arrangements, but he is able to secure at first hand, definite and reliable knowledge with reference to the proper treatment of trees and plants in all respects, and for a country with large forestry interests to care for, this is a most important consideration. In various parts of Europe, where the care of forests is conducted upon scientific principles, and placed in the hands of a suitably educated person, all such details as pruning, transplanting and the treatment of disease are regarded as matters of great importance, which must be carefully looked after. And thus, while it may not be a necessary function of a garden or arboretum to give special instruction in such matters, yet it can exert a most potent influence in this direction, in a quiet way and without special effort.

Kew, however, affords a most valuable example of what such a garden may do in educating gardeners to a better understanding of their calling, while the results of their work also demonstrate, not only the need for consideration of the necessities of this class, but the appreciation with which it is received at their hands, as well. For some years it has been the custom there, to hold classes two evenings in the week during nine months of the year, for instruction in elementary chemistry, physics and meteorology. The attendance has been good from the first, but according to the official report, it would appear that in 1880, these lectures had become so popular in meeting an actual want, that the accommodations were insufficient to meet the demand.

A third aspect of the educational value of such institutions in any community, is to be found in their influence upon the public at large; and this comes not only through rendering scientific work and names popular, but through a constant moral and social elevation. The habit of reflection, which unconsciously springs from the frequent contemplation of natural objects, particularly when the prevailing laws are well defined, engenders higher ideals, a clearer moral perception and a less morbid disposition, and there is thus a constant tendency to turn men from the commission of deeds which are a disgrace to humanity, to the performance of that which is worthy of a noble manhood. It is unquestionably true that, in communities having frequent access to such institutions, there is the greatest intelligence and refinement, and we doubt not that, no more certain means of reducing the long list of crimes now annually recorded, could be adopted, than by gradual education of the lower classes through popular channels of this kind. If we examine the record of annual visitation at Kew, we will doubtless see this more clearly. Taking four years at random, we find in 1879 a total visitation of 569,134, which, from unusual causes, represented a decrease over the previous year, of 156,288. In 1880, there was 723,681, or an increase of 154,547 over 1879. In 1881, there was an increase of 112,995 giving a total of 836,676; while in 1882, there was an increase of 407,490, giving the surprising total of 1,244,166 visitors for the year. Furthermore, the maximum visitation for any one day in the four years, was 95,300; the average daily visitation for the whole period was 2,310, and for the year 1882, it was 3,409.

We next turn to the special bank holidays of which there are four mentioned in the official report, in order to determine what particular class is affected and to what

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extent. It is safe to say that upon such special days of freedom; any particular increase in number of visitors, would represent directly the very class it is most desirable to reach, viz., the clerks, artisans, etc., etc. And we may, therefore, take the visitation at such times as practically an index of the degree to which this class is affected. For each of the four bank holidays, therefore, the visitation in 1880 ranged from 864 to 61,831; in 1881 from 1,131 to 50,688, and in 1882 from 1,460 to 95,300 in a single day. If we then examine the relation which this visitation on special days bears to that for the same year, we get the following values; for 1880 it was 16.2 per cent.; 1881, 17 per cent., and for 1882 it was 18.4; and these figures are the more impressive, since we find with increasing visitation each year, the visitors from the working class not only held their full percentage proportion, but actually increased from year to year at the rate of about one per cent. If we now bear in mind that these gardens are but one-twelfth of all similar institutions in Great Britain, we will realize that they appeal to a very large constituency, of which a very considerable percentage represents the class which it is most desirable to reach. Also, the annual increase in number of visitors is a most convincing proof, not only that the work of these gardens is meeting with increased appreciation, but that their efforts are directed in a way which appeals to and meets the popular wants.

SCIENTIFIC VALUE.

Aside from their specific value in promoting the diffusion of scientific knowledge through the education of students, botanic gardens may very properly be regarded as capable of exerting an important influence upon the advancement of pure science, by the encouragement to original research which they offer, particularly in those which are liberally endowed, and thus able to embrace a wide field of usefulness.

One of the first and most obvious directions in which their efforts may thus be turned, is to be found in the exact determination and classification of plants from all parts of the world. It thus becomes one of the most imperative duties of a garden of high order, to give authoritative information concerning, not alone plants which are new to science, but those which are new to the particular region in which the garden is situated, as well, since such classification is a most necessary preliminary to, it is in fact a basis of, other knowledge of a more practical character. The plants of a region once accurately described; their peculiar habits of growth, geographical distribution and particular associations carefully determined, all other facts concerning them will follow in natural order and have far more significance. As a necessary outcome of such studies, large herbaria gradually accumulate and ultimately come to serve as most important means of reference, when questions arise with reference to the flora of a given region, whether from a purely scientific or practical point of view.

As the direct outcome of concentrated advantages thus placed at the disposal of the competent student, we may cite such important works as Bentley & Trimen's *Medicinal Plants*; Watson's voluminous *Flora of California*; the various works on botany by Dr. Gray; the invaluable *Tenth Census Report* by Prof. Sargent, on the *Forestry of North America*, and the indispensable *Genera Plantarum* of Bentham

and Hooker; and while we unhesitatingly admit the great value of such works, we cannot but feel that their realization would be very difficult, were it not for the special facilities for such work afforded by the gardens at Cambridge, U.S., and Kew, England, from which they have emanated.

A second direction of scientific utility, is readily found in promoting study and research in those fields where the results obtained ultimately come to have a definite practical value in their application to the solution of questions bearing upon important industries; and this is chiefly to be found in the encouragement to, and opportunities for researches in vegetable physiology. It is not essential or desirable that a botanic garden should assume the functions of an experiment station proper—although in one sense it is such—but in questions of a purely botanical nature, it offers a stimulus to the prosecution of such researches, which might not be found elsewhere. It is, first of all, desirable to keep in mind that all botanical questions, however practical it is desirable their ultimate bearings may become, must first of all be approached in their scientific aspects. When these are clearly understood, the application of the principles thus made clear, follows naturally and with comparatively little difficulty. Thus studies relating to the potato disease, diseases of fruits, grape mildew, the coffee disease, and many others of a similar nature, may be cited as conspicuous examples. All of these, however, first require to be dealt with from a purely scientific point of view, as the exact knowledge thus obtained affords the only certain basis for further operations to combat and overcome. But we are well aware that the ultimate bearing of such studies must have a most important industrial aspect, as is readily seen in the case of the coffee disease, where a large and most important industry is threatened with destruction.

The rapid denudation of vast areas, through consumption of the timber which once covered them, is already leading to many interesting and difficult problems for solution. As a means of checking the disastrous results which may well be anticipated from this cause, attention is being directed to the special planting and care of trees, and to the better care of those yet undisturbed. The natural outcome of this has been a careful and scientific study of trees, with reference to the best methods of repairing injury and treating the diseases to which they are subject. Germany has already made great progress in this direction, and we may reasonably expect other countries to follow at no distant day. Here again, we have the purely scientific and the practical meeting on common grounds. Important practical results are achieved, and large industries are directly effected through the application of principles derived from scientific methods in the consideration of each particular case, and all these must be regarded as springing primarily from the stimulus and opportunities afforded by gardens and similar institutions.

These facts then, may be taken as indicating the direction in which such institutions may be of great scientific value, particularly where there is a practical application in the end. It would hardly be wise to expect one garden to actually undertake all the work here indicated, and, indeed, it is apparent that to do so would require an extensive plant. Each garden should actually undertake only such parts of this work as is justified by the requirements of its location and the strength of its

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resources. The facts brought forward, however, render it fairly clear that, however much the functions may be limited to one or more of these lines of usefulness, the garden must exercise a very sensible and important, though silent influence, in every direction.

PRACTICAL VALUE.

The value of a botanic garden, so far as practical results are concerned, may be considered from several standpoints. Perhaps the first and most obvious of these is found in the distribution of seeds and plants. In this connection, we may reasonably suppose this material to be first of all distributed to various parts of the country in which the garden is located, and for which it essentially becomes the testing ground. We thus may have valuable shade or timber trees quickly brought to the notice of a very large constituency through channels which give the information thus conveyed, the full weight of authority. After these wants are supplied, the surplus material will readily find ample outlet in distribution to more remote countries, where it will be likely to have specific value. We may also assume with reason, that this distribution does not alone concern those plants which have been introduced and found to be adapted to the climate and popular needs, but that it involves indigenous species, through the wide dissemination of which, by such means, the native flora becomes more generally and favorably known. Usually such distribution takes the form of exchange, by which means the least burden of expense is imposed upon all concerned, while it also secures reciprocal advantages. Examples of this are to be found in all the larger and older establishments of this kind, now found in various parts of the world.

In certain cases, when the garden derives a measure of support or other substantial advantages from the city or district in which it is located, it may offer an equivalent by supplying such trees as may be required for street purposes, and bedding material for public grounds, thus directly extending its value as an educator of the public, in a way which will bring the most permanent good to the greatest number. In these respects, as in so many others, the gardens at Kew have set an example which may well be followed by all others. From the official reports, it would appear that for the four years from 1879 to 1882 inclusive, there were distributed 8,703 packages of seeds; 20,167 stove and greenhouse plants; 4,817 herbaceous plants, and 12,458 trees and shrubs, to a total of 730 recipients. If we bear in mind that the parties receiving this material were in all parts of the world, we will at once perceive the far-reaching and great value of this work. Individuals frequently receive their share, but the larger portion constantly and primarily goes directly to other centres for study, propagation, trial and redistribution. It appears, however, that during the latter three years of this period, the London parks were directly benefitted by this distribution, since 7,730 trees went to them alone. Cities, as a rule, are far too deficient in shade trees for the public health and comfort, and in this one direction alone, gardens may accomplish much good.

The special interchange of trees and plants, with a view to directly utilizing whatever desirable qualities they may possess, presents a second phase of the practi-

cal value of such gardens. This we at once recognize if we call to mind the resources now placed at the disposal of the landscape gardener through the introduction of valuable ornamental plants from abroad. What is true in this respect, is also equally true in the case of those plants which are the source of valuable timber; which yield valuable fruit; which possess important medicinal properties, or which serve as the source whence is obtained valuable textile, cordage or paper material. The results of Mr. Gibb's efforts for the introduction of Russian fruits into Canada, offer a very strong argument in favor of our statement. In fact, such interchange at once opens up a very wide and important field of usefulness.

Each year witnesses important additions to our economic plants, and doubtless many still remain to be discovered to the general public. Such acquisitions, however, require to be carefully and systematically tested, not only in their climatic adaptations, but in the direction of their special applications. Were it not for this, the introduction of new plants might be left largely in the hands of the horticulturists; but men of this class, following such a business for a livelihood, have little time or inclination, and far less preparation for the work required. They rather depend upon seeking their knowledge of the plants they raise, from authoritative centres.

Yet another aspect of the question, is found in the possibility of distributing the knowledge thus obtained, with all the weight which authority can give. The particular mode of distribution may be largely determined by circumstances. Special publication should be issued, as is frequently the case; or by consultation and observation on the part of those desiring special information, or by means of correspondence. The best evidence to be adduced in support of these statements, is to be found in the work actually performed in this direction.

During the four years from 1879 to 1882 inclusive, the gardens at Kew issued, or were the direct means through which their preparation and publication were realized, no less than fifty-eight (58) separate works, some of them of a very voluminous character, conveying the information there accumulated concerning a great variety of subjects. At the same time, correspondence and special examinations, or the results of continued observations upon trial plants, have been published from time to time, and thus has been given a very wide distribution of information upon a great variety of subjects and of the most valuable character.

An idea of this may be gained from the following summary for 3 years, in which the figures indicate number of plants examined or number of reports made, or both together. We thus have, woods and timbers, 14; textiles, 7; paper materials, 20; food products, 34; perfumes and oils, 8; diseases, 7; fodder plants, 13; resin and wax, 5; India rubber, 39; medicinal plants, 23; dyes, 1; poisonous plants, 1; sundries, 5. In conclusion, it is only necessary to direct attention to the very important bearing which this information has upon large commercial enterprises, since it deals directly with the distribution, adaptation and special value of plants and trees, which are the source of mahogany, india rubbers, gutta percha, chinchona alkaloids and their substitutes, indigo, textile and paper materials and important food products, no less than with the diseases which often exert a most serious influence upon many of these industries.

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CONCLUSION.

Any question which may have arisen with reference to our being too far north for a garden to meet with success, has already been met in a general way in our previous considerations, and it only remains to point out that gardens are successfully maintained in other parts of the world, where the climatic conditions are equally severe. We find that there are gardens at Christiana, Stockholm, Upsala, St. Petersburg, Kasan and Moscow, as well as at Helsingfors; let us, then, institute a comparison with these places. Montreal is situated in about $45^{\circ}30'$ N. lat.; while Christiana, Upsala, Helsingfors and St. Petersburg lie close along the parallel of 60° N. and Stockholm at about $59^{\circ}20'$. Latitude alone, however, does not afford a safe means of comparison, as is well known, since other considerations have an important modifying influence upon the climate of particular localities. The mean annual isotherm of Montreal is 41° F., and this is found to pass through Christiana and Stockholm, but considerably to the south of St. Petersburg, Helsingfors and Kasan, and somewhat to the south of Moscow. Quebec, in a latitude of about $46^{\circ}49'$, and thus more than a degree north of Montreal, lies in the mean isothermal line of 36° F. This latter passes well to the north of Christiana and Stockholm, but passes directly through St. Petersburg. It then bends to the south and passes somewhat to the north of Moscow, but well to the south of Kasan. From this it appears that there are at least two gardens in climates as cold or colder than Quebec, while there are no less than six gardens successfully maintained in climates of equal or greater severity than that of Montreal.

The growing season usually opens, in the vicinity of Montreal, the first week of May, and it continues well into the autumn, thus giving five months duration to the vegetative period. Within that time growth is rapid, and a varied flora is developed. Moreover, it is a well known fact that, owing to the very considerable warmth of our summers, it is quite possible to bring to maturity, Indian corn, peaches, grapes and other fruits which it is not possible to ripen properly in any of the places here compared, or even in England. It thus becomes reasonably clear that, no serious difficulty is to be met with here in climatic severity.

It is probably true that no other city of the Dominion can claim so many important educational institutions, representing so wide a range of interests as Montreal; and thus, as the educational centre of the country, it becomes highly desirable, if not a necessity, that a garden should be established here. More than that, also, its position in many respects, makes Montreal a natural centre for all such purposes as the acclimatization of plants. Trees and shrubs grown here will be able to meet the slightly colder climate of all such more northern places, where they would be likely to be grown, without injury. Any location farther south and west, would be of much less value, as the plants would then be adapted to warmer climatic conditions, and would not be adapted to the more northern localities for which they might be needed. Plants grown in Montreal could be safely distributed throughout the Dominion.

