

1890

FIFTEENTH ANNUAL REPORT
OF THE
MONTREAL HORTICULTURAL SOCIETY
AND
FRUIT GROWERS' ASSOCIATION
OF THE
PROVINCE OF QUEBEC



PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY

MONTREAL
L'ETENDARD, 35 ST. JAMES STREET

1892

THE STATE OF CALIFORNIA

CENTRAL HORTICULTURAL SOCIETY

FRUIT GROWERS' ASSOCIATION

PROVINCE OF CALIFORNIA



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MONTREAL HORTICULTURAL SOCIETY

AND

FRUIT GROWERS' ASSOCIATION OF THE PROVINCE OF QUEBEC.

ANNUAL MEETING.

The Annual Meeting of the Montreal Horticultural Society and Fruit Grower's Association of the Province of Quebec was held in the Fraser Institute Hall, Montreal, on the 5th December, 1890, at 8 o'clock p.m. Prof. D. P. Penhallow, the President in the Chair. There were present Messrs. R. W. Shepherd, jr., Vice-President; A. Joyce, E. J. Maxwell, J. B. Goode, D. R. McCord, W. Bell, J. Kirkwood, J. Betrix, W. B. Davidson, A. C. Lyman, J. Johnson, P. A. Somerville, Canon Fulton, J. Ainslie, S. Ward and others.

The Minutes of the last Annual Meeting were read and confirmed.

The Secretary read the following report of the operations of the Society for the past year and the Financial Statement which were adopted.

SECRETARY'S REPORT.

The following report of the operations of the Society for the past year is respectfully submitted.

In accordance with our usual custom application was made for the admission of our members to the Conservatories during the winter months and we were enabled to announce the opening of several fine collections of plants. Our cards last winter contained the names of Sir George Stephen, Mr. H. Montagu Allan, Mr. Andrew Allan, Mr. Mackay, Kildonan Hall, Hon. J. J. C. Abbott, Mr. John Molson, Mr. R. B. Angus, Mrs. Redpath, Mr. James Burnett and Mr. W. McGibbon. The Society is greatly indebted to those who have so generously accorded to it this privilege.

The Annual Competition for Conservatories was held on the 7th March and resulted as follows:

CONSERVATORIES OVER 700 SUPERFICIAL FEET.

- | | | | |
|-----|-----------------------|----|-----------------------|
| 1st | W. Wilshire, gardener | to | Hon. J. J. C. Abbott. |
| 2nd | J. Betrix, | " | " Andrew Allan, Esq. |
| 3rd | J. Kirkwood | " | " R. B. Angus, Esq. |

UNDER 700 FEET.

- 1st J. Bland, gardener to James Burnett, Esq.
 2nd J. Hockey, " " John Molson, Esq.
 3rd J. Eddy, " " Mrs. Redpath.

The important event of the season, the Fall Exhibition was held on the 23rd, 24th, 25th, September.

The entries were numerous and the magnificent collection of plants and fruits formed a display worthy of a more extended patronage by the public. The Premier of the Province who was present, at the invitation of the Directors, expressed himself as being astonished and gratified at the display. The result of the attendance was however disappointing.

The Financial Statement is as follows:

Financial Statement of the Montreal Horticultural Society and Fruit Grower's Association of the Province of Quebec for the year ending 30th November, 1890.

RECEIPTS.

Cash on hand 1st December, 1889.....	\$27 05
Exhibition.....	260 10
Special prizes.....	6 00
Members Subscriptions, 444 at \$2 \$888; 15 at \$1 \$15.....	903 00
Provincial Government Grant for 1889.....	1,000 00
Dominion Convention of Fruit Growers.....	157 85
	<hr/>
	\$2,354 00

EXPENDITURE.

Sundry accounts remaining unpaid from last year.....	\$880 79
Rent.....	101 00
Advertising and printing.....	171 66
Insurance.....	8 90
Postage.....	35 00
Commission on Collections.....	77 80
Prizes.....	50 00
Delegates expenses to Dominion Convention.....	103 47
Plant, plates.....	7 50
Sundry accounts.....	544 85
Sundry petty expenses.....	16 08
W. W. Dunlop, Secretary-Treasurer on account.....	250 00
Balance deposited in Merchant's Bank.....	106 95
	<hr/>
	\$2,354 00

It will be noticed by the foregoing Statement that the prizes awarded at the last exhibition have not been paid owing to our not having received from the Provincial Government our grant for the current year. The receipt of this amount will enable us to pay all liabilities and leave a surplus of \$263.45 as per following statement.

ASSETS.

Cash on hand.....	\$106 95
Due by Provincial Government.....	1,500 00
	<hr/>
	\$1,606 95

LIABILITIES.

Due for prizes.....	\$1,093 50
Due Secretary-Treasurer.....	250 00
	<hr/>
	1,343 50
	<hr/>
	\$263 45

In my report for 1888 I directed attention to the fact that our revenue was not keeping pace with our expenditure and stated that the experience of the past few years would seem to show that neither in receipts from exhibitions nor from membership could we reasonably expect any increase in this direction, and in order to obtain an increased revenue other means must be devised.

Our Annual Exhibitions which were formerly a source of revenue have during the past ten years been a source of loss—a loss which we have so far been able to meet by drawing upon a surplus accumulated in more prosperous years.

With this experience, which I may state is not alone the experience of Our Society but of many of the principal societies on this continent holding Horticultural Exhibitions, it would be well to consider the advisability of holding annually an exhibition of the magnitude of ours.

The decrease of receipts at our Exhibitions, and the decreased number of subscriptions may be attributed to the same cause—a want of public interest in Horticultural matters, and if we cannot arouse this interest we must at least adopt means to carry on the good work, now continued through nearly half a century. I would therefore respectfully suggest for your consideration whether, in view of the large expenses incurred in holding our September Exhibition, it would not be more desirable to hold two or more smaller exhibitions of flowers and fruits in season, also with a view to induce a greater number to join our society and become interested in horticultural matters that the annual fee be reduced to \$1 and life membership in proportion.

To adopt any or all of these suggestions would involve changes in our Cons-

titution and By-laws notice of which would require to be given and the details carefully discussed before coming to a decision.

During the present year it has been our misfortune to lose by death one of our most valued members, the late Mr. Charles Gibb, whose close identification with this Society for many years has enabled us to share to a great extent in the honour he had won by his untiring efforts in the cause of horticulture.

Time, alone, may lessen the regret we feel at his removal, but cannot repair the loss we have sustained.

W. W. DUNLOP, Sec.-Treas.

The President addressed the meeting referring to the operations of the Society in the past and appealing to the public for a fair share of support in the good work being carried on, and concluded by a touching reference to the great loss sustained through the death of Mr. Charles Gibb.

The election of Directors was next proceeded with and Messrs. J. W. Beall and John Doyle appointed scrutineers.

The question of amending the constitution with a view to reducing the fees for annual and life-membership, and the holding of exhibitions was then discussed and the following notices of motion made by Mr. D. R. McCord.

1st That article No XI be amended so that the Directors shall decide how many exhibitions shall be held in each year, at what times and places, and of what classes of horticultural products, fruits, plants, flowers and vegetables.

2nd That article XII be amended to read annual fee of one dollar instead of two dollars.

3rd That article XV be amended by substituting the amount of ten instead of twenty dollars for life membership.

The scrutineers reported the election of the following Directors:

Prof. D. P. Penhallow, Messrs. E. J. Maxwell, A. Joyce, R. W. Shepherd, jr. John Doyle, R. Brodie, J. Kirkwood, W. J. Wilshire and W. Evans, jr.

The meeting then adjourned.

REPORTS OF LOCAL SOCIETIES.

Fruit Grower's Association of Abbotsford.

CHARLES GIBB, President.

A. M. FISK,

Secy-Treasurer.

Report by J. M. Fisk

J. M. FISK,

Vice-President.

The past year has proved an eventful one to us and the Fruit Growers of the Dominion. At the Annual Meeting held on the 28th October, 1889. Mr.

Chas. Gibb was unanimously elected President, at which time he was absent on a journey around the world, mainly in the interest of Horticulture, following out a long contemplated scheme of visiting Japan, China, India, Ceylon, and other parts of the Continent. But, "where man proposes, God disposes," and a noble life's work was suddenly brought to a close by his death at Cairo, Egypt, on the 8th of March.

Mr. Gibb had already twice visited Russia, and through him there have been disseminated throughout this country many hardy varieties of the Apple, Pear, Plum, and Cherry, which give promise of great value to the colder sections of the Dominion. By his zeal and enthusiasm in all matters relating to Horticulture and Arboriculture, he obtained a position both at home and abroad, that few may hope to reach, and through his death the country sustained a loss that will long be felt by all who had the pleasure of his acquaintance.

At a special meeting convened on April 15th, the following resolutions were unanimously adopted.

Resolved 1st.—That the members of this Association have learned with profound sorrow of the death of the late Mr. Charles Gibb, their President, at Cairo, Egypt, on March 8th, 1890, while on his return from a tour of research around the world, gratuitously undertaken in the interest of Pomology and other scientific objects for the benefit of his country.

Resolved 2nd. That in consideration of the eminent and influential position to which Mr. Gibb had attained, both at home and abroad, as a leading Fruit Grower in this Province, and of the many noble qualities manifested by him in his genial, social and useful intercourse amongst all those with whom he came in contact, during the seventeen years of his residence at Abbotsford; We hereby give expression to our regret at the great loss we have sustained by his demise, and to our earnest sympathy with his near relatives in their bereavement.

Resolved 3rd.—That the Secretary be hereby instructed to transmit a copy of these resolutions to Mr. and Mrs. J. J. Gibb, of Como, P. Q. and to Mrs. J. B. Hill, of Bath, England.

Another event to chronicle is the first meeting of the Dominion Convention of Fruit Growers, which was held at Ottawa on the 19th, 20th and 21st of February, in the organizing of which Mr. Gibb took a very active part, and was a success, as it brought together the delegates and fruit growers, with samples of fruit from the different provinces, and afforded an opportunity for an exchange of ideas and experiences in the different lines, that affect the interests of the fruit growers over an extent of country reaching from the Atlantic to the Pacific coast.

The convening of such meetings and publishing their transactions is a matter

of great importance to a growing industry in this Canada of ours, and we trust the Government will continue the work so well begun. The report has lately been issued by the Government. It is a pamphlet of 164 pages, and contains much to interest all those engaged, or interested in fruit growing. We were enabled to obtain a copy for each member of our Association by applying to our M. P. the Hon. G. A. Gigault, and beg to acknowledge thanks for the same.

The Abbotsford Association took its share of prizes at the convention. Through their delegates they were enabled to place on exhibition several varieties of the leading winter apples of the Province, taking 18 prizes, amounting to \$51. An aggregate of over one eighth of the amount, offered in prizes for dried, preserved, and green fruits.

The Association had another distribution of trees last spring, which was the balance in stock of the Russian and North German pear, plum, and cherry, and consisted of 258 pear, 257 plum, and 55 cherry, forming a total of 570 trees, which with 525 distributed in the spring of 1889, and 50 furnished by the Experimental Farm, forms a grand total of 1145 as the result of the Moscow importation of 1884.

The Annual Exhibition was held at Abbotsford on the 18th September, when we were fortunate in having a fine day and a good attendance.

The display in fruits, flowers, and vegetables, was quite up to the average for size, beauty and quality, though the competition was below average in several sections; especially was this the case in the section for grapes. The season being an unfavorable one for outdoor grapes, and the exhibition being held earlier than usual will to a great extent account for this.

At the close of the exhibition a selection was made from the tables, to form a county collection of apples to compete in Montreal, and supplemented by a few plants from the Whitfield orchard, at Rougemont. This collection was placed in competition with three other counties, (Hochelaga, Huntingdon and Chateauguay), taking first prize.

The Annual meeting was held on the 3rd of November, when the financial statement of the Secretary showed a healthy state of the Society's funds; all expenses to date having been met, and a fair balance carried forward to the incoming year.

The result by ballot for officers was as follows:—J. M. Fisk, President, W. J. Gibb, Vice President; A. M. Fisk, Sec.-Treasurer. Directors, A. Brousseau, Geo. Roach, Jno. Donahue and W. R. Hovey.

MISSISSIQUOI HORTICULTURAL AND FRUIT GROWER'S
ASSOCIATION.

HON. T. WOOD, President.

B. A. LONGEWAY,

Vice President.

DAVID WESTONER,

Sec.-Treasurer, 1890.

The eleventh annual exhibition of this Society was held at Durham, on the 11th and 12th of September. Cloudy days dampened the ardor of some intending visitors, but judging by the admittance fee the attendance was quite as numerous as heretofore. All the fruit on exhibition was grown in the County.

Owing to the regulations of the Council of Agriculture, requiring reports of societies to be sent in before the 15th Sept., the time of holding the exhibition was fixed before that date, quite two weeks earlier than usual, and in consequence much of the winter fruit had not attained its full growth, or maturity. The total number of plates of apples was 491, including 31 of crab apples. Nine plates of the New Russian varieties (representing as many different sorts) were shown, some were large, larger than the Alexander, but not equal to it in flavor, some decidedly poor. Season, early in Fall. 19 plates Pears, 15 plates Plums and 31 plates Grapes, made a fine display, but not equal to some previous exhibits. Our people have much to learn yet before making fruit growing a success. The past season is conspicuous as a failure, all over the province shows that more time, care and cultivation must be given to our orchards if we expect to keep them healthy and prolific. Many have an idea that an orchard will produce fruit and bear cropping, but forget that if this course is followed, twice the amount of fertilizer should be applied. Too often it is left in grass without any application whatever. Another practice is to plant too extensively, which if not followed up with skill and good management results in feeble growth, insects and disease, and unsatisfactory returns. A good rule to go by would be to apply plenty of manure and keep the trees making a growth of at least one foot a year. After coming into bearing continue the application of lime and ashes by top dressing in sufficient quantities to keep up a vigorous growth. A feeble tree will not give the finest fruit.

FRUIT GROWER'S ASSOCIATION OF THE COUNTY OF SHEFFORD.

GRANBY, OCTOBER 27TH, 1890.

To the Montreal Horticultural Society,—

SIR,—I have the honor to present to you the report of our Tenth Annual Horticultural Exhibition held by the above association, on Tuesday and Wednesday, the 16th and 17th September last in the Town Hall and grounds at Granby.

This show was a magnificent success far surpassing any former year both in quality of exhibits and the quantity placed on exhibition. When we remember that the Horticultural Exhibition in Granby has always been a success the directorate have reason to feel proud of the results of their efforts for the present year. There were visitors present who said they had not seen the exhibition equalled in Sherbrooke, Ottawa or Toronto in the departments of Vegetables Fruit and Flowers.

There were over eleven hundred entries in the several departments, as follows: In Fruit 346 entries, Vegetables 428 and Pot Plants and Flowers 160. Total 934. Then in special exhibits there were 177 entries: in all a grand total of 1,111.

In fruits there were 44 collections of apples shown, the largest containing over sixty named varieties. In single plate there were 14 Russets, 28 Alexanders, 34 Duchess, 30 St. Lawrence, 33 Fameuse, 9 Can. Baldwin, 8 Late Strawberry, 14 Peach, 9 New Russian, 12 Wealthy, 23 Red Astrachan, 29 other grafted fruit, besides other smaller lines. There were three entries in pears showing, they can be successfully grown in this climate, also 8 collections of grapes, one comprising over twenty named varieties.

The greatest improvement, however, was noticed in the department of Vegetables, extra room having been provided at the side of the Hall and under the spacious tent. Our prize list had been largely increased which drew out a much greater competition. There were in this department 428 entries. There being as many as thirty entries in a single section. There were collections of vegetables of over twenty distinct varieties of squashes containing twenty-four different kinds and of onions and potatoes in sufficient numbers to satisfy the taste of the "comoiseur."

The display of Plants and Flowers was really beautiful and called forth the admiration of all beholders.

They were arranged in pyramidal form down the center of the main hall and produced a fine effect flanked with the long tables of apples and grapes on either side. A pleasing and satisfactory feature in this department this year was the fact that many of the farmers living outside the limits of the town were successful competitors in this class. Showing that the influence of this association is extending, and a love of the beautiful is being cultivated in homes where a few years ago no thought or attention was given to anything but those products that would return the most money, and the attractiveness and the refinement of the home were altogether neglected.

Our prize list as already intimated was largely increased this year. The prizes being more numerous and larger in amount, amounting to over \$300 of which \$260 were paid out. This of course entailed increased expenditure, and

as we do not run any circuses, baloon ascension, or jumping jacks in connection with our show and our admission being only the nominal sum of five cents to each department merely to regulate the rabble it is evident that but for the liberal support of our citizens there would have been a serious deficiency in our balance sheet. This exhibition has far surpassed what was contemplated at its inauguration and the association feel that they should be entitled to a special grant of at least \$200. Hoping this may receive favorable consideration on the part of the Council of Agriculture.

I have the honor to remain, Sir,

Your obedient servant

J. A. TOMKINS,
Sec. Treasurer.

E. A. BARNARD, Esq.
Sec. Ag. Society,
QUEBEC.

KNOWLTON, Jan., 1891.

I have great pleasure in again reporting a very successful exhibit and increased interest in our horticultural show this year. We have added a good many new members to our list, and expect to still increase the number for 1891.

The exhibit of fruit was large and attractive comprising nearly all the varieties of apples grown in the Eastern Townships, also plums grapes and pears. The show of vegetables, grain etc., exceeded any previous exhibits in this county. We have paid out in prizes one hundred thirty six $\frac{75}{100}$ dollars. Also thirty one $\frac{50}{100}$ dollars in special prizes and been able to give nearly six hundred appletrees " new varieties " to members.

We are already begining to see exhibits from the young trees of former years.

In conclusion would say fruit growing and the Horticultural Society are in a prosperous condition in this county.

H. E. WILLIAMS, President.
Brome County, Hortl. Society.



CHARLES GIBB, B. A.

CHARLES GIBB, B. A.

By Professor D. P. PENHALLOW.

Mr. Charles Gibb, son of the late James Duncan Gibb, was born in Montreal on the 29th of July, 1845. His early education was received at the Bishop's College Grammar School, from which he proceeded to McGill University, where he graduated in 1865. The hard work of a college course told somewhat severely upon a not very rugged constitution, with the result of impaired eyesight. For the purpose of recovering his health he then visited Europe, where he spent six months, returning very much benefited by the change. Natural weakness of the lungs, however, induced him to seek some active occupation which would give the benefit of open-air employment. This led to his spending several years with some of the more prominent fruit culturists of New York and New Jersey, from whom he gained a practical insight into the most approved methods of fruit culture. It was this experience which soon aroused a decided taste for horticulture, and eventually led to his adoption of that pursuit into which he threw so much energy and enthusiasm. Fortunately for himself and for the country whose good he sought to promote, Mr. Gibb was possessed of means sufficient to enable him to execute his plans without undue restriction, and future generations will have reason to hold in respect the name of one who, in so unselfish a spirit, endeavored to promote the welfare of his country in one of the most useful directions possible.

On his return from the States in 1872, he sought for a locality where he might pursue special studies in fruit culture and arboriculture, and eventually selected the warm, western slope of Yamaska mountain at Abbotsford, as fully meeting his requirements. In 1873 he purchased a large tract of land there, planted extensive orchards, established testing grounds for exotic trees and shrubs which might prove of value in Canada, and stimulated a local interest in his chosen pursuit, hitherto unknown in that part of Quebec. Here he established a delightful home, the door of which was constantly open to his many friends, all of whom have on more than one occasion, experienced the full measure of his most generous hospitality. This Society has special reason for holding Mr. Gibb's charming retreat and his warm hospitality in remembrance. Two of their most profitable and enjoyable Field Days were those held at Abbotsford.

Of a somewhat retiring disposition, strangers were not drawn to him as quickly as they might be to many others, but even a brief acquaintance was sufficient to reveal qualities which were certain to cement a warm and enduring friendship, while to those who knew him best, his greatest fault lay in a modesty which permitted him to sacrifice a just appreciation of his own merits. Pos-

essed of a warm heart, it was his first desire to see others about him happy, and had this idea not been carried out rather too unselfishly, doubtless his home would have known the blessing of a partner in a useful work. Though not a man of large means, he conscientiously endeavored to make the best use of what he possessed, and while his modesty forbade any ostentatious display, he accomplished a large amount of good in many directions. He was an active supporter of the Art Association of Montreal, a contributor to most of our public charitable institutions, and a warm supporter of those societies whose work lay in the promotion of science and horticulture. He contributed in many ways to the work undertaken by McGill College in promoting the study of science, his various donations at different times being most judiciously applied. Among other gifts of a similar nature, he, on more than one occasion, made valuable donations of trees and shrubs, which are now growing in the College grounds, and constitute an important element in the foundation of the Botanic Garden now in process of development.

As a pomologist Mr. Gibb was justly accorded a high position, and his writings on this subject will have a lasting value. Whatever he undertook to do was executed with a degree of intelligent interest and thoroughness which left little to be desired, and it was his most conscientious scrutiny of facts which has given character to his various writings, as being thoroughly reliable statements. The same thoughtful care and attention to details was evident in the expressions contained in the last letter, indited only two days before his death, of the near approach of which he was conscious.

Mr. Gibb died of pneumonia at Cairo, Egypt, on the 8th March, 1890. To all who knew him his death is a personal loss; to his more intimate friends, it is the loss of a brother; to his country, for whose welfare he nobly and generously toiled, and in whose interest he was making a prolonged tour of foreign lands when death overtook him, it is the removal of one who filled an important place in our material progress, one who could not well be spared.

Although not a scientific man, he had given such close and accurate attention to fruit culture as to make him eminent among the pomologists of this continent, while his name was well and favorably known throughout Europe. It is therefore desirable that his work in the interests of improved horticulture should receive consideration.

Mr. Gibb was a life member, and in 1879-81, vice-president for Quebec of the American Pomological Society; corresponding member of the Mississippi Valley Horticultural Society; corresponding member of the Massachusetts Horticultural Society; honorary member of the Nova Scotia Fruit Growers' Association; member of the Natural History Society of Montreal, and a member and, at the time of his death and for several years previous, vice-president of the Montreal

Horticultural Society and Fruit Growers' Association of the Province of Quebec. He founded the Abbotsford Fruit Growers' Association, was its leading spirit to the day of his death, and at various times held most of its leading offices. He took a most active part in the recent efforts to establish a Botanic Garden in the city of Montreal, and was at all times one of the leading and most useful members of the Montreal Horticultural Society, to whom his loss comes as a most serious one. At the time of the Indian and Colonial Exhibition at London, he was one of the principal promoters of the important fruit exhibit then made.

In 1882, acting upon a suggestion made by Prof. Wm. Saunders, while president of the Ontario Fruit Growers' Association, and impressed with the need of a better acquaintance with the fruits of the old world, in order to determine how far improvements in our own fruits could be made through the importation of and crossing with those from similar and colder climates, Mr. Gibb, in company with Prof. J. L. Budd of Ames, Iowa, visited various parts of Russia and Northern Europe, and brought back information of great value. The expenses of this journey were wholly met by the private means of these two gentlemen. The knowledge gained was subsequently embodied in several valuable articles published in the reports of the Montreal Horticultural Society and elsewhere. In 1888, Mr. Gibb visited California in the interest of fruit culture, and in June, 1889, he started on a journey through the east, for the purpose of more closely examining their various fruit products. Proceeding to Japan by way of Vancouver, he traversed the "Island Empire" from one end to the other, and was particularly interested in examining the resources of the northern Island of Yeso, which, on account of its high latitude, he felt sure was likely to yield many plants which would prove of great value in Canada. There he met with every attention from various officials to whom he had letters of introduction, and through whose courtesy he was enabled to carefully examine many localities of interest. The notes he took during this part of his travels undoubtedly contain a large amount of material of special value, and it is to be hoped that it may be possible to publish them at some future time. From Japan he proceeded to Hong Kong, Ceylon, Calcutta, Bombay, and thence to Cairo, where his fatal illness overtook him.

The work undertaken by Mr. Gibb, in the line of practical horticulture, was of the greatest importance to Canada, and more especially to Quebec, where the kinds of fruit which can be successfully grown are necessarily limited. At Abbotsford he had established extensive orchards of Russian fruits, which he was testing not only for quality, but for climatic adaptation and their value for purposes of hybridizing with native and less hardy kinds. Most of these trees are yet very young, but some of them have attained that age at which they are in a condition to yield important results. An extensive plantation of fruit and orna-

mental trees was also an important feature of his work, and had he been spared for another decade, valuable results would have been secured from a work wisely conceived and intelligently prosecuted. Though not known as an originator, one fruit will serve to transmit his name to future generations of pomologists. The Gibb Crab, a most delightful fruit of its class, was discovered by Mr. Gibb, in the orchard of Mr. Peffer of Pewaukee, Wisconsin, by whom it had been overlooked, but who promptly named it in honor of him who had rescued it from oblivion.

