SIXTEENTH ANNUAL REPORT

OF THE

MONTREAL HORTICULTURAL SOCIETY

AND

FRUIT GROWERS' ASSOCIATION

OF THE

PROVINCE OF QUEBEC.

Printed by order of the Legislative Assembly.

QUEBEC.
CHARLES-FRANÇOIS LANGLOIS,
PRINTER TO HER MOST GRACIOUS MAJESTY THE QUEEN.

1894.

P. O. Box 1078.

MONTREAL, 1st May, 1894.

TO THE MEMBERS,

In presenting this, the Sixteenth Report of our Society to you, I desire to express the thanks of the Board of Directors to all the gentlemen who so kindly furnished the papers for publication. Some of these gentlemen are not connected in any way with our Society, and to them we are especially indebted for their assistance. I also desire to express our obligations to the "Gardeners and Florists Club" of this city, from whom we received some valuable papers.

It will be seen that this volume comprises the two years ended 30th November, 1893. This course was rendered necessary by causes over which we had no control.

I venture to hope that this report will be found of some use to many of you; and that thereby the cause of Horticulture may be advanced throughout the province.

THOS. WILLIAMSON,
Secretary-Treasurer.

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MONTREAL HORTICULTURAL SOCIETY

AND

FRUIT GROWERS' ASSOCIATION

OF THE PROVINCE OF QUEBEC.

ANNUAL MEETING,

6TH DECEMBER, 1892.

The annual general meeting was held in the hall of the Fraser Institute on 6th December, 1892, at 8 p.m.

Present: Mr. Frank Roy, the President, in the chair, and Messrs. J. Bland, J. Eddy, R. W. Shepherd, jr., G. Trussell, J. Doyle, T. McHugh, J. Kirkwood, W. O. Roy, J. Walsh, J. F. Torrance, R. Jack, J. Betrix, W. Ward, R. Hamilton, W. M. Dunlop, Sam Ward, J. Bennett, J. Wilshire, T. Williamson, J. Perrin, T. W. Burdon, T. A. Somerville, J. Dunbar, W. Evans, C. Campbell, H. Stocking, J. McNulty, T. J. Gorman, J. Bray, W. M. Ramsay, and D. Williamson, the Secretary-Treasurer.

The minutes of the last annual general meeting were read and adopted.

The Secretary submitted the following report and financial statement for the year ended 30th November, 1892, which were considered satisfactory, and adopted on the motion of Mr. R. Hamilton, seconded by Mr. T. W. Burdon.

SECRETARY-TREASURER'S REPORT, YEAR ENDING 30TH NOVEMBER, 1892.

I have the honour of presenting to you the following report of the Society for the year just closed.

FINANCES.

The financial position of the Society is now, as it has nearly always been, the most important question, and I shall deal with it first.

The following statement shows the position of the Society on 1st December, 1891, and its present position :—

YEAR ENDED 30TH NOVEMBER, 1891.

ASSETS.

1891.		
30th Nov.—Cash in Merchants Bank of Canada		$ 119 30
Due by Provincial Government on ac. of grant		1,238 51
		$1,357 81

LIABILITIES.

Prizes for 1891 Exhibition	$913 75	
Less special prize given by Mr. Cheney	25 00	
	$888 75	
Rent of Victoria Rink	129 90	
Lighting of Victoria Rink	70 00	
Printing, etc	196 39	
Balance Secretary-Treasurer's salary	200 00	
		$1,485 04
Deficit on 30th Nov., 1891		$ 127 23

YEAR ENDED 30TH NOVEMBER, 1892.

RECEIPTS.

Cash in Bank as above	$119 30	
Mr. Cheney, special prize	25 00	
Provincial Government on account grant	500 00	
Members' fees	409 00	
Balance due Treasurer	56 75	
		$1,110 05

EXPENSES.

J. Johnson, for services at 1891 Exhibition	$ 50 00
Insurance	8 90
Stamps and envelopes for special circular	18 00
Advertising Observatory openings	2 00
Rent of room in Fraser Institute	62 50
Prizes, 1891 Exhibition	913 75
Commission collecting fees	40 90
Stamps and wrappers for reports	6 50
Stationery and postages for year	7 50
	$1,110 05

ASSETS.

Due by Provincial Government for grant		$1,788 51

LIABILITIES.

For year 1891:			
Rent and lighting of Victoria Rink	$199 90		
Printing, etc	127 64		
Secretary-Treasurer	200 00		
		$527 54	
For year 1892:			
Balance prize money of 1892 Exhibition	$456 84		
Periodicals	6 15		
Rent of Fraser Institute	25 00		
Printing and other expenses of Exhibition	63 94		
Salary of Secretary-Treasurer for 10 months	166 66		
Balance due Treasurer as above	56 75		
		775 34	
			$1,302 88
Surplus on 30th Nov., 1892			$ 435 63

Audited by A. F. Riddell, Chartered Accountant.

This statement has been printed and put into the hands of all present, so that every member may see precisely how the Society stands. Compared with last year, we have made considerable progress. Instead of a deficit of $127.23, we show a surplus of $449.23. When the present Directors assumed office, they felt it to be their bounden duty, first and foremost, to put the Society on a sound financial basis, without which it was impossible to make any progress. This policy they have rigidly pursued during their whole term of office. They have incurred no expense which was not deemed absolutely necessary and they have curtailed the usual expenses wherever possible. They regard the result as only so far satisfactory. Keeping in view the fact that the Society has spent in past years, in defraying its current expenses, the sum of $840 of its Life Membership fees, which, by its constitution, it was bound to leave untouched, your Directors feel that we must replace that sum as soon as it is possible to do so, and to that end they would recommend a continuance of strict economy.