We may now briefly recapitulate our main points, to show concisely in what particular direction good may be expected from such an institution:—

1. In its relations to the public at large, it will serve as a means of popularizing botanical science, while at the same time it will afford a most invaluable means of recreation and instruction to the laboring classes, and its final effect must be a gradual elevation of the public sentiment.

2. In its relation to special education, it will serve a most important purpose, both in technical and general instruction. If the present plans are successfully executed, the garden will be so located and so managed, that all the educational institutions of the city may derive an equal measure of benefit upon common grounds.

3. In its relation to the city, there should be no difficulty, under proper arrangements and in return for advantages such as land, etc., in the way of supplying the city with such plants as are needed for bedding-out purposes, and such trees as are required for the streets, which at present are altogether too destitute.

4. In its relation to the Dominion, at large, the garden may directly become a valuable centre of information, and, under proper conditions, even a centre of experimentation. That it will exert a most important influence upon Dominion interests, goes without the saying; since such a garden, unless its efforts are confined to exceedingly narrow limits, must, in the necessary fulfilment of its purpose, extend its influence even beyond the boundary line of the country in which it is located. We may therefore expect forestry and its dependent industries, and whatever pertains to the cultivation and care of trees and plants, to receive important benefits. Beyond this, as already shown, important industries must be largely influenced and promoted by the information which it is within the power of such an institution to distribute.

Finally, we may venture to suggest that such undertakings are not to be successfully prosecuted without the sinews of war, which, in this case, appear as dollars, and it is earnestly to be hoped that the general public will so far appreciate the need of such a garden here, that the efforts now being made, will meet with substantial financial encouragement from the city, the province, the Dominion, and even from private individuals.

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SIBERIAN APPLES AND THEIR HYBRIDS.

BY CHARLES GIBB, ABBOTSFORD, P.Q.

It is of the hybrids between the Siberian crab and the common apple that I specially wish to speak, a class of fruit of great value in our cold climate.

I find that I have fruited 29 varieties. When I began work on my farm in the spring of 1873, I planted root grafts of eighteen kinds. These were from Minnesota and Wisconsin. By degrees I obtained about ten more kinds, most of them from the West. I was in search of a race of fruits that might be grown successfully to the north of us, in regions where our apples could not be grown. A new rival has since appeared. The Russian apple will enable us to extend our area of apple culture northward. Let us remember, however, that the hardiest known form of the apple, is the Cherry crab of Siberia. Such is the opinion of Mr. Peter M. Gideon, as tested by the climate of Excelsior, Minnesota. Such was pretty much the opinion of apple growers as given to me in Kazan, in Russia, the coldest profitable orchard region of the Old World, where the "Chinese apple," or as we would say the Siberian *Prunifolia* Crab was said to bear extremes of cold which the apple could not. At Fergus Falls, Minnesota, 300 miles North West of St. Paul, in the orchard of Mr. Alexander Angus, it was very evident to me that a number of these crab hybrids, which I describe below, were many degrees hardier than the Duchess growing alongside of them.

Let us weigh the merits and demerits of the crab apple.

The good points are: 1st, hardiness and productiveness; 2nd, early bearing; 3rd, thinness of skin of the fruit; 4th, brisk, sprightly flavor. The weak points are: 1st, smallness of size of fruit; 2nd, astringent or "puckery" flavor.

Most of the kinds described below, combine all these good points, with increased size, and in many cases without the slightest astringency of flavor.

In the North-western States many varieties of the crab apple are very unpopular, in fact, thrown aside as worthless, owing to their tendency to blight; fortunately, however, injury from blight is rare with us.

I must, however, specially warn those who grow crab-apples, that the smallest crab can produce as good a codling worm as the finest apple, and that inferior crabs, whose fruit is not worth picking, may produce a numbers of codling moths and may thus be a source of great loss to the owner of an orchard.

The following nineteen varieties I will describe more or less in their order of ripening. They may all be considered hardy trees and early bearers, unless stated otherwise.

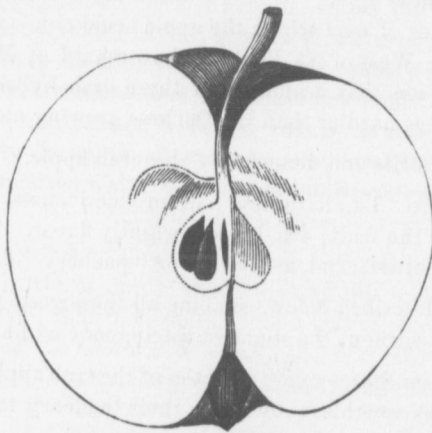
EARLY STRAWBERRY (*of Minnesota*).—This is a fruit about the size of Transcendent; striped, and mostly covered with red; of fine texture, brisk and sprightly in

flavor; free from astringency, and ripens with Red Astrachan; hence its special promise of usefulness, as an early, edible fruit, better in quality than Red Astrachan, and one that can be grown in climates where that variety cannot. I used to think that it might be grown profitably for near market, but I fear the early Russian apples of the Early Transparent and Charlotenthaler class, hardy trees, and heavy and young bearers, are fruits of far greater market value. I might add that the Early Strawberry, though not an early bearer, is a good bearer, and the fruit very good for canning.

HESPER ROSE (*of Minnesota*).—This is larger than the above. The past season, unusually fine; like small, highly-colored Fameuse; very fine in texture, yet somewhat flat and insipid, and inferior to the above.

I. X. L. (*of Wisconsin*).—This is a soft texture, pale yellow, non-astringent, sub-acid crab, in flavor somewhat like a second-rate Bergamot pear, but lacking in character, and not equal to some others.

BRIERS SWEET (*of Wisconsin*).—This is a cross between Bailey's Sweet, and Transcendent, by A. G. Tuttle, Baraboo, Wis. It is a fruit of decided beauty, of large size, and free from astringency. It lacks Siberian sprightliness, yet is a nice crab for eating, and good for baking. The tree, though hardier than our fameuse, does not appear to be as hardy as some others.



WHITNEY'S No. 20 CRAB.

WHITNEY'S No. 20 (*of Illinois*).—I tasted this about fourteen years ago, at the orchard of Mr. A. R. Whitney, Franklin Grove, Ill., and was much struck with its fine texture and good flavor. Mr. Tuttle mentioned it to me at the time, as the best crab he knew of. I find that this tree, on account of its hardiness, is becoming a favorite with nurserymen in the neighborhood of Minneapolis. On account of its large size, good color and fine quality, it is well worth growing. It is, however, a fruit that decays rapidly after it is ripe.

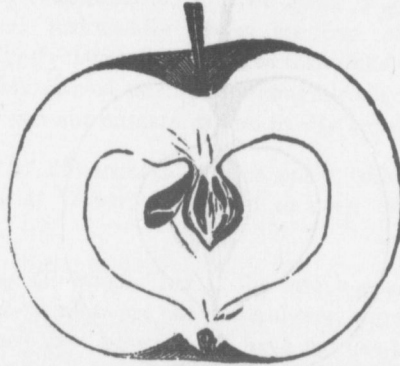
ALLEN (*of Wisconsin*).—This is a good sized, oblong, yellow crab, with a bright red side; a mild sub-acid, with a very peculiar flavor.

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GENERAL GRANT, (*of Minnesota*).—A crab of very large size, and sometimes very dark in color. It is also a hardy tree, and a young and abundant bearer. It really bears an immense amount of fruit, which would be good for cooking. It might be useful farther north. I do not seem to want it either for home use or for market, and have cut all my trees down.

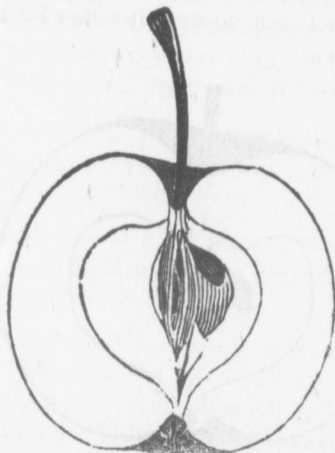


GIBB CRAB.

GIBB, (*of Wisconsin*).—This is a seedling raised by Geo. P. Peffer, of Pewaukee, and named, it would seem, after the man who first observed it to be bearing in Mr. Peffer's orchard. It is a seedling of the Siberian, fertilized by Fall Greening. The fruit is large in size, averaging two inches across, by an inch in depth. I have grown specimens which were three inches in diameter. The skin is yellow, with a blush of dull red on one side; flesh remarkably yellow, crisp and juicy, with a rich mingling of acidity and sweetness. Its astringency is so slight that it is hardly perceptible, unless specially looked for. The flesh is quite firm, but breaking, though not melting, until it becomes mellow and ceases to be crisp. Its thinness of skin and sprightliness of flavor are Siberian characteristics which make it a favorite. In competition for the prize "Best plate of Crabs," it has invariably taken the first prize, except on two occasions, when the judges ruled it out as not being a Crab. The tree is a slow grower, and did not appear to me to be specially hardy, though a report from Crookston, Minn., has spoken of it as promising to prove hardy there. It has borne heavily with me for the last four years. It is also my favorite crab for canning. It is as yellow as a Crawford Peach, and has much of the richness of a plum of the yellow gage type, yet too sweet for constant use. Season from Sept. 15th to 30th. I see in the last report of Wisconsin Horticultural Society, this variety is named among the "6 best Crabs." If ever I originate a good fruit I ought to name it "Peffer."

GENEVA, (*of Illinois*).—This has also been known as Lady Elgin, and is considered the finest in quality of the Marengo Group. Mr. J. J. Thomas and others have spoken very strongly of its fine quality. With me it has been a crab of medium beauty, fine in texture, non-astringent, of good flavor, but somewhat lacking in spicyness. The tree, too, is of slender and feeble growth for a crab.

HESPER BLUSH, (*of Minnesota*).—To all intents and purposes this is a small apple with some astringency. It is larger than Transcendent, an early and profuse bearer, but not worthy of cultivation.



ORANGE CRAB.

ORANGE, (*of Minnesota*).—This is an unusually young and heavy bearer of fruit the size of Transcendent. The skin is thin, and it is free from astringency, not as rich in flavor as Gibb, yet nice for eating, and a good canning crab. A good crab for home use. For market it is the wrong color. Its season, from Sept. 15th to Oct. 15th, is not a time when crab apples are in special demand.

SWEET RUSSET, (*of Minnesota*).—This is a fruit I rather like. It is lacking in beauty, and not of large size, but a fruit of good quality, like a sweetish russet, peculiar and not easy to describe. The tree is a good grower, but not as young a bearer as some others.

MINNESOTA, (*of Minnesota*).—This is a large fruit, variable both in size and form. Sometimes we find it about twice the size of Transcendent, with a stalk two inches in length. I have also had specimens the exact size and form of a good peach apple with a stalk not more than half an inch in length. It is not to say an early bearer, and has never borne heavily with me until the past year. The fruit is of good quality, sub-acid, inclining to sweet. I saw trees of it at Fergus Falls which seemed quite hardy and doing well, and Mr. Underwood, of Lake City, Minn., told me that it was a tree that was in fair demand.

AIKEN'S STRIPED WINTER, (*of Iowa*).—When looking over the Minnesota collection at the Centennial I heard a person remark that "There is our Striped Winter Crab." The originator of this crab, Mr. Aiken, was much surprised to find it on exhibition. He was still more surprised to hear that I was growing it in Eastern Canada. The tree is not as hardy as some others, but it is a good grower, and a heavy biennial bearer. The fruit is a little smaller than Transcendent, usually a

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good red on one side, thin skinned, and a good sharp acid. Not a winter, but a late fall fruit. It has many good points about it, and yet is not of special value.

Several of these crabs, noted as coming from Minnesota, originated near or perhaps some of them with Mr. Aiken, in Iowa, but quite close to the Minnesota boundary. They have, however, always been noted as Minnesota varieties.

GOLDEN SWEET (*of Wisconsin*).—As grown by its originator, Mr. J. S. Stickney, of Wawautosa, Wis., this had usually proved free from astringency, and its thinness of skin and brisk, sprightly flavor caused me to take quite a fancy to it. In my own orchard it has invariably proved astringent, though it is good for baking. It should be tried in some very extreme climate, where hardly anything else will grow.

QUAKER BEAUTY (*of Minnesota*).—A nice, spicy, rather acid, little crab, not of special size or of special beauty. It is said to keep till March, but with me till October or November.

MARENGO No. 1 (*of Illinois*).—This is the late keeper of the Marengo group. Dr. Charles Andrews took me to see the original tree, a grand old tree, bearing fruit of larger size than I have ever grown it. I have but one tree in orchard, and what little fruit it has borne has been small in size and very astringent. I shall cut it down.

MEEDER'S WINTER (*of Minnesota*).—This has been a favorite with Dr. Hoskins, of Newport, Vt., who speaks of its spicy and rich dessert qualities. It is a little undersized, but is thin in skin, of good color, good in flavor and in texture, and keeps till December. A nice variety to have one tree of.

SOULARD (*of the Western States*).—Is interesting to a botanist as a sample of the *Pyrus Coronaria* (American wild sweet-scented crab). To a fruit grower it has but one point of merit: it is the longest keeper in this list of crabs. Its flavor is bitter, and acrid beyond anything one might expect; yet it is said to be as unfair thus to judge it as to test a quince uncooked. There is truth in this. Still, I find baked Soulard a failure. Stewed, it largely loses its astringency, but not its bitterness, even with an amount of sugar that would spoil cranberries; yet, with a little lemon in it and lots of cream, it makes *fair* apple sauce. Its merit is that it keeps. In spring it loses its acidity but not its bitterness. It *might* be of use in a time of famine.

The four following kinds I know too little of to insert in the foregoing list:—

VAN WYCK'S SWEET (*of Fishkill, N. Y.*).—I planted two three-year-old trees of this ten years ago, but I have not had more than eight or ten specimens of fruit from them. The fruit is not of special beauty, and judging from my own samples, and others which I saw at Dr. Hoskins' at Newport, Vt., they are not as rich in flavor as I expected. Dr. Hoskins complained that the tree had not proved hardy in nursery.

JUDAH (*so called*).—The origin of this variety I do not know. It has been grown

in the garden of Mr. Judah, in rear of his house in Dorchester street west, whence grafts were procured by Mr. Wm. Middleton, late of Montreal. It is a very beautiful, dark-colored crab, scarcely an inch in breadth, and sometimes two inches in length. When well grown, one of the handsomest crabs on the tables of the Montreal Horticultural Society. It is, however, very astringent. What few samples I have grown have been defective and worthless.

MILTON (*of Wisconsin*).—This is a seedling which has been disseminated by Mr. J. C. Plumb, of Milton, Wis. It fruited with me for the first time this summer. A bright red crab, tender, delicate and of fine quality. Season about the middle of September.