Mr. Gibb's writings upon horticulture are somewhat numerous and of very considerable value. Almost his first contribution was the publication of "A Fruit List for the Province of Quebec." This little pamphlet was published in 1875, by the newly organized Fruit Growers' Association of Abbotsford, and led to the issue, in the following year, of a "Report of the Fruit Committee of the Montreal Horticultural Society for 1876." The publication of this report was secured by Mr. Gibb in the face of great obstacles, but its importance demonstrated the need of an annual publication of the work of the Society. It thus came to be the first of a series of annual reports to which Mr. Gibb contributed largely, and which, through the valuable character of the material they contain, have gained a high reputation both at home and abroad. Perhaps Mr. Gibb's most important publication is his contribution to "The Nomenclature of our Russian Fruits." This paper was prepared at the request of the American Pomological Society, and offers at once a most careful, exact and authoritative revision of Russian fruits imported into America, extant. It is a monument to the zealous and painstaking care of one who verified his statements in every possible way before giving utterance to them. The following list of publications will best serve to express the character and extent of his work :

1. "Report on Quebec Fruits," Rept. Amer. Pom. Soc., 1874, p. 33.
2. "A Fruit List for the province of Quebec," published by the Abbotsford Fruit Growers' Association, 1875.
3. "Report of the Fruit Committee of the Montreal Horticultural Society," first An. Rept. M. Hort. Soc., 1876.
4. "Propagated Seedling and Other Undescribed Fruits," Rept. Mont. Hort. Soc., 1876, p. 19.
5. "Report on the Fruit Growers' Association of Abbotsford," Rept. Mont. Hort. Soc., 1876, p. 67.
6. "Notes on Outdoor Grapes," Rept. Mont. Hort. Soc., 1879, p. 54.
7. "Ornamental and Timber Trees," Rept. Mont. Hort. Soc., 1881, p. 58.

8. "The Work of the State Agricultural College at Ames, Iowa," Rept. Mont. Hort. Soc., 1881, p. 151.
9. "Russian Fruits," Rept. Mont. Hort. Soc., 1882, p. 17.
10. "Hasty Notes on Trees and Shrubs of Northern Europe and Asia," Rept. Mont. Hort. Soc., 1882, p. 99 ; Rept. Ont. Fruit Growers' Association, 1883, p. 302.
11. "Catalogue of Russian Fruits Imported by the U. S. Department of Agriculture in 1870," Rept. Mont. Hort. Soc., 1883, p. 52.
12. "Report on Russian Apples Imported by the U. S. Department of Agriculture in 1870," Rept. Mont. Hort. Soc., 1883, p. 58.
13. "Report on Russian Fruits with Notes on Russian Apples Imported in 1870 by the U. S. Department of Agriculture," Rept. Ont. Fruit Growers' Association, 1883, p. 192.
14. "Siberian Apples and their Hybrids," Rept. Mont. Hort. Soc., 1884, p. 33.
15. "Hardy Fruits in Wurtemberg," Rept. Mont. Hort. Soc., 1884, p. 19.
16. "Ornamental Trees," Rept. Mont. Hort. Soc., 1884, p. 50.

THE FARMER'S ORCHARD

WHAT IT USUALLY IS AND WHAT IT OUGHT TO BE

By R. W. Shepherd Jr., Montreal.

Almost every farmer can grow good apples, if he tries. Few succeed however, many give up in despair after a very limited trial. That the farmer should make the attempt, fail, and not try and persist until he has succeeded as well with his apples, as with his crop of potatoes, corn or peas, can only be explained by the fact that in the former case, more time must elapse before a result is obtained, which is scarcely ascertainable in a season like other farm crops. A few years must necessarily pass before any result can really be known. If he fails he is discouraged. Time is money, he thinks, and having failed once he is too impatient to lose more time in trying again.

Patience and perseverance, therefore, are the first principles of successful orcharding. The old proverb says "*Patience is a virtue*," who can say that the farmer is not blessed with this most excellent virtue? But by patience and perseverance combined with the same degree of intelligence used in cultivating the other crops of the farm, he must succeed. The Farmer's Orchard usually consists of a few dozen sickly or half dead and alive trees, planted *near* the house (without regard to fitness of soil or exposure) as if the one great object in view was to

prevent the orchard being robbed. Of course if soil and location are suitable proximity to the house should be recommended for convenience sake. Frequently very indifferent fences, if any, surround the family orchard. It is commoner to see horses and cows browsing under the trees nipping off the tend growth of branches, undisturbed, unless the good wife can spare time from her many and arduous duties to drive off the intruders.

The Orchard is periodically manured by heaping up a little mound of it *against* the trunk, as if that were all that were necessary.—*It is starvation*— Along with starvation there are pretty sure to be insect depredators. The Borer gets into the trunk ; the Tent Caterpillar preys on the leaves and the Codling moth worm devours the fruit.

The trees, if pruned at all, are desperately amputated in the larger limbs, with stumps left to project and decay, as if the one idea was to get as much fire-wood as possible without regard to symmetry of tree or the prevention of inter-lacing of the branches. Is it strange, is it surprising, that with such treatment one frequently hears the complaint : I've often tried to raise fruit "*but have always failed?*"

There is no reason why every farmer should not have enough fruit for his family use to last through the whole year, and enough to sell too at a good profit.

Only go to work determined to win, displaying as much intelligence as you do in raising your calves, pigs and poultry and you will succeed.

Now, as to what the Farmer's Orchard should be.

First choose ground that is naturally drained or that can be easily drained. You can grow apples on a great variety of soils but they seldom thrive on *very dry* sands or soils saturated with moisture. The favorite soil is a strong loam of a calcareous or limestone nature such as that in the vicinity of Montreal Mountain, or a deep gravelly, marly or clayey loam or sandy loam on a gravelly subsoil are best adapted to apple growing. A sandy soil is so porous that it does not retain moisture long enough, and all the soluble parts of manure are quickly washed out of it, and therefore there is great difficulty in growing an orchard on *dry* sandy soil. In such cases the addition of clay and manure is recommended as beneficial.

A clay soil, in which clay predominates, is defective inasmuch as it retains moisture too long, and in dry weather becomes hard, baked, and impervious to light showers. Such soils must be underdrained and an application of sand or muck is recommended. Although the apple tree requires a rather moist soil, wet soils are most unsuitable. If a young orchard tree in the spring, after the snow has disappeared stands in wet soil it cannot live. I have always endeavoured to plant my trees on sloping ground (and I believe that Orchards on northern

slopes thrive best even in this cold north land) and my test as to moisture of soil, has been, to dig a hole 18 or 20 inches deep just after the disappearance of the snow. If water percolates into this hole, do not *plant trees in such soil*, unless *you underdrain*. The ground should be prepared for the trees by ploughing deeply a year or more previous to planting. Poor soil should be manured; and turning under green crops, clover, peas etc. will lighten and enrich the soil preparatory to planting.

I forgot to mention that the farmer must first have put a good substantial fence around his orchard. It must be done before he buys his trees, in fact it is the next step after choosing the location of the orchard.

What to plant? Well, that is a difficult question to answer. My advice is not to experiment with varieties that are little known. It will not pay the farmer to do so.

Leave that to the experimentalist, who too, will find it costly, but very fascinating

As an example of the advantage of beginners receiving advice as to what varieties to plant. I may tell you that about 17 years ago, when I first decided to plant out an orchard and wishing to plant out only winter varieties. I ordered 100 trees from an Ontario Nursery of the following, viz :

- 20 Northern Spy
- 20 Wine Sap
- 20 Wagener
- 20 Fallawater

and I thought I had done something clever, after reading the descriptions of these fruits in Chs. Downings' book. (The Encyclopedia of fruits)

But fortunately, for me I happened to come across my late lamented friend Mr Charles Gibb, shortly after the order had gone in, and he astonished me by stating that not one of the above named varieties would survive the winters of this province. I was therefore able to change my order to such varieties as he recommended and thus was prevented from making a loss of perhaps several hundred dollars in experimenting with unknown kinds, of which there was a dead certainty none would succeed. But in order to satisfy my curiosity and gain experience I ordered two instead of 20 of those varieties. The result is that I have one Northern Spy and one Wagener which have been killed down to the ground several times, but have never yet borne a single apple. The others were all killed out after the first or second winter.

The agents of distant nurseries have also been the cause of considerable loss to farmers in this province, by selling them varieties quite unsuitable. Remember that what may be classed as hardy varieties in catalogues of Ontario Nurserymen are not always to be relied on as hardy for this province.

I have tested over one hundred varieties of apples within the last sixteen years, but there are very few of all these that I would recommend the farmers of this province to plant

Do not plant too many kinds. Do not plant out more trees than you can properly look after. If you can take care of one hundred trees, plant out that number. If not, then plant less. Begin in a small way and add to your orchard by degrees as you find it profitable.

For an orchard of 100 trees for the ordinary farmer I would recommend.

- 5 Yellow Transparent for August
- 5 Duchess for September
- 5 Brockville Beauty for September and October
- 5 St Lawrence for October
- 5 Alexander for October and November
- 5 Winter St Lawrence for November and December
- 20 Wealthy for December
- 20 Fameuse for December and January
- 10 Canada Baldwin } For February and March
or Pewaukee }
- 15 Scotts Winter for April and May

All the above varieties can be grown successfully here. The ordinary farmer is generally too busy to market his fruit profitably before the fall. I have not, therefore, in the above list, you will observe, put down more than five of each variety until we come to the early winter varieties, but if any one feels in a position to be able to devote sufficient time to the marketing of early varieties, I would advise the planting of them largely. In this province we can grow August and September apples which cannot be surpassed and in the city of Montreal they command higher prices than fruit from Ontario, because we can place them on the market in better condition.

The *Yellow Transparent*, is a Russian apple but not one of the recent importations. It is being successfully grown throughout the province, Eastern Ontario and the state of Vermont. It ripens its fruit about the first week in August (Mr Brodie of Montreal says he has marketed them about 25th July). The fruit will not keep more than a week or two at most. It is a fine large yellow apple good for cooking or eating.

The *Duchess* is perhaps the most satisfactory of all known apple trees for this climate. Very hardy, bearing heavily and regularly, the finest and most beautiful of fruit. My advice to those who see their way to handle this fruit profitably would be to plant a larger proportion than that given in my list above mentioned.

Brockville Beauty is a Canadian variety originating near Brockville, Ontario.

The tree is hardy and a great bearer of beautiful fair sized fruit, which ripen, just after Duchess in September.

St Lawrence, is a difficult tree to get to grow and tardy in beginning to bear, but once established it is a grand tree which grows to great size and bears enormous crops of fruit that always command good prices. The *St Lawrence* is also a Canadian variety which originated in Mr Molson's garden, Montreal, and the parent tree only died a few years ago.

Alexander, a Russian which has been cultivated here for over 25 years, is a hardy tree, tardy in commencing to bear but bears enormous fruit plentifully when it does begin. It is a grand cooking apple. How it would eat I do not know. I have grown many bushels of them but never had the courage to attack such giants. The *Alexander* always makes a great show at Exhibitions and I suppose attracts more attention than any other variety.

The Winter St Lawrence is a large beautiful apple, and a most satisfactory tree, with me, in all respects. The fruit has the great recommendation of hanging on to the tree in gales of wind, until picking time arrives. It is also a most profitable apple so attractive in appearance, and being good for cooking and eating.

The Wealthy is a native of Minnesota and the best apple I have yet seen from the North Western States. The tree is a great grower, very hardy, clean and healthy looking. Bears early and enormously, in fact perhaps too heavily, so much that in order to have large sized specimens it is necessary to thin the fruit. The chief recommendation of this variety is its seeming adaptability to all soils (I have it growing in sand, gravel and clay,) its fine quality and appearance and its freedom from spotting. I have always found the *Wealthy* a most profitable apple and much appreciated in both Canadian and English markets.

Fameuse, you all know. The fruit is so fine and delicious when free from spot that we cannot do without it. The tree however is not satisfactory, being subject to disease and now, of short life, seemingly. It flourishes best on calcareous soils. Those who can grow *Fameuse* successfully should plant largely for the fruit when fine is always profitable.

Canada Baldwin, another native of Canada, is hardy and satisfactory at Como. Tree grows to large size and bears heavily every other year. The fruit is about the size of *Fameuse* very handsome but only fair quality. This variety keeps well into winter hence I recommend it.

Scott's Winter, is highly recommended in Vermont where I believe it originated. I have fruited this variety for over ten years. It is undoubtedly a hardy tree and good bearer of medium sized, red apples, rather tart, but becoming mellow and pleasant eating towards spring. I recommend it because we have no better that is as hardy a tree and as satisfactory. This province is very

deficient in late keeping *hardy* varieties. It has been the desire of the Provincial Fruit Growers Association to ferret out a late keeper, hardy as Duchess, and fruit as good as Northern Spy.

The late Mr. Charles Gibb spent his whole life, you may say in trying to find such an apple for this province. It was this object he had in view when he visited northern Russia, at great personal expense, a few years ago. We are testing many new Russians and perhaps such an apple may be found among them; but whether it will come to us from Russia or be found amongst our many grand Canadian Seedlings, we may rest assured of one thing, it will be hailed with delight by all apple growers throughout this Province of Quebec.

After having procured your trees from the nursery take them out of the bundles and heel them in the ground—each kind by itself, until you are ready to plant them out. Stake out your Orchard by marking the centre of each hole you intend digging, with a small stick. Have the rows not less than 25 feet apart and the trees about the same distance apart in the rows. Some trees of slow and dwarfish growth such as Duchess, Tetofsky, and Yellow Transparent may be placed nearer together in the rows, but all trees of vigorous growth should not be set less than 25 feet apart—Even 40 feet is advocated by some. In selecting trees from the nursery it is not best to choose the largest. Three year old trees can be dug up without much loss of root, but with four year old trees that is impossible, therefore the former with its roots intact, well planted and cared for, will grow quickly and two years after planting will surpass in size the four or five year old nursery tree set out at the same time.

In planting the Orchard I need scarcely say that for the purposes of cultivation after the trees have been planted, and also for sake of good appearance, it is necessary to set the trees in straight rows, looking every way.

Dig large, shallow, holes about 16 in. or 18 in. deep. Do not put any manure into the holes. Before setting the tree, throw into the middle of the hole a shovelful or two of fine surface earth, making a little mound upon which set your tree, spreading out the roots carefully. Be particular to see that there are no spaces or interstices beneath the roots; fill up the hole with finest surface earth, packing it carefully around the roots, firming the soil with your feet gently, so as not to crush or tear the smallest root. In advanced spring or dry weather a pail of water (water that has been exposed to the sunshine is best for this purpose as it will not chill the roots) might be given to each tree, when the earth is partly filled in. At other times when the soil is moist, water is not necessary, it is injurious.

Do not plant too deep. Nature has put a mark to indicate the proper depth for planting. It is the swelling or collar from which the roots go downward and the stem goes upward. Let this collar be even with the surface of the ground.

Avoid deep planting ; it is worse than too shallow planting. Roots are of two kinds ; first the young and tender rootlets composed entirely of cells—the *feeders* of the tree—always found near the surface of the earth seeking air and moisture—and secondly roots of over one year old which serve only as supporters of the tree and conductors of its food. Hence the injury that ensues when the delicate rootlets are too deeply buried in the earth.

As to the treatment of young trees, immediately after planting make a point of mulching all newly set out trees. Many people do not know the meaning of the word *Mulch*, which expresses a direction of great importance. Mulch consists of loose, light, litter, such as coarse manure. Chips, corn husks, or whatever will keep the surface of the ground moist, and prevent it from becoming dry and hot from the action of the sun. Whatever will shade the ground keeping the surface cool and moist will do. A tree well planted, well mulched, can hardly fail to live and do well.

It is absolutely necessary in all young orchards to keep the ground mellow and loose by cultivation for a few years at least, until the trees get well established. Indian corn, potatoes, beets, carrots and the like are the best crops for a young orchard, while grains such as wheat, rye, oats, etc., are injurious, although buckwheat is a favorable crop.

Fertilizers such as stable manure, wood ashes, lime, plaster, etc., are the best, and should be applied over the whole surface of the ground between the rows of trees. The feeding rootlets at the ends of the larger roots are not found near the trunk, but out near the middle, between the rows of bearing trees—as far as the branches extend from the trees. It is folly to suppose that a large growing apple tree will not, after a few heavy crops exhaust the soil of much of its proper food, and if we desire our trees to continue in a healthy bearing state we should manure as regularly as any other crop. Situated as most of us are at some distance from towns and villages, it is difficult to procure a sufficiency of manure even for the farm crops, but there is scarcely a farm where the waste barnyard and liquid manure, if economized by mixing with swamp muck, would not be amply sufficient to keep the orchard in good condition. A good way of renewing the soil of an orchard when manure cannot be had, is to sow peas, and when they are grown just to blossom, plough them under. After the trees become large it will be necessary to seed down to grass or clover. But an effort should be made to keep the ground under the branches, around the tree, clear of grass and weeds stirred up at intervals.

At the Dominion Fruit Grower's Convention, at Ottawa, last winter, Mr. Kew a large fruit grower near St. Catharine's Ontario said :

“ In regard to cultivation, I let a large number of hogs run in the orchard, “ I raise considerable coarse grains and buy a good deal I believe that letting

“ the hogs run in the orchard is the most convenient thorough and profitable way of cultivating it, and there will be no necessity of manuring. I take out the hogs when I am picking—as soon as the apples are out of the orchard the hogs eat up the refuse and when winter comes my orchard is clean ”

In 1889, Mr. Kew took out of his orchard of 25 acres (planted 16 or 17 years) an average of 100 barrels per acre equal to 2,500 at \$1 per barrel would realize \$2,500. Pretty good, but I think his average was high. I wonder if it was all owing to the system of cultivation ?

A thorough scraping of the trunks of trees, and washing with diluted soft soap should be done at least once a year—the month of June I think is the best for this work. And at the same time a search should be made, just beneath the surface of the ground, by scraping the bark of the trunk for the Borer whose presence may be discovered by the saw dust he exudes. The most effectual mode of destroying this pest is by picking it out with the point of a knife or by thrusting a flexible wire into the hole as far as possible and killing him.

The Caterpillar is a great pest in the apple orchard. If allowed by the careless cultivator to go on and multiply, feeding most voraciously on the leaves, they will often strip whole orchards of their foliage. As the Caterpillars lie quietly in their nests in the morning until the sun is high in the heavens the destroyer of them should be up and doing early, before they move out to prey upon the foliage.

The Apple Worm or Codling Moth is another great pest. These are small moths, the forewings gray with large round spot on the hinder margin. These moths appear in the evenings in early part of June and lay their eggs in the eye, in the blossom end of the young fruit. In a short time these eggs hatch, and the worm burrows its way into the fruit until it reaches the core ; the fruit then ripens prematurely and falls to the ground. Here the worm leaves the fruit and creeps into the crevices of the rough bark, spins its cocoon and remains there until the following spring, when the young moth emerges to begin its work of destruction. The readiest way to destroy this pest, when it can be done conveniently, is to allow pigs and poultry to have the run of the orchard when the premature fruit is falling or to pick up the fallen fruit daily for feed to the hogs.

But spraying the trees with Paris green in solution is now the mode usually adopted in Ontario and the States for getting rid of this enemy. About three ounces of Paris green to 40 gallons of water is the correct proportion, and it is usually applied about beginning or middle of June when the moths are supposed to lay their eggs.

To prevent field mice gnawing the bark of young apple trees the easiest method is to tie in Autumn some tarred paper—not fresh paper but what has

been exposed to the atmosphere for sometime—around the trunk of each tree as high as the snowline. Treading down the snow around the trees at intervals during winter, on mild days, is also a capital plan, Mice will often destroy whole orchards, if some trouble be not taken to frustrate their ravages.

PRUNING.—Apple trees require very little pruning if they are properly attended to when young. In fact in this severe climate the less we cut and slash the better. The trees should be inspected early in April, and all crossing branches taken out while they are small. If properly looked after when young, the trees when they come into bearing require the pruning saw very seldom, The cutting out of dead limbs or such as interfere with one another is all that need be done. When a limb is cut away the surface of the wound should be neatly smoothed, covered with shellac, paint or grafting wax.

In conclusion, I would recommend a more general planting of orchards with such varieties as are known to succeed in this district. A ready sale can always be had for good fruit. No fruit is more generally used than the apple and the demand is increasing every year. My advice therefore is *plant!* If you fail once, try again and avoid previous errors. Have *patience* and *perseverance* and you will be successful.

RUSSIAN APPLES FOR THE NORTH.

BY J. C. CHAPAIS, ST DENIS.

In the spring of the year eighteen hundred and eighty nine, I planted an experimental orchard, at St Denis, Kamouraska County, Province of Québec by 47° 30 of latitude.

The orchard is established on a ground composed in equal parts of clay and sand, well drained and manured, gently sloping to the North, North-West. In winter, it is covered by an average of two feet of snow from the fifteenth of December to the fifteenth of April and of three feet from February first to April first, and it is exposed to the violence of western, northern and north-western winds which are the prevailing winds of the district, during winter.

Before planting, the soil had been dug up and well mellowed to the depth of three feet and the trees had been planted in excellent condition, the fourteenth of May, eightee hundred and eighty-nine.

I have planted in that orchard many varieties of apples, plums and cherries but I intend to speak here only of the Russian varieties of apples planted.

As to the choice of varieties, respecting the Russian apples forming the subject of this paper, that choice has been made under the direction of the late Mr Charles Gibb, fruit grower of Abbotsford, P. Q., whose loss is so deeply felt

by all those interested in arboriculture, and of Mr John M. Fisk, nurseryman, also well known, of the same place.

I have planted nine varieties of Russian apples, of which I give here the names :

Summer Apples { Arabka (1890)
Charlottenthaler (Thaler)
Titovka

FALL APPLE—Grand Duke Constantine

EARLY APPLES { Antonovka
Arabka (Ell and Barry)
WINTER APPLES { Babuschkino (Grandmother
Longfield
Roschdestwenskoe (Christmas)

Of these nine varieties, Mr Gibb indicated to me Arabka (Ell. and Barry) Grand Duke Constantine and Longfield, with the hope that these apples, from the experience he had of the change often produced in the keeping qualities of apples imported from other climates into our own, would probably acquire, in our latitude, a more distinct keeping character which would make of them true late winter apples for us.

The other varieties were given to me for experimental purposes by Mr John M. Fisk.

I will give now a few notes on the growth of the trees mentioned.

All the trees, four years old from the nursery, were very thrifty, and in excellent condition when planted. They took root very well, many of them even flowered, but the flowers were all carefully removed and in the fall of the year, they had all made good growth.

In the summer of eighteen hundred and ninety, at the end of July, when the vegetation was at its best, I noted with care in what condition the trees were, how they had borne the winter, which had not been very severe, the thermometer not having gone below zero 16° Fah.

I give here these notes :

NAME OF THE TREE	GROWTH	DAMAGE BY COLD	REMARKS
Antonovka.....	Thrifty.....	None.....	
Arabka (Ell and B)....	Good.....	End of branches three.....	
		inches winter killed	
Arabka (1870).....	Thrifty.....	None.....	
Babuschkino.....	Thrifty.....	None.....	
Charlottenthaler.....	Very thrifty.....	None.....	Gave ripe fruit at the end of August.....
Grand Duke Constan- tine.....	Good.....	End of branches three.....	
		inches winter killed	

NAME OF THE TREE	GROWTH	DAMAGE BY COLD	REMARKS
Longfield.....	Thrifty.....	None.....	
Roschdestwenskoe....	Good.....	End of branches one.....	
		inch winter killed...	
Titovka.....	Thrifty.....	None.....	

These notes do not offer much interest just now, but, as I intend to continue them from year to year, they will become more interesting as the trees will become older, give fruit and show their true character, with the defects and qualities they will offer to us inhabitants of the cold districts of the Province.

COMMERCIAL ORCHARDS IN THE PROVINCE OF QUEBEC:

BY REV. R. HAMILTON, GRENVILLE, QUE.

By commercial orchard I mean an orchard planted solely with a view to the revenue to be drawn from it. In planting such an orchard, the chief, I may say the only object, is to make money, and to attain that end only such sorts as are calculated to yield a profit will be planted, whether they be good or only mediocre. It may be that a third or fourth class fruit, such, for instance, as the Ben Davis apple, may yield better returns with a smaller outlay of capital, talent and labour, than a high class fruit like the Northern Spy, and in such a case it would be the right one to plant. It is questionable, however, if the public would not in time get over the depraved taste that permits the purchase of such poor fruit as the Ben Davis.

The apple is the orchard fruit, *par excellence*, of the Province of Quebec. A very few pears are produced, as well as a few plums and cherries, but the quantity is so inappreciable as not to call for mention; so that, when I speak of orchards, I mean apple orchards exclusively.

It is a matter of regret to all of us who take a lively interest in the subject that the range of our larger fruits is so limited, and it is to be hoped that in the near future it may be greatly extended, as a good deal of well-directed effort is being put forth in that direction.

The principal orchard section of the Province of Quebec is the island of Montreal. Its soil produces the sorts of apples chiefly consumed in the city, in the greatest perfection. They are of large size, fine texture, glowing colour, and delicious flavour, and are produced in great abundance. And, proximity to the city, the great centre of consumption, must naturally lead to ever-increasing areas being given up to the production of this most important fruit.