The membership has slightly decreased during the year. There is no doubt that the public of Montreal, for whatever reason, take little interest in the work such a society as ours ought to do; and until public interest can be aroused, our success will be small, and the means of doing such work will still remain beyond

our reach. Your Directors have had under consideration a scheme, which they believe would help to create such public interest as is desired. It was the holding of free monthly Parlour Exhibitions of special subjects during winter, with conversational discussion thereon. This proposition came up too late last winter to test it, but it is hoped the new Board of Directors will give it immediate consideration. It will say very little for a city like Montreal if, after an earnest effort, some such scheme should fail for want of support.

The Annual Exhibition this year was held on the Grounds of the Montreal Exposition Company, and with their co-operation. The following was the number of entries in the varions classes :—

Plants and Cut Flowers	335
Fruit, Outdoor	502
" Indoor	43
Vegetables	398
Amateur Fruit and Vegetables	28
Total	1306

It was admitted on all hands that the Exhibition surpassed any of recent years, the exhibit of fruit being especially large and fine. Much can still be done, however, to improve these exhibitions in the way of encouraging exhibits of special fruit and flowers, and in raising the standard of all exhibits. Poor specimens should be rigidly excluded, no matter at what cost, as the only way to improvement.

The fifteenth report of the Society has just been completed and mailed each member. It is hoped it will prove of value to many of you, especially those who are amateurs.

In conclusion, let us hope that the progress made during the past year will continue and increase in the years to come. This will only follow, however after much earnest and continued work.

D. WILLIAMSON,
Secretary-Treasurer.

In reply to a question, the Secretary-Treasurer stated that he had received a letter from the Provincial Legislature stating that the annual grant had been passed and would be paid as soon as possible.

Mr. Robert Jack expressed a hope that in future Exhibitions the fruit, etc., should, as far as possible, be donated to charitable institutions at the close.

Mr. R. W. Shepherd, jr., then moved, seconded by Mr. W. W. Dunlop : " That a special meeting of the society be called at an early date to consider the " question of amending the charter of the Society with the view of separating

" the Horticultural and Fruit-Growing interests and forming two societies " instead of one." This motion was supported by Mr. R. Hamilton and a few others, but vigorously opposed by the large majority of the meeting, led by Mr. Torrance; and on a vote being taken, the motion was lost by an adverse majority of 25 to 5.

Mr. Torrance then moved, seconded by J. Walsh, that instructions be given the incoming Board of Directors to investigate the matter of the incorporation of another society and ascertain if it is taking any steps to interfere with the present Government grant to this association. This was carried nem. con.

The meeting then proceeded to ballot for the new Board of Directors. Mr. T. Williamson and Mr. W. W. Dunlop were appointed scrutineers, and having counted the votes, reported the following gentlemen elected, viz.: Messrs. F. Roy, John Doyle, Jules Betrix, Joseph Bennett, J. Walsh, J. Eddy, Jonathan Brown, R. Hamilton and R. W. Shepherd, jr.

Mr. J. Doyle moved, seconded by Mr. Jules Betrix, that a meeting be called at an early date to consider the advisability of amending the by-laws so as to raise the annual subscription for members to $2 as formerly. This was carried.

The meeting then adjourned.

ANNUAL MEETING-1893.

The annual general meeting was held in the Library Fraser Institute on 6th December, 1893, at 8 p.m.

Present: — Mr. Doyle, the President in the chair; Messrs. D. Williamson, J. Walsh, W. B. Davidson, W. Evans, R. Hamilton, J. Bland, Geo. Coupland, J. Perrin, J. McKenna, J. Kirkwood, J. Dunbar, G. Trussell, Jos. Bennett, J. Eddy, F. Smith, W. M. Ramsay, R. W. Shepherd, J. Harper, H. Stocking, J. F. Torrance, T. Holder, W. O. Roy, Hugh Andrews, A. Ward, A. Somerville, T. J. Gorman, Jules Betrix, and T. Williamson, the Secretary-Treasurer.

The Secretary-Treasurer read the following annual report, which was unanimously adopted on the motion of Mr. Evans, seconded by Mr. McKenna:

Annual Report of Secretary-Treasurer of the Montreal Horticultural Society and Fruit Growers' Association of P. Q., for year ended 30th November, 1893.

FINANCES.

RECEIPTS.

Annual Subscriptions :—		
342 at $2	$684 00	
72 at $1	72 00	
414		$756 00
Exhibitors' Entrance Fees at Exhibition		6 00
Special Subscriptions :—		
Sir Donald A. Smith	$100 00	
Mr. W. W. Ogilvie	25 00	
Mr. James Morgan	25 00	
Messrs. William Ewing & Co	25 00	
Mr. William Evans	25 00	
Mr. D. Williamson	50 00	
Messrs. Warden King & Son	20 00	
Messrs. Hart & Tuckwell	10 00	
Mr. A. Joyce	10 00	
Miss Sprigings and Brother	6 00	
Mr. W. M. Ramsay (Merchants Bank)	5 00	
Mr. W. Woodhall	5 00	
Mr. Walter Paul	7 00	

Mr. W. O. Roy		3 00	
Messrs. Stone & Wellington		25 50	
Montreal *Witness*		20 00	
Montreal *Star*		50 00	
The Directors and Secretary		50 00	
			461 50
Government Grant :—			
Balance due of 1891-92	$ 500 00		
Grant 1892-93	1000 00		
			1,500 00
			$2,723 50

PAYMENTS.