LAKE WINTER (*of Wisconsin*).—This also has been disseminated by Mr. Plumb. Both this and the above are very hardy and satisfactory trees. The fruit, as borne this last year, was a little larger than Transcendent. It is partially red, and evidently a good keeper. Unfortunately, I forgot to taste it.

The following four kinds I have not fruited:—

ROSE OF STANSTEAD.—This has been grown largely in the Stanstead and St. Francis districts. It is an early and beautifully colored fruit of fine grain and fine quality. In some orchards I have noticed that the fruit is defective, but am told by those who have grown it that this is exceptional. This variety combines fine quality with good size and deep rich color. It ripens soon after Red Astrachan.

WHEELER'S SCARLET (*of Knowlton, Que.*).—A beautiful fruit of a peculiar carmine color, unlike any other variety I know. It is of good size, but quite astringent and fit only for cooking.

BAILEY'S CRIMSON (*of New York*).—This is a seedling produced by Mr. John W. Bailey, of Plattsburg, N.Y. I saw the parent tree at Mr. Bailey's in full bearing. It is a fine hardy tree, a good grower and a good bearer. The fruit is of fair size, in color mostly a dark crimson, often purplish on one side. The flesh is yellowish, sub-acid, fine-grained and fine-flavored, but I think slightly astringent. In this crab we have great beauty combined with good quality.

ROTTOT.—This is a variety which is grown at Mount St. Hilaire. A few barrels of it may sometimes be seen from there on the St. Hyacinthe market. I believe this to be the same as what I have seen growing at Abbotsford and Rougemont. It is of medium size, conic, and as deeply colored as a Hyslop, and mildly acid and free from astringency. This variety combines beauty with good quality.

The following well known kinds I will note next.

MONTREAL WAXEN.—This is the variety known in Ontario and in the States, as the Montreal Beauty—the mistake is a very old one, as one may see in 1st report Montreal Hort. Soc., 1876, p. 17. Of late years it has been largely sold about Stanstead under the name of Queen's Choice. It is an invariably early and heavy bearer. The fruit has good size and beauty, and fair color, but is slightly astringent.

MONTREAL BEAUTY.—Is but little known except in the Province of Quebec. It, like the above, seems to have been a seedling of the late Robert Cleghorn, of Blink-bonnie Garden, in Sherbrooke Street; and its right to its name is attested by the fact that all the nurserymen of the past generation, except one, propagated it as such. The fruit is well known. It has perhaps higher color, but a thicker and less transparent skin than the above, and is more astringent. Tree not as hardy.

TRANSCENDENT.—This possibly may be a true Siberian (*Pyrus prunifolia*). If so, it is the first that I have mentioned, that is not a hybrid of the Siberian Crab and the apple. Its origin is unknown. It is such a hardy and thrifty growing nursery tree that it has been largely planted, especially in unfavorable localities for apple growing in the North-West, where, some years ago, whole orchards of it were planted as a market fruit for culinary use. Its weak point is its astringency, which makes it a cooking fruit only.

HYSLOP.—This variety bears less than Transcendent, but has sold at slightly higher rates, on account of its great beauty and slightly prolonged keeping qualities. It is even more astringent than Transcendent, yet is good for cooking. Once at a hotel, in Vermont, I tasted Hyslop pie; the astringency of the fruit was scarcely perceptible; the skin so thin that it was not noticeable in texture; but its deep color had stained the fruit red.

RED SIBERIAN, YELLOW SIBERIAN, and other crabs of this class, are useful as jelly crabs, or perhaps the larger kinds for canning. For jelly, small size and astringency matter but little; deep color is the special thing needed.

CHERRY CRAB, CURRENT CRAB, &c., are another species from Siberia, known as the berry crab (*Pyrus Baccata*). The cherry is grown to a fair extent for jelly, and may be known by the falling off of its segments, leaving the fruit berry-like. This species also crosses with the common apple. As early as 1807, the late T. A. Knight obtained prizes in England for the Siberian Harvey, seedling of the cherry-crab pollenized by Golden Harvey—Foxley, from Cherry and Golden Pippin, and others were produced at the same time, but were considered of value for cider only, or mainly. The Cherry Crab has been found by Mr. Peter M. Gideon, Excelsior, Minn., to be the hardiest known variety of the crab, hardier than Red or Yellow Siberian, much hardier than Transcendent.

Enough I have said to show the value of these Siberian hybrids, a race of fruit of great value in our climate.

THE FORM OF APPLE TREE FOR THE NORTH,

BY R. W. SHEPHERD, JR.

"Every fruit tree, grown in the open orchard or garden, as a common standard, should be allowed to take its natural form, the whole efforts of the pruner going no further than to take out all weak and crowded branches"—truly wrote the late Chas. Downing. But I would go further and say "every fruit tree grown in the nursery orchard, &c., &c. &c."

It is, I think, an acknowledged fact that one of the first principles to success in orcharding in this northern climate, is the selection of hardy varieties; but a second and equally important one is a healthy, well-formed tree.

The question naturally arises, what is a well-formed tree?

Most writers on fruit culture would have us believe that a handsome, symmetrical head to a nursery tree is greatly to be desired, and they generally have a chapter or two on the principles and practice of pruning fruit trees—the object being to instruct the reader how to prune his tree to form a symmetrical head.

We must, of course, remember that most of the best American authorities such as Downing, Thomas, Barry and others, who have written on this subject, experience climate much milder than the Province of Quebec.

It would seem to be the chief object of most nurserymen to raise large (therefore, in the eyes of the purchaser) saleable trees *in as little time as possible*.

Thrifty trees may be made saleable at two years from the setting out of root grafts, by forcing the growth and allowing the young trees to branch out the second year, from the topmost buds of the first year's growth. The wood at the top of the yearling shoot, in almost all cases, is soft and unripe, and branches should never be allowed to start from unripened wood. But the unscrupulous nurseryman cannot afford to cut back his trees and wait another year, that branches may start only from well ripened wood of the second year's growth. It would not pay. In order, therefore, to have this two year old tree *saleable*, it must branch sufficiently high from the ground, and from the topmost buds. He cannot afford to rub off any intermediate buds, because the branches would then be too low, therefore, they must necessarily start from near the same point at the top of the stem of the young tree, *like the ribs of an umbrella*. This is of no consequence, he thinks, for the inexperienced purchaser will not find fault; on the contrary, if the tree be tall, stout and handsome enough, he will be quite well pleased with his purchase.

A branched two year old tree would take the form of *Fig. I.*

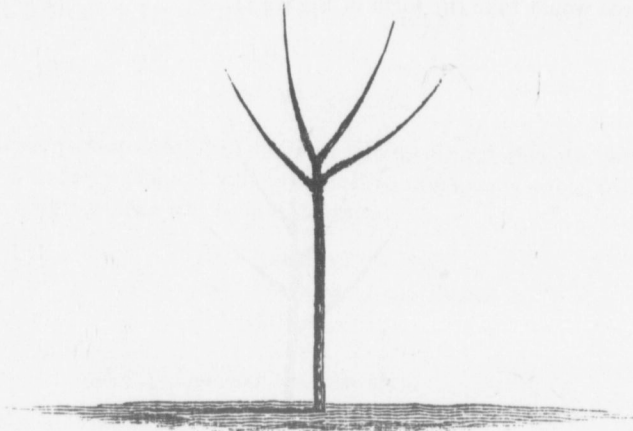


FIG. I.

Experience has proved this to be a bad form of tree for our climate, yet, how often do we see such trees sent out from some of our most enterprising nurseries? Unbranched two year old trees may be set out in orchard and grow well, soon getting established; but branched trees of that age, if they be not *iron clad* varieties, ought not to be set out at all. The branches which have been allowed to start from the unripe wood, will, in course of a few years, break off in high winds, at the point of junction with the trunk, disclosing rot and decay—caused by forcing the tree to branch a year too soon. When branches are allowed to start so near together (as in Fig. I.) a handsome head may be had, but, as the tree grows, and the branches become larger and closer together at the trunk (forming a basket, as it were), they are a receptacle for wet and dirt in summer, and snow and ice in winter. The repeated melting of the snow in the day, and subsequent formation of ice at night in the month of March each year, is the cause, in my humble opinion, why so many trees are found to have the bark killed on the upper sides of their branches near the trunk, and which growers frequently attribute to the so-called “blight.” This bad form of tree may perhaps be the result of ignorance as well as design on the part of the nurseryman; but in these progressive days when competition is considered the “life of trade,” the temptation is great to produce saleable trees at two years from the setting out of the root graft.

In training a nursery tree of the grade of hardiness of *Fameuse*, I would allow the branches to start, only from thoroughly well ripened wood. The tree must not be allowed to put forth branches until the third year.

The second spring, cut down the yearling shoot until ripe wood is reached, training the tree up the second year in the form of a stick, rubbing off all incipient branches, if the tree should attempt to put them forth.

The third spring, cut down the stick again until you get to good sound wood.

Train the topmost bud to shoot up perpendicularly, to form a central stem, and induce lateral branches to start from buds, not less than four inches from each other.

Such a tree would take the form of Figure II.

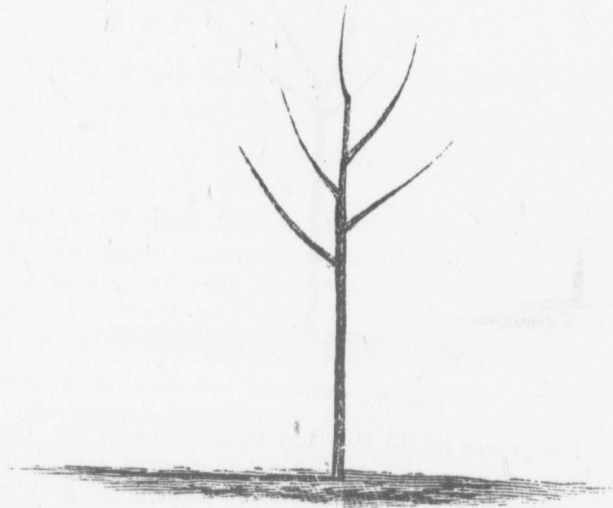


FIG. II.

I maintain that it is all important to encourage the growth of the central stem, as making the best form of tree to withstand our severe winters.

If a healthy tree (I say healthy, advisedly; for it is a waste of time to attempt to alter the form of a weak unhealthy one), in orchard partook of the spreading "umbrella" form, I would induce the growth of a central stem by tying up the most convenient branch in such a manner as to cultivate an upright growth, and by pinching the ends of the other branches in the growing season, encourage the more rapid growth of that branch.

That Mr. Downing was correct in his assertion that "*trees should be allowed to take their natural form,*" is proved by closely observing the form of seedling trees growing in hedges and out of the way places; they are, generally, healthy trees, "survivals of the fittest," which more closely resemble the form of Figure II. than the artificial form of Figure I.

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THE CULTURE OF THE STRAWBERRY PLANT IN THE DISTRICT OF
QUEBEC.

COL. W. RHODES.

I have been requested by the Montreal Horticultural Society, to furnish some notes on the Strawberry plant. I will do so, and as much as possible, from a practical point of view. My remarks will be divided into—

- 1st. Nature of the Soil.
- 2nd. Varieties of the Plants.
- 3rd. Markets.

NATURE OF THE SOIL.

To ascertain whether the farm, proposed to be placed in strawberry cultivation, is naturally well adapted for the purpose, a personal inspection of the land will soon discover whether the wild strawberry has established its home there? The wild variety, being Alpine in its characteristics, soon makes its presence known, and a very diminutive fruit gatherer can say where the sweetest and finest berries grow. An examination of the soil will then show you the material which the plant loves best; it is generally porous, well drained, and in this neighbourhood it is shaley, (Bituminous shale) or a sandy loam. The field ought to be one where the grass is not winter-killed; for instance, to make a strawberry field where snow is often removed in the winter would not be a good selection, but any field where there are two feet of snow in the month of January, and where the land is sufficiently porous to prevent pools of water forming, would answer well, providing the other conditions existed, viz., shale or sand. Boggy land, (Savanne) is too cold and wet for the delicate strawberry, the same may be said of strong clay. The weeds I have found to fight the best battle in a strawberry field, are dandelion, cow-thistle, red and white clover, common dock and joint-grass, and these, if not carefully attended to, will soon overcome the standard crop. Strawberries also love shelter, which may be got by spreading straw, or any non-weed-sowing substance, in October or November, so that the snow may collect as it does on stubble, in a field where grain has been reaped. If the land is sufficiently porous so that a stick can be easily run into it, or in the summer, if a horse-hoe can keep two inches of soil to act as a mulch, then, in the spring, the necessary fertilizer can be placed on the surface and so enrich the plant by a constant liquid manuring. The best guide to the land, however, is the natural one,—look for wild strawberry plants, dandelions and docks; if these are growing well (Prize) you may stick in a garden strawberry-plant and expect to pick fine fruit in due season, but follow nature as closely as you can,—the plant you want to grow is the production of some skilled horticulturist who, by his art and his patience, has produced a monster berry, (say of seven inches in circumference) which will flourish only for a few years, and pass into oblivion; you, therefore, want all the assistance nature can give.

VARIETIES OF THE PLANT.

The finest flavoured strawberries are the Alpine and the wild varieties. The wild berries, such as are sold in the markets, surpass all others in flavour, and as they are picked ready for cooking, they usually make the best jam, but they do not answer so well for preserves, as the larger berries which retain their shape better. I have cultivated the wild varieties, they respond well to cultivation, but the fruit when picked, looks like cheap market berries and does not produce those exclamations of pleasure which usually accompany a dish of strawberries; there are no "oh! oh's!" and nothing is said about "big berries," but the remarks are finished with an often repeated statement of "I prefer their flavour," as if the speaker only about half believed his own words. My policy has always been to grow the finest fruit, it is sold in quantities in the market. I mean by the word "fine" the variety which will bring 15c. per quart, whilst others, such as Wilson's Albany, only fetch 7c. I do not think much attention ought to be paid to any particular variety, as most of those that have gained any reputation were, a few years ago, very expensive plants; there is the law of the "survival of the fittest" and what is wanted is a good growing plant that is sufficiently strong in constitution to survive the battle in winter, when death has the advantage over life.