Besides the counties of Jacques Cartier and Hochelaga, which, together, compose the Island of Montreal, outside of the city, the Counties of Huntingdon.

Beauharnois, Chateauguay, Rouville, Missisquoi, Shefford and Brome, contain many large and valuable orchards. Rigaud, on two Mountains also contains some fine isolated orchards.

Of orchards in the neighbourhood of Montreal, undoubtedly the finest are those of the Upper and Lower Lachine roads. There the soil and situation seem to suit them admirably, and fruit of the highest excellence is produced.

The number of varieties to be found in Quebec orchards is very large. Upwards of 150 have been collected. Still, the commercial apples, are comparatively few in number. I believe that nearly the half of all the apples produced in the Province are Fameuse, and the remainder are, in great part, Strawberry (of Montreal,) Peach (of Montreal,) St. Lawrence, Red Astrachan, Alexander and Duchess of Oldenburg, and in recently planted orchards, Wealthy. In some districts a few other sorts have been pretty widely planted. Amongst others are the so-called Winter St. Lawrence, Decarie, Roseau, Pomme Barré, Golden Russet, Ben Davis, Swazie, Pomme Grise, Cellini and the King of Pippins.

What are the principal commercial apples of the Province of Quebec ?

Twelve years ago the consensus of opinion said, first, Fameuse. If a vote were taken to-day I believe that decision would be altered ; for, while that fine sort is of as high a quality as ever, and as productive, it has become so subject to spotting as to be, in many places, almost worthless, and can no longer be depended on for a crop. As it is only a biennial bearer, and every other crop, at least, spots, in can only be counted on for a crop about once in four years, except in specially favorable localities.

Duchess is, in the opinion of many, a much more profitable sort. It comes into bearing, profitable bearing, earlier than almost every other sort. It is almost always good, that is, saleable. Its season is, for an early apple, a long one ; it bears few culls ; it hangs well on the trees, and carries well, even for long distances. Taken one year with another, it is one of the most productive and, best feature of all, for our Province at least, it is unsurpassed in hardiness. It has yet other points in its favour : Being of compact growth, it may be planted more closely than most sorts. Again, it seems to have fewer insect enemies and to be less subject to injury through atmospheric changes than most of the sorts with which we are acquainted. Taken all in all, it has few equals.

Strawberry (of Montreal) approaches the Duchess in many respects. It is only second to it in hardiness. It is as thrifty and as healthy, but it does not bear so early or so heavily. But, on the other hand, the fruit is of better quality, and Montreal fruit men say, sells better. It is slow in coming into bearing, but bears well once it gets started, and the fruit is beautiful and of good quality both as a dessert and cooking apple.

Peach [of Montreal] is another hardy, vigorous and fruitful variety, that in

those respects leaves little to be desired. It also has few insect enemies and is not liable to disease. Like the Duchess and Strawberry, it is an early sort. Unlike them, it will not carry well, and must be grown near to market; but put up in nice shape it sells well. It is of very fine quality, whether for eating or cooking, and is superior in point of productiveness to the Strawberry, though not equalling the Duchess.

Yellow Transparent is another very early apple, perhaps the earliest of all, being often ripe in the end of July and always by the 10th of August. It is an early bearer, a heavy bearer, and a continuous bearer, taking its off year about once in four years—at least such has been my experience with it. It is probably the most profitable of the early apples, and being a compact grower may be planted closely. It is a beautiful, clean and thrifty tree, but is subject to diseases of the bark, and on that account requires constant watchfulness. I feel inclined to assert that these are the best four early apples to plant in the greater part of the Province of Quebec, combining hardiness, healthiness, fruitfulness, early bearing, beauty and good marketing qualities in a greater degree than any others, besides being not difficult as to the character of the soil.

Red Astrachan, a variety that is grown with profit in some localities, cannot compete with those mentioned in any of the features indicated, unless in that of beauty. Its fine colour is in its favour. In a favourable situation, where the soil is rich, deep and cool, it may pay, though probably under such conditions any one of those mentioned would surpass it.

The Alexander demands almost similar conditions for its successful production.

The St. Lawrence, one of the best apples, is less planted now than formerly. In many localities it is uncertain and capricious. Occasionally it is found to be a light annual bearer, generally fair, but sometimes spotted and cracked. In fact, it is not a profitable commercial apple.

Cellini, an apple of the season of Alexander and St. Lawrence, is, I believe, coming to the front. It is a large, fine cooking fruit, almost rivalling the Alexander in size and better in quality. It is a moderate annual bearer, and the tree is amongst the hardest, and of a thrifty disposition. It is not so well known and widely planted as it deserves to be.

Wealthy, an apple of the season of the fameuse, is a variety of which too much cannot well be said. It is a more universally useful apple than any other with which I am acquainted, uniting in itself almost every desirable feature of a first class fruit. It is as hardy as a Duchess, and as early a bearer; it is as fruitful as the Fameuse, and rivals it in size, shape, colour and quality, and keeps fully as long. It reaches a good size quite early in the season and cooks well, and up to this date I believe has shown no tendency to spot. As a shipper it will prove

about equal to the Fameuse. Its weak point is, a tendency to bark disease. Nothing is perfect.

A more beautiful apple, if possible, and a larger, is the so-called Winter St. Lawrence, but it is not so productive, and is decidedly tender in the colder and bleaker sections.

There are very few sorts that can be called winter apples that are at all widely grown, and no one sort that can be singled out and declared to be generally suitable for cultivation in the Province of Quebec as such. Quite a few are found occasionally being successfully grown.

In the counties of Huntingdon, Chateauguay and Beauharnois, in several orchards the Northern Spy is found doing very well—most frequently in strong, deep, cool soil.

The same may be said of the Ben Davis, Golden Russet and Blue Pearmain. But there are more than enough of failures to prevent any one planting any of these varieties extensively. One very promising sort, especially in the cool, strong soils, is the Canada Baldwin. It is hardy, a good and heavy bearer of fair-sized apples of fine quality, that keep well and ship well. Its weak point is that on all but the deepest and coolest soils it sun-scalds, and the bark splits on the south side and, as a consequence, it dies early. Its many good qualities should induce orchardists who have suitable soil to plant it largely. It is the only purely Canadian long-keeping apple that can be grown in our Province.

Scott's Red Winter is highly spoken of by some who have grown it, but is very small and exceedingly sour until quite late in the spring, and at my place is far from being hardy.

The great need of our Province is a long keeping apple—one that shall combine the quality of the Northern Spy with the beauty of the Winter St. Lawrence, the fruitfulness of the Fameuse and the hardiness of the Duchess. One that might be planted in any situation, like the Duchess, for example, with some promise of success. Such a variety would be of incalculable benefit to the whole country. Let us hope that those who are in a position to do something, looking to the accomplishment of so desirable an end may take it into their consideration, and take such measures as may insure its being accomplished.

NEW VARIETIES OF OUT DOOR GRAPES.

WM. MEAD PATTISON, CLARENCEVILLE, P. Q.

In the Annual Report of progress in trial of new varieties of out door Grapes for adaptability to conditions in our Province I am gratified in stating that on the whole the past year has been a very satisfactory one, several noticed in former reports have improved and I am enabled to view their introduction with more favour. In one instance, I confidently hope that the much desired extra early black, possessing much finer qualities than any we have, has been discovered. Jacob Rommell the introducer is cautious and modest in his pretention and has devoted a long life to the improvement of the Grape, valuable testimony as to his success is given in the third edition of the Bushberg Catalogue, as follows: "No person has been more successful in the production of valuable hardy and healthy seedling grapes adapted to general cultivation in a very large section of this country than Jacob Rommel, of Morrison, Missouri." (This catalogue I may here say is the most valuable treatise on the Grape published on this continent.) Under remarks on Delaware Seedlings, page 92 says: "Rommel has lately produced a Black Delaware Seedling which is very early, of fine quality, and may become valuable as it seems to do well in localities and soils where the old Delaware fails." I had previously in cultivation six varieties of Mr. Rommels Seedlings. In 1882 he sent me three cuttings of his Black Delaware Seedling, on trial under the customary restrictions, the two I succeeded in raising from them have borne for three or four years and have attained the age when vines usually are at their best,

"Rommels early black,"

as he has recently called it ripened last year at the same time as Champion and while birds do not often touch Champion the ripened clusters of Early Black had to be bagged to preserve them from their ravages. This Grape in size is between Delaware and Concord, of the first quality in flavour, thin skin, bunch twice the size of Delaware, and generally shouldered, clusters compact and berry not subject to crack or drop, keeps well till December. The vine is a rapid grower, very productive and foliage healthier than its parent.

I trust it will be tested in various localities and soils through the Province and if it does as well generally as amidst the Utica formation of this section will be a valuable acquisition to our Grape list. For the purpose of disseminating this grape for trial, Rommell and Sobbe of Morrison, Mo., will supply vines at moderate rates. It has not been propagated for sale in Canada.

"Matterny."

Another extra early, the production of the late A. J. Caywood, ranks next to Rommels Early Black and Champion in season of ripening. Though I am

not aware of vines being yet offered for sale, its adaptability and value to us warrant a description of it, which I will give in Mr. Caywood's words, "Matterny is nearly as early as Champion, a rampant grower and good cropper, clusters resembling Clinton in size of berry and colour, perfect in quality, not the slightest acidity in skin or flesh and as pure as Duchess. The wine makers say it is making an article equal to anything in Europe."

This Grape here, in the short time it has been on trial, has proved in the main all that is claimed for it, although we have a multitude of black varieties of its size this one promises to be in every way worthy of its lamented propagators life efforts to produce varieties of high quality and value.

Burr's "Jewel" and "Standard."

These medium sized blacks, described in former reports, continue to improve. Standard having a tendency to overbear. They are early and of excellent quality.

White varieties

Ricketts, "El Dorado" has greatly improved here, it is a cross of Concord with Allen's Hybrid but far in advance in ripening to either parent, it has not received the attention in this Province that its earliness and fine quality merit, has had the reputation of being subject to mildew in the south but has been very free from it here, medium berry, in bunch as large and showy as any white grape cultivated here. Last season it bore cluster as fine in appearance as Niagara or Pocklington.

Duchess.

Though somewhat later continues satisfactory, clusters require bagging to protect them from soiling by insects.

Empire State.

On red gravelly dry soil with long pruning and restricted in bearing has latterly improved, but in ordinary soil has not done as well.

Mason's Seedling.

Of Concord parentage, though in bearing here for five years has not merited the praise given it in Illinois, its native home.

Grein's Golden.

A Taylor Seedling, now several years bearing here, still has the defect of dropping its berry when fully ripe, it is the largest of any white out door grape in cultivation, clusters last year were immense, but their looseness and want of tenacity of the berry prove great defects.

Red Varieties.

Ideal, a Kansas grape, seedling of Delaware but twice its size (one of the venerable John Burr's numerous seedlings) for earliness and high quality gave much promise.

Ulster Prolific.

Improves in bearing and size of fruit and is a testimony of the noble efforts of its propagator, the late Mr. Caywood.

Woodruff's Red.

Probably the largest and most productive red grape yet introduced gives proofs of value to us, remarkably healthy and vigorous, fruit of good quality and as appearance and size of a grape seem to be considered with most people, it will likely in time be preferred to Lindley on account of its being earlier and not subject to mildew.

Mary.

A Catawba seedling originated at Mexico, New York, now eight years in cultivation here, gave very satisfactory results, it had hitherto borne loose bunches with many berries missing but with age seems to overcome this objection, fruit of high quality, a good bearer and quite as valuable as a keeper as Salem or Vergennes, of the older varieties.

Gaertner, Rogers Hybrid No. 14.

Is gaining yearly in favor with me; it is early and as the vine gains age and strength, moderately productive. The fruit for high flavour has no superior and has many good points to recommend it for cultivation in this Province.

Summary.

The year's results indicate the advent of several very early black varieties seedlings of the Delaware, possessing a good measure of its high quality with a good deal more vigor of vine and leaf, but it still requires time and patient trial in different localities and soils before it can be assured that they will give us Standards as valuable as Champion has proved for earliness and vigor. The Delaware Seedlings incline to revert to their probable origin in some type of the "Labrusca," for that reason very few, if any of them have developed the refined qualities in fruit of its parent.

In red and white varieties the recent productions incline to earlier ripening, with fine quality of fruit and good keeping qualities, which last property will

prove of value in this Province where the grape can be mainly cultivated for own domestic use and with little attention in packing may extend the use (of a fruit of surpassing dietary value) in the family till well through the winter.

On the whole the work of propagators of new varieties in the last decade has given encouraging results. If the future has the same in store for us the next generation in the Province will enjoy many varieties of their own raising in the month of August.

I cannot conclude this paper without expressions of sorrow on the loss to the Montreal Horticultural Society and Fruit Growers Association of Quebec, as well as fruit growers generally by the death of Mr. Charles Gibb. Though these enjoyed the benefit of a large share of his labours he was not idle in other fields of usefulness and was the exemplification of a truly unselfish man and sincere friend whose loss, at almost the dawn of a useful career, is a great public calamity.

If any measure of success has attended my efforts in fruit culture it may be attributed to the advice and encouragement of Mr. Gibb.

PROMISING CHERRIES FOR NORTHERN LATITUDES.

BY JOHN CRAIG, HORTICULTURIST TO CENTRAL EXPERIMENTAL FARM.

According to DeCandolle, our most reliable authority on the origin of species, all varieties of the cultivated cherry belong to two species which are found wild. 1. *Prunus avium*: Tall, with no suckers from the roots, leaves downy beneath, fruit, sweet. This is supposed to have been the parent of the Heart and Bigarreau varieties. This species, from which the black and white cherries are developed, grows wild in Asia; in the forests of Ghilan (north of Persia), in the Russian Provinces to the south of the Caucasus and in Armenia; in Europe, in the south of Russia proper, and generally from the south of Sweden to the mountainous parts of Greece, Italy and Spain. 2. *Prunus cerasus*: Sour cherry, shorter, with suckers from the roots, leaves glabrous, and the fruit more or less sour or bitter. From this we have the Dukes and Morellos. These are supposed by DeCandolle to have been known to Greek civilization very early, and to have been in cultivation in Italy and Europe long before the White Hearts were introduced from Asia Minor.

The natural distribution of the wild representatives of both classes, the Hearts and Morellos, seems much the same, though the cultivated representatives of the latter have a much wider distribution in northern and eastern Europe at the present time. This class seems to have had a greater climatic adaptability

than their tenderer relatives, the Hearts, and to have gradually worked northward and eastward till they have become common roadside trees in Poland and Central Russia. Before reaching this northern latitude they have become, however, specialized forms, and differing materially from our west European types, as represented by the Kentish and Morello varieties—so different, indeed, in leaf, bud and texture of bark, as almost to point to a different origin. The west European Morellos, which in ordinary or average seasons have been fairly successful south of the 43rd parallel, in the somewhat dry western and middle States, and further north in the moister, though colder, portions of Canada, have in late years, from one cause or another, as in the west, injury from winter and black root, and bark bursting in the east, been dying so rapidly and giving such poor returns as to compel the thoughtful planter to look for varieties more suited, if possible, to the vicissitudes of climate north of lines indicated.

Within a few years several varieties, as instances Ostheim and Wragg, have been brought into notice as having special qualifications in the way of hardiness and adaptability to climate. As far as we can learn, these varieties have been "incidental seedlings from east Europe importations, and to have inherited their hardiness from typical varieties of those regions." The result of investigation is that several importations followed, being special and personal selections made by Prof. J. L. Budd, of the Iowa Agricultural College, in 1883-4. These introductions comprise about forty varieties. From four years of personal observation, and from reports received from widely-separated sources, I am led to believe that we shall find among them many adapted to the more trying districts of Quebec and Ontario, and the milder portions of the North-West. But should our success be only partial with the originals, we can still use them as stepping-stones to something better, by means of crossing and selection, and this line of advance will have a prominent place in the horticultural work of the farm.

I will name a few of the principal groups comparing favourably in quality with Early Richmond, and surpassing it in hardiness, as far as tested. Beginning with those of the same season, among the most prominent are Orel 23, June Amarelle, King's Amarelle, and Strauss Weichsel. With the exception of King's Amarelle, which is excellent for canning, they are all better in quality than Early Richmond. So far they have endured a dry atmosphere, and 30° below zero, with little snow on the ground, at the same time being used as bud and scion stock.

Among those ripe with Late Richmond, or Late Kentish, as sometimes called may be mentioned Brusseller Braun, Lutovka, Frauendorfer Weichsel, Griotte du Nord, Orel 24, Orel 27, and Bessarabian. This collection will cover a period of about two weeks, beginning with Lutovka and closing with Bessarabian. Prof. Budd, in speaking of this last, says that "it will endure more abuse of tree than

most of our forest trees. Our original specimen has been cut for buds and scions for five years, taking off nearly all the new growth, yet the tree is sound to-day. Fruit large, firm-fleshed, and when ripe very mildly sub-acid; it promises to make a long lived tree of considerable size, and to prove a regular bearer of choice fruit.

The members of the next group to which I wish to call your attention are more or less dwarfs in habit, and mature their fruit with the English Morello. These are Shadow Amarelle, Spate Amarelle, and Large Long Late; with Spate Amarelle as earliest. The fruit of these should be allowed to hang on the tree till of a dark purplish colour when fully ripe. The trees are smaller than English Morello, with pendulous habit. As fruited in 1889, they were superior to Wragg for dessert use.

Another class, belonging to the Vladimir family, coming from Orel and northward to Kazan, Russia, is represented by Orel and Shubianka. These are specially promising for the dry sections of the North-West Territories. They are shrubby in habit, having the appearance of large currant bushes rather than trees. The leaves are very small; the twigs so slender as to be difficult to graft. They come into bearing early—when 3 or 4 feet high. Fruit, size of Montmorency, nearly black when ripe and mildly sub-acid. With this cherry on a hardy stock, such as the small-growing western forms of Bird Cherry [*Prunus Pennsylvanica*]—or Sand Cherry [*Prunus pumilla*],—the first of which it has been budded upon with success,—we should be able, very materially, to extend the limit of profitable cherry growing northward. These cherries probably belong to the same race as the "Koslor bush Morello" recently imported by the Fruit Growers' Association, through Mr. Neimetz, of Odessa. The forty trees of this variety now at the farm, and imported with the association's consignment, will be increased as rapidly as possible, for distribution to the colder part of the Dominion. We will probably find some variation among the originals, as they are seedlings from the parent tree; but Mr. Neimetz assures us that the cherry grown from pits do not vary, and its early-bearing habits will aid very much in the matter of selection.

As root-grafting the cherry is not generally practised, a few remarks in that connection may not be out of place. I am strongly of the opinion that grafting the cherry is better for the planter, than propagation by budding. The root grafts are set down to the last bud on the scion as in apple grafts, thus giving the more or less tender mazzard stock additional protection and encourages rooting from the scion. When set still deeper in the orchard they are practically out of danger of rootkilling. I have with me a few specimens illustrating the method. The scions are cut after the twigs are thoroughly matured, and before hard freezing, which is apt to weaken their vitality. They are firmly packed

in forest leaves. In sand or moss it is difficult to preserve them in a strictly normal condition, owing to improper degree of moisture, often absorbing too much water. The scion is set in the root at the crown by the mode known as side grafting; the wedge should be about equally thick on both sides—if any difference is made, the outside should be slightly thickest. Again, if too much difference is made in this direction the whole pressure coming upon the *cambium* layer, the conditions are very unfavourable to growth of cell structure, by which the root and scion become united. Waxed thread and grafting wax are used to bind and cover the union. A mixture of equal parts of sand and earth seems to make the best material in which to pack the grafts for winter storage. The same danger must be guarded against here as in scion packing—that of too much moisture. This will cause the buds to swell before planting—a condition which is never followed by a good stand in nursery, except where the roots are equally advanced, and this we seldom find to be the case under ordinary cellar conditions. The simplest kind of cellar, with means for ventillation, serves the purposes. It should be kept near the freezing point by opening in the evening and keeping it closed through the day when practicable. In this way a low temperature may usually be preserved, and the grafts kept perfectly dormant till planting time.

In closing, I wish to say a word in favour of mixed planting, especially in regard to cherry and plum orchards. By mixed planting I mean the intermingling of varieties. With small fruits the principle is established; with plums it is recognized; and late observations in various countries, notably in California and Europe, incline to the belief that alternating varieties in the cherry and plum orchard favours regular and continued fruitage. It is advanced by Prof. Budd and others that a variety which may be relatively a poor bearer when planted alone and depending on its pollen may be found regularly fruitful when intermingled with other sorts; and further, that if the weather during the blossoming season is hot and windy a variety may mature and waste its pollen before the pistils are in a condition to be fertilized. In such cases, if surrounded by different sorts, the work might still be performed through the agency of insects and the breeze.

I will only add that I wish the title of my paper to be bornr in mind in connection with statements made, and the varieties touched upon regarded as promising in advance of more extended tests, though many may develop defects not yet noted. But from varieties herein mentioned, or others not named of the same race, we will I beleive, be able to select sorts which, if not of the highest quality, will at least make cherry growing more profitable and satisfactory in northern latitudes.

WINTER APPLES

BY REV. J. F. PARADIS, ST-RAPHAEL DE BELLECHASSE.

Are there to be found, in the Province of Quebec, apples of a good quality and of a long keeping, to which can be given the precious qualification or title of WINTER APPLES ?

To answer the question, in the affirmative, as far as that portion of the Dominion under the latitude of the City of Quebec is taken into consideration, I am not quite ready yet, although I have been endeavouring, for several years past, to find a solution to that effect, solution which would be of such vital importance to all apple tree growers, of our country. Many experiences and lot of study have I made and still I am questioning whether the real Winter Apple will ever grow here.

But my hopes are not all forlorn. Observations and facts give me legitimate sense to believe that in near future the Winter Apple will grow in our Province.

The planting in my orchard of several new varieties of apple trees brought from Russia, has greatly increased the list of my summer and fall apples to a certain advantage. The "Yellow Transparent," the "Charlottenthaler" and the "Tituka," which keeps a month longer than the "Duchess" are all three new and excellent varieties producing good and beautiful apples, selling very well.

Up to the present time, of all the Russian varieties, with the exception of the *Borsdorf*, none has produced "Winter Apples." In my opinion the *Borsdorf*, is not a profitable fruit, as it is wanting the essential quality which makes the sale of apples, that is the size and shape. They are small. Here as elsewhere, people are inclined to buy in preference beautiful and large apples.

Some Arboriculturists have expressed the opinion that Russian apple trees transplanted to America would cause the fruit to ripen earlier. Would this change take place in our province ? I would be inclined to think so as the "Anis" which is a winter apple in Russia is hardly a fall apple here, ripening so early.

Among the American apples of long keeping which I have tried, the "Bethel" is undoubtedly, the only tree which has given me the best of satisfaction, although it be a lazy grower. It is a tree that appears not to suffer during our cold winters. Its apples are remarkably large and of excellent quality, keeping well throughout winter. Will this tree last and be productive ? I cannot say as I have not had it long enough yet.

Dr Hoskins, in "Orchard and Garden" wrote lately that the "Bethel" when grafted at the top of another tree would invariably bear prematurely." The following fact, to which I vouchsafe its authenticity, seems to corroborate the doctor's assertion :—

In the Spring of 1888, I grafted Bethel sprouts at the tops of a healthy and

robust young tree and the following summer the sprouts bore a great number of apples. Singular to say these apples ripened long before those of the mother tree. Should this happen in future, every time the Bethel is grafted on young trees, there is no doubt but this variety would have to be classed among the fall producing fruit. It may be, however, that this feature may not be a lasting one, but temporary, being due, as I believe, to the great quantity and superabundance of sap in the tree, of which numerous and vigorous branches have been cut off to be replaced by a less number of a weaker kind. The future, of course, will tell if my previsions are exact or not. At any rate, the Bethel when grafted on the root, will bear, in the Province, excellent apples which will keep.

Now will the Bethel be our winter apple so desired and so sought for? Before saying it will, a more complete experience, from my part, is yet required.

The "Fameuse" as a winter apple is far from being reliable. The "Canada Baldwin" is undoubtedly a long keeping apple, of fine appearance, having an agreeable taste. The tree is vigorous, tough to our hard winters, grows in a beautiful and symmetrical form and becomes in a short time, by its extensive proportions and beauty the king of the orchard. But with all these qualities this tree requires a special soil not to be found everywhere. Hence it is not the tree required.

I have in my orchard twenty-two new kinds of apple trees, I ordered from Russia, and which are all winter apples in that country. How will they grow here and shall I find real winter apples among them? Time will tell. So far they have all done well, growing rapidly and regularly, showing exterior signs of health and force. Shall they become like their sister mate the "Anis," fall apples? Time again will tell.

Should the Russian apples prove no good for "winter apples," we must then rely upon the Bethel and the "Canada Baldwin" with the restrictions I expressed above.

I hope before long to be able to say that I have found the real winter apple, beautiful and excellent, only then will my orchard have a great importance, as it will possess the golden apple tree for Quebec.

“ON COMMISSION.”

BY R. JACK, CHATAUGUAY BASIN.