Expenses carried over from previous years :—			
Balance due Treasurer from last year		$ 56 75	
Expenses of year 1891 :—			
W. W. Dunlop, salary	$200 00		
W. W. Dunlop, expenses	10 63		
Witness, Printing Account	112 90		
Victoria Rink, $129.90, compromised for	75 00		
A, Joyce, refreshments	42 64		
Morton, Phillips & Co., stationery	5 60		
La Presse, advertising account	7 50		
		454 27	
Expenses of Exhibition 1892 :—			
Montreal Exposition Company	$500 00		
King's City Express, account	19 90		
T. Williamson, services assisting Secretary	20 00		
J. C. Wilson & Co., account	8 39		
John L. Cassidy & Co., account	4 55		
W. M. Pattison, prize	8 00		
Thos. Davidson & Co., account	10 55		
		571 39	
D. Williamson, Sec.-Treas., salary to 30th Nov., 1892		166 66	
Rent Fraser Institute, 30th Nov., 1892		25 00	
			1,274 07
Rent :—			
Fraser Institute, for year to 30th Nov., 1893		$ 75 00	
Rent of hall for annual meeting		5 00	
			80 00

Salaries :—		
D. Williamson, Sec.-Treas,, to 31st May, 1893	100 00	
T. Williamson, " to 30th Nov., 1893	100 00	
		200 00
Expenses Exhibition 1893 :—		
Montreal Exposition Company, proportion of prize money, etc., per agreement	$581 60	
Sabiston Lithographic Company, for prize cards, members' tickets, etc	25 10	
Witness, for printing and advertising	39 75	
Star, for advertising	17 33	
H. P. Waller, services assisting Secretary	30 00	
Petty cash disbursements for postages, stationery and other expenses	30 40	
		724 17
Expenses of Report :—		
Postages, etc		10 15
Expenses Collecting Subscriptions :—		
Wm. Budden, 10 per cent on $600 collected	$ 60 00	
Wm. Budden, additional $5, and car fares, $1	6 00	
Treasurer, 10 per cent on $156	15 60	
		81 60
Insurance :—		
Premium to 31st January, 1894		4 34
Printing, Advertising and Stationery :—		
Higgins Bros.' account, printing	$ 3 75	
Witness' account, printing	8 00	
Star, advertising	8 78	
La Presse, advertising	6 50	
Witness, "	6 41	
La Minerve, "	4 20	
Morton, Phillips & Co., stationery	3 41	
C. F. Dawson, "	1 13	
Sabiston Lithographing Co., "	21 50	
Petty cash disbursements	16 12	
		79 80
Periodicals :—		
Rural Publishing Co.	1 85	
Gardener's Chronicle	4 00	
		5 85

Nursery Stock :—	
From Stone & Wellington, for distribution	25 50
Postages and Sundry Office Expenses :	
Petty cash disbursements for year	25 05
Bank Account :—	
At Credit, Merchants Bank, per Pass Book	212 97
	$2,723 50

Audited by A. F. RIDDELL, Chartered Accountant.

The present financial position of the Society is as follows :—

ASSETS.

Cash in Bank	$ 212 97
Due from Provincial Government for arrears of grant, as per the accounts of recent years	1,238 51
Subscriptions considered collectable	28 00
	$1,479 48

LIABILITIES—Nil.

As compared with last year, this shows a net gain of over $1,000, upon which I think the retiring Directors and the Soeiety are to be congratulated.

The value of the asset of $1,238.51 (entered as due by the Government for arrears of grant), is doubtful. I have been, and am still, in correspondence with the Department of Agriculture and the Provincial Treasurer in respect of same, and have called for the production of certain vouchers in their possession to substantiate our claim ; but up to the present that request has not been complied with. This is a subject which should receive the early attention of the incoming board.

MEMBERSHIP.—During the year 45 new names have been added to the roll, while 41 have withdrawn, leaving the membership at 414—a net gain of 5. Considering the fact that on the 13th January the annual subscription was raised from $1 to $2, this result is fairly satisfactory. The receipts from this source were $756, an increase of $347 over the previous year.

SPECIAL SUBSCRIPTIONS.—It will be seen from the accounts that the Directors developed a large amount of revenue from this source, which had hitherto been hardly appreciable. The amount realized was $461.50 ; and the thanks of

the society are due to the lady and gentlemen who so generously contributed. In my opinion, this annual revenue could not only be maintained, but be largely increased. The matter was taken up rather late in the season, and I am sure many ladies and gentlemen were overlooked who would gladly have contributed.

CHANGE OF OFFICERS.—At the first meeting of the Board of Directors the resignations of Messrs. R. W. Shepherd, jr., and Jonathan Brown, were handed in, and accepted with great regret, and only after every effort had been made to induce these gentlemen to act. The Rev. Canon Fulton and Mr. Geo. Trussell were subsequently elected in their stead.