Our system has been to collect the runners as soon as they make the first leap, transfer them to the nursery where they are planted in close rows three inches apart and about the same distance in each row, they then can be shaded and watered, so that each one of them will grow. Being occasionally given a light dressing of good dry manure, the plants are left till spring, when they are planted as soon as possible, in order that their early growth may not be interrupted. I recommend the rows to be three feet apart and the plants to be placed every twelve inches, the object of leaving three feet is to give plenty of room for horse culture, and for the manure dressing, which will occupy the space of a foot where the plants are growing; this dressing is necessary, for the fruit, if allowed to rest on the ground, becomes "gritty" after a rain-storm. It is not absolutely necessary, however, to use manure, as other mulches will do as well, but the space of three feet ought to be provided in the first plantation. I have found in very dry weather, stirring the ground with a horse-hoe is very nearly equal to a good shower of rain,—there are also other advantages in allowing this space (three feet), the pickers are not so liable to injure the unripe fruit. The distance of twelve inches between each plant (though rather close), does not make such large gaps between the plants, if one of them fails, and as there are only two profitable crops to come from the plantation, it is most important to have plenty of room between the rows. The manure we use, is mixed dung (about six inches in length). This is placed over the plants in the month of May before the flower stalks appear, by which time any weeds left from the winter can have been destroyed. I generally pass a light roller pretty quickly over the young plants, as soon as they are put in the rows, and afterwards over the manure in the spring; this presses down both soil and manure and prevents the latter from being blown out of place—strawberries are fond of pressure. With regard to the runners, we give them one good cleaning in September, and then leave the balance to be winter-killed, so that in the spring,

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there is nothing left but the old plants; the last will generally be found thriving, if they are not more than three years old and have not been in an ice-pond all winter.

Plants of the *Triomphe de Ghent* type, for market, and of the Alpine, for private gardens, are the best varieties; the fancy are merely fashionable and profitable only to the seller, who asks big figures for his new strawberry with its attractive name of a presidential, military or naval sounding.

THE MARKETS.

There are few parts of the labour of growing fruit, so easy to attend to and so frequently neglected, as the preparations for market. Fruit ought to be dressed up in a pretty and coquettish way, especially strawberries, which compete with beauty for the palm, consequently, let the red strawberry have the assistance of a green background. This color throws out the red and makes it more brilliant and more attractive; as this fruit is delicate, the cases ought not to be too heavy. Market boys and girls bang things about, in fact this type of labor originated with trunk smashers, who are only too glad of the excuse of "weight" to make their calling more agreeable to them.

My cases are made to hold two tiers of quart boxes, of fifteen each (with a tray between them) equal to thirty quarts in a case; these at 20 cents, figure to six dollars, at 15 cents to \$4.50. Either price is not too much for a seaside customer, and those which cannot be eaten fresh, may be preserved, so nothing is lost. Such cases as I refer to have large augur holes in their sides. The covers are put on with screws, and they can be made, trayed, painted and all ready for market, (with a "Return to Colonel Rhodes" in very bright red paint), the whole for seventy-five cents each. They ought to be prepared in the winter, so that they will be ready. The quart boxes are procured when navigation opens; they can always be bought, but as they are sometimes damp, it is as well to get them about one month before the crop is ready. Our boxes come from W. B. Chisholm, Oakville, Ontario, who furnishes everything in the fruit box line, but I do not like his cases, as they are too large and too heavy; besides, their color (wood) does not show off the fruit; his picking baskets, however, are very useful. In picking the berries, I find the contract system the best; one cent or one cent and a half per quart. In this way the picker has an interest to pick all fruit within reach, and as the grower (it is to be hoped) has only grown good berries, a fairer sample of fruit goes to market. When fruit is picked honestly, the seller has another advantage in selling, as he can empty the box before the buyer, thus getting rid of the fruit's stale appearance, which was creating hesitation in the mind of the purchaser. Fruit when packed and manipulated, gives the idea of a "rogue" being in the neighborhood, and causes suspicion and distrust, disagreeable to the honest fruit merchant, whose interest is to please his customer rather than to quarrel with him. Of course there are "cheap Johns" in all markets, but they soon get known and quickly earn the reputation, as the French put it, of "vermine." The best pickers I know, are widows with large families; a healthy, lean, French Canadian, with a troop of children somewhere, and with sloe-black eyes, will pick between four o'clock in the morning and seven at night, about twice as much

fruit as a fat, blue-eyed English Canadian. The former does not suffer from the summer climate, whilst the latter is quite prostrated by the heat. Five or ten acres of strawberries (say one-third being the first year and yielding nothing) is about as much as an ordinary farmer can manage; by selling at the very low price of 15 cents on the ground, it becomes easier for the neighbors to buy than to steal. A good bull dog or a policeman also helps to watch the berries, for boys will steal, but strawberries cannot be bagged or picked in the night, as the unripe fruit is quite unpalatable, and is neither eaten nor carried away.

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GALLS ON ORNAMENTAL TREES AND SHRUBS,

REV. THOMAS W. FYLES.

The attention of the country gentleman, is often arrested by warty disfigurements upon the leaves and other parts of the trees and bushes which adorn his grounds. Very often, examination of these excrescences leaves him still in the dark, and he ascribes them to some mysterious organic disease of the plant itself, and holds their appearance to be as inexplicable as the growth of warts on a boy's hand. Perchance, on opening some of the larger examples of galls, he comes upon the larva of a *Psylla* or a *Cynips*; but, whether to regard its presence as the cause of the abnormal growth, or as an accidental intrusion upon it, he knows not. It shall be the object of this paper to throw some light upon the subject of plant galls.

Galls are found upon the veins of leaves, or occupying the position of terminal buds, or protruding from other parts of the plant. They are caused by the irritation of a foreign agency which produces an unnatural flow of sap, and, in consequence, a stimulated growth of plant tissues over the area affected. A great variety of minute living things are gall-producers.

PHYTOPTIDÆ.

I. We have the gall-mites (*Phytoptidæ*), Acarids low down in the scale of animal organisms. These have a wide field of operations. Their galls, which are very small but numerous, take the appearance of specks and blotches, which sometimes turn black. They are found upon the leaves of the different varieties of maple, plum, pear, lime, birch, beech, willow, ash, elm, alder, &c. The mites are very minute—never more than one seventy-fifth part of an inch in length. They have four legs, and their bodies are worm-like, and marked with dotted lines or striæ. It is believed that they are all of one kind. Professor Buckhout, of State College, Pennsylvania, who has made a special study of these creatures, says:

"After examination of mites from a great variety of trees, I was not able to distinguish any marks upon which specific distinctions could be based, and consequently believe the mites to be of one species, and if Dujardin's *Phytoptus tilix* was the first one described, then all with which I am acquainted fall under that name. Such species as have been named, have been found upon the trees which they infested, their form, their size, their color, all of which are deceptive and quite unreliable. I found no difference of *structure*, and concluded that *Phytoptus tilix* was a parasite upon vegetable tissue, and as widely distributed as the house fly among insects, or the earth-worm among annelids."

APHIDÆ.

II. Galls are produced by some kinds of plant-lice (*Aphidæ*). The winged aphid, or "emigrant," lays her eggs in suitable positions. From each egg, if no

accident happens to it, issues, in due time, a "stem mother," who, piercing the leaf on a vein, causes the formation of a gall which becomes her shelter, her store-house and her nest. She proceeds to lay her eggs, which are very numerous. The young lice issue from their home and form new colonies. By and bye, a *pupa* development occurs, and then the winged insects are again produced, and they go "in search of other fields and pastures new."

The irregularly massed galls, so conspicuous at times on the tips of the twigs of the balsam-poplar and the cottonwood, are caused by an insect of this sort, *Pemphigus vagabundus*. The cockscomb gall of the elm leaf, is caused by another, *P. ulmi-cola*.

The most dreaded of all the gall-producing aphides, is that of the vine, *Phylloxera vastatrix*, which is indigenous to this continent. And good cause has there been to dread the inroads of this minute but destructive insect. In France, one million acres of vineyards have been utterly ruined by it, and it has extended its ravages to other lands.

The insect is known under two types, the *Gallæcola* or gall-inhabiting, and the *Radicola*, or root-inhabiting. Under the latter it is the more destructive, as the roots attacked by it rapidly decay.

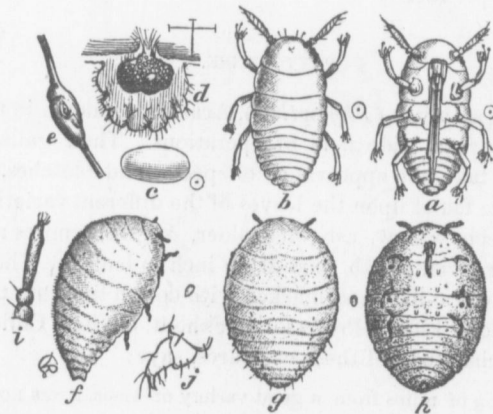


Fig. I (after Riley). *Phylloxera vastatrix*, type *Gallæcola*. a, b, newly hatched larva, ventral and dorsal views; c, egg; d, section of leaf-gall; e, swelling on tendril; f, g, h, stem-mother, side, upper, and under views; i, antenna; j, two-jointed tarsus. N.B.—The dots in rings show the natural sizes of the objects.

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Fig. III (af
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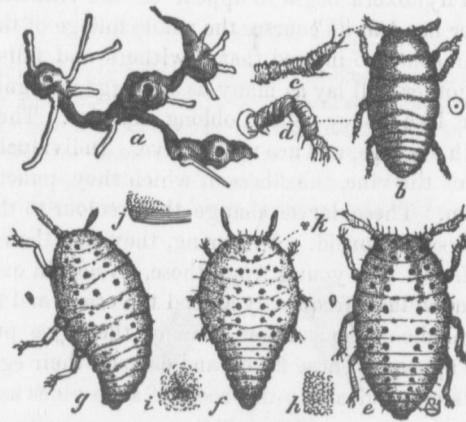


Fig II (after Ridley) *Phylloxera vastatrix*; type *Radicola*. a, root showing swellings produced by the lice; b, young louse when hibernating; c, antenna; d, leg; e, f, g, appearances of more mature lice.

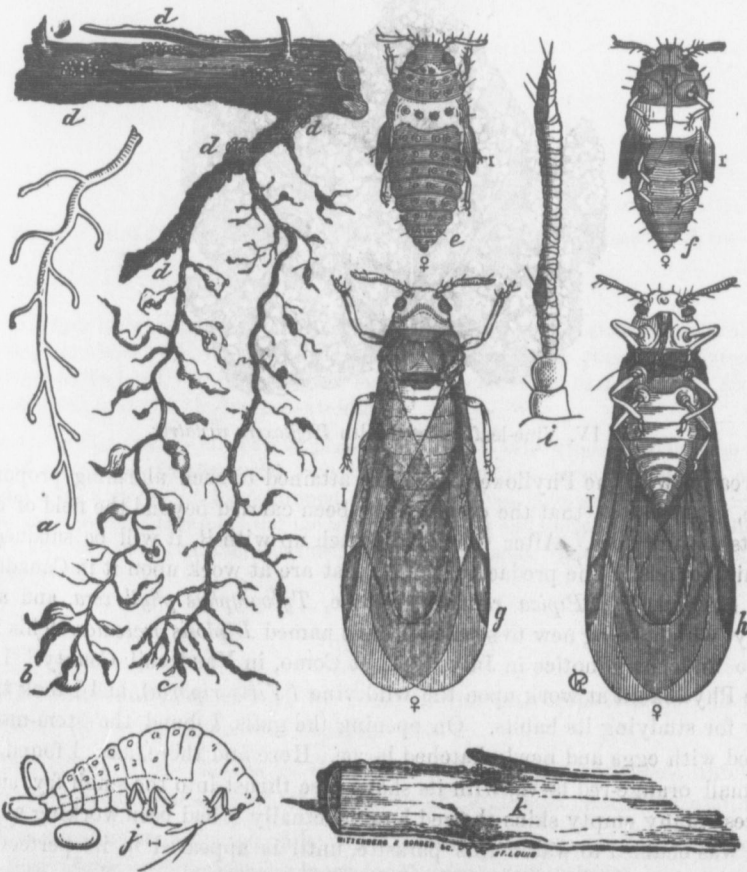


Fig III (after Riley). a, healthy root; b, one assailed by the Phylloxera; c, a decaying root deserted by it; d, d, the natural size. e, f, female pupa, dorsal and ventral views; g, h, winged female, dorsal and ventral views; i, magnified antenna of perfect insect; j, side view of stem-mother laying her eggs; large root of vine punctured by the Phylloxera, and dying in consequence.

The galls of the *Phylloxera* begin to appear on the vine-leaves, early in June; and, before the summer has run its course, the whole foliage of the plant is, in many cases, disfigured, and in some, so injured that it withers and falls to the ground. It is said that the stem-mother will lay as many as 500 eggs in a gall. The eggs, under the microscope, appear like honey-yellow, oblong capsules. The larvæ are supplied with antennæ, and with six legs, and are very active. Individuals of the late broods hibernate at the root of the vine, the fibres of which they puncture, causing warty excrescences upon them. These larvæ change their colour to that of the root, and, as the cold comes on, become torpid. In spring, they cast their skins, and develop rapidly into stem-mothers. The young from these, do not, in every case, remain at the root of the vine: individuals frequently ascend the stem, and form galls upon the leaves. Towards the middle of the summer, some of the larvæ pupate, and, after a while, winged females appear. These fly off and deposit their eggs on the underside of the leaves, on the stem, and about the roots of such vines as their instinct leads them to.

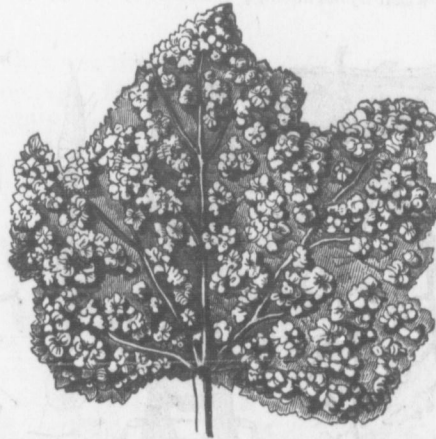


Fig. IV. Vine-leaf infested with *Phylloxera vastatrix*.

The reason why the *Phylloxera* pest has attained to such alarming proportions in Europe, is, doubtless, that the creature has been carried beyond the field of operations of its natural foes. After these foes catch up with it, it will be subdued and kept within bounds. The predacious tribes that are at work upon it in Canada, are, chiefly, a *Syrphus* fly, *Pipiza radicum*, a mite, *Tyroglyphus phylloxera*, and a two-winged fly, which, being new to science, I have named *Diplosis grassator*. This insect first came under my notice in July, 1882, at Como, in Vaudreuil County. I there found the *Phylloxera* at work upon the wild vine (*Vitis riparia*), and I took the opportunity for studying its habits. On opening the galls, I found the stem-mothers, surrounded with eggs and newly-hatched larvæ. Here and there, also, I found in the galls, a small orange-red larva, with its sharp nose thrust into the small fry, sucking their juices. Many empty skins shewed how effectually it had been working amongst them. I was enabled to watch this parasite, until it appeared in its perfect form. The following is an account of it, in its different stages:

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Larva, one-tenth of an inch in length, pointed at the head, rounded and blunt at the hinder extremity. First three segments the colour of amber, and semi-transparent: the rest of the body salmon-coloured. Nine sets of retractile feet, or tentacula, the first two in pairs, the remainder in threes. The larva has the habit of holding itself erect, by means of peculiar anal protuberances, which seem to cling by suction. The body has minute hairs thinly scattered over it. On the sides of the head, which is small and black, there are bristle-like palpi. The larva is full fed by the end of August.