I have nothing new, to write from my experience in fruit growing this season except to enter a plea for better security, and fairer dealing for fruit growers in marketing their produce. The growers largely prefer to deal with middlemen, which is not encouraging to the grower—who seldom get fruit prices at first hands. The middlemen are not obliged to give any security, any one can start up a business, taking in fruit to sell, to keep their ship afloat; using the money without interest, and if there is a glut in the market it is allowed that he “store” or “dump” it, at his own sweet will without making exertion to place it in the towns. There is not sufficient interest in making the sales for the benefit of the producer, and I have known cases where good fruit was allowed to go to waste, and no redress. If a commission man fails, he has often no assets, and for that reason there is necessity for a stricter law to protect the grower. Fruitmen should combine to sell their own products, putting in reliable men, and co-operate in sending the surplus to places where there is a scarcity. There are many honest middlemen who do their best to sell to good advantage, but the balance after commission cartage freight and package is often so small as to be a yearly discouragement.

FRUIT GROWING,

BY MRS. J. W. F. FRELIGLESBURG.

Notwithstanding the complaints against the past unfavorable season for horticulturists, heard from many directions, the fact remains that the growers of fruit and vegetables in the county of Missisquoi have had an average crop. I am glad to see an improvement in fruit and vegetables at our annual exhibitions, both in quantity and quality. There has been a steady improvement, and who will say what ten years will do for this county, in the improvement of apples, pears, plums and small fruit. When our people are educated up to the fact that fruit is more than a luxury; that it is a necessity in the family; we shall see more interest taken in fruit growing. If more fruit and vegetables were eaten in our families, and less pastry and meat our doctors bills would be less. Apples are our standard fruit, but strawberries, raspberries and currants, hold no mean place in the ranks of useful fruits. Many Pomologists believe that varieties of fruit grown in our locality are better suited to this country than those from foreign lands. Hence to obtain such varieties as are of the highest value for

endurance and excellence, we must select those originating in Canada. I know from experience that apple trees purchased from a local nursery, a few miles from our farm, have grown better and come into bearing sooner than those brought from the south. I think there is not attention enough given to seedlings. We have seedlings that are far superior to any named fruit that we have. One of our seedlings is a young tree just come into bearing, a large beautiful red apple, a good keeper and a fine eating apple. The golden russet is a good winter apple and keeps well into the summer.

We want more good winter apples in this county, those that will keep through the spring. The black spots that appear on the fameuse and some other varieties of apples hurt them very much. We think we have found a remedy. The last three years we have put wood ashes around our trees in the spring. We throw the ashes well up on the trunk of the tree after a rain. There has been an improvement in the apples, they grow smooth with very few spots on them. I think if apple trees are treated to a liberal supply of ashes from time to time, the black spots will soon disappear altogether.

Why do we not grow more plums and cherries, there are varieties that will grow and bear in this northern land with very little trouble. You will find a strawberry bed in almost every garden, but raspberries are not so plenty. They are far better than strawberries in my estimation.

The black caps are a beautiful fruit, growing from year to year with very little care.

The Greggs and Ohio do well with us

The currant is easily grown but for the worms. Last year I showered our currant bushes with water, heated to 130 degrees and found it a good remedy for the worms.

FRUIT EVAPORATION AND ITS RELATION TO THE FRUIT-GROWER :

BY J. T. DONALD, MONTREAL.

When the process of evaporating fruit was first introduced it was thought by many that it would soon displace canning as a mode of fruit preservation. Such, however, has not been the case.

At the present time, in Canada at least, evaporating is practically employed in the treatment of apples only. Much the same limitation is found in the United States, if we except the Pacific coast, where the process is successfully applied to peaches, apricots, pears and other fruits.

Evaporation has been successfully applied to vegetables as well as fruits. Corn has been treated on a large scale, but at present little, if anything, is done in this line.

When properly applied, evaporation produces but little change in the fruit beyond the removal of a large portion of the water originally present, and of course a corresponding reduction in weight and bulk. It follows, therefore, that if the proper quantity of water be added to the evaporated fruit it is practically fresh fruit.

Why, then, is it that evaporation is not more extensively employed? The reason is not far to seek. On account of the amount of water removed in evaporating fruit considerable time and care are required to prepare the evaporated fruits and vegetables for the table; whereas, in the case of canned goods the cooking is done in the factory on a large scale, and the goods come into the consumers' hands quite ready for the table, or at best merely requiring to be warmed. This it is that prevents the wider application of our process of fruit preservation. The question of fruit evaporation is thus practically limited to apples, and in this connection the industry has assumed somewhat large proportions, and is yet capable of considerable development.

The apples sent to the evaporating factory are such as are not suited for shipping; that is such as are not possessed of keeping qualities, windfalls and the culls of winter fruit. At the factory the apples received are divided into two grades; first those of good flavor, size and shape, and so suited for peeling by machinery; and second, all inferior, badly-bruised, misshapen and small fruit. The first grade is peeled, cored and sliced by machinery, often in one operation. The sliced fruit is at once exposed for a few minutes to the gas produced by burning sulphur. This prevents discoloration, and in no way injures the fruit; at most only a mere trace is left after evaporation is completed. After being "sulphured," the slices are spread on trays of galvanized iron netting, or of cloth, and heated air, passed over them, the result being, as already mentioned, that a

large portion of the water is withdrawn, and at the same time certain chemical changes, akin to increased ripening, are produced in the fruit, resulting in an increased percentage of sugar, and diminished acidity.

The length of time the apples are exposed to the heated air depends upon the temperature employed. Considerable skill is required to obtain a satisfactory article; if the temperature of the evaporating chamber be not right at the beginning of the process there is danger that the slices will become damp, whereas a properly evaporated apple is dry and spongy. After withdrawal from the evaporator the apples are usually allowed to lie in a heap for several days, to equalize the moisture that may be in different batches. They are then packed in boxes usually containing 50 lbs. each.

The cores and peelings of the first grade of apples are not wasted. They and inferior apples that reach the evaporating factory may be classed together, as they usually undergo the same treatment, although worked up separately. According to the market, these two materials are used as a source of cider, or are evaporated, and shipped to jelly makers on this continent, or sent to Europe, where they are used in the fabrication of certain grades of wines. Sometimes the apples are quartered before being evaporated; sometimes they are treated whole.

Let us glance now at this process in its relation to the fruit-grower. In the first place, an evaporating factory presents a means of rendering marketable fruit which otherwise would be unsaleable, and in the second place it gives employment for several months of the year to a large number of hands, thus giving an increased home market for fruit-growers' products. These benefits have been recognized by fruit-growers in places where evaporating factories exist, and the inhabitants of such localities have been willing to offer inducements to companies to locate in their midst.

If it be granted that an evaporating factory is of advantage to fruit-growers, the question arises: What is to be done in the fruit-growing districts where no such factories exist? Can the individual fruit-grower evaporate his own apples? There are small machines made for this purpose and widely advertised. Experience has shown, however, that they do not give as good results as they should, and as are claimed for them, and there is difficulty in finding a market for the small lots, and of course working on a small scale the expense of manufacturing is greater than in a large factory. In the opinion of the writer evaporation on the large scale should be the object of those who would derive benefits from the process, and he would suggest that the fruit-growers of a district combine, and agree to support a factory, as they do in the case of cheese-factories and creameries, and it is altogether likely that someone could be found who would be willing to erect the not very expensive plant required and conduct the manufacture.

It must not be forgotten, however, that experience is a very desirable quality in the manager of an evaporating factory, and unless such is at hand the promoters of an evaporating business should begin operations on a very small scale, gradually expanding as experience is gained by their manager.

THE COMPOSITION OF APPLE TREE LEAVES.

At the Dominion Fruit Growers' Convention held in Ottawa, February, 1890, I had the honour of reading the following paper, which is the first of a series on the chemistry of the apple. As time allows, the fruit and the old and young wood of the tree will be analysed. From the data thus amassed it is confidently hoped that we shall be able to ascertain with more or less accuracy the nature and amount of those fertilizing elements withdrawn from the soil by the apple tree in bearing. This will be the first step towards a more rational mode of applying fertilizers to orchards.

“Agricultural chemists throughout the world are, and have been for some years, directing their attention towards the solution of questions concerning the growth and bringing to perfection of plants and animals which serve for the use of man. With regard to plants—and by that term I include all farm crops—analyses have been made of all their parts, so that their composition is, to-day, pretty well known.

“Field experiments and experiments in water culture—in which the various salts required by the plants are dissolved in water—have also been made, enabling us, at the present time, to state definitely what special fertilizing constituents are valuable for the growth of certain crops, what classes of soil are most suited to cereals, the leguminous plants, and so on.

“But as yet it appears that little has been done in this direction for the fruit-growers, and the reason for this is not difficult to find. In all experiments of this nature it is necessary to weigh and analyse an aliquot part of the final product of vegetable growth in order to arrive at the amount of plant food absorbed from the soil and other sources, and in this way ascertain the extent to which the soil has been exhausted and the special inorganic and organic elements which enter into the composition of plants tissues. In the case of farm crops, which are reaped annually, this is comparatively an easy task, but it is obvious that in the case of fruit trees—both small and large—this of necessity cannot easily be done. As, however, it is as highly important to the fruit-growers to know what kind of food and what class of soils are best suited to produce the largest amount of fruit as it is to the farmer to be in possession of such infor-

mation respecting his crop, it is but the duty of those engaged in working out these problems to direct their study, as far as in their power lies, towards the solution of such difficult questions.

“ It was with a view of throwing some light upon this abstruse subject, of proposing some rational mode in the application of fertilizers to orchards, that the work included in this paper was undertaken.

“ Now, it must not be thought that even if we knew the exact composition of all the parts of the tree [and as long as the fruit is hanging it remains part of the tree], and the total weight of those component parts, and had also a knowledge of the composition of the soil in which the tree was growing, that the whole question would be settled. Until a few years ago it was thought that such data were sufficient to guide the agriculturist in manuring certain fields for certain crops, but latter facts, evolved by patient experiments, conducted most carefully over many years, have now proved this theory fallacious. I might illustrate this by reference to the cereals and leguminosæ. The former contain but half the nitrogen of the latter, yet notwithstanding this fact, and all that it seems to imply, it is found that the application of nitrogen is specially beneficial to the cereals, but of little or no value to the leguminosæ, especially after a certain stage of their growth. Without going into the reasons, or rather theories, which have been advanced to account for this state of affairs, I will ask you to bear these facts in mind, and at the same time to remember that *ex nihilo nihil fit*, that we have to draw upon the soil, the air and water for the constituents of plant food, and that the soil, generally speaking, is the only one of the three we can modify or alter in composition by mechanical or chemical agents. The climate, including degree of frost, amount of rainfall, snow, sunshine, &c., all these are important factors in agriculture. But as we have no control over the elements the line of experiment seems rather in making choice of and breeding from such varieties, whose qualities, dependent upon heredity and environment, make them seem especially adapted to the climate immediately under consideration, and then finding out, by all the means at our command, and applying those elements of plant food best suited to their growth and development.

“ In this series of experiments five well-known and hardy varieties of apple trees were selected and the leaves gathered at two stages of their growth, viz., 25th May and 20th September. The leaves in all cases were taken from two or more trees, so that their analysis should reveal the fair average composition of the leaf of that variety at that particular stage of the tree's growth. Upon the first date some difficulty was experienced in a few instances in getting sufficient leaves for analysis without seriously denuding the tree of foliage, so that these first specimens represent leaves in a very early stage of development. On 20th

September all the leaves were still quite green, and their life apparently unimpaired and vigorous.

“ Mr. John Craig, Horticulturist to the Central Experimental Farm, has kindly furnished me with the following descriptions of the apple trees under discussion:—

“ *Duchess of Oldenburch*.—Tree is vigorous and hardy, forming a roundish upright head. Bears young, and abundantly. Young shoots, smooth, reddish. Leaves medium-sized, firm and glossy. September.

“ *Tetofsky*.—Tree upright, very hardy, vigorous. A young and annual bearer. Young shoots, stout, reddish-brown. Leaves very large. August.

“ *Wealthy*.—Hardy, vigorous and healthy. Spreading, open head. Bears young; is an abundant and annual bearer. Shoots, dark, medium. Leaves medium. October.

“ *Fameuse*.—Tree moderately vigorous and hardy, round-topped, spreading. Young shoots, reddish-brown. Fairly young annual bearer.

“ *Northern Spy*.—Rapid, upright growth. Tardy and moderate bearer. Young shoots, large, dark reddish-brown. Winter.

“ The following table shows the composition of the leaves, together with such other data as many help to elucidate the question under consideration. After the column containing the name of the apple tree and the date when the leaves were gathered are three columns, representing in percentages the composition of the leaf—the water, organic matter and mineral constituents. Then follow six columns, showing the percentages of the chief inorganic components of the ash. The percentages of nitrogen in the dry organic matter are then given, followed by columns depicting the amounts of nitrogen, phosphoric acid and potash contained in 1,000 lbs. of the green leaf, which serve to illustrate the absolute and relative values of the leaves as a fertilizer, as well as to show the quantities of these materials taken from the soil for the growth of the leaves.

ANALYSES OF APPLE TREE LEAVES.
 Composition of the Leaf, Percentage Composition of Important Constituents in Ash.

NAME	COMPOSITION OF LEAF.				PERCENTAGE COMPOSITION OF IMPORTANT CONSTITUENTS IN ASH.					NITROGEN.	WEIGHT OF FERTILIZING CONSTITUENTS IN 1,000 LBS. OF LEAVES.				
	When Gathered.	Moisture.	Organic Matter.	Ash.	Phos. Acid.	Potash.	Lime.	Magnesia.	Oxide of Iron.		Silica.	Nitrogen in Organic Matter.	Lbs. of Nitrogen in 1,000 lbs. Leaves.	Lbs. of Phos. Acid in 1,000 lbs. Leaves.	Lbs. of Potash in 1,000 lbs. Leaves.
1889.															
Duch. of Oldenburg....	May 25..	70.94	26.67	2.39	9.67	9.25	21.50	9.56	1.63	.92	2.87	7.65	2.31	2.21	
Tetofsky.....	do 25..	72.11	25.40	2.49	8.82	14.33	18.20	7.52	1.81	1.16	2.84	7.21	2.20	3.55	
Wealthy.....	do 25..	71.25	26.84	1.91	8.95	10.19	16.02	8.49	1.44	.93	2.98	7.99	1.71	1.94	
Famouse.....	do 25..	75.45	22.01	2.54	11.61	9.54	16.26	10.84	1.64	1.04	3.01	6.62	2.94	2.42	
Northern Spy.....	do 25..	72.04	25.62	2.34	13.33	.....	14.00	12.43	1.92	1.30	2.99	7.66	3.11	.....
Average.....	.....	72.36	25.31	2.33	10.47	10.82	17.40	9.77	1.49	1.07	2.94	7.42	2.45	2.52
1889.															
Duch. of Oldenburg....	Sept. 20.	57.30	38.75	3.95	3.00	6.35	34.80	5.62	1.43	1.00	2.48	9.61	1.18	2.50	
Tetofsky.....	do 20.	60.49	35.87	3.64	5.93	11.02	33.59	5.55	1.19	1.28	2.20	7.80	2.15	4.01	
Wealthy.....	do 20.	60.02	36.53	3.45	5.23	13.09	22.40	5.22	1.08	.80	2.38	8.70	1.80	4.51	
Famouse.....	do 20.	63.45	33.15	3.40	5.64	13.65	26.35	4.16	1.56	1.05	2.50	8.28	1.91	4.63	
Northern Spy.....	do 20.	62.30	34.85	2.85	9.31	14.04	22.40	3.50	1.80	1.57	2.84	9.89	2.65	3.99	
Average.....	.....	60.71	35.83	3.46	5.82	11.63	27.91	4.91	1.41	1.14	2.48	8.87	1.94	3.92

Moisture.—With the exception of the Fameuse, the percentage of water in all the specimens taken 25th May lies between 70·94 and 72·11— practically, between 71 and 72. The Fameuse is more succulent, and contains 75·45 per cent. water. In the leaves gathered 20th September we find a general diminution in the percentage of water, the loss being in the neighbourhood of 12 per cent. It is interesting, and perhaps instructive, to note that with regard to the amount of water, the leaves of 25th May fall into the same order with those of 20th September, the Duchess of Oldenburgh containing least and the Fameuse most water, showing clearly that while all have followed the general law in loss of moisture, each has retained its own characteristic individuality.

Average percentage of water in young leaf.....	72·36
do do maturer leaf.....	60·71

Organic Matter.—This includes all the combustible material of the leaf, and is composed of carbon, oxygen, hydrogen and nitrogen. In the leaves of 25th May, those of the Duchess of Oldenburgh and of the Wealthy, the percentages of organic matter are almost the same, and head the list. The Tetofsky and Northern Spy also contain almost identical amounts, or somewhat less than the two first mentioned, while the Fameuse contains the smallest quantity of organic matter. This order is preserved in the leaves plucked 20th September. From an inspection of these two columns it will be observed that there is a general diminution of water and increase of organic matter as the season advances, and that any special variety preserves its relative position to other varieties in this respect throughout the season,

Average percentage of organic matter in young leaf....	25·31
do do maturer leaf....	35·83

Ash.—The percentage of all the inorganic or mineral constituents of the leaf are found in this column. With the exception of the Wealthy we find the amounts of ash of the leaves of 25th May closely approximating one another. The leaves of the Wealthy fall about ·5 per cent. below the others in ash constituents. In those of the 20th September we find a general increase in the percentage of ash, amounting from ·5 to 1·5 per cent. over those of 25th May.

Average percentage of ash in young leaf.....	2·33
do do maturer leaf.....	3·46

Phosphoric Acid.—With regard to the composition of the ash as detailed in the columns following, it is difficult to discover in many cases what principal, if any, underlies the distribution of the mineral constituents throughout the tissues of the leaf during its growth. Without reading too much, however, into the

results of a single analysis, an inspection of this column shows most clearly that the young leaf contains in its ash a much larger percentage of phosphoric acid than the maturer one— in some instances the phosphoric acid in the latter is but one-half, or even less, than that of the younger leaf. This would lead us to suppose that, as the season advances, there was a retrograde movement of the phosphoric acid of the leaf to other parts of the tree. As the seed is well known to contain a relative large quantity of this acid we may legitimately be allowed to think that the food elaborated in the leaf found its way finally, in part, at all events, to the fruit and other portions of the tree. And this undoubtedly expresses a truth (though probably not the whole truth), for we observe that the average number of pounds of phosphoric acid per 1,000 pounds of the younger leaf is higher than the corresponding number for the maturer leaf, viz. : as 2.45, 1.94, and this in spite of the fact that the percentage of ash in the latter is considerably higher than the former.

Average percentage of phosphoric acid in the young leaf . .	10.47
do do maturer leaf	5.82

Potash.—It would not be safe from the results tabulated to advance strongly any theories regarding the disposition of this important element in the leaf. The percentage of potash in the young leaf is somewhat lower than that in the maturer leaf. When we, however, consider the increased amount of ash in the latter, we find that per 1,000 lbs. the older leaves contain 1.5 lbs. more potash than the younger leaves. On comparing the amounts of potash obtained in these analyses with the quantity as found in leaves of other trees it is at once apparent that the leaves of the apple tree are exceptionally rich in this material.

Lime.—The average percentage of lime in the ash of the young leaf is 17.40, while that of the maturer leaf is 27.91, an increase of 10 per cent. This increase would appear also to be regular throughout the varieties examined. Thus, the Duchess stands first in percentage of lime in both lists, followed closely by the Tetofsky, and so on.

Magnesia.—While the percentage of lime increased during the growth of the leaf, the analytical data show that the percentage of magnesia decreases during that period. Thus, in the young leaf we have magnesia 9.77 as the average percentage, and in the maturer leaf this number is reduced to 4.81. This fact is the more remarkable and interesting when we remember that the percentage of phosphoric acid diminished in the same ratio during the same period. It seems quite possible that these two elements of plant food are intimately related in the economy of the plant, and that in the elaboration of the plant food within the tissues and the distribution of this food to the different parts of the tree these two play a very important role.

“*Oxide of Iron and Silica.*—Throughout the whole series the amounts of these constituents are seen to be very similar, and the average in the young and the mature leaf closely approximate each other. The iron after it has performed its functions in the chlorophyll of the leaf appears to remain in the leaf, and from the figures in the table it is seen that there is no extra deposition of silica in the cells of the leaf as it grows older.

“*Nitrogen.*—The only constituent of great importance that remains to be discussed is nitrogen. The differences in the amounts of nitrogen contained in the organic matter of the leaves of the different varieties examined are so small that one would not be warranted in drawing any conclusion therefrom as to differences in this constituent between the varieties. On taking the averages, however, of nitrogen of the leaves in the two stages of their growth, a considerable difference is at once apparent—a difference that corresponds to 3 per cent. of albuminoids. The figures are :—

Nitrogen in young leaf	2.94	corresponding to	18.61	per cent albuminoids.	
do	maturer leaf	2.48	do	15.50	do

“The amount of nitrogen per 1,000 pounds of the maturer leaf is 8.87 pounds, as against 7.42 pounds in the young leaf. This is due to the increased percentage of organic matter in the older leaf. It is evident from these results that changes which affect the relative percentage of nitrogen in the organic matter take place in the leaf during its development—but what these changes may be is beyond the scope of the present paper to discuss.

“Phosphoric acid, potash and nitrogen are the three constituents which above all others must be put back into the soil if we are to preserve its fertility. Plants of certain orders require more of one or other of these than plants of other orders. Some soils are specially rich or poor in one or more of the materials—and consequently in the rational mode of application of fertilizers much intelligence and patience must be exercised.

“That the leaves of the apple trees draw a large amount of food from the soil annually has been shown. This must be replaced in excess for the vigorous growth of the tree. The leaves of the tree play no unimportant part—respiration and digestion are their two chief functions—which, if they do not perform well, the tree cannot live and bring to perfection its fruit. Therefore when we feed the leaves we are indirectly feeding the fruit.

“The results of this work seem to point in the direction of mineral fertilizers, and specially of potash, as being more particularly required for the growth of the leaves, and, therefore, for the vigorous development of the tree, including an abundant crop of fruit.

“A heavy dressing of wood ashes (which may be procured in many parts of

Canada at a very low price), or of kainit or other form of potash, is, therefore, to be recommended for orchards.

“The value of the leaves composted—a process to be advised as more economical than burning—is also well established by the data afforded by this work.”

EFFECT OF FUNGICIDES ON APPLE LEAVES.

FRANK T. SHUTT AND JOHN CRAIG.

The experiments, as set forth in the accompanying table, were instituted with the following objects in view:—

1. To ascertain the greatest strength in which the different fungicides can be applied without injury to the leaves of apple trees;
2. To ascertain the effect on the leaves of the copper salts, with or without the addition of ammonia;
3. To ascertain the effect on the leaves of apple trees, of a combined fungicide and insecticide, using Paris green as the latter.

The trees chosen for the experiment were of the Wealthy variety—a row set of out three years ago, in which all the trees selected were in an equally vigorous condition. As shown in the table, a series comprising 14 combinations of fungicides in different strengths was prepared. Each application was prepared on the basis of a 22 gallon mixture, though the quantity used—the trees being small—was in each case about 1 gallon. A tree was set aside for each preparation, and numbered in accordance with the number of the mixture used.

Series I, received three applications, notes being taken at short intervals after each application. At the close of this series a new lot of trees was selected; these received two applications, and were used as checks on the results of the first experiments.

TABLE showing effects of Fungicides of different strengths on Apple Leaves.

Number.	FUNGICIDES.	Quantity.	1ST. SERIES. — DATES OF MAKING AND EFFECT OF APPLICATION.			2ND SERIES. — DATES OF MAKING AND EFFECT OF APPLICATION.		
			July 12.	July 17.	July 23.	July 21.	July 30.	
1	Copper carbonate...	3 ozs....	Rain 3 hrs. after application	Rain 2 days later.....	.....	Slight injury.....	Injury increased, but slight.
	Ammonia.....	1 qt.....	Injury scarcely perceptible	Injury scarcely perceptible	Injury not increased...	.....	.....
	Water.....	22 galls.	.....	.....	.....	.....	.....
2	Copper carbonate...	6 ozs....	Injury scarcely perceptible	Injury scarcely perceptible.	Injury slightly increased, few lvs turning brown	.....	No increase of injury.
	Ammonia.....	2 qts....	Considerable blue deposit on leaves	Large blue deposit in patches.	.....	.....	.....
	Water.....	22 galls.	.....	.....	.....	.....	.....
3	Copper carbonate...	3 ozs....	No injury; no deposit	No injury; slight deposit.	No injury; slight deposit	No injury.....	No injury.	
	Water.....	1 gall.	.....	.....	.....	.....	.....
4	Copper carbonate...	6 ozs....	No injury; no deposit	No injury; slight deposit.	No injury; slightly increased deposit	Slight injury.....	Injury slightly increased.	
	Water.....	22 galls.	.....	.....	.....	.....	.....
	Copper Sulphate.....	8 ozs ..	Injury scarcely perceptible	Injury somewhat increased; lvs. brown.	Lost $\frac{1}{4}$ of leaves; much injured.	Considerable injury.	Injury somewhat increased.	
5	Water.....	22 galls.	.....	.....	.....	.....	.....
	Copper sulphate	16 ozs....	Distinctly injured.....	Considerably injured.....	Badly injured, $\frac{2}{3}$ of the leaves falling.	Badly injured.....	$\frac{1}{3}$ leaves falling.	
	Water.....	22 galls.	.....	.....	.....	.....	.....
7	Copper sulphate.....	8 ozs....	Slight injure on older leaves	Injury somewhat increased.	Older leaves badly injured, $\frac{1}{3}$ falling.	Slight injury.....	Injury increasing.	
	Ammonia.....	1 $\frac{1}{2}$ pts....	.....	.....	.....	.....	.....
	Water.....	22 galls.	.....	.....	.....	.....	.....