On 17th May your late Secretary, Mr. D. Williamson, sent in his resignation, being prevented by pressure of private business and a projected trip of three months to Scotland from continuing. His resignation was accepted with regret, a vote of thanks passed for his valuable services, and your present secretary appointed in his place.

MEETINGS.—Your Directors have not been idle during the year, having held fifteen meetings, all of which were well attended.

There have been three general meetings of the Society. The first was held on 13th January, when the by-laws were altered to raise the annual subscription to $2. The second on the 11th October, when notice of motion was given to amend the by-laws providing for the creation of sundry honorary officers. The third on 25th October, when this motion came up for discussion, without any action being taken.

CONSERVATORY OPENINGS.—Through the courtesy of their owners, the following conservatories were opened to members of the Society and their friends during the winter, viz.:—

Mr. Andrew Allan, March 4th and 11th.
Mr H. Montague Allad, February 25th.
The late Sir John C. Abbott, February 17th, March 11th and 18th.
Mr. R. B. Angus, February 11th and 18th.
Mr. J. Burnett, February 18th, March 11th.
Mr. W. R. Elmenhorst, February 25th, March 4th.
Mr. John Molson, March 18th.
Lord Mount-Stephen, March 4th and 11th.
Mr. W. W. Ogilvie, February 25th, March 4th.
Mrs. Redpath, March 4th and 11th.
Mrs. Robertson, February 11th and 18th, March 11th.
Sir Donald A. Smith, March 4th and 11th.

This privilege was largely taken advantage of. As many as 300 ladies and gentlemen visited some of the conservatories in the course of an afternoon, which

shows that the public of Montreal take an interest in really good horticultural work.

EXHIBITIONS.—The annual exhibition was again held in conjunction with the Montreal Exposition Company, and on their grounds. The prize money offered amounted to nearly $1,800, the largest sum in the history of the society. The number of exhibitors was 75, and of entries 1,320. Of the latter, 121 were in the amateur department. The special feature of the exhibition was the magnificent display of decorative and flowering plants, than which there perhaps never was a finer collection brought together in the city of Montreal. Fruits, especially grapes, were a little backward on account of the wet weather and the comparatively early date of the exhibition. Cut bloom and bedding plants suffered from the severe storm which preceded the exhibition. But, taken as a whole, it was pronounced, by general consent, the best exhibition ever held by the Society. The Directors of the Exposition Company expressed their high appreciation of our efforts and satisfaction at the result.

AMATEUR DEPARTMENT.—I think it is to be regretted that more inducements were not offered to the amateurs, from whom the society derives a large share of its support. With our membership barely maintained, we cannot afford to ignore their claims. In this connection allow me also to say that it might be the privilege of the society to hold monthly meetings (at least during the winter), where the amateurs could meet their professional friends, and where any member desirous of information or assistance could obtain the help of the more experienced. Such a scheme would, I think, increase the popularity as well as the membership of the society. In the meantime any enquiries addressed to me will be placed in the hands of the Director best posted on the subject for his immediate reply.

REPORT.—We have accumulated a large number of valuable papers for our annual report. The manuscripts of these are, and have been for some time, in the hands of the Department of Agriculture at Quebec, where they were sent for perusal, at their request. It is hoped that we will be able to issue the report, brought up to the close of our year, on an early day.

In conclusion, I think we have every reason to feel satisfied with the result of the year's work, especially from a financial point of view. With a continuation of such success, we will very soon be in a position to replace the permanent investments required by the constitution.

Respectfully submitted,

THOS. WILLIAMSON,
Secretary-Treasurer.

The meeting then proceeded to the election of Directors for the ensuing year, Messrs. Harper and Stocking being appointed scrutineers.

At this stage a proxy for voting was tendered by Mr. Ramsay in his favour from Mr. Geo. Hague, which the chairman refused to entertain. Mr. Ramsay insisted upon his right to vote for Mr. Hague. Mr. D. Williamson moved, seconded by Mr. J. Walsh, "That it is with much regret the society is unable to accept any proxies for voting, inasmuch as no provision for same is made in the constitution, and inasmuch as such proxies have been disallowed heretofore."

Mr. Ramsay moved in amendment, seconded by Mr. W. O. Roy, "That on the ground that no disability is set up by the constitution, and also on the ground of expediency, the proxy in question and also any other proxies in the meeting must be allowed. The amendment was lost by a very large majority,—Mr. Ramsay entering protest.

The scrutineers then announced the election of the following Directors, viz: Messrs. J. Walsh, J. Doyle, F. Roy, J. Bennett, W. M. Ramsay, G. Trussell, J. Betrix, J. Eddy and D. Williamson.

The following Honorary Officers were then unanimously elected, viz.:—Hon. President. Mr. W. W. Ogilvie; Hon. Vice-President, Mr. Robert Mackay. It was decided, on the motion of Mr. Ramsay, that in the event of either of these gentlemen declining to accept, the Board of Directors should have power to fill the vacancy.

Mr. J. McKenna spoke as to the desirability of amalgamating the Society and the "Gardeners and Florists Club." Other members followed on the same subject, and ultimately it was decided to appoint a committee to consider the whole question of the relations between the two organizations. The following committee was named, viz.:—Messrs. D. Williamson, J. McKenna and J. Bennett.