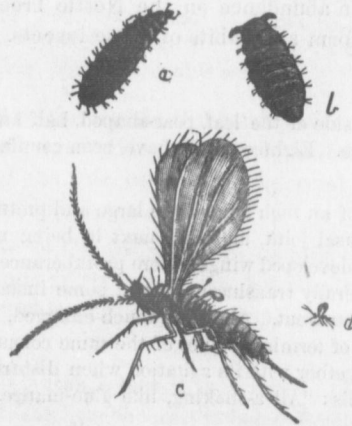


Fig. V (Fyles) *Diplosis grassator*. a, larva; b, pupa; c, perfect insect; d, the same natural size.

Pupa, dark brown, about 1/10 of an inch long. The antennæ-cases form a striking feature projecting, on either side, about one-sixth of the length of the pupa, and giving a flattened appearance to the head. A pair of setæ mark the position of each spiracle; and there is a rounded protuberance at the hinder extremity.

Imago.—Wings semi-transparent, beautifully opaline, three-ribbed, having the form of the blades of a propeller, fringed with long hairs. Halteres conspicuous, antennæ setaceous, 24 jointed, having a circlet of hairs around each joint. Eyes large and black. Thorax reddish-brown, has a peculiar hump behind the wings. Legs long and hairy. Abdomen salmon-colored, has two lines of hairs extending lengthwise on the under side. The perfect insect appears early in September.

CECIDOMYIDÆ.

III. Galls are also formed by some of the near relatives of the insect just described—by various species of Cecidomyidæ.

The edges of the leaves of the white willow, *Salix Alba*, are thickened and twisted into pseudo-galls, in which the larvæ of *Cecidomyia clausilia* are found.

The peculiar cone-shaped galls, which are so often seen on the terminal shoots of the sallow, *Salix cordata*, are produced by *Cecidomyia strobiloides*.

Galls produced by cecidomyidæ are found, also, upon the hickory, pine, oak, lime, maple, beech, cherry, &c. The grape-leaf Trumpet Gall of *Vitis viticola*, is formed by a species of *Cecidomyia*. This remarkable gall resembles a small crimson trumpet. It springs usually from the upper surface of the leaf, and when found in numbers, gives it a thorny appearance.

PSYLLIDÆ.

IV. Again galls are produced by Homopterous insects called Psyllidæ. A description of a Psylla, found in abundance on the Nettle Tree (*Celtis occidentalis*) will give a sufficient idea of the form and habits of these insects.

Psylla Celtis-mammâ.

Gall formed on the under side of the leaf, pear-shaped, half an inch long, forms a cup-like indentation on the upper surface. Eighteen galls have been counted on one leaf. Usually one insect in a gall.

Immature Insect, one-tenth of an inch long. Eyes large and protuberant, light red. Antennæ moniliform, ten jointed—the basal joint, and that next it, being much larger than the rest. Proboscis for suction. Four undeveloped wings—mere protuberances, in the case of some (probably younger) specimens, generally translucent, but in some instances, smoky brown. Legs, six in number, hairy, semi-transparent. Abdomen much enlarged, top-shaped. The three last segments reddish-brown. Tuft of terminal spines of the same colour. The creature has a gelatinous appearance, and this, together with its agitation when disturbed, reminds one of Young Blight's description of Old Dolls: "All a-shaking, like glue-mange." It attains its growth in August and becomes quiescent.

The Perfect Insect makes its appearance in September. To allow its egress, the pupa skin is ruptured from the head to a point beyond the base of the wing-covers. Its appearance is that of a very minute Cicada. Colours light at first, but darkening by exposure. Eyes large, madder-brown, in a lighter setting. The facets very distinct, giving the eye a granulated appearance. Three ocelli like small rubies, one above each compound eye, and one between the plates of the face, just above the palpi. Antennæ moniliform—two large, and eight smaller ones; joints as in the larva. Thorax dark brown above, with longitudinal bands of lighter colour, amber-coloured beneath, mottled with dark brown. Six powerful legs, covered with short bristly hairs, femur much stouter than tibia, and more darkly coloured; tarsus two jointed. Upper wings large and full, pearl grey, thickly peppered with black—the peppering leaving a band towards the lower end clear. The nervures are brownish amber. Under-wings of finer texture, and with no black spots, but, in some lights, beautifully iridescent; have three nervures, the innermost indented. The insect is quick in its motions, making a sudden spring like the Frog-hopper.

CYNIPIDÆ.

V. A great diversity of galls (amongst them the "nut-galls of commerce") are produced by the punctures of hymenopterous insects of the family *Cynipidæ*.

Many an English village-boy, who has heard nothing of the Restoration, nor of the retreat of Charles II and Captain Careless in the "Royal Oak" at Boscobel, has shouted the rhyme,—

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and carried a sprig of oak with a gall upon it, merely because the custom and the saying were "folk-lore" handed down amongst his people. One of my earliest lessons in Natural History was given on a Restoration Day, by a friendly naturalist, who showed me the insect within the oak-apple, and explained to me that the gall was of the same nature as the Aleppo gall imported from the Levant.

The following gives the generic character of the genus *Cynips*:—

Head small; palpi four, short and capitated. Mouth with mandibles, no proboscis. *Antennæ* moniliform. *Thorax* thick and hunched. Fore-wings with but little venation, and hind-wings apparently with none. *Abdomen* attached to thorax by a short stem. Sting or borer, spiral, internal; the opening through which it is thrust covered by two scales (hence the generic name given by Geoffroy, *Diptolepis*, double scales).

It is believed that when the female *Cynips* deposits an egg in the nervure of a leaf or elsewhere, she discharges with it a drop of irritating fluid, which, mingling with the natural juices of the tree, causes the abnormal growth which we denominate an "oak-apple" or a "gall."

Each different species of *Cynips* produces its own kind of gall, different from the galls of the rest, not only in size and form, but also in substance and properties. Some kinds of gall are corky, and some are firm, some are bitter to the taste and some are acid, &c., &c.

After the egg of the *Cynips* is laid, it increases in bulk by absorption from the surrounding moisture. Meanwhile the gall is being developed, and when the young grub bursts from its shell, it finds ample provision for all its needs. In appearance, the larva is short and thick. It is said to move by means of contractile warts set in the ridges of the segments* (just as the larva of *D. grassator* moves). It usually pupates in September, and in about three weeks the perfect fly makes its appearance, having gnawed a way of exit from the gall. Among the North American oak gall-flies are *Cynips quercus spongifica*, *C. q. aciculata*, *C. q. inanis*, *C. q. prunus*, &c.

Another genus of the Cynipidæ, is *Diastrophus*. The insect, which forms the large irregular galls on the stems of blackberry and raspberry canes, is *Diastrophus rubi*.

A third genus is *Rhodites*. The "Bedeguar," or "Poor Robin's Pincushion," that large, hairy excrescence found upon the rose-bush both in Europe and America, is the polythalamous gall of *Rhodites roseæ*.

TENTHREDINIDÆ.

VI. Galls result, too, from the operations of certain insects commonly called saw-flies, belonging to the genus *Nematus*, in the Tenthredo family. Who has not noticed the oblong, capsule-like galls, with which the leaves of the white willow (*Salix alba*) are often so thickly set? When one of these galls is opened, it is usually †found to contain a greenish larva, which has a dorsal line of darker green,

* Harris' Insects injurious to vegetation, p. 545.

† Occasionally an inquiline, or a parasite usurps the place of the rightful tenant.

a brownish-green head, and twenty legs—three pairs of legs proper in front, and after them, seven pairs of "false legs." In the fall, a small hole on the side of the gall, shows where the insect has bitten its way through. Sometimes the leaf falls before the insect makes its exit. The larva, after leaving its early domicile, buries itself in the ground, and then spins a close cocoon of a reddish-brown color. In this cocoon it spends the winter in a quiescent state. Towards spring, it becomes a pupa, and when summer opens, it takes its perfect shape. The name of this insect is *Nematus gallicola*.

Another species of the same genus is *Nematus s. pomum*. This insect produces the small, rosy apples, that are met with at times, on the leaves of the heart-leaved willow (*Salix cordata*), and on those of the glucous willow (*Salix discolor*). The larva of *N. s. pomum*, changes to a pupa within the gall; and the perfect fly begins to appear in April.

We have glanced at the most prominent of the gall-producing insects, which affect the foliage of our Canadian ornamental trees and shrubs. In observing them and their operations, a feeling of astonishment comes over us, at the number of species and the countless myriads of individuals belonging to those species, that exist in Nature's alleys and by-ways, and upon the super-abundance of the provision which has been made for other things. We are impressed, also, by the consciousness of the invincibility of that "great army" of minute creatures, which God maintains around us, and which He, by a slight variation in the appointed system of checks and counter-checks, can bring to bear, at any time, for the benefit or the correction, or the discomfiture of man.

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THE NEW VARIETIES OF OUT-DOOR GRAPES,

BY WM. MEAD PATTISON.

Clarenceville, Que.

The spring and early summer of 1884 were cold and unfavorable for out-door grapes, but August and September, in a measure, compensated for this. Grapes seldom set worse, some varieties blossomed unusually late and required much thinning out. On the other hand we were exempt from mildew—and frost at this place held off till the last of October.

WHITE GRAPES

claim at present much attention from propagators of new varieties.

Lady, the earliest, continues to do well, developing more of its Concord character as the vine gets age; its bearing requires to be checked and summer pruning less resorted to than with most varieties.

Campbell's Concord Hybrid No. 5, bore its first fruit, a real white Concord improved in size and earliness, and we will undoubtedly have occasion to refer to it hereafter.

The Miner Seedlings—Belinda, Antoinette and Carlote, ripening in order named, still continue to do well. The first two resemble the Concord in size and bunch, and are a few days earlier.

Grein's Missouri Riesling No. 2, known as *Grein's Golden*, ripened for the first; bunch medium, not compact, usually shouldered; berries large, yellow; skin very thin; in flavor quite distinct from any white variety, having somewhat the taste of the plum; is healthy and prolific and promises to be a good amateur grape.

Duchess, in some situations, did well. Fruit excellent, though the berry is not yet up to its natural size, probably will improve with age.

Prentiss, improved on last year, ripened the 20th September, when it was sweet and good, much inclined to overbear; the fruit is improved by liberal thinning out.

Lady Washington bore for second year remarkably fine clusters which never ripened, entirely too late for the north.

Pocklington, "the golden," ripened earlier than last year and improved in size of berry; the seeds adhere to the pulp, and on the whole, it will probably never be a desirable variety for this Province.

Faith bore heavily and required more than half the clusters cut out to ensure size and maturity; ripens with Delaware and is about its size.

Amber is entirely too late.

Autuchon, though very fine when you get it, is of such tender foliage, it becomes a nest for the thrip in season, when they abound; it should be discarded. *Empire State* and *Masons' Seedlings* are growing vigorously, white varieties of extraordinary merit are probably about to dawn upon us.

The public are now graciously permitted to purchase the much boomed "*Niagara*," dangled before them for some years, but reliable authorities consider *Empire State* earlier and in some respects preferable.

BLACK GRAPES.

Early Victor after three years' fruiting, has fully established a reputation as a profitable and good grape for the north as well as the south, though not so large or early as *Champion*, is infinitely better. The vine bears early, is usually loaded the third year after planting, and a good portion of the bunches require removing to ensure size and earliness in remainder.

Dempsey No. 25 has fruited for some years here, and has proved earlier than any of *Roger's black Hybrids*, and in other properties quite as desirable. It is said to have been the result of fertilizing the *Hartford* with *Black Hamburg*. *Burnett*, a similar cross by *Mr. Dempsey*, there seems to be a difference in opinion about, arrived at most likely by persons neglecting to restrict it in bearing. Except for highly favored localities in this province, it is too late, but where it will ripen, it comes closer to the famous *Black Hamburg* than any out-door grape I know of.

Waverly fruited for the first time this season, but as its thinning out was neglected at the proper time, the berries set imperfectly, but the fruit proved all that is claimed for it by *Mr. Ricketts*, its introducer. The berry is medium, fresh, crisp, juicy, sweet and refreshing." My vine was grafted from a scion sent by *Mr. Ricketts* in 1882.

Belvidere, *Rockland Favorite*, *Linden*, *Black Eagle* and *Early Dawn* have proved not as desirable as varieties we have long had. Those intending to raise a few vines can safely rely on the following in black: *Champion*, for earliness only. For beauty and quality of fruit, in order of ripening—*Early Victor*, *Worden*, *Dempsey No. 25*, *Aminia*, *Barry*, *Herbert* and *Wilder*. Any of these are more reliable than *Concord*.

RED GRAPES.

On these some improvement can be noted. *Vergennes* continues to do well by being well thinned out (one of the most important duties in grape culture). It is not as early as claimed for it, ripening not much before *Delaware*. Its thick skin renders it one of the best and longest keepers.

Poughkeepsie Red gave a very favorable impression, in color and quality resembling *Delaware*, and somewhat larger in berry, having the advantage of stronger foliage and growth.

Challenge.—A New Jersey grape, bore very early, resembling in berry the old Northern Muscardine, without its faults, and far superior to Wyoming Red in quality.

Mary.—A supposed Catawba seedling, introduced by Stone & Wellington, gave a favorable impression; earlier than Salem, which it resembles, but with healthier foliage and as good a keeper.

Owasso.—A Michigan grape, of a dark amber color; ripens with Delaware; is twice its size, sprightly in flavor; hardy and productive. Have fruited it for three years.

Ulster Prolific bore its first fruit. The vine is a vigorous grower, and the fruit much admired. Mr. Caywood in this and his Poughkeepsie Red, has given us varieties of value, they are offered for sale this spring for the first.

Gaertner.—Roger's No. 14, though not new, should be more cultivated in this province. I am indebted to Mr. Charles Gibb for calling my attention to it, and have found it healthy and productive; good sized berry and bunch; pleasant in flavor and quite early.

Dempsey's No. 5, continues to do well; an abundant bearer, closely resembling Massasoit, but a few days earlier.

Amongst the older varieties, *Massasoit*, *Lindley*, *Brighton* and *Delaware*, in reds, should be in every collection.