8	Copper sulphate..... 16 ozs...	Slight injury; slight deposit.....	Injury increasing.....	Badly injured, $\frac{1}{2}$ leaves falling.....	Considerable injury.....	in-Badly injured; leaves falling.
7	Ammonia..... 1 $\frac{1}{2}$ pts ...	.....	Considerable deposit.....	.....	.....	.....
6	Water..... 22 galls.	.....	.....	.....	.....	.....
5	Copper carbonate..... 1 $\frac{1}{2}$ ozs...	No injury; slight dep't	No injury; slight dep't	Slight injury to older leaves.....	No injury.....	No injury.
4	Paris green..... 1 $\frac{1}{2}$ ozs...	.....	.....	.....	.....	.....
3	Ammonia..... 1 qt.....	.....	.....	Considerable deposit..	.....	.....
2	Water..... 22 galls.	.....	.....	.....	.....	.....
1	Copper carbonate... 3 ozs...	No injury; slight dep't	No injury; slight dep't	Injury scarcely perceptible.....	Injury scarcely perceptible.	No increase of injury.
10	Paris green..... 1 $\frac{1}{2}$ ozs...	.....	.....	.....	.....	.....
9	Ammonia..... 1 qt.....	.....	.....	.....	.....	.....
8	Water..... 22 gall.	.....	.....	.....	.....	.....
7	Copper carbonate..... 1 $\frac{1}{2}$ galls.	.....	.....	.....	.....	No injury.
6	Paris green..... 1 $\frac{1}{2}$ ozs...	No injury.....	No injury.....	No injury.....	No injury.....	.....
5	Water..... 22 galls.	.....	.....	.....	.....	.....
4	Copper carbonate... 3 ozs...	.....	.....	.....	.....	.....
3	Paris green..... 1 $\frac{1}{2}$ ozs6.	No injury.....	No injury.....	Traces of injury barely perceptible.	No injury.....	No injury; very slight deposit.
2	Water..... 22 galls.	.....	.....	.....	.....	.....
1	Copper sulphate..... 8 ozs...	.....	.....	.....	.....	Badly injured.
13	Paris green..... 1 $\frac{1}{2}$ ozs...	Injury barely perceptible.....	Injury increasing.....	.....	Considerable injury.....	.....
12	Water..... 22 galls.	.....	.....	.....	.....	.....
11	Copper sulphate..... 8 ozs...	Injury barely perceptible.....	Injury increasing.....	.....	.....	.....
10	Paris green..... 1 oz.....	.....	.....	.....	.....	.....
9	Water..... 22 galls.	.....	.....	.....	.....	.....
8	Paris green..... 1 oz.....	.....	.....	.....	.....	.....
7	Water..... 22 galls.	.....	.....	.....	.....	.....
6	Paris green..... 1 oz.....	.....	.....	.....	.....	.....
5	Water..... 22 galls.	.....	.....	.....	.....	.....
4	Paris green..... 1 oz.....	.....	.....	.....	.....	.....
3	Water..... 22 galls.	.....	.....	.....	.....	.....
2	Paris green..... 1 oz.....	.....	.....	.....	.....	.....
1	Water..... 22 galls.	.....	.....	.....	.....	.....

SUMMARY.

Quantities given below are all on the basis of 22 gals. of water, with ammonia as the solvent:—

1. Copper carbonate—3 oz. in solution, caused slight injury.
2. Copper carbonate—3 oz. in suspension caused no injury; 6 oz. in suspension caused slight injury, which did not increase with repeated applications.
3. Copper carbonate—3 oz. in solution, Paris green $1\frac{3}{4}$ oz. (proportion of 1 lb to 200 gals. of water), caused slight injury in the later applications.
4. Copper carbonate— $1\frac{1}{2}$ oz. in solution, Paris green $1\frac{3}{4}$ oz., caused very slight injury after the third application.
5. Copper carbonate— $1\frac{1}{2}$ oz., in suspension, Paris green $1\frac{3}{4}$ oz., caused no injury.
6. Copper carbonate—3 oz. in suspension, Paris green $1\frac{3}{4}$ oz., caused slight injury after later applications.
7. Copper sulphate—8 oz., dissolved caused much injury, and proportionately as the quantity of sulphate was increased.
8. Copper sulphate—8 oz., with $1\frac{1}{2}$ pints of ammonia, caused much injury.
9. Copper sulphate—8 oz.; Paris green .93 oz., and $1\frac{1}{2}$ oz. caused much injury.

The more promising lines, as indicated in the above summary, will receive careful attention another season, and on such a scale as to enable the submitting of a more complete summary of conclusions.

V.—EXPERIMENTS WITH FUNGICIDES.

The annual losses to orchards during the past eight or ten years from the disease known as apple-scab (*Fusicladium dentriticum* FCKL.) has been so heavy as to cause some hitherto profitable varieties to be discarded in certain localities, and to raise the question of their usefulness in future planting. These failures among old and well-tried varieties have also brought about enquiry and experiment as to the best means of combating the disease.

A series of experiments along this line were conducted at Abbotsford, Que. during the past season, on the farm of Wm. Craig & Son. I am indebted to Mr. Wm. Craig, jr., for his labour in superintending the work, and furnishing me with some of the facts upon which the deductions are based.

I am also indebted to Mr. F. T. Shutt, Chemist to the Experimental Farms, for valuable assistance in planning the lines of experiments, and for the preparation of the copper carbonate and other necessary materials.

The trees selected were of the Fameuse variety, planted fourteen years ago on a loose, gravelly soil. During the past four years this orchard has not yielded more than 25 per cent, of first-class apples.

Five rows in the centre of this orchard were selected, each row, which contained fourteen trees, being treated with a different mixture. A row of trees untreated was allowed to remain on either side of those operated upon. Four applications were made, one on each of the following dates : 14th and 26th June and 16th and 28th July. At the time of the first application the fruit was about the size of garden peas.

When the fruit was picked it was divided into three grades, numbered 1, 2, and 3. The results are given in this way :—

Row 1.—Treated with

Copper carbonate.....	1½ oz.
Ammonia.....	1 qt.
Water.....	22 gals.

Result :

	Per cent.
No. 1.....	33
No. 2.....	25
No. 3.....	42

Row 2.—Treated with

Copper carbonate.....	3 oz.
Water.....	22 gals.

Result :	Per cent
No. 1.....	50
No. 2.....	25
No. 3.....	24

Row 3.—Treated with

Copper sulphate.....	1 lb.
Ammonia.....	1½ pts.
Water.....	22 gals.

This solution was too strong, injuring the leaves to such an extent as to cause half of them to drop within ten days from time of application. A second and weaker application had the same effect.

Row 4.—Treated with

Copper Sulphate.....	1 lb.
Water.....	22 gals.

This had practically the same effect as the above, and was discontinued after a second application. It would seem in this result before us that the ammonia did not increase the injurious effect of the copper sulphate.

Row 5.—Treated with

Hyposulphite of soda.....	1 lb.
Water.....	22 gals.

No beneficial effect was noted, though the experiments on this row were rendered useless by severe inroads of the leaf-crumpler.

Row 6.—Untreated.

	Per cent
No. 1.....	24
No. 2.....	26
No. 3.....	50

The time occupied in making each application, covering the 70 trees, was about 3½ hours with one man and boy and a horse. Of course, if the same mixture were used on the whole lot without any change, the time taken in making the application would be greatly reduced. As the cost of the application is much increased by the addition of ammonia in the copper carbonate mixture—while the results in the experiments cited above do not seem to warrant its use—it would appear that the copper carbonate and water mixture, in the strength as applied above could be used as advantage, and at a cost of about 1 per cent per

tree each application, or 5 cents for the season. This is an outside estimate even for large trees. It is noteworthy to mention a fact, which has attracted the attention of other investigators, viz., that the older leaves seem to be more sensitive to injury from most fungicides and insecticides, than the young and growing leaves. The later applications emphasized this observation.

OTHER FUNGICIDES.

Bordeaux mixture.—The remedy for downy mildew and black-rot of the grape, though only of recent introduction, has, by reason of its efficacy, become one of our important fungicides. It is prepared as follows :

“Dissolve 6 lbs. of sulphate of copper in 16 gallons of water. In another vessel slake 4 lbs. fresh lime in 6 gallons of water. When the latter mixture has cooled it is slowly poured into the copper solution, care being taken to mix the fluids thoroughly by constant stirring. Prepare some days before needed for use. Stir before applying. Stronger mixtures were at first recommended, but they are not now used. For downy mildew and black-rot of the grape, blight, and rot of the tomato and potato.” (Bailey, Horticulturist's Rule Book)

Eau celeste.—“Dissolve 1 lb. of sulphate of copper in 2 gallons of water. In another vessel dissolve 1 lb. of carbonate of soda (washing soda); mix the two solutions. When chemical reaction has ceased, add 1½ pints of ammonia; then dilute to 22 gallons.” (Bailey, Horticulturist's Rule Book). Use for treatment of the same diseases as Bordeaux mixture.

I herewith append some conclusions arrived at by Prof. C. P. Gillette of the Iowa Agricultural Experiment Station, who conducted last season an extended series of experiments on this subject :

“The oldest leaves are most susceptible to injury from arsenical applications; they often turn yellow and drop, without showing the burnt spotted appearance.” * * * “London purple, (Paris green and white arsenic have not yet been tried) can be used at least eight or ten times as strong without injury to foliage, if applied in common Bordeaux mixture instead of water.” * * * “The arsenites mix readily in carbonate of copper solutions, and do not seem to do more harm than when applied in water only.” * * * “London purple in sulphate of copper solution, does vastly more harm than when applied in water only.”

In the Journal of Mycology, Vol. VI, No. 3, published by Prof. Galloway and assistants, Department of Agriculture, Washington, an account is given of results of spraying grape vines to prevent black-rot with “Bordeaux mixture; ammoniacal copper carbonate solution; copper carbonate in suspension; and a mixed treatment, consisting of three applications of the Bordeaux mixture, followed by five of the ammoniacal solution.” The following conclusions were reached:—

I. "That while the amount of fruit saved by the Bordeaux mixture was greater than that by the ammonical solution, the latter preparation is, after all, the cheapest. In other words, there was more profit in using the ammonical solution than the Bordeaux mixture."

II. "A mixed treatment consisting of Bordeaux mixture and ammonical solution, is more profitable than a treatment of Bordeaux mixture alone, but not as profitable as the ammonical solution alone."

EXTRACT FROM PAPER READ BY J. W. HUGHES, ESQ., OF HUGHES & STEPHENSON,
ON STEAM AND HOT WATER HEATING (by permission.)

In the conservatory, it is a much more complicated problem. The kind of plants, the position of the house, the effect of the sun, wind, shelter, construction, bottom heat, and of late years top heat, evaporation, ventilation, have all to be considered, and the wonder is we do as well as we do, all things considered. I sometimes think you gardeners attempt too much in one house containing plants some of which require the conditions of our Spring and Autumn, while others do best under conditions such as are given by our mid summer, and besides all this you have plants that require the conditions of climate, that prevail in the tropics. Of late years conservatories have been multiplied, or if not increased in number, the houses have been divided into parts, so that the gardener can classify his plants and have them growing under the conditions most favorable to success. Gardeners know the necessity of this because when they are growing plants for sale, they have different houses and different conditions favorable to plant life, but in the private conservatory attached to a gentleman's residence, we often find them trying to grow all sorts of plants, in the one house and I must say they meet with wonderful success.

As to the best kind of boiler, this is a question I am often asked. Well, gentleman, I tell you frankly, I do not know. There is not a boiler in the market that has not its friends and earnest advocates, while other men see no good in them and would not have them at a gift, but there are some points that every good boiler should possess.

Ist. It should have an ample fire box both in size and depth, this of course covers the question of grate area. It should be so arranged as to be easily fired and cleaned have an ample and easily cleaned ash pit, the flues must not be small or complicated, and be easily accessible for cleaning because soot "carbon" is one of the best non conductors known to science, and unless the surfaces are so constructed as to prevent the accumulation of soot on them, they must be so constructed that it be the work of a few minutes to clean them, and they must

be kept clean if the best and most economical results are to be gained. As much surface as possible must be exposed to the direct glow of the fire, piling sections one on top of the other has its limit of usefulness as after the smoke and gases have travelled a certain distance, they have given off all the heat they contain over and above the heat of the boiler itself, then they are useless as a heating medium and the sooner they go up the main flue the better.

The water spaces must be thin but every precaution must be taken to insure the freest possible circulation because water is a poor conductor of heat, but the slightest application of heat, sets up the motion which we call circulation and when the freest circulation is provided for nature's law of heat, which is motion, can come into free play and the heated particles of the water at once move off from the boiler where we do not want them to the pipes in the house where we do want them, and where quickly giving off their heat they want to travel back to the boiler, and they will do so without fail if you have your boiler and pipes constructed in such a way as to enable them to do so. For this reason I favor four inch pipes as, for the quantity of water they contain, and that means heat, they afford the least amount of friction, and friction means loss of power and requires fuel to overcome it for the power is in the heat; in fact heat and motion or power is the same thing. For this reason very long and complicated runs are to be avoided, and the fewer bends or angles you have the better. Some I know advocate small pipes because they heat up quicker, well this is an undeniable fact, but, they heat quicker because they are carrying less heat, and for the same reason they cool quicker—not always a desirable thing in our climate.

A good draft is an imperative necessity. Without it you can have no success: with it you may get excellent results with even a very poor apparatus, a poor draft, strange as it may seem, is a great waster of fuel as instead of perfect combustion and as a result getting out all the heat there is in the coal, it merely moulders. You can always check the draft: there is no difficulty about that, but when you cannot get up a white heat in your fire, if you want to there is room for an improvement in the draft.

Your boiler should also be constructed of some material that will not be destroyed by standing in a moist place during many months in the year, for this reason cast iron is best, although for other reasons it may not be as good as wrought in some respects. Always put in a boiler having ample capacity so as not to have to force the firing in any weather. A very important factor in the heating and ventilating of a house is its construction. It is a big contract in this climate to "heat all out of doors," and if every pain of glass is leaking at the joints, if the frames do not fit, if the sides are single instead of double glazed, the heating of such a house is difficult, and the ventilating almost impossible, But given a reasonably tight house you will have plenty heat with economy,

and can work your ventilators, so as to get such results as you may require, The question of ventilation is too large for me to attempt to elucidate tonight, but on that let me say a few words. You must have an inlet as well as an outlet, a hole in the roof does not mean ventilation unless you have a corresponding hole, some where else to let air in you cannot ventilate a bottle, unless you make a hole in the bottom or rig it with some contrivance at the neck that will let air in as well as out.

My remarks of course have reference to a hot water heating apparatus, as I believe that is the best for a gentleman's green house. It is simple, direct, carries heat a long time after the fire has gone down—requires no special skill in its management, not liable to break downs or leaks, not dependent on pumps, injectors or a constant pressure supply of water, has no safety valves, try cocks Automatic feeder, etc., to get out of order, and has behind it a weight of experience and trial that is important.

In making these remarks I am not saying anything in disparagement of a steam plant, which may be for aught I know very suitable for heating commercial conservatories—where there would be some one in attendance day and night—but even then I should advise that the plant be doubled the same as is done in newspaper offices, electric light stations and such like, so that when an accident occurs a boiler may be in reserve and ready to put into operation in a short time.

In comparison of steam and hot water heating I give the following extract from Hood p. 63. “ One of the greatest advantages which the plan of heating by “ the circulation of hot water possesses over all other inventions, for distributing, “ heat is, that a greater permanence of temperature can be obtained by it than by “ any other method. The difference between an apparatus heated by hot water, “ and one where steam is made the medium of communicating heat is not less “ remarkable in this particular than in its superior economy of fuel. It seldom “ happens that the pipes of a hot water apparatus can be raised to so high a “ temperature as 212° fah ; and in fact it is not desirable to do so because steam “ would then be formed, and would exape from the air vent or safety pipe with- “ out affording any useful heat. Steam pipes on the contrary must always be at “ 212° at the least because at a lower temperature the steam will condense. A “ given length of steam pipe will therefore afford more heat than the same quan- “ tity of hot water pipe : but if we consider the relative permanence of tempera- “ ture, of the two methods we shall find a remarkable difference in favor of pipes “ heated with hot water. The weight of steam at the temperature of 212° fah. “ compared with the weight of water at 212° fah is about as 1, to 1694, so that a pipe “ which is filled with water at 212° fah contains 1694 times as much heating mat- “ ter as one of equal size filled with steam. If the source of heat be cut off from the

“ steam pipes the temperature will soon fall below 212° and the steam immediately in contact with the pipes will condense ; but in condensing the steam parts with its latent heat, and this heat in passing from the latent to the sensible state—will again raise the temperature of the pipes but as soon as they are a second time cooled down below 212 a further portion of steam will condense and a further quantity of latent, heat will pass into a state of sensible heat, and so on until the whole quantity of latent heat has been abstracted, and the whole of the steam condensed in which state, it will possess just as much heating power as a similar bulk of water at the like temperature, that is the same as a quantity of water occupying $\frac{1}{1004}$ part of the space which the steam originally did. The specific heat of uncondensed steam compared with water is for equal weights .8470 to 1—but the latent heat of steam estimated at 1000° fah we shall find the relative heat obtainable from equal weights of condensed steam and of water by reducing both from the temperature of 212° to 60° fah to be as 7.425 to 1, but for equal bulks it will be as 1 to 228, that is bulk for bulk water will give out 228 times, as much heat as steam on reducing both from the temperature of 212° to 60° fah. A given bulk of steam will therefore loose as much of its heat in one-minute as the same bulk of water will loose in 3 $\frac{1}{4}$ hours.

“ When the water and the steam are both contained in iron pipes, the rate of cooling will, however be very different from this ratio, in consequence of the much larger quantity of heat which is contained in the metal itself than in the steam with which the pipe is filled, the specific heat of cast iron being nearly the same as water if we take two similar pipes 4 inch diam. and $\frac{1}{4}$ inch thick, one filled with water and the other with steam, each of the temperature of 212° ; the one which is filled with water will contain 4.68 times as much heat as that which is filled with steam, therefore if the steam pipe cools down to the temperature of 60°, in one hour the pipe containing water would require 4 $\frac{1}{2}$ hours under the same circumstance before it reaches the like temperature, but this is merely reckoning the effect of the pipe and of the fluid contained in it. In a steam apparatus this is all that is effective in giving out heat, but in a hot water apparatus there is likewise the heat from the water contained in the boiler and even the heat from the brick work around the boiler, which all tend to increase the effect of the pipes, in consequence of the circulation of the water continuing long after the fire is extinguished, in fact so long as the water is of a higher temperature than the surrounding air of the room. From these causes the difference in the rate of cooling of the two kinds of apparatus will be nearly double what is here stated, so that a building warmed by hot water will maintain its temperature after the fire is extinguished, about 6 or 8 times as long as it would do if it were heated with steam. This is an important consider-

“ration wherever permanance of temperature is desirable, as for instance, in
“hot houses, conservatories and other buildings of a similar description. And
“even in the application of this invention to the warming of dwellings, etc., this
“property which water posseses of retaining its temperature for so long a time
“and the very great amount of its specific heat prevents the necessity for that
“constant attention to the fire which has always been found so serious an ob-
“jection to the general use of steam apparatus.”

Another question of importance I may just touch upon is the best kind of pipe joint. In my opinion nothing equals the joint made with red lead and hemp packing, it is easily made, durable, perfectly water tight, and at the same time has a certain amount of give in it, and when it is desired to make a change, it is a simple matter to pick them out.

Cement and hemp has its advocates and I have no doubt of its being an excellent joint. But great care must be taken in properly mixing fresh cement every time a joint, or a small number of joints have to be made.

The great feature about the last joint is its durability, but I know of no reason why a red lead joint should not last quite as long.

Another trouble with last joints is their rigidity. In most conservatories, some little twisting or settling will take place, and snap goes your joint or fitting, and it is generally in the most awkward place and season that this occurs.

In case of a break down necessitating the putting out of fires, I know of no better or more expeditions plan to keep up sufficient heat to save the plants, if there is no way of setting up a stove, than to get a number of large coal oil lamps, and set them burning. They may be set in large tin dishes, containing an inch or two of water, for the sake of safety, but it is generally possible if the trouble occurs in day light to get up a stove even if you have to punch out a pane of glass in the roof for the pipe, but sometimes a break down will occur in the night or on a Sunday, or holiday, in such a case the gardener is all right provided he has a supply of coal oil and half a dozen or more good big lamps to set agoing.

Tubs of warm water set about the house also retard the rapid fall of temperature, for this reason the big tanks of water in the houses are of benefit, as they not only serve as reservoirs of water, and moisture but also of heat.

The question of fuel is an important one, but I am of opinion that with the more modern forms of boilers, when of ample size and judiciously managed, there is as near approach to the maximum theoretical result as we are likely to obtain for some time.

A FEW NOTES

BY T. H. HOSKINS, NEWPORT, VT U. S.

The Secretary, in kindly sending me the Society's 14th Report, has done me the honor to ask for something from me for the next issue. In looking over the Report at hand, I am forced to regret that my utterance, in speaking of Iron Clad Apples at the meeting of Dec. 5th, 1888, was so indistinct that the reporter fell into a number of errors, destructive of the sense of my remarks. This being the case, it occurs to me that I may better occupy the space I shall take in the next Report by corrections, and comments of a practical character, in regard to orcharding.

The first error I note, (perhaps my own, as I spoke entirely without notes,) was (p 22) that north of the parallels of 42°-43° north latitude, in Vermont, "it is practically impossible to raise apples outside of the Champlain Valley." What it was intended to say is, that until recently it had been so believed. Orchards are becoming quite abundant there now. On the same page I am made to say that "all our towns and villages have sextupled in population," which is a great error. This remark was made in reference to the village of Newport, Vt., near which I reside.

The remark (p 24) that "the Shiawassee Beauty spots as badly as the Fameuse in some parts of the Province," was not made by me, but by some one else while I was speaking. My continued experience with this admirable Michigan seedling of the Fameuse is so extremely favorable in regard to spotting that I still must think that parties who hold this belief have not the true Shiawassee. It is a very scarce apple in the nurseries. Even so great a firm as that of Ellwanger and Barry of Rochester, N. Y., wrote me last fall that it was so little called for that they did not grow it. Downing, in his "Fruits and Fruit Trees of America," says the Shiawassee closely resembles Fameuse, but may be distinguished by the color of the young wood. This has led unscrupulous nurserymen to think they may send Fameuse where Shiawassee is ordered, and I fear this is too generally done. But the fact is, that though the flesh and the flavor are alike, the fruits are exteriorly so different as to be easily distinguished, and one could not be sold for the other, where either was well known. The Shiawassee is larger, and not round like Fameuse, but very markedly oblate, or flattened, while the shades of red are quite variant. With me it is as free from spot as the Wealthy.

In regard to the keeping of the Wealthy apple, I had the pleasure of sending a quantity of them in the spring of 1888 to R. W. Shepherd jr., Esq., of your society; and he will doubtless testify that they were then sound, firm and well flavored. The whole secret of this is in gathering them in September, as soon as the seeds are colored, and placing them at once in a cool cellar, of which the

windows are opened during cold nights and closed by day, up to the time when it becomes necessary to close them permanently. So handled, the Wealthy keeps with me as well as the Baldwin.

On p. 24, I am made to say, "while gathering my Fameuse," etc. It should have been "Wealthy." The object of the statement then made was to show the immense difference in the keeping of apples, according to the way in which they are handled. This art is one that the Russians have well studied, and we, in the northern parts of America, ought to study it closely, if we want to winter our fruit successfully. In the same paragraph there is a second error, which is perfect nonsense as it reads. It makes me say "two weeks after gathering my Fameuse (should be Wealthy,) in the middle of *March*," etc. This "March" should be October. I was trying to show that by different treatments I could have the same apple,—the Wealthy,—dead ripe in October, or hard and firm in April. I wish here to add that the past season I shipped a car load of Wealthy to Massachusetts, (probably the first ever sent to that market,) and realised the same price as for Fameuse. It is an excellent shipping apple, and meets the requirements of the best city trade as a dessert fruit.

On p. 23, the force of my remark about keeping the Duchess of Oldenburgh is entirely lost. I gathered them as soon as well colored, put them at once in a cool cellar, and had them for sale a month after other Duchesses were out of the market, and at a double price. On the same page I am made to say that the Scott's winter apple originated on Lake Champlain; it should have been Memphremagog. Also, that the Iowa Russet is "highly polished," which would be queer indeed for a russet. I said it was a highly flavored apple. On p. 26, instead of saying, in reply to Mr Gibb's question, that the Bethel is grown in the St Lawrence Co., N. Y. under the name of *Snow* apple, it should be *Stone* apple.