Messrs. A. F. Riddell and W. J. Common, chartered accountants, were appointed auditors for the ensuing year.

The following Library Committee was appointed, viz.:—Messrs. R. Hamilton, R. W. Shepherd, jr., J. McKenna, J. Bennett, H. Stocking, W. O. Roy, W. Evans, and the Secretary-Treasurer.

Votes of thanks having been passed to the auditors, scrutineers and the chairman, the meeting adjourned.

PRIZE LIST, SEPTEMBER EXHIBITION, 1892.

Class A.

PLANTS.

Sec. 1. Collection of Decorative and Flowering Plants, 100 sq. ft.: 1. John Doyle, gardener to W. R. Elmenhorst; 2, J. Betrix, gardener to Andrew Allan 3, W. Spriggings, Mount Royal Cemetery.

Sec. 2. Collection of Decorative and Flowering Plants, 50 sq. ft.: 1, John Walsh, gardener to W. W. Ogilvie; 2, J. Bennett, florist; 3, P. McKenna and Son, florists.

Sec. 3. 6 Adiantums: 1, W. J. Wilshire, gardener to Sir J. C. Abbott; 2, W. Spriggings; 3, John Doyle.

Sec. 4. 2 Anhuriums: 1, W. J. Wilshire; 2, W. Spriggings; 3, John Walsh.

Sec. 5. Am. Aloes: 1, John Eddy, gardener to Mrs. Redpath; 2, W. Spriggins.

Sec. 6. Am. Aloes, specimen: 1, W. S. Horseman, gardener to Mrs. Robertson; 2. C. Smith, gardener to T. A. Dawes, Lachine.

Sec. 7. 12 Begonias, foliage: 1, W. S. Horseman; 2, C. Smith; 3, A. Pinoteau, city gardener.

Sec. 8. 12 Begonias tuberous: 1, G. Trussell, gardener to J. H. R. Molson; 2, F. L. Girdwood, Ste. Anne de Bellevue; 3, A. Pinoteau.

Sec. 9. 6 Begonias tuberous: 1, F. L. Girdwood; 2, Geo. Trussell.

Sec. 10. 6 Caladiums: 1, J. Betrix; 2, W. J. Wilshire.

Sec. 11. 3 Caladiums: 1, John Doyle.

Sec. 12. 6 Crotons; 1, John Doyle; 2, W. J. Wilshire; 3, A. Pinoteau.

Sec. 13. 3 Crotons: 1, W. Spriggings; 2, A. Pinoteau.

Sec. 14. 1 Cycas: 1, J. Betrix; 2, A. Pinoteau; 3, J. Walsh.

Sec. 15. 4 Dracaenas: 1, W. J. Wilshire; 2, John Walsh.

Sec. 16. 1 Dracaenas: 1, John Walsh.

Sec. 17. 6 Ferns: 1, W. J. Wilshire; 2, W. Spriggings: 3, John Doyle.

Sec. 18. 1 Ferns, specimen: 1, J. Doyle; 2, C. Smith; 3, J. Walsh.

Sec. 19. 1 Ferns, tree: 1, J. Doyle; 2, J. Walsh.

Sec. 23. Geraniums, Zonal: 1, Trussell; W. Spriggings.

See. 24. Geraniums, double: 1, G. Trussell; 2, W. Spriggings.

Sec. 25. Gloxianas, 6; 1, A. Pinoteau; 2, C. Smith.
Sec. 26. Gloxianas, 3: 1, A. Pinoteau; 2, C. Smith.
Sec. 27. 1 Ficus, Elastica: 1, J. Walsh; 2, W. J. Wilshire.
Sec. 28. 1 Ficus Elastica variegata: 1, C. Smith; 2, J. Doyle.
Sec. 29. Greenhouse Plants, 4: 1, A. Pinoteau.
Sec. 30. Hanging Basket of Plants: 1, W. Spriggings; 2, C. Smith
Sec. 31. Hanging Basket of Ferns: 1, A. Pinoteau; 2, C. Smith.
Sec. 32 Lygodium Scandens: 1, J. Walsh.
Sec. 33. 3 Marantas: 1, W. Spriggings.
Sec. 34. 1 Marantas: 1, W. Spriggings.
Sec. 35. 3 Nepenthes: 1. W. J. Wilshire.
Sec. 37. 6 Orchids: 1, W. J. Wilshire.
Sec. 38. 3 Orchids: 1, W. J. Wilshire.
Sec. 39. 1 Orchids: 1, J. W. Wilshire.
Sec. 40. 6 Palms: 1, W. J. Wilshire; 2, J. Doyle; 3, J. Walsh,
Sec. 41. 3 Palms: 1, W. J. Wilshire; 2, J. Walsh; 3, J. Doyle.
Sec. 42. 1 Palm: 1, W. J. Wilshire; 2, J. Doyle.
Sec. 43. Plants, vase of: 2, W. Spriggings; 3, W. B. Davidson and Sons.
Sec. 44. 6 Plants for Table Decoration: 1, W. J. Wilshire; 2, J. Doyle; 3, J. Bennett.
Sec. 45. Selaginella (Lycopodium): 1, W. Spriggings; 2, J. Doyle.
Sec. 46. 6 Stove or Greenhouse Flowering Plants: 2, W. S. Horsman.
Sec. 47. 1 Specimen: 1, J. Walsh.
Sec. 48. 6 Stove or Greenhouse Foliage: 1, W. J. Wilshire; 2, J. Walsh
Sec. 49. 1 Specimen: 1, J. Betrix; 2, J. Walsh.