When we look back five years, the progress of improvement has been marked, particularly in red and white varieties. In black, Mr. Dempsey, in our own Canada, has added to our list; Mr. Burr, of Kansas, U. S., has given us Early Victor. Mr. Garbe has discovered in the South, a black extra early grape, which promises to entirely eclipse the Champion in earliness and quality. The grape is not yet named or distributed. It was sent here for trial in the spring of 1883, and the fruit was on the tables of the Montreal Horticultural Society in September, 1884. I hope to have an abundance of it for our exhibition of 1885, and would call attention to it.

GRAPE GROWING AT CHATEAUGUAY BASIN,

BY MRS. ANNIE L. JACK.

The word "vine" is from the Celtic word "gwid," signifying the best of trees, and it comes to us giving the oldest named fruit, for in the Books of Moses we are told that Noah planted a vineyard, and among the oldest profane writers, the vine was supposed to have been a gift from the gods. The Africans ascribe it to Bacchus; the Egyptians have a tradition that Osiris first taught how to plant and cultivate it. It is said to be indigenous in Asia, and climbs to the top of the highest trees.*

The frost grape (*Vitis riparia*) grows in magnificent strength along the bank of Lake St. Louis, and some of the soil in that portion of Canada was evidently intended by Nature for vineyard purposes, if one can judge by the immense growth of wild vines, the old gnarled and twisted wood speaking for itself of great age, while the grapes hang in clusters that never fail to ripen. Twenty-five years ago, the only grape cultivated here was a small purple fruit of inferior quality, the name of which I have never been able to ascertain. But the growth of vine was remarkable, and the fruit without stint. Some years after we procured the old standards Concord and Hartford, and have gradually increased our varieties till we have now over thirty, an experiment that is not safe for an amateur, but must be made by those who wish to ascertain what is most suitable for their soil and climate, but if carried to any extent is often both costly and disappointing.

Undoubtedly the best soil for grapes is a rich gravelly loam; a clay soil is objectionable, and a hill slope is preferable, for a vine is very impatient of wet feet. I think a southern exposure with a little of east as well as west is best, for in many years experience of grape gathering, I find that those vines ripen their fruit best that have the full benefit of the *morning* sun. A vineyard should be provided with shelter, for the natural habit of even the hardiest vine is to seek the protection of woodland or trees, they also need some safeguard against high winds. The preparation of the soil is very important and so also is the method of planting. The soil should be uniform, not over rich, nor does the vine object to stones, since they add warmth, and it likes to feel a little limestone among its roots and fibres. It is not advisable to use strong manure, as coarse feeding causes the wood to become soft and sappy, and thus the buds to suffer from frost for want of hardness, as the branches continue to grow without ripening their wood. There is nothing better than a compost of leaf mould and old manure that has been well worked up, but the black muck from swamps seems particularly well suited to vines. The distance apart very much depends on varieties, and with our method of cultivation, all the work being done by horse-power, we plant in rows twelve feet apart, and six feet in the row. But small growing

**Vitis vinifera* is indigenous to western Asia and Europe. Other species of *Vitis* are indigenous to eastern Asia.—ED.

vines like the Delawares can be grown even nearer, while the strong Concord and others might be still further apart. In planting, the roots should be placed from five to eight inches below the surface, light sandy soil requiring the greatest depth. The hole should be two feet in diameter or according to the size of root. Ashes are good for top dressing, and if bones could be economically crushed, they are of great value as a fertilizer to be put in when the vine is planted. Tie to a stake the first year, leaving only one cane, and cultivate the ground as for corn. In autumn cut the vine back to three buds, after the leaves fall, cover with earth, so as to turn off the water, and uncover in spring according to your own judgment, as to danger from frost being past. The trellis system is best for ripening the fruit, and the second year stakes are set at each vine, and two wires run along, then the vine is trained to one cane till about the top wire, and the end is then kept pinched, leaving only two laterals, one on each side of the vine. At the close of the second year, six buds may be left for fruiting. The third year and afterward, the great danger is not in pruning too much, but in leaving an over growth of wood, but it is only by experience this lesson is learned, that too much wood, or too many clusters of fruit, spoil the best results.

It is always safe to protect vines in winter, however small, as early training, "just as the twig is bent" makes the vine more pliable when of stronger growth. The ground must be cultivated with light implements, as too deep plowing is sure to injure the roots.

It is no use to attempt to enumerate all the grapes named in the catalogues, as too many varieties are a stumbling block in the way of the fruit grower, as well as the amateur. I remember reading many years ago the experience of a noted horticulturist, that you can go to the Concord to gather your grapes with a wheel-barrow, but most other varieties may be gathered with a hand-basket, and for profit, this grape proves to us what the Fameuse is amongst apples., "best for profit."

Among the black grapes we value most highly *Eumelan*, and that newer grape *Moore's Early*. The former has a flavor more approaching that of grapes grown under glass, than any other out-door variety; the last named is very large, prolific, of good quality, and ripens earlier than the *Concord*. Of red grapes we place "Brighton" first, a large, sweet, prolific, hardy grape, that grows well in this latitude, then *Agawam* and *Delaware*.

There is a very pretty little grape called *Amber Queen* that is not red, nor is it white, but very sweet, and stays well on the vine. Our hope for the future, however, is in the white grape, and there are several new varieties that have proved both hardy and profitable.

The *Lady* grape is pale green, hardy, sweet, very prolific, and with us a first-class berry. It has never failed to give a full crop, but does not cling to the bunch as does the *Duchess*, a smaller, yellower berry, very compact and well shouldered. The *Duchess* is a decided acquisition, in fact a revelation to us, as it does not drop, and bears a load of fruit that is a constant surprise. For the last two years we have kept some of the fruit without any extra care loosely in a basket, with layers of paper between, and have been able to offer them to our friends on New Year's day, this

year using the last on the 8th January, and they would certainly have kept longer, being fresh and sweet, and clinging well to the stem.

Our latest acquisition is the *Niagara*, called by some the White Concord, because it is as hardy and prolific as that vine, but its quality is better and it keeps well. The vines are strong and healthy, and the fruit large and plentiful, selling in Montreal at double the price of the blue grapes last autumn. There is a future for white grapes in our market, and they who plant now will soonest reap the reward, for they are more highly prized, as of finer flavor and texture than many of the darker varieties. So the *Niagara* will make its way, and when the vines are cheaper, will be largely planted, as filling many requirements.

There is a black grape called *Othello* that deserves commendation. It is of rich, vinous flavor, and has the qualification of resisting slight frosts better than other varieties when hanging on the vine. These qualifications of resisting frost and of clinging to the stem after gathering, must be taken into account with a fruit grower, as at the season when grapes are just ripe, the markets are flooded with fruits, and it would be a great advantage if it could be kept until winter.

In marketing grapes we cut into shallow baskets that will hold ten or fifteen pounds—they are selected as cut, and carefully handled, so as not to rub off the bloom, which helps to preserve them from the air. Grape scissors are used, and each basket is weighed, and the bunches placed evenly, rising a little towards the centre. They are then covered with a coarse netting and ticketed, the weight being marked on the handle. The fruit must be uniformly good, without any bruised or imperfect bunches, for dealers soon learn where the fruit is honestly packed, and it does not pay to cheat in this business, when fruit is often sold or refused according to the good name and standing of the grower. There is no doubt that Canada is able to grow some of the choicest grapes in an ordinary season, though there are times when they fail to ripen. Two years ago we lost over 2,000 pounds by frost before they were fully ripe, but this exceptional case had never happened before, and if one gets good varieties there is no need of failure, if they are pruned well, cultivated thoroughly, and manured judiciously, with proper drainage and sunlight. Nor is there any reason why the owner of even a few rods of ground should not have a plenty of this luscious fruit. The profits of grape culture vary so much that it is impossible to give a very correct estimate.

The expenses of cultivation are light, if weeds are taken in time and cut down, nor is it profitable to grow a crop between the vines after the second year. The work of tying to the trellis has to be performed two or three times in the season, as also pinching back needless growth. We use the coarse bags that are around coconuts, and can be bought cheap from the dealers, while the work is light, and can be easily done by young, nimble fingers. The baskets cost from 70 to 80 cents per dozen, while the netting adds about one-fourth of a cent to expenses. There is not any difficulty in procuring help to cut the fruit, as all the children of a neighborhood, who work out, are very anxious to assist in the vineyards, and potatoes and other farm crops have to wait if help is needed at fruit-gathering. Dark grapes sold last season from 8 to 10 cents, and white from 15 to 20 cents. From prolific varie-

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ties such as Concord, Hartford, Brighton, Niagara, Duchess and Lady, and perhaps Moore's Early, the average is \$200 per acre for dark, with a higher estimate for white grapes. But prices vary so that it is hard to state exactly, and a great deal depends on taste in packing, freshness and nearness to market. It is, however, an occupation that has a peculiar charm, whether the owner has one vine or a thousand, and the real glory of autumn can best be seen in a grape-loaded vineyard.

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HOW TO GROW MELONS,

BY R. BRODIE, JR.

Montreal has long been noted for its excellent nutmeg melons, they are much prized in the New York market. A seed merchant from across the border, bought on our market a couple of hundred and cut them up for the seed and treated the cabbies and usual frequenters to a melon feast.

One of the principal points in growing good melons, is the saving of the seed of good specimens; we generally choose the earliest to ripen, the best flavored, the best shaped and heaviest melon for seed and leave them to ripen thoroughly before saving the seed. The seed may be sown in hotbeds about the first of April, taking care to choose a sunny time, for a couple of cold, cloudy days might cause them to damp off. The hotbed may be made with fifteen inches deep of hot manure, one foot larger than the frame, laying the frame thereon, and banking all round with hot manure the height of the frame, then putting about five inches of earth in the frame, and then put on the glass, leaving it in this state for a couple of days, till the first great heat is over, raking the earth over once to kill the weeds that are started.

The seed may be sowed in five inch pots, (or where pots are not available, sods cut in squares buried upside down in the earth may be used), buried in the earth close together, as many as the hotbed frame will hold, planting about five seeds in each pot one inch deep; at the end of three or four days the plants may be seen coming through the ground, this is the time they require closest watching,—if they get too much heat they grow too rapidly and topple over, or if they get a chill they turn blue in the leaf and wilt away. The hotbeds should be kept at about eighty degrees Fahrenheit, although melons can stand over one hundred degrees without injuring the plants, but it makes them grow too fast and tender. To regulate the heat, pieces of board with notches cut in, may be put under the sash.

About the first week in May, trenches may be dug about fourteen inches deep by two feet broad, and as long as your frames, filling them with hot manure pretty well rotted, being careful not to put any strawy manure, covering it with the earth taken out of the trenches to the depth of eight or ten inches; then put on the frames and glass, leaving it in this condition for a day or so for the earth to get warm, then rake the earth thoroughly and transplant the melons, putting one pot containing three or four stout plants, in the centre of each sash, turning them out of the pots. When they make a growth of three leaves, nip off the top so that they can send out side shoots for fruit. We need to be careful to give air to the frames every day, closing them at night. About the first July, when the vines have made growth enough to fill the frame and melons are formed the size of your fist, then it is time to remove the frame, beginning gradually to harden the plants. Towards the ripening season it is a good thing to put shingles or pieces of wood under each melon, to prevent them being infested with worms, and also from decaying if the ground is wet after rain.

For late melons, a few seeds could be sown in the centre of each sash instead of plants taken from another frame.

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RUSSIAN APPLES.

The following notes on Russian Apples are inserted here for the purpose of keeping the public informed concerning the results as obtained.

Mr. A. W. Sias writes as follows :—" It is a pleasure to handle these hardy Russians. There is no more need, as of old, of complaining about winter-killing ; no more complaint about small, souldard, crab-like fruit ; no more complaint of not being able to raise fruit in Minnesota. Mr. Gibb, Prof. Budd, A. E. Tuttle, Dr. Hoskins, A. Webster, and others in this good line of horticulture, are public benefactors to a greater extent than they can possibly imagine. This is offered simply as a word of encouragement to this hard working class of eminent horticulturists.

"The tornado that passed over this city (Rochester, Minn.), last year, removed and damaged so many of our oldest Russians, that we did not fruit many new sorts this season."

Mr. A. Webster, of Northfield, Vermont. gives the results of his observations the past year as follows :—

"105.—RUSSIAN GRAVENSTEIN. This variety has previously been overlooked in my notes. As tested here, top-worked on both crab and apple stocks, and growing on poor soil without manure or cultivation, it is a slow grower and good bearer of rather small apples of fine form, attractive color, white flesh and good quality for dessert. It ripens in September, but when put in the cellar early, has kept nearly or quite through the winter without loss of flavor, and will improve in texture. To my taste, it is sweetish, rather than sub-acid, especially after long keeping.

225. GETMAN'S BEAN.—This fine apple is not only a tardy bearer, but, I fear, a very poor bearer as well.

247. POPOFF'S STREAKED.—This fine dessert apple, though so early, keeps for some time after picking, growing tender and delicate in texture ; gaining in flavor.

275. ZOLOTOREFF.—This large, showy apple improves in quality by keeping, becoming of almost melting texture. I have sent specimens to Charles Downing, who pronounces it 'undoubtedly valuable for home use and market.'

304. SWITZER.—This fine apple sometimes keeps till winter (unless eaten before) since I have eaten it in fine condition in January of this year (1886).

317. WHITE PIGEON—Mr. Gibb speaks of the defective texture of this apple. Those who do not eat it too early, but give it sufficient time to ripen, will, I think, agree with Mr. Sias, that it is tender and juicy.

324. GERMAN CALVILLE.—With early picking and cool storage, which so many

Russian apples require to develop their best qualities, this keeps into winter, and is really fine, especially for cooking.

342. CHARLOTTENTHALER.—This fine, early apple seems to be very popular with all who raise or use it.

343. RED WINE.—A good substitute for Red Astrachan as a market apple, where the latter lacks hardiness.

407. BLACKWOOD.—This apple proves to be really fine when kept till winter. I have specimens now (Jan. 22nd), that seem capable of keeping a month or two longer.

Of the other varieties that I have tested, I have nothing that I can add to or change what I have reported before. I have added a considerable number of promising kinds to my trial list in the last two years, but as they have not fruited, it is too soon for me to give an opinion of them."

Dr. Hoskins, of Newport, Vt., writes concerning his observations as follows :

PROF. D. P. PENHALLOW,

Montreal, Que.

MY DEAR SIR,—In reply to yours of the 15th, I can add but little information about Russian apples, to the report of Mr. Gibb in the 9th Mont. Hort. Society's Report. I will go over that report and make a few comments.