At the bottom of p. 27, speaking of the yellow Transparent and Grand Sultan apples, the word "Scions," twice used, should be *Trees*. On page 28, I am recorded as saying that I gather the Wealthy before the sun is up. What I said was that I preferred a cool or cloudy day; or, if otherwise, to pick before the sun gets high. I am not a very early bird.

On page 82, near the top, I should have been reported as saying that in the first importations of Russian apples, including red and white Astrachan, Tetofsky, Alexander and Oldenburgh, which come nearly 50 years ago, we had a class quite distinct from previous importations; but in the later importation, in 1870, by the U. S. Department of Agriculture, we had a very mixed lot, by no means all natives of Russia.

On p. 83, for "Maine Russet" read Black Oxford.

On p. 95, near the top, "if they are not hardy," should be "if they are not planted."

In finishing, I will take the opportunity to remark briefly upon the teachings of the past year, as regards fruit growing in the St Lawrence valley. I am fully satisfied that with our new hardy native seedlings, and some selections from the numerous East European fruits recently acquired, we can grow apples as easily, cheaply and successfully as anywhere on this continent, and with as much profit. My early ambition was to supply the home market, and so keep the money paid for fruit at home. But now I am satisfied that we can successfully compete in all American Cities with fruit growers any where. Especially in the Wealthy we have an early winter apple which can be grown as cheaply as the Oldenburgh, and sell as well and at as good prices as the Fameuse, the Gravenstein, or any other apple in the markets of Southern New England, or as an export apple for the English market. All we want now is good cool storage and careful handling, on the transatlantic steamers. We had a large crop when apples were a failure all over the continent, and I think there is little doubt that the apple is a surer crop here than anywhere else on the Atlantic slope

COUNTRY HOMES.

By Mrs. Annie L. Jack.

It is a great drawback to rural life that the people who form its society are so often careless of the outward appearance of their homes, and it is the true mission of Horticulture, and Horticultural societies to so cultivate a taste for the beautiful, that the homes may be an index of the people. I have heard it said that fine grounds and trees are expensive, but the added beauty pays for all the toil in added value to the property, if one does not take æsthetic beauty into consideration. The real need is not a fine house, elegant walks, and costly buildings, it is in keeping things in order, and *picked-up*. I know a lady whose son once told her if he wanted her photograph in the most natural position and occupation in spring, it would be picking-up about the doors.

When old boxes, barrels, cart wheels, bits of iron or boards are left in the yard, when the ashes are scattered or spilled here and there, chips heaped among sawdust at the woodpile and everything in the same mixed condition, one cannot expect neatness, or much enterprise in horticulture.

A little time once or twice a week will keep a grass plot in good order. A sharp knife takes out plantain and dandelions, till the grass becomes a smooth sward. Trees are cheap, and grow quickly and it is a pity, if with all our natural advantages and facilities we leave it to the city and suburban homes to show us how to beautify the grounds about our door, *or yards*. For a little originality

and individual taste will make a wonderful improvement and be something for our children to remember in after life. It is wonderful how large returns we can get for a small investment in trees and plants.

A neat house with a few well kept plants is a daily certificate of the owner's neatness and good taste.

I pass many grounds in my drives to and from the villages, where potatoes are close up to the door step, with honorable exception for a row of late cabbages or a few onions. There may be a pathetic little row of asters, or dahlias may be seen here and there but there is no ground wasted in flower beds. If you ask the thrifty farmer he will tell you it doesn't *pay* in time or labor, but he does not see very far or he would read between the lines and know that the added beauty pays in the appearance of his home.

A tumble down, dilapidated fence is an unsightly object, often to be seen in this part of the province. It is not always a sign of shiftlessness, but of carelessness, and also of not going enough from home to notice and care to improve, as is done in other parts of the country.

Farmers have awakened to the value of fruit, they are planting trees to grow while they are resting, and in hopes of future recompence in the shape of golden fruit, but they have not yet quite awakened to the aesthetic beauty of ruhsbbery, of vines, of flowers and ornamented trees, and so the home is marred by the lack of these things.

I once drove up to the door of a farm house when all nature was beautiful, the trees white with blossoms, river and sky perfect, and the air soft, and pure. But between the barn and the house was a desert of odd wheels, cart bodies rotting boards, old barrels, heaps of ashes and chips. The house was a model of neatness inside, the stable and barns in good repair—but O! these surroundings—this waste of land in harboring a wilderness of rubbish!

Plant trees for beauty, then as well as for dollars, let a thought be given to the ornamentation of the home, and the taste will grow till it refines and elevates the whole life, and if in our schools it was part of the routine of study to teach Horticulture, to learn Botany, instead of some of the useless "ologies," it would develop a taste among the youths of our day for the best in everything they undertake.

The school yard should be made to blossom with the rose, and encouragement given to improve its surroundings. So should our children learn, in their every day life lessons to improve their county homes.

MUSHROOM CULTURE.

By John Perrin, Montreal.

According to my experience, I have proved the following method to be the most succesful for the cultivation of Mushrooms during the winter.

Sometime during the Summer months, not later than August, but as much earlier as possible, I collect a quantity of fresh horse droppings which have not been wet by rain or other-wise, as free from straw as possible and which have not been heated to any great extent, I then place the droppings under cover, say in a shed or outside so that they can be covered and kept from any rain falling on them or water runing under them. I turn and mix the droppings thoroughly every second day for about two weeks, this is to dry them and keep them from heating or becoming burnt, as I find when the manure has been burnt it loses the properties necessary to the growth of the mushroom.

I find that the mushroom spawn will not run or work in the manure where-ever it has been burnt or become mouldy from heating. When the droppings are ready, that, is to say when they are sufficiently dry so as not to become heated to any great extent, remove them to the place intended for the mushroom bed. After making and completing the bed or portion of bed as the case may be according to the quantity of manure already prepared, and if not sufficient droppings to complete the whole of bed or beds at once be sure and complete the bed as far as the droppings will allow. I would advise that the remainder of bed or beds be finished as soon as every thing can be made ready.

Experience teaches me that ten or twelve inches in thickness of manure is sufficient when beaten firm. When the bed of droppings has become firm by beating, place about two inches of earth on the top and beat solid.

Yellow loam is preferable as when it is once beaten firm it is not so liable to become loosened. I should have said that the bed should not be earthed for a few days so as to allow the heat to escape if there be any.

I would reccomend that the bed be spawned at a temperature below eighty degrees and that on the decrease. In fact I find the natural heat at this season quite sufficient to cause the spawn to run rapidly. Whenever I made mushroom beds for myself I always used spawn of my own making and generally put pieces of spawn the size of a goose egg into holes about eight or ten inches apart and about three inches deep after which I would pour a little water into each hole. I then fill the hole with earth and beat firm, then cover the bed with straw or litter to keep the bed at an even temperature, also to keep the bed from becoming too dry. My reason for pouring water into the holes containing the spawn, is, to moisten the manure slightly around the spawn so as to start the spawn which

in a short time will draw out into the droppings and in about one month should be working throughout the bed.

The bed should not be loosened or disturbed in any way whatever but to remain for three or four months, when the spawn will have worked and become strong throughout the bed, then remove the straw or litter from the bed leaving a clean smooth surface, give a gentle syringing and protect the bed from the sun and air by hanging grey cotton around it or something similar. The syringing may be continued two or three times a week taking care not to wet the bed more than an inch or so deep, by this method mushrooms should show in about two weeks and should continue to bear a full crop for three or four months at the end of which time there should be a great deal of good spawn in the bed, in fact I have found some of my beds to be a solid mass of spawn when the mushroom season had passed, after giving a full crop.

I may say that when clumps of mushrooms appear above the surface I place light sheets of paper such as newspaper over them, syringe the clumps of mushrooms lightly two or three times a day. This I find causes them to grow faster and larger causing them to weigh heavier which is of great importance to those who sell by the weight. In addition it gives to the mushroom a perfect form and color also improves its flavor. Experience teaches that a mushroom which has been dried and discoloured by the air has unpleasant flavor similar to that of meat which has been exposed to dry air. I desire to say that every gardener should know good spawn from bad also how to make it.

THE CULTURE OF BULBS.

By Alfred Wilshire, Montreal.

Forced bulbs, particularly the Dutch varieties are now so much in demand not only for decorating the conservatory, but for cut flowers house decoration that they now form a very considerable portion of our winter flowers. And this is not surprising when we consider the wonderful variety of color and beautiful forms that we meet with in this class of plants. Add to this their comparative cheapness and ease of cultivation and the fact that they can be brought into bloom at a time when flowers are most appreciated. I think that we as growers and sellers should do all we can to encourage the taste and love for bulbous rooted flowers among the general public.

The bulbs chiefly forced are the Dutch and Roman Hyacinthe, Tulips, Narcissus, Tilliums and Trecora. There are several other kinds which may be

forced more or less succesfully, but are either too uncertain or too short lived to be worth handling, in quantity.

The chief thing in bulb culture is of course to get the right quality bulbs for if you haven't got good, plump, firm bulbs to start with the after cultivation can never produce good flowers. The best are always the cheapest. Dont grow too many varieties but get the most distinct colors and those best adapted for forcing. Get your bulbs as early as possible in fall so as to give them time to get well rooted before they are brought into the forcing house. While they will grow in any ordinary soil I believe it pays to give them some good rich open stuff that will not sour or get water logged easily. They may be grown in either shallow boxes or pots and will bear being put very close together. They can be started under the green house benches in a shed or cellar but I beleive they do best out of doors. If they are placed in frames with about 2 or 3 inches of sand or fine ashes and as the severe weather comes on dry leaves and boards over them, they will root strong and naturally and can be brought in as required during the whole winter, and if they get a little frost I believe it does them good rather than harm particularly the Tulips.

Care must be taken however to allow them to thaw out gradually and not let the growths be exposed to extreme cold. Do not bring them into heat till they are well rooted and the flower sprike above the crown of the bulb. Place them in a temperature of sixty to seventy and cover them with moss or some other material for a few days to keep some of the light from them. Watch them carefully right along that they dont dry.

Never put Dutch bulbs on shelves exposed to the sun or in fact in any very light place till in bloom. When once in flower put them in a cool green house or concervatory.

This treatment applies to Hyacinths, Tulips and Narcissus except that with Tulips they should be kept a little closer and darker after being brought into heat.

I will give you a list of some of the varieties that we have tried and found to be good.

HYACINTHS.

SINGLE WHITE.

La Grandesse.

Mad Van der Hoop.

SINGLE PINK.

Norma.

Robert Steiger.

YELLOW.

Ida and La Critroniare

Barroncos Von Shuyll and Gigantea.

SINGLE BLUE.

Grand maître.

Grand Lilas.

DOUBLE PINK.

Noble par mérite.

Prince of Orange.

Lord Wellington.

DOUBLE WHITE.

La tour d'Avergne.

La Virginité.

DOUBLE BLUE.

Bloksberg and Rembrandt.

TULIPS.

Keizer Kroon, King of the yellows, Cottage Maid, Vermillion Brilliant, Bottebacker white, and Due Van Thol yellow and red.

Among the Narsissus the Von Sion seems far ahead of all other kinds. The others are nice for variety. Several of them especially Poeticus are useful for cut flowers but Von Sion is the showiest of all and I think forces the best.

The Lilliums especially Harrisii are indispensable both to private Gardeners and Florists and seem to be growing in favour. These should be kept in a warm house from the first. In potting keep them low in the pots when growing give them plenty of light, heat and room and not too much water.

Freesia Refracata deserves to be more extensively grown than it is. It can be grown in pots or in quantity in boxes. Keep in the greenhouse and in the light. It keeps well when cut and is thought much of on account of its delicate scent.

The Amaryllis is a bulb I would like to see cultivated more. It is perhaps most useful in private houses but even there we seldom see more than one plant or two of the common variety Johnsonii.

I have had very little experience in its culture but from what I have seen it should not be allowed to dry right off but watered sparingly during the resting season.

The Calla and Tuberose although not coming strictly under heading of bulbs I might just mention. The Calla which is always in demand seems to do best when dried off in summer, potted in rather small pots and watered with plenty of liquid manure.

The Tuberose seems to have had its day but would I think come into favour again if flower design manufacturers would leave off putting them into funeral work.

FLORISTS' FLOWERS

By C. Campbell, Montreal.

Among Florists Flowers the rose is well known to hold the first place. Of the very large number of roses known to the botanist. A very few are grown to an extent for florists' use. These are divided into three classes, viz : Fancy Roses, Hybrid Roses and Tea Roses.

Of fancy roses the most popular varieties are Catherine Mermet, Niphetos, Pearl des Jardins, Cornelia Cook and Maréchal Neil. In addition to these there have recently been put on the market, the Bride, W. F. Bennett, and Papa Gontier each of which will no doubt be as largely grown and become as well known and valued, as the former varieties, although so far they are not obtainable in such quantities as the older fancies.

Catherine Mermet has many commendable properties being of a rich pink colour, when grown under favourable conditions, can usually be cut with long stem, is very double and substantial, is finely formed and keeps well.

Niphetos is one of the most useful roses grown and is always in good demand. Being white in colour it can be used for any class of florist's work, whether in the construction of a last token of respect to a departed friend, or the formation of the bouquet carried by the maiden clad in colour emblematic of purity who is about to change her maiden name for that of Mrs. Somebodyelse.

Pearl des Jardins on account of its colour I suppose, (yellow being a popular colour with the patrons of the florist, for some years past) is quite saleable, its form is not just graceful, being rather short and dumpy, its foliage is generally good, being of a dark green, well shaped, with good substance. One of its advantages is its long stem, and its disadvantage its poor keeping quality, which after all is pardonable when its head does not split partnership with its stem until it reaches the ballroom, and this saves the florist the trouble of subjecting it to the metallic process.

Cornelia Cook is a noble rose and possesses all the qualities desirable in that flower except perfume, of which it is devoid, although at times when kept for several days, or weeks, in the refrigerator with an insufficient quantity of ice, it does attain a certain odor, whether pleasant or otherwise, customers can best judge. It is classed white in colour, but usually shows a creamy tinge which adds to rather than deducts from its excellence. When well grown its shape is almost perfect and helps much in its sale. It is very strong in stem and head, and keeps remarkably well, is valuable for the construction of first class work and is frequently used at balls and evening parties tied up in loose bunches with all the stem, which is very long, and when arranged with long streams of ribbon of a contrasting color with the leaves the effect is very pleasing.

Maréchal Neil to my mind is one of the handsomest roses grown. Its rich yellow colour, large substantial and finely shaped head pretty bright green foliage, graceful drooping habit and delicate tea perfume, all afford points of admiration to the lover of flowers. I always feel happy when I receive a few of them from the grower, and feel that with them on hand I can undertake, with a certainty of satisfying, the execution of an order from the most particular customer, but when some "habitant" in dude's attire, enters, and tries to persuade me that he is conferring a favour by offering to possess himself of some of them at "cat pour de cent," I turn billious right off. Of the Bride, W. F. Bennett, and Papa Gontier, I will say little as my knowledge of them is limited, but believe from what I have seen of them, they will yet be extensively grown here.

Another rose which I am not clear on whether to name a fancy or Hybrid is the American Beauty but I expect my doubt to be decided in after discussion I will not take up space by commending this rose, as I can't do so conscientiously. To my mind it has very little to commend it, but many points which tend to depreciate it. A strong coarse grower, both in stem and flower, its colour, a washed out dirty red, or faded dark pink, is too large for general bouquet work, and button holes, unless for a clown. I presume it is found useful by florists of large American Cities, who frequently use large vases filled with roses alone, for some of the extensive decorations they often have to arrange. Here we are not often troubled with orders of this nature.

We next come to Hybrid Roses. Among these, first in rank comes the General Jacqueminot. This old rose is about all a Rose can be, and has been justly termed King of Hybrids. Its colour, a rich velvety crimson, is most attractive, and never fails to command the admiration of all, not only the lovers of flowers, but those who scarcely know what class of flower they admire: Its rich rose perfume also adds much to its sale. I have known some gentlemen to be so facinated with it as to procure some of its fallen petals to place in their tobacco pouches to impart a rich aroma to the weed that soothes. Its foliage of itself when well grown attracts attention, being well shaped, substantial and rich green in colour. This Rose has brought a higher price I believe than any other known. A Florist of New-York tells of a grower who on a New Years Eve, brought 4 buds to market, and received for them the enormous price of \$60.00 or \$15.00 each, about 8 times their weight in gold. I have myself on more than one occasion paid at wholesale \$2.00 and 2.50 per bud and retailed them at a profit after paying expense of importation from New-York.

Another very showy Hybrid Rose is the Barroness Rotchild. A very large Pink, Rose of very strong growth. It has not been my fortune to have had many decorations to construct when I could use it profitably, as it usually fetches a pretty high price. One grower near Boston told me that \$10.00 per doz.

whole sale was his price for them, and had no difficulty in getting rid of them at that. They are not grown to any extent here and my opinion is that but a very few of them would supply this market.

There are many other Hybrids grown extensively in the States for the trade, but as we seldom have any call for them, I think it premature to excite any discussion on their merits.

Next we come to Tea Roses; these are a vexation of spirit to the Florist. When received from the Grower they are often either too close in the bud or too open, and unless we get them (as the Yankee says) just so! they are very little use. In warm weather they open out like a pancake, showing a lovely yellow centre, no matter what colour the rose, whether it be Bon Selene. Safrano, or Isabella Sprunt, all show the same coloured centre when expiring, a dead give away to the honest florist who tries to persuade the customer, they will last a week, and then they will close again when the sun goes down. At other times we get them about the size of peas. I do not admire tea roses and believe that very shortly they will be crowded out of the market entirely. True they have a taking appearance when well grown and cut and delivered at the proper hour. They also have a delicate tea scent, but their slim build and consequent small faculties of endurance over balances their other qualities.

Second in order of superiority and usefulness to roses, are carnations, of which we have many varieties, but the Florists use about three sorts or colours, white, pink and red. Although fancy colours when in good condition, usually find ready sale, the supply of these being rather small we don't generally depend on them for use in filling orders for made up pieces. White Carnations are more largely used than any other colours, in fact I don't know of any other flower of which there are so many used as the white Carnation. In funeral work it is very suitable, and when a good supply of these are on hand, a very creditable design can be arranged with the addition of a few other flowers. They are also more suitable for the construction of bouquets, baskets, &c., than many other flowers, on account of their lasting qualities. A Carnation keeps its freshness remarkably well for several days, with less trouble than most other flowers. I have found that when most care was taken to keep them they usually lasted the shortest time. I have tried several ways of keeping them, with varied success. I had a shallow vessel constructed with a wire net cover, which was filled with water to within one half inch of cover, then place the carnations in spaces in cover, so that the base of the flowers touched the water, but sometimes found the flowers had contracted during the night and in the morning were swimming on top of the water under the wire. I also filled tin trays with wet moss and stuck them in that, but with little better success. I have now come to the conclusion that they will keep a certain length of time

only, kept moist or not, (provided they are kept rather cold,) and any labour spent in attempting to lengthen their existence after being cut from the plant, is a waste of time. Acting on this belief, when we receive a lot, we just dump them into a tray and leave them there till used.

The varieties which seem to be most profitable to the grower are Snowdon white, Crimson, King red, and L Purite pink. There is also a very good bright red variety which finds ready sale, and is well worth a large space in the greenhouse, raised by a local florist and known in our store for the sake of distinguishing it from others approaching its colour as Mons. Grams.

Two very popular varieties lately introduced are Anna Webb and Grace Wilder, the former dark crimson, the latter rich light pink both well formed and full flowers, Their colour and form being very attractive they find ready sale at better prices than most other varieties.

Another very useful Florist Flower is the Bouvardia Recently it is not so much sought after for *fine Bouquets* being considered among the common class of Flowers, It lasts well when kept tolerably moist, but when exposed to the dry hot atmosphere of the ballroom, it wilts quickly and becomes more an eyesore than a thing of beauty. Another disadvantage to its popularity is its lack of perfume of which most varieties are entirely devoid still its partial resemblance to the honey suckle deludes some lately emigrated customers into the belief that it scents like it and when they pass a remark to that effect, the unscrupulous Florist is credited with saying *yes*.

Next of importance to the Florist I would class violets. Although their sale is not very large on account of their apparent high price, still the Florist who has a good "upper-ten" trade can dispose of quite a few in a season In this City we handle violets at a great disadvantage on account of there being no local grower who devotes any space to their culture, and when they reach us from across the line after being packed in a close box from 12 to 18 hours during their carriage, they lose most if not all their perfume and thus half their value. Were it not for the strictly conscientious principles of all Florists, this defect might partly be remedied artificially. A certain florist did on one occasion attempt this method of restoring their aroma and succeeded to his own satisfaction. When a lady violet customer entered and seizing a bunch of the doctored violets placed them to her nasal organ gave a snort. Slightly closed her left eye, raised her right shoulder, dropped the bunch of violets, pulled out her handkerchief mutered *too strong*, while closing the door on the outside.

I would suggest that one or two of our growers would devote some time, space and ability to the culture of these beautifully chaste flowers and can promise (judging from past experience) that a ready sale and good price will be found.

There are numerous other flowers which are constantly brought into requisition by the florist, which it is impossible to treat separately in a paper such as this. It is of no apparent benefit that I should enumerate the various flowers used by and useful to Florists, for most all flowers, grown within their reach are used at one time or another, and sometimes when there is a dearth of flowers and a brisk demand, any variety of flower is prized. Bulbous plants are now very largely grown to supply the cut Flower Market, and prove profitable both to grower and retailer. Many thousand spikes of Roman Hyacinthe have been sold in our City during the past winter. Lilly of the Valley has also had a large sale at paying prices. While the demand for Trumpet Major Narcissus and Tulips far exceeds the local supply. The great trouble the florist experiences in retailing Spring Flowers is to convince the customer they are really worth the price asked for them. Such remarks as this are sometimes dropped by some of our more liberal customers:—Dear me, how expensive these things are out here, why in England they grow wild. To that remark we once replied the reason they are so dear here, we grow them tame. They are under cover all the time while growing. Still with all this flowers are constantly growing in favour.

A slight growing demand seems to be decernable in the large cities of the states for orchids, but with us it is premature either to attempt their growing or retailing for profit, for with a very large majority of our patrons a dozen good carnations would fetch a better price than the same number of dendrobiums.

Some ten or twelve years ago Camelias could be handled by the florist profitably, but they have been gradually superseded by roses, untill now it is difficult to get rid of them at all, unless it be good whites which can be used with good effect in funeral work. Coloured camelias are seldom asked for and unless there is a large decoration on hand when large and effective blooms are necessary a stock of them has no millions in it. If I knew any other man than one of independant means engaged in gowing camelias for the market, he certainly would have my pitiful sympathy. It is possible that among the numerous customers of the florist in large American cities a few may be found who still cling to their love for the camelia, and thereby create just enough demand during each season, for that flower, so that the unfortunate grower is able to procure the wherewith to prolong his existence till the advent of the following season of torture, when he will again have the depressing fact freshened in his mind that the demand for these flowers is waning, by witnessing a larger number than formerly falling from their stems while yet uncut. However the freaks of fashion are strange and let us hope that soon her goddess will appear in ball costume adorned with camelia blossoms, when I make no doubt (if the cost of the ball ticktes are within their reach) the camelia growers will attend in full force.

Heliotrope, Mignonette, Stevia, Callas, Candidums, Tube roses, Pansies, and Daisies are all usefull in their place and are valueable when nothing better can be had to fill an order with, but it is a matter for discussion whether the growing or retailing of either is profitable.

PELARGONIUMS

By Jules Betrix, Montreal.

Pelargoniums the zonal section of which is better known by the name of geranium are most popular flowers.

By this paper I give you my impression of the best treatment to obtain the finest specimens.

The compost to grow them all the time is a mixture of rich loam, peatleaf mould and well decomposed manure, in proportion of half the first to one fourth each of the latter and add a sufficient quantity of sharp sand to make it gritty.

Start cuttings or seeds in March. For cuttings choose thick short eyed shoots, and make them to root near the light and root them well before potting; three inch pots are sufficient untill June. At this time between April and June they should not have too much pot room, as they adapt themselves to more robust habits. In June give six inch pots, to put them outside, full sun burying the pots in the ground, see that they grow well, and pinch the centre and all the shoots so as to form the plant, and continue pinching. In September for winter quarters they should be put in a low house and quite near the light, with plenty of room.

Put sand or other material on the benches to keep it damp and give an atmosphere of from 40° to 50° Farenheit, not higher.

By March, or now one year old, pot in 9 and 10 inch pots and let them bloom; the plants if they have had good care will be at least two feet in diameter and bloom profusely the rest of the season.

For the sections denominated as show and fancy the same compost previously recommended should be used, spring cuttings in March make the best plants but do well also in July when old plants are pruned back. For fine plants these sections should be treated like the geranium except in summer, they must be placed so as to preserve them from heavy rains and mid day sun.