CUT BLOOM.

Sec. 52. Annuals, collection: 1, Davidson, W. B. and Sons; 2, S. Trussell; 3, C. Smith.
Sec. 53. Asters, 24: 1, J B. Goode, Cote St. Antoine; 2, W. G. Horsman; 3, W. B. Davidson and Sons.
Sec. 54. Asters, 12: 1, J. B. Goode; 2, Morgan, James, of Henry Morgan and Co; 3, W. B. Davidson and Sons.
Sec. 56. Dahlias, double, 12: 2, W. Penny, Quebec.
Sec. 58. Dahlias, single, 12: 2, W. Spriggings; 3, C. Smith.
Sec. 59. Dianthus, collection: 1, W. M. Ramsay, Merchants Bank; 2, A. Pinoteau.
Sec. 60. Gadiola, 12: 1, W. B. Davidson and Sons; 2, G. Trussell.
Sec. 61. Gladiola, 6: 1, A. Pinoteau; 2, W. B. Davidson and Sons; 2, G. Trussell.

Sec. 62. Pansies, 24 : 1, G. Trussell ; 2, W. Spriggings ; 3, W. B. Davidson and Sons.

Sec. 63. Pansies, 12 : 1, W. M. Ramsay ; 2, G. Trussell ; 3, W. B. Davidson and Sons.

Sec. 64. Petunias, single : 1, A. Pinoteau ; 2, W. M. Ramsay ; 3, W. Spriggings.

Sec. 65. Petunias, double : 1, A. Pinoteau ; 2, C. Smith ; 3, W. Spriggings.

Sec. 66. Phlox, Drummondi : 1, W. Spriggings ; 2, J. Horsman ; 3, F. L. Girdwood.

Sec. 67. Phlox, Perennial : 1, B. T. Graves, Cote St. Antoine ; 2, W. Spriggings ; 3, G. Trussel.

Sec. 68. Roses, Hybrid perpetual : 1, J. Doyle.

Sec. 69. Roses, Tea or Noisette : 1, J. Doyle ; 2, B. T. Graves ; 3, W. B. Davidson and Sons.

Sec 70. Sweet Peas : 1. J. Doyle ; 2, J. P. McKenna ; 3, W. Penny ; 4, W. B. Davidson and Sons.

Sec. 71. Verbenas ; 1, F. L. Girdwood ; 2, C. Smith ; 3, W B. Davidson and Sons.

Sec. 72. Zinnias : 1, C. Smith ; 2, J. B. Goode ; 3, G. Trussell.

Sec. 73. Growing model of a carpet bed : 1, W. O. Roy, Mount Royal 2, P. McKenna.

DINNER TABLE AND MANTELPIECE DECORATION AND BOUQUETS OF CUT FLOWERS.

Sec. 74½. Bouquets, Bride's Bouquet, Basket of Cut Flowers : 1, W. B. Davidson and Sons ; 2, J. Kirkwood ; 3, G. Trussell.

Sec. 75. Vase or Epergne ; 1, G. Trussell.

Sec. 76. Vase of Roses : 1, J. Doyle ; 2, B. T. Graves ; 3, W. B. Davidson and Sons.

AMATEUR DEPARTMENT.—CLASS B.

PLANTS.

Sec. 77. 12 Plants, in bloom : 1, T. W. Burdon, 142 Hutchison street.

Sec. 78. 6 Plants, in bloom : 1, T. W. Burdon.

Sec. 79. 3 Plants, in bloom : 1, T. W. Burdon.

Sec. 80. 1 Plant, in bloom : 1, T. W. Burdon.

Sec. 81. 12 Plants, foliage : 1, T. W. Burdon.

Sec. 82. 6 Plants, foliage : 1, T. W. Burdon ; 2, P. A. Sommerville.

Sec. 83. 3 Plants, foliage : 1, T. W. Burdon.

Sec. 84. 1 Plant, foliage : 1, T. W. Burdon ; 2, P. A. Sommerville, 47 Mayor street.

CUT BLOOM BOUQUETS.

Sec. 85. Annuals, collection : 1, W. M. Ramsay.
Sec. 86. Asters : 1, J. B. Goode ; 2, W. M. Ramsay ; 3, P. A. Sommerville
Sec. 87. Bouquet : 1, P. A Sommerville.
Sec. 88. Cut Flowers : 1, P. A. Sommerville.
Sec. 89. Cut Flowers, vase or epergne : 1, W. M. Ramsay.
Sec. 92. Gladioli : 1, P. A. Sommerville.
Sec. 93. Pansies, 12 : 1, W. M. Ramsay.
Sec. 94. Pansies, 6 : 2, W. M. Ramsay.
Sec. 95. Petunias, double : 1, W. M. Ramsay.
Sec. 96. Petunias, single : 1, W. M. Ramsay ; 2, J. B. Goode.
Sec. 97. Phlox, Drummondi : 1, P. A. Sommerville ; 2, J. B. Goode ; 3, W. M. Ramsay.
Sec. 98. Stocks : 1, W. M. Ramsay.
Sec. 99. Sweet Peas : 1, P. A. Sommerville ; 2, W. M. Ramsay.
Sec. 100. Verbenas : 1, J. B. Goode ; 2, W. M. Ramsay.
Sec. 101. Zinnias : 1, J. B. Goode ; 2, P. A. Sommerville.
Sec. 102. Geranium : 1, W. M. Ramsay.