105. RUSSIAN GRAVENSTIEN. (Rept. p. 64).—If this apple is lost, it should be at once re-imported from a reliable source.

161. LONGFIELD. (Rept. p. 66).—Having received specimens from Prof. Budd, I now know that the Russian winter apple I have grown and supposed to be the Longfield, is not that variety, and bears little resemblance to it. The Longfield is a much larger apple, and equally good, but not so long a keeper I think. It, is, however, extremely valuable, and a very close rival to Wealthy. Prof. Budd thinks it will keep longer than Wealthy, but this is not confirmed, but rather doubted, by Sias and Jordan, of Minn. and Phoenix and Tuttle, of Wisconsin.

182. RED SUMMER CALVILLE.—Mr. Gibb reports me as saying that my trees of this are, "perhaps," from the Department. Mr. Nelson of Pennsylvania, from whom I received it, states positively that he received it from the Department. My trees have not yet fruited.

188. YELLOW ARCADIAN.—I have a large tree of this. It is very hardy and productive; fruit, size and shape of Fameuse, yellow, with russet spots and streaks, sharp acid flavor, coarse flesh, useful only for cooking; season September; very perishable, and on the whole of little value.

225. GETMAN'S BEAN.—Mr. Frank Phoenix of Delaware, Wisconsin, thinks this

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very similar to, if not identical with, 978, Golden White. I have not fruited Getman's Bean (received from A. Webster, Roxbury, Vt.), but the appearance and growth is quite different from Golden White. Getman's Bean is a slow, crooked grower, Golden White quite the reverse.

334. **YELLOW TRANSPARENT.**—Grown under exactly the same conditions, I do not find any appreciable difference between this and 342, Charlottenthaler. The same is true with regard to 344, Sultan, if that is the same as the apple I have under the name of Grand Sultan, with the exception that the latter suffers badly from death of the bark, killing many trees, from which both the others named seem quite exempt. Sweet Pear, another seemingly identical apple, in tree and fruit, is exactly like Grand Sultan in being destroyed while young by the "bark blight" of the trunk.

351. **PROLIFIC SWEETING.**—Experience confirms and increases my high estimate of this apple. It is of the size and shape of St. Lawrence, but more ribbed; of a clear straw yellow; tree hardy; a strong, erect grower; does not bear a full crop while young, if root grafted, but is much improved in this respect by the grafting on Tetofsky. When it gets to bearing it is very productive, the fruit is very good for baking, or eating raw, and its fine appearance makes it very salable. Season Sept., and keeps two or three weeks, if gathered while turning from green to yellow.

372. **ST. PETER'S.**—This apple now grows considerably larger than when the trees first came to bearing, and is, therefore, more valuable as a market apple. It is very productive and very salable.

387. **GOOD HUSBANDMAN.**—Here is another of these Russians that should have more attention. It may prove a good keeper in Canada.

398. **ENORMOUS.**—My trees of this variety have not borne, but they are extremely hardy, and most vigorous growers. (Received from A. Webster). The size of its fruit, combined with its earliness, color and good flavor, will make it profitable, while it can be grown in the coldest places.

402. **BORS DORF.**—This variety is hardy and a good bearer, and by manuring can be grown to a full medium size. It is finely colored, very good quality, and a good keeper.

410. **LITTLE SEEDLING.**—This is iron-clad in tree, a very long keeper, and can be grown to a fair size with care. It is by far the best keeper yet found among the Russians, and though not of high quality, it is quite good, even for dessert, near the end of its season. It keeps until July.

448. **CARDINAL.**—If my trees of this variety is true, it is not a valuable fruit. It is small, unattractive in appearance, dry, sweetish, mealy; and though the flavor is not unpleasant, there is nothing desirable about it. The tree is a natural dwarf.

455. **RIABINOUKA.**—It is quite doubtful whether any trees of this variety are true to name. The fruit is very much like Alexander, yet not the same. The tree, not grafted, is far from iron-clad. Top-grafted upon Tetofsky, it does much better.

469. **BABUSCHKINO.**—Here is another long keeper that should have attention. It would seem to be a very valuable apple, being of good size as well as good color and quality. However, it may be lacking in productiveness; of which nothing is reported.

502. **RUSSIAN RAINBOW QUEEN.**—Still another worth investigating.

579. **SUMMER LOWLAND.**—And another, an apple, otherwise equal to Duchess, of better flavor and a later season; should not be neglected.

978. **GOLDEN WHITE.**—I am better pleased with this apple every year. It keeps just about with Alexander, is not so showy, but a great deal better in dessert quality, and is nearly as large. The tree is very vigorous and very hardy, but does not bear very young when not grafted. Top-worked on Tetofsky, it would be hastened, I do not doubt.

985. **RED ANISETTE.**—The cut accompanying the description of this apple, on page 114 of Mr. Gibb's Report, is marked Anis Alui, and very closely resembles my unrivalled winter Russian, but the description does not correspond at all. I have sent specimens to Mr. Budd, and he thinks it belongs to the Rephka family, of which the *Little Seedling* (410) is a representative. It is, however, entirely unlike that apple as I have seen it. It much resembles Fameuse in form, color and size, but is a little duller in tint, and while ungathered, has a heavy blue bloom, like Blue Pearmain. In quality, it is very good, mild, rich sub-acid. It is not a soft fleshed apple, like Fameuse, Wealthy and Layfield, but more like the American Baldwin. The flesh is quite yellow. This apple keeps well all winter without loss of quality. The tree is productive, and the only drawback is its lack of size. The Codlin, moth certifies to its quality by giving it too much attention.

Yours, very truly,

T. H. HOSKINS.

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JUDGES' REPORT ON CONSERVATORIES AND WINDOW GARDENS.

TO THE PRESIDENT AND BOARD OF DIRECTORS,

Montreal Horticultural Society,

We, the undersigned, having been appointed judges of greenhouses and window gardens, for the winter of 1884-85, and having jointly examined the various conservatories and gardens entered in competition, beg to submit a report of results as follows :

CONSERVATORIES—CLASS A.

The points of excellence upon which conservatories were judged, were—

1st. Cleanliness ; 2nd. Evidence of superior culture ; 3rd. Arrangement for effect ; 4th. Forethought for succession of bloom ; 5th. Provision of plants for bedding purposes. Each point was judged upon a scale of ten, making a total possible maximum of fifty (50.)

The prizes were awarded as follows :

Mr. Geo. Stephen,	45.	-	-	-	-	1st Prize, \$10.00
Mr. H. McKay,	44.2	-	-	-	-	2nd " 6.00
Mrs. Redpath,	41.8	-	-	-	-	3rd " 4.00

All of the conservatories entered were private, and the judges feel that it is only just to direct the attention of the society to the very superior condition of all, particularly with reference to cleanliness. In one or two cases, the amount of bloom did not appear so great as the season would demand, but in most cases there was not only a good show of flowers, but there was evidence of care in providing for proper succession of bloom. One very noticeable feature was the general provision made for bedding out, even in cases where the available land would not permit of great outlay in such direction, and this in private conservatories, is particularly gratifying and worthy of encouragement, since it affords evidences of the degree to which private citizens are disposed to become public benefactors, by placing so large a number of plants in a position which will enable them to appeal to the public at large.

WINDOW GARDENS—CLASS B.

The points of excellence serving as a basis of judgment were—

1st. Taste in selection of plants for window garden purposes ; 2nd. Evidence of attention ; 3rd. Variety and bloom. Only two competitors entered for this purse, to whom the awards were made as follows :

Mrs. John Auld,	-	-	-	-	1st Prize.
Mrs. Jas. Riddle,	-	-	-	-	2nd "

Both of these gardens were deemed worthy of special mention, that of Mrs. Auld being of a very superior character, and passing in some respects, the bounds within which window gardens should be confined. The most gratifying results displayed in these gardens, as well as the fact that they are most important means of great benefit to a class of people who can enjoy but few of the luxuries of life, lead the judges to express the hope that the society may be able to still further encourage efforts in this direction, by offering prizes which may be a still greater stimulus to the cultivation and care of house plants. The small number of entries this year, would seem to imply that the prizes were an insufficient inducement.

D. P. PENHALLOW,
J. C. MAXWELL,
J. DOYLE,
R. HAMILTON.

March 5th, 1884.

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 REPORT OF THE FRUIT GROWERS' ASSOCIATION OF ABBOTSFORD, 1884.

N. C. Fish, President. A. N. Fish, Sec.-Treasurer.

Report on J. N. Fish

Our annual meeting was held on Nov. 13th. After a satisfactory showing of the years' transactions, and the general business of the meeting was over, a very interesting sketch, by Mr. Chas. Gibb, was given of the work done by the society during its ten years' existence; from which many of the following facts are gleaned. The society was organized in Dec., 1874. In 1875 it published a pamphlet of nineteen pages entitled "Fruit list for the Province of Quebec," which was based upon all available local experience, supplemented by the experience of fully one hundred growers outside of Abbotsford, gathered with great trouble and care. This was reproduced in full, in leading Montreal and Toronto papers, and in a condensed form in many other papers in Canada, and in Horticultural reports and periodicals in the United States, including *The Country Gentleman*. In 1876, the first exhibition was held in the local cheese factory, at which 179 plates of apples were exhibited, to the surprise of even residents of Abbotsford. In 1877, at the second exhibition, 410 plates of apples and 56 of grapes, were shown, competitions coming from Montreal, Brome and Missisquoi Counties, and from Rougemont and St. Hilaire. Prizes on grapes were carried off by W. W. Smith, of Philipsburg; James Morgan, jr., of Montreal; and Judge Duncan, of Knowlton. The collection of apples was believed to be the best ever seen in the Province of Quebec, and the collection of grapes was by far the best ever made in the Province to that date. This year (1877) the Montreal Horticultural Society became a Provincial organization. In 1878 there were 430 plates of apples and 23 of grapes exhibited at Abbotsford, J. M. Browning, President of the Provincial Council of Agriculture, being present. His report, together with a detailed statement of the operations of this society to date, was laid before the Council of Agriculture. Mr. Joly promised to put \$500 in the Provincial estimates for the encouragement of Horticultural societies, and since then the Province has had a system of Horticultural as well as Agricultural societies. It was also during this year (1878) that the Montreal Horticultural Society opened its prize list to the Province, for County competition for the best collection of apples. Abbotsford then made its first county collection (Rouville) and was beaten by Huntingdon county, taking second prize. For seven successive years, Abbotsford has competed in Montreal on collections, taking two first and five second prizes, amounting to \$215.

In 1879, at the fourth exhibition, 420 plates of apples were shown, including many specimens from new localities, and embracing over one hundred different varieties, and 52 plates of grapes, for the second time beating the Province up to date. This year the Association received its first grant (\$50) from the Council of Agriculture, and this year the first sister society (Missisquoi) was organized. In 1880 the fifth exhibition brought out the grand collection of 150 plates of grapes, embracing 71 varieties, many new and promising kinds being from the United States,

and exhibited here for the first time in Canada. This collection excelled by far anything before seen in the Province. Of apples, 310 plates and 110 varieties were exhibited. This year the counties of Brome and L'Islet held their first exhibition. In 1881 this society united with the Shefford County Society in holding a joint exhibition at Granby. There were about 580 plates of apples and 72 different varieties of grapes shown. In 1882 and 1883 the exhibitions were held at Abbotsford, at the latter of which 308 plates of apples, 137 of grapes, 29 of plums and 8 of pears were shown.

In June, 1882, Mr. Chas. Gibb, in company with Prof. J. L. Budd, commenced their journey to Russia, in the Horticultural interests of the Dominion and the United States, in search of hardy varieties of fruit, &c.

On Feb. 6th, 1883, Mr. Gibb arrived at Abbotsford, on his return from Russia, when a public reception and address was given him by the members of the Association.

On Sept. 25th, 1884, the eighth annual exhibition was held at Rougemont in connection with the Rouville County Agricultural exhibition and at the special request of the latter society. Here, 469 plates of apples and 155 plates of grapes, including 65 varieties grown by Mr. Pattison of Clarenceville, were shown. This year, the society took up a new branch of work and imported 190 apple trees from the North Western States, of Russian origin, for distribution among the members, and a Flemish Beauty pear tree from Ontario for each member, besides 119 cherry and 50 plum trees from Moscow, Russia.

This importation of cherries and plums did not reach Abbotsford until the 26th June, during a period of hot and dry weather, and was much injured from their long journey, consequently but a small percentage will be available for the members.

Before distributing the apple trees, each tree was carefully labelled, and a record is in the hands of the society, showing the varieties each member received. Thus each member becomes an assistant, in the testing of these new varieties; and as they must necessarily be planted on a variety of soils and exposures, the test will prove a practical one. In a few years the society will be in a position to report as to what is of value, and what to discard among the varieties in its hands.

The chief work of the society the coming year, will be in the direction of importing Russian fruits of various kinds for trial in this locality, of which there are already some 75 varieties of Russian apples and 50 or 55 of Russian and North German pears growing at Abbotsford. It may be added that, during the earlier history of this association, visitors and competitors from outside *drove* in from distances varying from ten to forty-five miles, (without reckoning those that came by train,) who are now supporters of Horticultural Societies in their several localities.

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REPORT OF BROME COUNTY FRUIT GROWERS' ASSOCIATION FOR 1884.

It is with great pleasure that we are able to report the continued prosperity of this Association, in every sense of the word. Our membership has increased, thus showing a greater interest taken by the farmers in horticulture and fruit growing, and the articles exhibited have been more numerous and of better quality, thus showing that the people have been stimulated to make greater exertions and to take greater pains in the production of fruits and vegetables, than heretofore. At the same time, those who have rather an eye for the beautiful than the merely useful, have not neglected to make great efforts in the growing of beautiful flowers and foliage plants.

About a year ago, we were informed by Mr. Charles Gibb that an extra fifty dollars had been voted by the Council of Agriculture for the purpose of buying Russian apple trees for distribution among the members of the Association. Therefore, we procured from Messrs. Tuttle, of Baraboo, Wis., and Mr. A. W. Sias, of Rochester, Minn., about two hundred trees, consisting of sixteen varieties. The trees were distributed among fifty-two members of the Association, and from reports we have received, very few of the trees died. We hope to be able to find some brands among these several varieties, that will be suitable to our climate and worthy of propagation.

The annual exhibition was held on September 16th and 17th, on the grounds of the Knowlton Park Association, at the same time as that of the Brome County Agricultural Society. As the "Park Association" had put a floor in the upper part of their building, thus nearly doubling the space, we were enabled to make a very much better display of the fruits and vegetables than heretofore, both to visitors and exhibitors.

There were on exhibition more than 600 plates of fruit. The exhibit of grafted apples, was very large and of very good quality, and there was a larger number of plates of the newer and choicer varieties than ever before. Of crab apples, there were eight or ten collections, and many single plates that were very creditable. Mr. W. M. Pattison, of Clarencville, P. Q., made an exhibit of 60 plates of choice outdoor apples, a very beautiful collection. There were besides, two or three small exhibits from the neighborhood of the village of Knowlton, but owing to a severe frost a night or two before the days of exhibition, the display was very poor. By the way, the exhibit of seedling apples, was not good; it was below the average.