THE CYCLAMEN

By Alfred Wilshire, Montreal.

Cyclamen Persicum is in our opinion one of the most useful and beautiful winter flowering plants grown. It flowers fræely, lasts a long time in bloom, makes a good table plant, with great variety of colour and is often very sweet scented; in fact the plant has so much to recommend it that it is surprising it is so little grown here. I am sure that if private gardeners as well as florists were to give it a fair trial they would find themselves well repaid for their trouble. We think the chief reason why this plant is so seldom seen here in any quantity is that gardeners are under the impression it is such a difficult plant to grow in this country. I think this a mistake and that if the mode of treatment given below were followed and the same attention given them that is required to grow any ordinary plant well, that idea would be soon got rid of.

The seed should be sown in November in a shallow pan or box in light porous soil in a temperature of about 55 degrees; as soon as large enough to handle prick off into boxes and place near the glass. After remaining a short time in this way they may be potted into three inch pots and shifted on into 5 or 6 inch flowering pots as they require it, which will probably be in August. Rich light fibrous loam with a little sharp sand and leaf soil or well rotted manure is the best compost to use, never use fresh rank manure. Keep them growing right along till they flower without any check whatever. The old plan of resting them by drying off before flowering at all is almost entirely out of practice.

The *Cyclamen* may be kept outside in as cool a position as possible plunged in coal ashes and a sash over them to keep off heavy rains and hot sun if necessary, this is of course during the hot summer months. Take them in about the middle of September. I believe it is the custom in England to keep the *Cyclamen* very cool during its flowering season but we have found its flowers come finer and better in rather a warm house.

The *Cyclamen* has several enemies including greenfly, thrip and red spider; these must be kept down as they soon do great damage. The greenfly particularly will attack the young leaves and buds as soon as they break from the bulb and cause them to come deformed. The best thing to get rid of these is tobacco dust.

A little weak guano water occasionally will help the *Cyclamen*, but dont over do it. We have tried to flower them on benches but would not like to recommend that plan until after further trial.

The *Cyclamen* may be grown the second year or longer by drying it off after flowering, but we prefer young year old plants.

GROWING ROSES FOR WINTER BLOOM

By Joseph Bennett., Montreal.

It must be understood that I am speaking of Tea or Fancy Roses though some of the new Hybrid Tea's can be successfully grown in winter also.

One of the most important things in connection with the rose is to start aright, therefore the cutting is a very important factor in future success or failure.

Always select healthy, medium sized, half ripened shoots for cuttings, and when possible make with a heel, though this is not necessary, but from experience I find those made with a heel make the best plants. Put the cuttings in a bench of clean sand in the same way as you would any other cuttings and give a thorough watering keep the cuttings shaded from bright sun. The best temperature is 65 degrees in the sand and about 60 degrees top heat. Keep the cuttings well sprinkled with water. With this treatment they will be rooted and ready to pot in 25 to 30 days.

As soon as roots start lift the cuttings and pot in 2½ or 3 in. pots use a moderately stiff loam *without manure* and pot firmly. After potting place them on a bench well up to the glass in a temperature of 60°. I generally wait 3 or 4 days before watering them merely sprinkling them. Shade from very bright sun until the roots get hold of the soil. In about a month if your bench or bed is not ready they will require a shift into larger pots. Use the same kind of soil as in the first potting and be sure to pot firmly. Stand them in a good light position as before and give plenty of air on favourable days. By the time the pots are full of roots the benches or beds ought to be ready for them.

I believe the best success will be obtained by planting on benches with the soil about 4 inches deep. Use a good fibre loam mixed with one-fifth part of good rotten manure put in the bench for a few days before planting the roses.

When planting be sure none of the plants are dry and make the soil as firm as possible.

From this time keep them well syringed in hot weather two or three times a day, give plenty of air in fine weather but if dull cold weather comes along, close the ventilators and keep everything snug and warm. If you dont do this mildew will soon show itself and spoil your prospects for winter bloom. If mildew does appear dust the affected leaves at once with sulphur. Pick off all flower buds as they appear until about the middle of September; by that time the plants will be strong enough to perfect their flowers. Benches need to be watched carefully for water; they will require more water than beds would do.

Solid beds can be planted the same way as the benches but in this

long winter climate the benches will give the most flowers. The temperature should be from 50° to 56° at night with a little rise by day.

The most largely grown varieties are :

Whites,—Cornelia Cook ; the Bride ; Niphetoës.

Pink,—Catherine Mermet; La France; Mad. Cusin, Waban (new).

Red,—Papa Gontier; W. F. Bennett; Wootton; American Beauty.

Yellow or Cream—Perle des Jardins; Mad. Hoste.

The two old favourites Bon Silene and Safrano are almost entirely neglected now as the demand is entirely for larger roses.

AMARYLLIS

By Jules Betrix, Montreal.

The plants or bulbs called Amaryllis belong to the section or group Hippeastrum and are typical of the order of Amaryllidaceæ.

They are mostly natives of the Cape of Good Hope and South America and have been long in cultivation.

By hybridizing them new varieties have for years been obtained, chiefly by Louis Van Houtt of Ghent, but now finer hybrids are coming out every year from different parts of Europe. The price of the finest is yet high and that accounts for their being so sparsely disseminated they range from \$5.00 to 15.00 a piece.

They are of easy culture, the secret is to give them two alternate seasons in the year. One of rapid continual growth and one of complete rest. They can be had in bloom any time of the year if treated accordingly ; that is start them about three weeks before the flowers are wanted.

I have found them to succeed well in a mixture of *one* part of good turfy loam *one* of leaf mould and *one* of half sand and half old well rotten manure.

I should say here that some of the best growers differ as to the time of repotting ; some repot before starting them, others prefer after the plants have done blooming to encourage a good growth of leaves. I repot mine as I start in January, February and March, and place them at once near the glass in a temperature of from 50° to 60° and keep them growing until the leaves begin to decay. That time is the end of August and September (they require a little more water when the flowers are out.) It is very essential to them to have good drainage, failures very often happen through the want of that.

Offshoots to propagate require the same treatment.

This treatment is for the species and their varieties that are grown in

intermediate and stove houses such as Ackermanni-Alberti-Alexandra-Equestris-fulgida-Pardinum-Johnsonii-Reginæ Vittata and many others. Of the species and their varieties for out door culture, very few succeed here; but if grown in frames their season of rest must be in a cool place and during winter. I have seen some Belladonas and Purpurea Vallotas send out their flower Spikes when the bulb was shrivelled dry on account I think of too much heat at the time they were put to rest.

A FEW WORDS ABOUT MIGNONETTE

By John Perrin, Montreal.

Among the various varieties of Mignonette, my choice is, Machet, either for open air or pot culture. When required in large quantities for winter flowering in pots I consider the best method is to prepare a quantity of turfy loam and leaf mould in equal parts, mix the same and spread it over the place intended to sow the seed, say on an old hot-bed. If for early bloom, the seed should be sown early in August; and not later than the beginning of September if required for mid-winter and early spring.

After the seed is sown it should be well watered and shaded for a few days. When the plants are up give them all the light and sun possible. The plants may be allowed to remain in the seed bed until they have made four or five good leaves which will be in about three or four weeks, when a light hot-bed should be prepared. After the bed has started to heat, place sufficient earth over the bed to plunge the pots required, which will be about six inch; fill the pots with about three parts turfy loam and one part well decomposed cow manure mixed with a sprinkling of sand, taking care to give good drainage. When the earth becomes warm in the pots, the plants may be lifted and pricked off into the pots. Four or five plants in each pot will soon make a good saleable plant. The plants should remain in the frames as long as possible and that they should get plenty of air and light.

When Mignonette is grown in the green-house the plants should be given a cool, light, airy place near the glass. I may remark that, when the plants become pot-bound, liquid manure should be used, or it may be necessary to repot them if large plants are required.

Where only a few plants are required I would advise that the seed should be sown in small pots in a cold frame. When up, thin out and repot when large enough.

CULTIVATION OF THE FERN.

By Geo. Robinson, Montreal.

The cultivation of the fern is such an inexhaustible subject that I have chosen a few of the best known species and leave the rest for another paper.

The first consideration in fern growing is the soil. The following compost will suit most species viz: 2 parts fibrous loam, 1 part peat, 1 part leaf mould and good rotten manure, with a good sprinkling of sand. Of course strong growing varieties require a heavier soil, and fine growing varieties a lighter soil.

Ferns should be potted every year, except seedlings, which should be potted as they fill their pots with roots,

The spring is the best time for potting old established plants just before they start into growth.

Adiantums should be slightly dried off, thoroughly clean them, shake them out well, give them plenty of drainage, pot them moderately firm. Start them in a brisk heat and you will very soon have a good plant again.

They should be kept slightly on the dry side after potting until they have started well into growth when a plenteous supply of water is necessary. After they have filled their pots with roots they should have a liberal supply of manure water.

A fern house should always have a North aspect or as it is not always convenient to devote a house entirely to them, a shady part of the house in should be set apart for them, for though they like plenty of light they will not stand the direct rays of the sun.

Most varieties like a moist atmosphere and a high temperature, Although ferns are among the most obliging plants we have as some sorts thrive in almost any temperature, and in places where most everything else would refuse to grow at all.

There are a few varieties that like a drier atmosphere on account of their dense foliage holding the moisture and consequently rotting, such as: *Adiantum Gracillimum*, *A. Pacotti* and *Le. Grand*. I have seen *A. Gracillimum* do well as a basket plant.

The following are a few of the best varieties: *Adiantum Cuneatum*, *A. Gracillimum*, *A. Farleyouse*, *A. Williamsii*, *A. Concimum Latum*, *A. Macrophyllum*, *A. Princeps*, *A. Reubellum*, *A. Capillus Venerus*, *A. Pacotti*, *A. Le Grand*, *A. Edgworthii*, and *A. Formosum*. Among *Aspleniums*, the following will be found useful:

Asplenium Viviparium, *Asp. Veitcheanum*, *Asp. Radican*, *Asp. Nidus*, *Asp. Affine*.

For basket work ferns are very useful. I mention a few which are suitable for this :

Adiantum Venustum, *A. Gracillimum* *Govophlebium Reticulatum*, *Asplenium Viviparum*, *Asp. Veitchianum*, *Nephroopsis Esaltala*.

Specimen plants require a heavier soil and a little charcoal or broken crocks added to keep the soil open as it is not expedient to pot them every year or else the pots will eventually be larger and more conspicuous than desired. These are a few varieties that make good specimens :

Adiantum Williamsii, *A. Concimum Latum* *Davalia Moreava*, *Microlepia Hirta Cristala* *Phlebodiuve Aureum*, *Gymnogramma Chrysophlla* *Gleichenia Mendelli*, *Glei*, *Flabellata Neolopteris Australasice*, *Pteris Kingiema* and *Pteris Scaberula*.

PEACHES IN POTS.

By J. Bland, Montreal.

Few Fruit Trees give more satisfaction than the Peach grown in Pots, and none are more prolific if properly managed. We will say we get young trees from the nursery in October or November, from one to two years old. These should have one shoot more or less vigorous, which should be well furnished with buds towards the base. This shoot must be cut off at or about the seventh bud from the base. And then pot them in a compost of good turfy loam using plenty of bone meal or well rotted manure and sharp sand, using 9 to 10 inch pots to start with.

The following summer every bud ought to produce a shoot. If there are seven or eight shoots the tree is formed for the season. They need not have their tops cut off, but will require the laterals pinched off to within two buds, as soon as they are about 4 inches long. By the end of summer they will be full of bloom buds. At the end of August the point of each shoot should be pinched out. They will then only require the annual pruning in the spring, say the middle of February and our tree with its seven or eight branches of last summer is before us. Three of these should be cut down to within five buds to give a supply of young shoots for the succeeding year. The rest to be cut back so as to leave on each branche ten to twelve triple buds.

These are the fruit bearing branches for the present season, and so it must be every year, a few branches must be cut in closely on opposite sides of the tree to give the young shoots, and the remainder left to bear fruit. Those shoots that have born fruit will often be required to be cut out to make the tree dwar

and prevent it from becoming naked, as they die after bearing unlike any other stone fruits.

One thing must be born in mind do not let the tree become bare of young shoots at the base. If pruned in February or March the nature of every bud may be seen, and the tree formed by the proper use of the knife into a fruitful well formed bush.

Any one having either a hot or cold vinery can grow a few trees. My trees are laid on their sides in the vinery during the winter with mats thrown over them to keep the sun from opening the bloom buds too quick. I stand them up the beginning of February, prune and top dress them taking out 4 to 6 inches of soil from the top and round the sides of the pots, and then give them a dressing of turfy loam bone meal and sand given them a good watering. In three or four weeks from then they will be in flower. At this time I keep them as cool as I possibly can. In bright (sunny) weather ventilate freely. At this stage the temperature should range from about 38 to 50 degrees. Of course it is impossible at all times to keep them at that, bright sun soon send it away up into the seventys.

To help them in the setting of the fruit I pass a camel hair pencil or rabbit tail tied on the end of a stick lightly over the anthers and stigmas when the trees are in full bloom, so as to asperse the pollen which some times becomes glued to the anthers, I also give them a sharp rap every day, while in bloom. When the fruit is set and beginning to swell I springe morning and evening.

By this time my vines are started and going ahead they then get the same treatment until they are stoned, that is from the beginning to the latter part of May, I then put them outside.

I use manure water once a week. This summer I have had Peaches from the 8th of June to the 6th September.

I leave them outside till the middle of November, you can work them in a cold vinery the same way only when you take them in cover well up with straw or dry leaves, and don't uncover them until about two weeks before you start your vinery.

The varieties that I prefer are: for early hale early, Crawford early, Mid-season Royal George, Noblesse, Late Barrington. There are several other good varieties but these are only one I have had anything to do with.

J. BLAND.

EARLY AND LATE CAULIFLOWERS.

By Jules Betrix, Montreal.

For early cauliflowers to cut at the end of April, May and part of June.

About the first week of January I take a box 18 inches long to 12 wide and 3 inches deep, I fill it with half loam and half sand well mixed and press it down with a brick. I then sow the seed very clear, cover it up a quarter of an inch with same soil and press it down again, water it well and put the box near the glass in the greenhouse. When the plants are one inch long water no more on top, only to the roots. About the end of January, the plants having two or three leaves, I make a mixture of two parts of loam and one sand, and pot them in three inch pots, one in a pot, water well and place them near the glass again. Once in pots keep them growing to avoid failure and if too pot-bound before the frames are ready, re-pot in five inch pots.

By the second week of March the hot beds are made. Six inches of earth on the manure is needed. When the heat has passed through the earth, plant as soon as possible. Be careful not to break the ball of roots, I put 36 plants in a frame of three sashes, or 12 per sash. Press well round the roots and cover with the sashes. Of course frost must be kept out. They will not require water for a couple of weeks, the frames being kept closed at that period, the dampness of the frame is enough. Give light every day and a little air when fine during these two weeks; by that time they are generally well rooted, then begin to water, moderately at first and soak them as soon as they bud until cutting.

The frames come in use in time for melons; after lifting them up the manure is taken from each side to fill up between the cauliflowers up to the first leaves.

For late ones I sow the seed out doors in the middle of June; keep the black fly away with tobacco water or stems spread over the bed. When big enough, transplant where required to bear, one foot apart; by being thick the leaves grow straight up and give the head protection against the first frosts.

About the middle of October they are rooted up and put in frames head up, the roots to spread on the ground but not covered. Keep the frost out and give air at every opportunity.

This Cauliflower is the early Erfurt for both crops; it would be well to remember that nowballs, Searly Paris and all extras all turn out to be early erfurt.

PALMS AND DECORATIVE PLANTS

By John Walsh, Montreal.

If I understand the term rightly, it means a class of plants that will stand the dry atmosphere of a sitting-room, or the draughts of a hallway, exposed to gas and other injurious air, which always abound in such places. For this purpose we must select something hardy in Palms, for this object the varieties best suited are *Areca Lutescens*, *Kentia Belmoreana* and *Canteyberyana*, *Latana Barbonica*, *Raphis Flabelliformis*, *Phoenix Rhipicola*, *Coccoloba Weddelliana*, *Seaforthia Elegans*. Apart from decorative use a list of a few varieties I have in cultivation, which are worthy a place in every conservatory, *Genoma Gracilis*, *Areca Nobilis*, *Chamedora Elegans*, *Areca Vero habbelte* *Areca yeonperer*, *Alexandria*, *Areca Baueri*, *Lalana Rubra*, *Astrocarya Argenta*, *Martenzia Lindenior* the fish-tail palm, *Camerops Exelsa*, *Humilis Histala*, *Pheoniciform Shellerium*. *Franix Argenta*, and *Franix Parviflora*. Some requiring more heat in winter than the rest, they will succeed with any ordinary care; they are certainly rather expensive for decorative purposes, their cultivation is quite simple plenty of moisture in their growing season; in winter they need not get so much, next to the palm for Decoration comes *Ficus Elastic* and *Ficus Elastic Veregata*. Next comes *Dracæna Fragrans*, *Lindeni Massengena* and *Kenerki* which hold their foliage down to the pot. *Cordyline Indivisa* suits this purpose remarkably well, as does *Coldina Pandanus Utilis*, *Pandanus Veitchi*, *Araucaria Exelsa Bidwelli*, *Musia Ensetta* in a small state *Aspidistra Lurida* and *Veriagata Thormium*, *Tenax Variegata*.

For flowering decorative plants *Hydrangea Hortensis* *Genesta* and *Azelias* are certainly the flower of the flock.

ORNAMENTAL TREES.

By John Walsh.

This is a subject worthy of a little consideration, A glance into the greater number of our private grounds will at once convince the observer that this branch of landscape gardening is greatly neglected. You will see perhaps an unsightly maple, or some other forest tree, taking the place of a more suitable one for such a purpose.

It is to be regretted that the number of varieties of Evergreen trees suited to our hard Canadian winters are very few indeed. The first on the list of Ever-

greens I should say is the grand majestic Norway Spruce. It is one of the finest trees in cultivation, and a rapid grower when well treated. I have seen it make a growth of between three and four feet in one season, when planted in good soil and well manured. Austrian Pine is also a fine specimen tree. Scotch Fir is also quite ornamental on a lawn but is not a strong grower. Our native Cedar quite an ornamental tree when trimmed in close. It is to be regretted that *Arbor. vitae* are not sufficiently hardy to stand our climate, as they are indeed the cream of the Evergreens for landscape work. We have our native Spruce, Pine and Hemlock. The latter is a very graceful tree indeed, the former are not so desirable, as the pine is partly deciduous, and the spruce is apt to get bare at the Base of the trunk which is an eye-sore. The beauty of a spruce is for it to keep its branches down to the earth.

DECIDUOUS TREES.

I will head my list in this class with *Wiers Cut Leaf Birch*, it is certainly the finest Ornamental tree in cultivation, it hangs so gracefully with its feathery foliage, it is a rather slow grower, and is apt to get killed back considerably after first planting, it is a rapid grower and soon makes a fine specimen tree. *Weirs cut leaf maple* is another graceful ornamental tree. Unlike the Birch it does not get killed back the first season but grows right ahead and make a fine specimen in a short time. *Prunis Pissardi* or purple leaf Plum is a very handsome tree, planted in a sheltered position it will prove very useful. *Salesbury Adiantifolia* or maiden hair tree in a splendid specimen for a lawn. It is perfectly hardy, holds its dark green foliage, until cut away by hard freezing. Kentucky Coffee tree is rather ornamental, late of starting in spring, it is perfectly hardy. *Cornus* or flowering Dog-wood is also a useful tree. It grows umbrella shaped. Mountain Ash is also a handsome shaped tree. The Oak leaf variety is not as strong a grower as the old variety commonly called Rowan. There are several other varieties such as the horse chesnut, Lombardy Poplar, Ash leaf maple that are suitable for a large place where there is plenty of room for them to grow, they make very handsome trees and grow rapidly.

CARNATION GROWING

By B. T. Graves, Cote St. Antoine.

We put in our cuttings about the middle of the month of February in pure sand, subject to about seventy degrees of heat. We have put cuttings in as late as the first of March and have not noticed any difference in their growth by the Fall, they seemed to have grown as much as the first ones put in.

Cuttings are always taken from the strongest growth of young wood, any weak wood we do not use. This is so as to keep up a strong and healthy stock. We have put in inferior cuttings but have found that they do not make profitable plants. The strongest cuttings always turn out the most prolific in flowers.

Cuttings after they are well rooted are put into two and a half inch pots and are placed in the coolest parts of the greenhouse till weather permits them to be put in cold frames out of doors and are left there till the ground in the garden is in condition to receive them, that is about the middle of the month of May.

They are planted in beds of six in a row, about eight inches apart, we find this the handiest way for weeding them or them watering.

They are pinched back as often as needed to make them short and bushy ; the last nipping is done about the middle of July, if done later they will be too late for early blooming in winter.

We always try to get Carnations housed by the middle of September ; they have been left out later but we find that they are sometimes injured by frost and so checked in blooming.

They are lifted carefully and planted in benches of about five inches of soil, one foot apart or more each way ; if planted closer we have found that they are much more apt to damp off.

Plants are put in firmly and are then given a good soaking of water and syringed every day for about a week to keep them from wilting, and then are syringed on bright sunny days, only when the foliage will dry up quickly

If water hangs on the flowers any length of time it will cause the decay of the bloom ; all watering of the soil is also done on bright days.

The varieties we grow are Snowdon (white,) King of Crimson, (crimson,) Miss Jolliffe, (pink) Century, (carmine) and a scarlet of our own raising. We have found these to do well with us.

AZALEAS

By Jules Betrix.

The Azaleas native plants of China, Turkey and North America, are of easy culture. They stand cutting better than most hard wooded subjects, and after the bloom is off, if they are placed in heat and the wood kept damp they will become again completely furnished.

After blooming the plants should be repotted (except the very large specimens which do not require it for several years) and should have some weak liquid

manure applied occasionally: They should be then placed in a temperature ranging from 50° to 60°, syringing them freely morning and evening and giving plenty of air whenever the weather permits it.

After completion of their growth the temperature must be gradually lowered until they can be placed out-door where they will ripen their wood and form their flower buds. Once outside (a place partially shaded from the mid day sun being the best) care must be taken to water them with judgement as over watering those that are not well rooted or not sufficiently drained will be certain death.

In the autumn they must be removed into the greenhouse again before the frost sets in. A cool house ranging about 45° is required at that period of rest; any place will keep them in good order at that period if not too hot nor too dry, until wanted for blooming again when they should be placed near the light.

Azaleas succeed well in different composts; a good one consisting of six parts two of peat, two of leaf mould, one of light loam and one of sand: a free drainage is very important to them.

The propagation is by layers and cuttings, cuttings of last year's growth, also of half ripened wood, take readily in sand; and grafting of the best sorts on strong subjects is very easy and successful.

There are now hundreds of varieties and every year fresh ones are obtained by successful hybridizers.

I have seen in Western Continental Europe, acres of Azaleas grown in pits about five feet wide to any length with sashes to protect them from frost and heavy rains; they are transplanted from one to another as they grow larger; In Holland they grow to perfection in the country's natural earth consisting in some parts of rich, dark sandy loam.

HOW I GREW MY CHRYSANTHEMUMS FOR PRODUCING SPECIMEN BLOOMS.

By J. Bland, Montreal.

I take my cuttings from the middle of December to the end of January, that is for producing high class blooms. When they can be had the former date is preferable, as more time is then allowed for steady growth in a cool temperature.

Growths thus produced have the best chance of becoming solid. Most of growers round here I believe prefer to strike their cuttings in February and March, which is too late for producing as good a bloom as is afforded by plants

struck. As the time is too short for their proper development. I root my cuttings mostly in sand on a bench, but I don't think it is a good plan, as a chrysanthemum from the time it is a cutting to the time it is in flower should never have a check of any kind, I prefer therefore using small pots putting one cutting into a thumb pot. I half fill the pot with rough leaf soil the remainder sand. When the plants root, they run freely into the leafsoil so that there is no check whatever when they are put into larger pots.

When the plants are well rooted I remove them to a shelf close to the glass on the north side of my greenhouse as the cooler you can keep them the sturdier they will grow. Great care must be taken in supplying them with water never allowing the soil to become dry.

When the pots are well filled with roots and before they become rootbound I pot them into 3 or 4 inch pots, the next potting I give them 6 and 7 inches; the pots I bloom them in are 9 inches. The soil I use for first potting, consists of two parts fibre loam one part of leaf soil, and one part of old spent mushroom bed with a good dose of sharpe sand. I pass the compost through a coarse sieve rubbing the fibrous pieces through also, as it makes it much more easy when potting into small pots. I pot firmly and return them to their former position on the shelves near the glass. As soon as the pots get filled with roots I give them their second shift, I use the same materials before with the exception that I use bone meal freely. Much depends on the soil used for potting chrysanthemums; without soil of a proper character success cannot follow. But the after treatment of the plants is the important part to be studied. As chrysanthemums have such a short season of growth and so much to be done in a few months they must have all the support they can get and to this end the composition of the soil is of as much importance as after feeding. The soil then while it contains food must be regarded as a store for more food, that is required to be given from time to time and should always remain sweet.