CLASS C.

FRUITS.

Sec. 103. Apples, best collection : 1, A. Knight, Cataraqui, Ont.; 2, G. B. Edwards, Coney Hill, Que. ; 3, R. Hamilton, Grenville, Que. ; 4, G. Roach, Abbottsford Que.; 5, D. R. Leavens, Brockville, Ont.

Sec. 104. Apples, collection of Newer Russians : 1, R. Hamilton, Grenville ; 2, W. J. Craig, Abbottsford, Que.

Sec. 105. Apples, 3 varieties new seedeing : 1, G. B. Edwards ; 2, A. Knight ; 3, Canon Fulton, St. Vincent de Paul.

Sec. 106. Apples, 1 variety new seedings : 1, A. Knight ; 2, G. B. Edward ; 3, D. Dunn, Lachine.

Sec. 107. Apples, 12 varieties, 3 Summer, 3 Fall, 3 Early Winter, 3 Late Winter, 5 of each named : 1, A. Knight ; 2, C. B. Edwards ; 3, R. Hamilton ; 4, R. Jack, Chateauguay.

Sec. 108. Apples, 6 varieties, for commercial purposes : 1, J. Robson, Outremont ; 2, A. Knight ; 3, R. Jack : 4, D. R. Leavens.

Sec. 109. Apples, Alexander : 1, J. Robson ; 2, G. Roach ; 3, F. Ignace, Notre Dame des Nieges.

Sec. 110. Apples, Ben Davis : 1, D. Dunn ; 2, W. B. Davidson and Sons ; 3, A. Knight.

Sec. 111. Apples, Bethel : J. Robson ; 2, A. Knight.

Sec. 112. Apples, Bourassa: 1. J. Landers; 2, D. Dunn; 3, A. Knight.

Sec. 113. Apples, Brockville Beauty: 1, A. Knight.

Sec. 114. Apples, Blue Pearmain: 1, J. Morgan; 2, G. B. Edwards; 3 W. B. Davidson and Sons.

Sec. 115. Apples, Canada Baldwin: 1, G. Roach.

Sec. 116. Apples, Duchess: 1, Canon Fulton; 2, A. Knight; 3, F. Ignace.

Sec. 117. Apples, Fameuse: 1, O. Dagenais, St. Leonard, St. Maurice; 2, W. B. Davidson and Sons; 3, J. Robson.

Sec. 118. Apples, Golden Russet: 1, J. Landers; 2, W. Meade Patterson, Clarenceville, Que.; 3, G. Roach.

Sec. 119. Apples, Peach (of Montreal): 1, R. Hamilton; 2, A. Knight; 3, F. Ignace.

Sec. 120. Apples, Pewaukee: 1, J. Robson; 2, R. Jack; 3, W. M. Patterson.

Sec. 121. Apples, Pomme Grise: 1, D. Dunn; 2, D. R. Leavens; 3, A. Knight.

Sec. 122. Apples, St. Lawrence: 1, J. Robson; 2, R. Jack; 3, T. J. Gorman.

Sec. 123. Apples. Scott's Winter: 1, A. Knight; 2, W. Craig, jr.

Sec. 124. Apples, Strawberry (of Montreal): 1, P. McKenna; 2, G. B. Edwards; 3, Canon Fulton.

Sec. 125. Apples, Wealthy: 1, R. Hamilton; 2, T. Hall; 3, A. Knight.

Sec. 126. Apples, Winter St. Lawrence: 1, J. Robson; 2, P. McKenna; 3, H. Champ, Cote des Neiges.

Sec. 127. Apples, Yellow Transparent: 1, G. B. Edwards; 2, A. Knight; 3, W. S. Knowlton, Knowlton, Que.

Sec. 128. Apples, any other variety: 1, A. Knight; 2, D. R. Leavens; 3, W. Craig, jr.

Sec. 129. Crab Apples, 5 varieties: 1, A. Knight; 2, J. Robson; 3, W. B Davidson and Sons.

Sec. 130. Crab Apples, 1 variety: 1, A. Knight; 2, J. Robson,

Sec. 131. Pears, 6: 1, J. Betrix; 2, J. Eddy; 3, G. Trussell; 4, J. Doyle.

Sec. 132. Pears, 3: 1, J. Eddy; 2, T. J. Gorman; 3, J. Betrix.

Sec. 133. Pears: 1, J. Hall; 2, J. Gorman; 3, J. Eddy.

Sec. 134. Plums, collection: 1, J. Robson; 2, B. T. Graves; 3, J. Doyle.

Sec. 135. Plums, 2: 1, B. T. Graves; 2, R. H. Hennessy, Cote St. Louis: 3, J. Robson.

Sec. 136. Plums, Plate: 1, J. Betrix; 2, J. Robson; 3, J. Doyle.

BASKETS OF FRUIT.

Sec. 139. Basket of Fruit for Desert: 1, J. Betrix; 2, J. Eddy; 3, R. Jack; 4, G. Trussell.