The show of vegetables was large and exceedingly good. In some of the collections, there were as many as 35 different kinds of vegetables. Among the vegetables, the cabbages, onions, potatoes and turnips were particularly worthy of praise. In fact, there were no vegetables exhibited that were not really worthy of a prize.

Owing to the severe frost a night or two before the exhibition, the show of cut flowers, floral designs, &c., was much poorer than usual. Total failure in the floral department was, however, prevented by the goodness of some of our lady members in sending their choice foliage, flowers and plants in bloom to the show.

There were quite a number of aspirants for prizes in the noble art of bread-making. In truth, there was bread there on exhibition—both wheaten and brown—that would tempt the most fastidious person.

Finally, notwithstanding the mistakes made by the "clerk of the weather," or Mr. Wiggins, or other weather prophets or makers, we are able to report continued prosperity for our Association, and a very satisfactory year, taking everything into consideration.

H. W. WOOD, M. D.,
President.

GEO. W. WILSON,
Vice-President.

JOSEPH BRASSARD,
Secretary-Treasurer.

COUNTY OF LISLET HORTICULTURAL SOCIETY AND FRUIT GROWERS' ASSOCIATION, 1884.

The society is progressing fairly. There is enthusiasm among its members, who spare no efforts to encourage the planting of good varieties of fruit trees suitable to the severe climate of this part of the Province, by free distribution to every person joining the society from all parts of the Province.

The membership is sensibly increasing under the system of free distribution of plants, and the Directors have now the pleasure to count amongst its members, many distinguished citizens from different counties north and south. The object which the Directors seek to attain, in this distribution of trees, is to make an experimental garden of the eastern part of the Province, and each member an assistant gardener, who is expected each year to *report* whether the trees prove to be hardy, productive, free from disease, and the fruit good or poor in quality, its time of ripening, usefulness and profitableness.

It is expected that members are willing in this way to contribute to the diffusion of information with regard to the fruits that succeed or fail, that those who come after may know what to plant and what not to plant.

The society receive annually, *only* \$100 as Government grant, the members' subscription is \$1 each. The whole of this is needed for the annual exhibitions of fruits, flowers, &c., which have already accomplished much good, bringing hundreds of people into personal contact with good fruit: they have given a sensible impulse to fruit-tree planting; they help the planter in the selection of those varieties most suitable to the soil and climate, and orchards heretofore neglected, receive more careful attention at the hands of their owners. Consequently the funds must be kept for the

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exhibitions, and the society must rely on the liberality of one of its members for the supply of plants for free distribution.

Next spring, ten plants of the Wealthy Apple will be given to each member. The tree has proved very hardy in this county. The description of the good qualities of the Wealthy apple, given in the Reports of the Montreal Horticultural Society, attracted the attention of some of the members a few years ago, and they immediately planted some trees in exposed situations without protection. The results having been most satisfactory, the society was induced to distribute it more extensively.

The annual Exhibition of the Society was held at St. Jean Port Joli, the 28th September last, and was well attended. The display of fruits and flowers was very fine, and much interested the numerous visitors from this and adjoining counties.

The apple crop in this section was good this year; the plum crop was very light in all the parishes on the north and south sides of the St. Lawrence, except from St. Thomas to Ste. Anne Lapocatière, where it was moderate. The high price obtained (\$12 to \$15 a barrel) was very remunerative.

The plum orchards of the north shore, in the counties of Montmorency and Portneuf, have been practically destroyed by the *black knot*. Fine orchards yielding from \$400 to \$800 annually are so affected by the disease, that the proprietors have not the least hope of saving their trees. The Society has informed orchardists, through the columns of Agricultural journals, of the progress of the disease, (which has made its appearance even at Berthier, county Montmagny), and has given the best modes of prevention and cure.

The Quebec Horticultural Society having expressed the wish that the county L'Islet Horticultural Society should exhibit fruits *grown here*, at the exhibition to be held next fall at Quebec, it is expected that a satisfactory arrangement will take place to the mutual advantage of the two societies.

The members of this society desirous of improving fruit culture in this county, hope to learn how to do it by meeting orchardists of experience, who cultivate fruits for profit around Quebec.

Our society follows with great interest, the successful fruit growing of our neighbouring sister Province of New Brunswick.

AUG. DUPUIS,

Corresponding Secretary.

To PROF. PENHALLOW, Esq.,

Secretary Pub. Committee,

Montreal Horticultural Society.

REPORT OF THE HORTICULTURAL SOCIETY AND FRUIT GROWERS'
ASSOCIATION OF MISSISQUOI, 1884.

HON. THOS. WOOD,
President.

DAVID WESTOVER,
Sec. and Treas.

J. W. FERRIS,
Vice-President.

This society's exhibition was held on the 23th September last, and was attended by a larger number of people than ever before. The fruit crop being an abundant one this year, resulted in bringing together large collections in all classes, requiring the utmost care and examination in adjudging the prizes.

One hundred plates of grapes shown by Messrs. Pattison, Spencer, Hart, and Wood, was a marked improvement on previous exhibits, and as its culture becomes better known, its presence in every garden will be the rule instead of the exception.

One of the society's works this year, was the presenting of each of its members with two or three trees of the New Russian varieties. One hundred and seventy-six trees of twenty different varieties were thus distributed, and their hardiness, fruitfulness, or other desirable characters will be noted from time to time. It is not to be expected that all will be valuable acquisitions to our already long list, but it is quite likely some of them will be found deserving further propagation.

REPORT OF THE FRUIT GROWERS' ASSOCIATION OF THE COUNTY OF
SHEFFORD, 1884.

In presenting this, our fourth annual report of the Fruit Growers' Association of the County of Shefford for the past year, I will confine myself chiefly to our Exhibition which took place on the 23rd and 24th days of September last, and was a decided success, both flats of our large and magnificent Town Hall being loaded with vegetables, fruit and flowers. There were on exhibition 374 plates of apples, 42 of crabs, and 82 of grapes. The display of pot plants and flowers, owing to the unfavorable seasons, was not quite up to former years, but the vegetables were much finer than any previously shown; \$200 were paid in prizes, of which about \$80 were paid on fruit, \$70 on vegetables, and \$50 on plants and flowers.

The most hearty thanks of the Association are hereby tendered to the Council of Agriculture for the increase of the grant to \$100. We laid out \$50 in Russian apple trees, which we distributed among 165 members, gratis, and which we trust in time will help to improve the winter keeping quality of the fruit of this section.

We are happy to state that our society is at present out of debt. The grant of \$100 this year having enabled us to wipe out the deficits remaining over from the first two years of the society's existence, and which were unavoidably incurred in

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providing the preliminary expenses necessary for the holding of our Shows. As the expenses will not have again to be met, we trust by prudent management and keeping our prize lists within our legitimate resources, to come out hereafter with a clean sheet. We regret to say that we find great difficulty in working that part of the Constitution which holds members from year to year, until they give notice of withdrawal in writing. Not only has it been exceedingly difficult to collect the amount of these annual subscriptions from such members, but counting those subscriptions among our assets has put the directorate in a wrong light towards the members, as our position financially has appeared better than it should have done, and a large part of the receipts of one year had to go to provide for the fees of these nominal members whose subscriptions were never paid. The writer has this year taken the responsibility of striking out all such names and counting only those as members whose fees are paid in advance.

In conclusion, we trust that the Council may find it possible to continue the \$100 grant, so that we may not be obliged to curtail our Prize List to any further extent and so lessen the interest that has been awakened among our fruit growing community, but that the work so auspiciously commenced may be carried on with still greater success, till every hillside and valley shall be stocked with the choicest varieties of fruit-bearing vines and trees, and every wayside home be made attractive by well-kept grounds and neatly cultivated flowers.

J. A. TOMKINS,
Secretary Treasurer.

LIBRARY.

The Society's Library is now re-arranged and the books and miscellaneous publications have all been catalogued as in the following pages. From this it will be seen that there is a large and valuable exchange of publications with kindred Societies and with Botanic Gardens throughout the world, and it is to be hoped that members will avail themselves of the opportunities thus placed at their disposal. The Library is open each Friday afternoon in the week, for reference, and it is much to be desired that non-resident members of the Society should avail themselves of the advantages here offered, to consult works of reference and find a convenient centre for meeting and discussion.

The following donations have been received :

DR. T. STERRY HUNT—

Rivers Rose Amateur Guide, 1877, 1 vol.

Gardening for pleasure. P. Hendersón, 1879, 1 vol.

MR. E. J. MAXWELL—

Modern Practical Gardening. E. Watts, 1 vol.

Good Gardening. S. Wood, 1876, 1 vol.

American Flower Garden Directory. R. Buist, 1854, 1 vol.

The American Gardener's Assistant. T. Bridgeman, 1875, 1 vol.

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CATALOGUE OF BOOKS IN THE LIBRARY OF THE MONTREAL
HORTICULTURAL SOCIETY.

[Bound Volumes.]

- Agricole, Letters of, J. Young, 1882, 1 vol.
 Agriculture, *Official Journal*, vol. 12, 1859.
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 Canada at the Paris Exposition, 1855, 1 vol.
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 Connecticut Exp. Stat. Reports, 1878-79-81-82-83-84, 4 vols.

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 Fruit Trees, Cult. and Management of, W. Cobbett, 1803, 9 vol.
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- Illinois Hort. Soc. Reports, 1868 to 1877, 10 vols.
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 " Dept. of Agriculture Reports, 1872-79 and 1883, 9 vols.
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YEARLY ABSTRACT FOR 1884.

Meteorological Observations, McGill College Observatory, Montreal,
Canada, height above sea level, 187 feet.

C. H. McLEOD, SUPERINTENDENT.

MONTH.	THERMOMETER.				*BAROMETER.				†Mean pressure of vapour.	‡Mean relative humidity.
	Mean.	Max.	Min.	Mean daily range.	Mean.	Max.	Min.	Mean daily range.		
January	8.73	40.5	-16.5	16.38	30.0499	30.964	28.960	.3353	.0634	81.12
February	18.11	44.0	-11.0	17.52	30.0927	30.686	29.175	.3649	.0956	85.59
March	25.65	47.1	-9.4	14.02	29.9941	30.395	29.518	.2350	.1212	79.69
April	40.55	69.0	24.5	14.17	29.8369	30.317	29.233	.1635	.1794	71.68
May	51.95	75.9	33.5	17.92	29.8922	30.266	29.438	.1721	.2751	68.55
June	66.91	86.0	44.0	21.00	30.0187	30.565	29.584	.1544	.4478	67.00
July	65.84	86.7	51.0	16.48	29.7783	30.073	29.445	.1326	.4826	75.98
August	68.79	91.0	43.8	17.84	29.9733	30.348	25.569	.1227	.5006	71.05
September	61.76	87.7	36.5	16.07	29.9859	30.530	29.487	.2163	.4160	73.09
October	44.96	70.6	23.9	13.28	30.0393	30.623	29.573	.2557	.2427	76.41
November	30.34	49.8	13.2	13.45	29.9683	30.451	29.311	.2878	.1393	79.96
December	16.51	49.0	-23.5	13.57	30.1140	30.836	29.204	.2932	.1007	85.99
Means for 1884.....	41.675			15.975	29.9696			.2278	.25537	76.342
Totals										
Means for 10 years ending Dec. 31, 1884	42.113				29.9746				.25275	74.225

WIND.	Mean direction.	Mean velocity in miles per hour.	Sky clouded per cent.	Percentage of possible sunshine.	Inches of rain.	No. of days on which rain fell.	Inches snow.	No. of days on which snow fell.	Inches rain and snow melted.	No. of days on which rain and snow fell.	No. of days on which rain or snow fell.	MONTH.
S. W	12.23	66.4	27.6	0.22		3	44.2	21	4.38	2	22	..January.
W. S. W	9.98	75.8	22.4	2.18		3	29.3	20	4.95	6	23	..February.
W. S. W	11.41	56.2	47.0	1.32		7	20.9	14	3.39	2	19	..March.
N. W	9.33	68.2	33.7	2.09		10	3.9	6	2.48	1	15	..April.
W. S. W	9.84	70.3	43.8	3.51		19	0.0	0	3.51	0	19	..May.
S. W	8.99	45.7	68.8	3.38		9	0.0	0	3.38	0	9	..June.
W. S. W	9.61	59.5	46.4	4.11		19	0.0	0	4.73	0	19	..July.
W. S. W	8.35	39.9	67.1	1.11		7	0.0	0	1.75	0	7	..August.
W. S. W	9.87	44.7	58.9	3.87		11	0.0	0	3.37	0	11	..September.
W by S	9.72	73.6	33.2	2.62		17	0.5	5	2.67	3	19	..October.
SW by W	11.15	72.9	27.6	2.13		12	5.0	10	2.62	3	19	..November.
W. S. W	11.81	64.3	22.4	1.53		8	35.0	14	4.57	1	21	..December.
W. S. W	10.191	61.46	41.58									..Means for 1884.
					28.83	131	138.8	90	41.80	18	203	..Totals for 1884.
W by S	10.935	60.99	46.92	27.27	136.5	116.6	85.3	38.91	15.9	211.7		..Means for 10 years ending Dec 31, 1884.

*Barometer reading reduced to 32° Fahr., and to sea level. †Inches of Mercury. ‡Relative, saturation being 100. §For 3 years only. The monthly means are derived from observations taken every 4th hour, beginning with 3.08 a.m. The greatest heat was 91.0 on August 21st; greatest cold was 23.5 below zero on Dec. 20th; extreme range was 4.0 on Nov. 28th. The warmest day was August 21st, the mean temperature on one day was 37.6 on May 2nd; least range Dec. 20th, mean temperature 17.3 below zero. The highest barometer reading was 30.964 on January 27th, the lowest April 26th. The greatest mileage of wind recorded in one hour was 50 on May 2nd, when the velocity in one gust was at the rate of 80 miles per hour. (This is the greatest velocity ever recorded here.)

The sleighing of the winter closed on April 1st. The first appreciable snow of autumn fell on October 25th, but melted as it fell. The first sleighing of the winter was on Nov. 23th. Upper river navigation opened April 17th. Ferries running on April 22nd. River open to ocean ships on April 27th. First ocean ship arrived in port on May 2nd.

Auroras were observed on 21 nights. Hoar frost on 23 days, Fogs on 13 days; Lunar halos on 8 nights; Lunar corona on 2 nights. Thunder storms on 12 days, and lightning without thunder on 6 days.

The red sky at sunrise and sunset was very brilliant in January and February. It has decreased in brightness, but has been observable up to the end of the year.