The soil I use is four parts fibre loam, two parts horse manure, one part of leaves, half a part bone meal, and a half part of coarse sand with a good sprinkling of wood ashes.

The horse manure I save fresh every day for a week or so before I want it. I turn it over a few times, same as I would do if I were preparing it for making up a mushroom bed. It has in this way all the ammonia properties in it, and that is what chrysanthemums like.

Potting must be done in a proper manner, or it is useless to expect good Blooms. Many growers think that the potting of chrysanthemums is of no more importance than the potting of ordinary soft wooded stuff. When they are potted too loosely they grow strongly, and produce large leaves and are devoid of solid wood which is necessary for success. I ram the soil very firmly with the blunt

end of a stick. When the plants are potted firmly they don't grow so fast in the early part of the season but are rendered solid and firm as the growth proceeds. I give my largest pots two inches of drainage carefully laid in, the piece placed over the hole in the pot must be hollow so as not to fit close down over the hole.

I let my plants grown on one stem not pinching them at all till about the 16th or 18th of May, then I cut them down to within 4 to 8 inches of the soil. I stand them in deep frames and keep the lights on and syringe them once a day to assist them to start into growth again. I am very careful in watering them until they are started growing again freely. They soon begin to send out strong shoots. As soon as the growths were strong enough I rub all off but three, the first buds that appear on those after cutting down are the ones that give me large blooms. I rub all growth and buds from the stems as they appear, just leaving the one bud on each stem. I give them their final pots when the growths are from 8 to 12 inches long, that is about the 25 of June. I do not start to feed them until the later part of August, then I give them for two weeks soot water. I put two coal shovelfulls of soot into a bag tied down close and then put it into a barrel holding about 36 gallons of water, watering the plants each time they required it from the barrel. After giving them this for two weeks I start to give them blood water. Using the same barrel I put one cool shovel and a half of dried blood into a bag using the water from it each time they require watering only renewed the blood once. I continue to use it until the flowers are half expanded.

The varieties that I grew on this system were Ada Spaulding, (pen and pearl white) J C Price, (strawberry cream) Mdm C Audigueir, (rose pink) Stanstead Surprise, (purple and crimson) Excellent (soft pink,) (Elaine white,) Mrs J J Baily, (white) Mdm Boucherlet, (chestnut brown,) Mrs. Benj. Harrison, (pearl white) Kioto (Bright yellow,) Gloriosum (Lemon,) L. M. Fabre, (rose pink) Giallardia, (redish brown tied gold) Lillian B Bird, (schrimp pink) Gladiator, (deep crimson) Jessica, (white) George Pratt, (wine red) Count of Germany, (orange and brown) Lord Wolesly, (bronze red) Lady Slade, (pink) Spiralis (white shaded pink) Ethel, (white).

ANNUAL MEETING.

Minutes of the annual general meeting of the Montreal Horticultural Society and Fruit growers Association of the Province of Quebec held in the Fraser Institute Hall, Montreal on Monday the seventh day of December 1891 at eight o'clock p. m. Present: Mr. R. W. Shepherd jr. the Vice President in the chair. Messrs. A. Joyce, E. J. Maxwell, B. Graves, C. Campbell, J. Fraser Tor-

rance, W. Evans, jr. J. Doyle, J. Betrix, Frank Roy, J. Eddy, G. Russell, W. Wilshire, J. Walsh and others.

The minutes of the last annual meeting and of the general meeting held on the 9th day of January 1891 were read and confirmed.

The Secretary read the annual report of the past year and the financial statement.

SECRETARY'S REPORT.

The following report of the operations of the Society for the past year is respectfully submitted.

At our last annual meeting notices of motion were given to reduce the subscription for annual membership to \$1.00 and for life membership to \$10.00 also to change article of our constitution relating to exhibitions giving the Directors the power to held one or more exhibitions, and of such class of horticultural products as they might consider advisable.

At a subsequent meeting of the Society called for the consideration of these notices of motion the amendments were adopted and the operations of this year have in consequence been conducted on the basis of a reduced membership fee.

The results have been disappointing as you will notice by the financial statement which I will now read :

As I have stated the results of the decrease of subscription fees have been disappointing but it must be borne in mind that our revenue during the past ten years has been inadequate to conduct the operations of our society and as has more than once been pointed out unless our income could be increased our operation would have to be contracted.

How to increase this revenue was a problem your Directors have not been able to solve ; during the past ten years our average annual receipts from exhibitions have been \$300.00 and our average payment for prizes \$1100.00.

The small attendance at our exhibitions is only to be accounted for by a lack of public interest in horticultural matters and the decreased number of members may be attributed to the same cause.

In view of the apparent impossibility of conducting our operations on the same scale as heretofore it was thought advisable by your Directors to ask for the changes in the constitution alluded to and which would enable them to hold smaller and less expensive exhibitions or perhaps make arrangement to hold their exhibitions in connection with other enterprises of a somewhat similar nature.

During the past year the Montreal Exhibition Co., held its first annual exhibition which was very successful and hereafter these exhibitions will be held annually.

The prizes awarded at this exhibition have not yet been paid, awaiting our annual grant from the Provincial Government, which has not yet been received.

Moved by Mr. James McKenna, seconded by Mr. John Doyle: That the Secretary's report and financial statement be adopted.—Carried.

Moved by Mr. F. Roy, seconded by Mr. J. Walsh: That Messrs. W. H. Morrison and J. Bennett be appointed auditors.—Carried.

Messrs. F. Roy and L. Graves were then appointed scrutineers, and after having taken up the ballot papers retired to count the votes.

Mr. John Doyle, on behalf of the Montreal Gardeners and Florists Club, invited the members present to attend a lecture to be delivered by Mr. Hughes, on the evening of the 8th, in the Natural History Hall.

The chairman replied, thanking Mr. Doyle for the invitation.

Mr. J. McKenna asked what steps had been taken with regard to obtaining the Government Grant. The Secretary replied that application had been made for it, but at present the Government were not paying any claims.

The Scrutineers reported the following elected directors;

Messrs. F. Roy, W. Wilshire, John Doyle, J. Eddy, J. Bennett, J. Betrix, J. McKenna, J. Walsh and J. Bland.

Moved by J. McKenna, seconded by M. T. McAnnulty, that a vote of thanks be tendered the scrutineers for their services.—Carried.

The meeting then adjourned.

NOTICE.

The Society have pleasure in announcing that they have secured from the Dominion Government sufficient space for an exhibit of Canadian fruits at the worlds Fair in Chicago next year.

METEOROLOGICAL ABSTRACT FOR THE YEAR 1890.

Observations made at McGill College Observatory, Montreal, Canada.—Height above sea level 187 ft.
Latitude N. 45° 30' 17". Longitude 4h 54m 18s55 W.
C. H. McLEOD, Superintendent.

MONTH.	THERMOMETER.					* BAROMETER.				† Mean pressure of vapour.	‡ Mean relative humidity.	Mean dew point.
	Mean.	† Deviation from 16 year means.	Max.	Min.	Mean daily range.	Mean.	Max.	Min.	Mean daily range.			
January.....	14.86	+ 3.07	52.3	-21.6	17.34	30.1339	30.717	29.201	.400	.0824	79.6	9.5
February.....	19.08	+ 3.60	45.9	- 9.1	16.95	30.0184	30.703	29.092	.400	.1025	80.4	13.8
March.....	26.51	+ 2.64	43.0	- 4.0	18.67	29.9663	30.561	29.329	.243	.1158	71.9	18.5
April.....	40.01	+ 0.41	66.9	21.1	16.66	30.0415	30.456	29.220	.236	.1384	60.1	26.5
May.....	51.59	- 2.09	74.1	28.3	16.81	29.8991	30.311	29.558	.195	.2634	68.7	40.7
June.....	61.45	- 0.01	83.3	40.8	17.25	29.9106	30.270	29.632	.160	.4252	69.7	53.4
July.....	68.57	- 0.42	88.6	49.4	17.52	29.9253	30.259	29.501	.143	.4915	69.9	57.7
August.....	64.82	- 2.14	88.8	47.4	16.11	29.9395	30.261	29.533	.178	.4404	70.8	54.5
September.....	57.79	- 0.72	80.0	38.1	14.79	30.0786	30.450	29.606	.169	.3846	77.9	51.5
October.....	45.85	+ 0.79	71.7	30.7	11.75	29.9003	30.396	29.347	.179	.2583	80.7	39.8
November.....	31.71	- 0.34	55.0	9.0	13.49	29.9734	30.443	29.515	.283	.1490	76.8	23.2
December.....	7.14	-11.15	35.4	15.0	15.91	30.0718	30.677	29.326	.372	.0555	79.3	1.8
Means for 1890.....	41.03	- 0.60	.....	.....	15.69	29.9904	.....	.....	.246	.2433	73.8	32.7
Means for 16 years ending Dec. 31, 1890.....	41.63	.....	.....	.....	.....	29.9765	.....	.....	..	.2493	74.4	.....

MONTH.	WIND.		Sky clouded per cent.	Per cent. possible bright sunshine	Inches of rain.	Number of days in which rain fell.	Inches of snow.	Number of days on which snow fell.	Inches of rain and snow melted.	No. of days on which rain and snow fell.	No. of days on which rain or snow fell.
	Resultant direction.	Mean velocity in miles per hour.									
January.....	N. 75° W.	19.6	64.6	33.8	1.64	7	31.3	21	4.40	4	24
February.....	S. 52° W.	18.6	63.5	44.9	2.85	10	27.4	12	4.45	4	20
March.....	S. 55° W.	16.9	62.8	47.4	0.48	5	11.7	12	1.53	.....	15
April.....	S. 61° W.	17.9	49.8	56.8	1.80	12	3.0	5	2.11	.....	15
May.....	S. 38° W.	14.0	65.4	42.3	4.35	18	.....	.....	4.85	.....	18
June.....	S. 85° W.	12.2	60.7	57.2	2.72	14	.....	.....	2.72	.....	14
July.....	S. 39° W.	12.6	59.4	58.4	2.78	17	.....	.....	2.78	.....	17
August.....	S. 83° W.	11.5	50.8	58.1	8.08	20	.....	.....	8.08	.....	20
September.....	S. 49° W.	11.3	57.5	51.6	3.57	11	.....	.....	3.57	.....	11
October.....	N. 36° W.	9.5	72.5	33.8	2.69	15	.....	.....	2.69	.....	15
November.....	S. 58° W.	14.9	67.4	35.5	2.46	13	8.8	10	3.31	4	19
December.....	S. 84° W.	16.4	58.7	41.9	0.05	1	32.3	19	2.79	1	19
Sums for 1890.....	.....	.....	.....	.....	33.97	143	114.5	79	43.29	15	206
Means for 1890.....	S. 66° W.	14.60	61.1	46.8	.....	.....	.....	.....	3.61	.....	17
Means for 16 years ending Dec. 31, 1891.....	.....	* 15.54	61.4	‡ 46.1	28.13	134	124.6	84	40.25	15	202

* Barometer readings reduced to 32° Fah., and to sea level. † Inches of mercury. ‡ Saturation, 100° For 9 years only. * For 4 years only. † "+" indicates that the temperature has been higher; "-" that it has been lower than the average for 16 years, inclusive of 1830. The monthly means are derived from readings taken every 4th hour, beginning with 3h. 0m., Eastern Standard time. The anemometer and wind vane are on the summit of Mount Royal, 57 feet above the ground, and 810 feet above sea level.

The greatest heat was 83.8 on August 4th; greatest cold 21.6 below zero on January 10th; extreme range of temperature was therefore 110°.4. The warmest day of the thermometer in one day was 41.8 on Jan. 13th; least range was 3.7 on Feb. 27th. The coldest day was Jan. 10th, when the mean temperature was 76.45. The coldest day was Jan. 10th, when the mean temperature was 15.73 below zero. The highest barometer reading was 30.717 on January 23th, the lowest was 29.092 on February 5th, giving a range of 1.625 for the year. The lowest relative humidity was 15 on April 1st. The greatest mileage of wind recorded in one hour was 67 on January 13th, and the greatest velocity in gusts was at the rate of 104 m. p. h. The total mileage of wind was 127,618. The resultant direction of the wind for the year was S. 63° W. and the resultant mileage 30,720. Auroras were observed on 18 nights. Fogs on 42 days. Hoar-frost on 23 days. Thunder storms on 20 days. Lunar halos on 13 nights. Lunar coronas on 1 night. Solar halos on 4 days and contact arc on the day. The sleighing of the winter closed, in the city, on April 1st. The first appreciable snowfall of the autumn was on November 9th. The first sleighing of the winter was on December 3rd. There was a slight earthquake on September 26th, at 3 h. 3 m.

The yearly means above, are the averages of the monthly means, except for the velocity of the wind.

METEOROLOGICAL ABSTRACT FOR THE YEAR 1891.

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MONTH.	THERMOMETER.					* BAROMETER.				† Mean pressure of vapour.	‡ Mean relative humidity.	Mean dew point.
	Mean.	‡ Deviation from 17 year means.	Max.	Min.	Main daily range.	Mean.	Max.	Min.	Mean daily range.			
January	15.38	+ 3.38	58.5	-15.0	13.88	30.0308	30.719	28.874	.307	.0826	81.8	10.7
February	17.36	+ 1.77	45.2	-13.0	19.11	29.9984	30.725	29.225	.373	.0886	77.7	11.4
March	25.94	+ 1.95	49.0	- 2.1	14.18	30.1157	30.659	29.118	.243	.1098	72.1	18.0
April	42.19	+ 2.43	72.0	21.8	18.19	29.9198	30.538	29.441	.214	.1862	67.3	31.5
May	52.36	- 2.09	80.0	31.7	20.84	29.9845	30.312	29.608	.102	.2513	61.7	28.5
June	65.17	+ 0.67	90.0	40.4	19.98	29.9192	30.246	29.620	.114	.4052	63.6	51.6
July	66.33	- 2.50	86.8	45.6	17.00	29.9401	30.357	29.568	.131	.4564	70.9	55.9
August	66.65	- 0.30	90.2	50.6	17.40	29.9422	30.283	29.469	.140	.4750	73.0	57.0
September	62.29	+ 3.56	83.5	43.5	17.12	30.0870	30.473	29.732	.167	.4285	74.9	53.9
October	45.14	+ 0.08	80.1	24.5	13.45	30.0241	30.762	29.550	.218	.2416	76.6	37.9
November	35.10	+ 2.87	60.4	0.0	17.21	30.0406	30.620	29.013	.265	.1673	74.4	28.0
December	29.71	+10.75	52.5	- 4.0	14.11	30.0365	30.725	29.272	.303	.1387	78.4	23.5
Means for 1891	43.63	+ 1.88	....	....	16.87	30.0032	....	....	.280	.2523	72.7	34.8
Means for 17 years ending Dec. 31, 1891	41.75	....	....	....	....	29.9751	....	....	....	.2495	74.3	....

MONTH.	WIND.										
	Resultant direction.	Mean velocity in miles per hour.	Sky clouded per cent.	Per cent. possible bright sunshine.	Inches of rain.	Number of days on which rain fell.	Inches of snow.	Number of days on which snow fell.	Inches of rain and snow included.	No. of days on which rain and snow fell.	No. of days on which rain or snow fell.
January	N. 43° W.	15.6	74.8	29.0	1.29	6	21.0	23	3.33	5	24
February	S. 32° W.	17.3	66.8	38.7	1.62	8	18.7	15	3.19	5	18
March	S. 87½° W.	15.6	54.6	54.7	2.65	9	16.3	8	3.92	5	15
April	S. 72° W.	16.2	68.1	41.5	2.38	12	7.1	6	3.26	5	18
May	S. 58½° W.	14.7	59.9	55.3	1.71	12	....	1	1.71	1	12
June	S. 72½° W.	15.0	58.6	58.4	1.75	8	....	....	1.75	....	8
July	S. 34° W.	13.0	57.1	52.9	4.80	20	....	....	4.80	....	20
August	S. 44½° W.	10.8	53.0	58.4	3.70	14	....	....	3.70	....	14
September	S. 71° W.	11.6	44.0	62.7	1.03	14	....	....	1.03	....	14
October	S. 67° W.	13.0	69.0	41.9	2.38	13	1.5	3	2.53	2	14
November	S. 25½° W.	16.3	72.0	35.9	2.71	13	3.5	7	3.06	3	14
December	S. 40° W.	20.9	64.8	37.7	2.14	11	12.0	11	2.34	5	17
Sums for 1891	....	....	....	....	28.16	140	80.1	74	35.54	25	180
Means for 1891	S. 52° W.	14.99	61.1	47.3	....	....	....	....	2.98	....	16
Means for 17 years ending Dec. 31, 1891	....	* 15.27	61.4	‡ 46.2	28.13	134	122.0	83	39.97	16	201

* Barometer readings reduced to 32° Fah., and to sea level. † Inches of mercury. ‡ Saturation, 100. † For 10 years only. * For 5 years only. † " + " indicates that the temperature has been higher; " - " that it has been lower than the average for 17 years, inclusive of 1891. The monthly means are derived from readings taken every 4th hour, beginning with 3h. 0m. Eastern Standard time. The anemometer and wind vane are on the summit of Mount Royal, 57 feet above the ground, and 810 feet above the level sea.

The greatest heat was 90.0 on June 16th; greatest cold 15° on January 17th; extreme range of temperature was therefore 75° 0. Greatest range of the thermometer in one day was 40.9 on Jan. 1st; least range was 4° 1 on Aug. 21st. The warmest day was July 13th, when the mean temperature was 77.22. The coldest day was Jan. 16th, when the mean temperature was 6° 7 below zero. The highest barometer reading was 31.75 on Feb. 14th and Dec. 31st; the lowest was 28.874 on Jan. 12th, giving a range of 1.881 for the year. The lowest relative humidity was 25 on May 13th and June 7th. The greatest mileage of wind recorded in one year was 51.200. The resultant direction of the wind for the year was S. 52° W., and the resultant mileage 51.200. Auroras were observed on 8 nights. Lunar coronas on 4 nights. Fogs on 26 days. Hoar-frost on 17 days. Thunder storms on 18 days. Lunar halos on 8 nights. Lunar coronas on 4 nights. Solar halos on 3 days and on Dec. 6th. coloured halos of 22° and 46° with contact arcs and parhelia. The sleighing of the winter closed, in the city, on March 27th, and snow all gone on open ground on April 10th. The first snowfall of the autumn was on October 11th. The first sleighing of the winter was on December 7th.

NOTE.—The yearly means above, are the averages of the monthly means, except for the velocity of the wind.

ADDITIONS TO LIBRARY.

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Twenty Fourth Annual Report of the Connecticut Board of Agriculture,
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Transactions Dept. of Agriculture, Illinois, 1886.
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Twenty Fifth Annual Report of the Massachusetts Board of Agriculture.
- George Lawson, LL. D., Sec. :
Journals of House of Assembly, N. S., 1888.
Annual Report Secretary for Agriculture, N. S., 1889.
- N. G. Reynolds, Sec. :
Index Agricultural Reports, Michigan.
Reports Michigan Board of Agriculture, 1887, 1890.
- E. F. Riley, Sec. :
Sixth Report Agricultural Experiment Station of Wisconsin, 1889.
- B. M. Lelong, Sec. :
Treatise on Citrus Culture in California.
Annual Report Ste Board of Horticulture in California, 1889.
Official Reports, Tenth and Eleventh Fruit Growers' Conventions, Cali-
fornia, 1889.
Biennial Report State Board of Horticulture, California, 1887-88.
- Mrs. J. H. R. Molson :
Floral Cabinet, Vols. II, III.
- Dr. C. A. Goesmann :
Seventh Annual Report State Agricultural Experiment Station of
Massachusetts, 1889.
- Prof. W. E. Saunders, Director :
Reports of Experimental Farms, 1889-90.
- L. Woolverton, Sec. :
Reports Ontario Fruit Growers Association, 1889-90.
- E. Williams, Sec. :
Annual Report New Jersey State Horticultural Society, 1889.
- D. Martin, Sec. :
Bulletin No. 5, Dept. of Agriculture, Melbourne, 1889.

W. E. Saunders, Sec. :

Report Entomological Society of Ontario, 1889.

B. S. Honie, Sec. :

Reports Wisconsin State Horticultural Society, 1887, 1889-90.

F. N. Menzies, Sec. :

Transactions of the Highland and Agricultural Society of Scotland,
1889-90-91.

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Reports U. S. Dept. Agriculture, 1888-1890.

S. D. Hillman, Sec. :

Reports Minnesota State Horticultural Society, 1889-90.

A. Lene, Sec. :

Third Report Ohio State Forestry Bureau, 1887.

Estate late Charles Gibb :

Arboretum et Fruticetum Britannicum, London, 8 vols.

Floral Biography, Elizabeth, 1840.

Chapters on Trees, Kirby.

Agricultural Lectures, Olcott, 1860.

American Gardener, Fessenden, 1883.

Revue de l'Arboriculture, Metz, 1872.

Sad Ogrod, Owocowy, 1882.

Svensk Pomologie, Eneroth.

Geological History of Plants, Dawson.

Der Obstban, Goeschke.

Play and Profit in my Garden, Roe.

Flowers and their Pedegrees, Allen.

Apple Culturist, Todd.

The American Farm Book, Allen.

Ladies Companion to the Flower Garden, Downing.

Landscape Gardening, Downing.

American Grape Grower, Husman.

Money in the Garden, Quinn.

Parks and Gardens of Paris, Robinson.

Every Lady Her own Flower Gardener, Johnson.

Thoughts in my Garden, Ware.

My Vineyard at Lakefield.

Family Kitchen Garden, Buist.

American Home Garden, Watson, 1859.

- Grape Growers Guide, Charlton.
European Vineyards, Flagg.
Gardening for Pleasure, Henderson.
Miniature Fruit Garden, Rivers.
Cranberry Culture, Eastworth.
Papers on Trees and Fruits, Gibb. ✓
Ungarische Pomologie, 1884.
The Floral Cabinet, vol. I.
Rhinds Vegetable Kingdom.
Les Meilleurs Blés, Vilmorin.
Coleman's European Agriculture, vols. I, II.
Downing's British Agriculture.
Transactions of the Horticultural Society of England, 10 vols.
Dictionnaire de Pomologie, Leroy, 1873.
The Orchard, McIntosh, 1839.
Lanchie's Pomologie, vols. I, II.
The Ensilage of Maize, Goffart, 1879.
Farmers Guide, 2 vols., Stephens, 1851.
Plantations, Vilmorin, 1864.
Orange Culture, Moore, 1884.
Gardening for Ladies, London, 1853.
Essays Agricultural and Literary, Gray, 1856.
Farm Implements, Thomas, 1854.
New England Fruit Book, Ives, 1844.
How Crops Grow, Johnson.
New American Orchardist, Kenrick, 1843.
A. B. C. of Agriculture, Weld.
Book of Ensilage, Bailey, 1880.
Henderson's Hand Book of Plants.
Fruit Flowers and Farming, Beecher, 1859.
Five Acres Too Much, Roosevelt, 1869.
A Guide to the Orchard, Floy, 1846.
Gardening by myself, Warner, 1870.
Trees and Shrubs of Massachusetts, Emerson, vol. I.
Gray's Manual of Botany, 1876.
The Trees of Old England, Grindon, 1868.
Pine Plantations in France, Brown, 1878.
Canadian Horticulturist, 9 vols.
Plant Life, Masters, 1883.
American Orchardist, Thacher, 1822.
Fruits, Phillips, 1823.

- Gray's Lessons in Botany.
Insects injurious to Vegetation, Harris, 1852.
Botanical Annual, 1832.
Culture of the Beet, Childs, 1840.
Beet Root Sugar, Grant, 1867.
Field Notes on Apple Culture, Bailey.
Insects injurious to Fruits, Saunders.
Report Dept. of Agriculture Manitoba, 1884.
" Ontario Agricultural Commission, 1881.
" Agriculture of Massachusetts, 1886-87.
" Minnesota Forestry Association, 1879.
" Dept. of Agriculture U. S., 1862, 1865, 1866, 1867, 1876, 1888.
Reports Iowa Horticultural Society, 1876 to 1888.
" Wisconsin Horticultural Society, 1871 to 1877, 1884-85.
" Minnesota Horticultural Society, 1866 to 1873, 1874, 1876-77,
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" Agricultural Experimental Station, Wisconsin, 1889.
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" California State Agricultural Society, 1885.
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" Mississippi Valley Horticultural Society, 1883-84.
" Maine State Pomological Society, 1882.
" Kansas State Horticultural Society, 1884-85-86.
" Illinois Horticultural Society, 1874-75-76.
" Missouri Horticultural Society, 1883, 1885.
" University of California on Viticulture, 1883-84-85-86.
" Ontario Fruit Growers Association, 1875, 1876, 1879 to 1884.
" Agriculture and Arts, Ontario, 1887.
" Montreal Horticultural Society, 1876 to 1880, 1881 to 1883,
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" Western New York Horticultural Society, 1877-78.
" Indiana Horticultural Society, 1884.
" Ontario School of Agriculture, 1879, 1884.
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" Vermont Board of Agriculture, 1872.

Reports Massachusetts Horticultural Society, 1852.

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