Sec. 140. Basket of Out-door Grown Fruits: 1, J. Eddy; 2, G. Trussell; 3, R. Jack.

OUT-DOOR GRAPES.

Sec. 141. Grapes, collection: 1, W. M. Patterson.

Sec. 142. Grapes, 6 varieties: 1, R. Jack; 2, James Morgan; 3, W. M. Patterson; 4, J. Eddy.

Sec. 143. Grapes, 3 varieties, white: 1, R. Jack; 2, W. M. Patterson.

Sec. 144. Grapes, 3 varieties, black: 1, R. Jack; 2, W. M. Patterson.

Sec. 145 Grapes, 3 varieties, red: 1, R. Jack; 2, W. M. Patterson.

Sec. 146. Grapes, bunch, white: 1, R. Jack; 2, Joseph Landers; 3, W. M. Patterson.

Sec. 147. Grapes, bunch, black: 1, W. M. Patterson; 2, R. Jack.

Sec. 148. Grapes, bunch, red: 1, J. Landers; 2, R. Jack.

GRAPES GROWN UNDER GLASS.

Sec 149. Grapes, 8 varieties: 1, J. Bland; 2, J. McGuire; 3, J. Kirkwood.

Sec. 150. Grapes, 5 varieties: 1, J. McGuire; 2, J. Bland; 3, J. Kirkwood.

Sec. 151. Grapes, 3 varieties: 1, J. McGuire, gardener to John Molson; 2, J. Bland; 3, W. S. Horsman.

Sec. 152. Grapes, 2 bunches Black Hamburg: 1, J. Betrix; 2, J. Bland; 3, J. Kirkwood.

NECTARINES AND OTHER FRUITS.

Sec. 153. Nectarines: 1, J. Eddy; 2, J. Betrix.

Sec. 154. Peaches, 6: 1, J. Betrix; 2 J. Eddy.

Sec. 155. Peaches, best plate: 1, J. Betrix; 2, J. Eddy.

Sec. 158. Melon, Water: 1, F. Ignace.

Sec. 159. Melon, Musk: 1, W. Ross; 2, G. Trussell; 3, T. J. Gorman; 4, R. H, Hennessy; 5, C. Smith.

Sec. 160. Melon, best new variety, Musk: 1, W. B. Davidson and Sons; 2, F. Ignace

VEGETABLES.

Sec. 161. Artichokes, Jerusalem: 1, F. Ignace; 2, G. Trussell.

Sec. 162. Beets, Turnip, Blood: 1, C. Smith; 2, J. Betrix; 3, T. Irving, Logan's Farm; 4, F. Ignace.

Sec. 163. Beets, Long, Blood: 1, F. Ignace; 2, W. Cagmy; 3, W. B. Davidson and Sons; 4, G. Trussell.

Sec. 165. Beans, Kidney, yellow: 1, J. Robson; 2, H. Champ.

Sec, 166. Beans, Kidney, green: 1, F. L. Girdwood; 2, H. Champ.

Sec. 167. Borecole (Kale): 1, F. Ignace; 2, W. Ross.

Sec. 168. Brussels Sprouts: 1, F. Ignace; 2, C. Smith.

Sec. 169. Cabbage, Winter: 1, F. Ignace; 2, O. Dagenais.

Sec. 170. Cabbage, Red: 1, W. B. Davidson and Sons; 2, W. Cagmy.

Sec. 171. Cabbage, Savoy: 1, F. Ignace; 2, W. B. Davidson and Sons.

Sec. 172. Carrots, half long: 1, T. Hall; 2, P. McKenna; 3, W. Cagney.

Sec. 173. Cauliflower, 3 heads: 1, W. Cagney; 2, P. McKenna; 3, W. B. Davidson and sons.

Sec. 174. Cauliflower, best head: 1, W. Cagney; 2, P. McKenna; 3, H. Murphy.

Sec. 175. Cucumber: 1, O. Dagenais; 2, W. B. Davidson and Sons.

Sec. 176. Celery, White: 1, T. Hall; 2, F. Ignace; 3, W. B. Davidson and Sons.

Sec. 177. Celery, Red: 1, W. Cagney; 2, C. Smith; 3, T. Hall.

Sec. 178. Celery, Yellow: 1, T, Hall; 2, T. J. Gorman; 3, C. Smith.

Sec. 179. Corn, Sweet, late: 1, F. Ignace; 2, D. Dunn; 3, M. Bigras, St. Martin.

Sec. 180. Corn, Sweet, early: 1, M. Bigras; 2, F. Ignace.

Sec. 181. Egg Plants, 3, Purple: 1, F. Ignace; 2, H. Champ.

Sec. 182. Egg Plants, 2, White: 1, P. McKenna; 2, F. Ignace.

Sec. 183. Leeks: 1, F. Ignace; 2, W. Cagney.

Sec. 185. Onions, collection: 1, C. Smith; 2, G. Trussell; 3, T. Hall.

Sec. 186. Onions, White: 1, G. Trussell; 2, O. Dagenais; 3, R. H. Hennessy.

Sec. 187. Onions, Red: 1, T. Hall; 2, O. Dagenay; 3, H. Champ.

Sec. 188. Onions Yellow: 1, Hon. L. Beaubien, Outremont; 2, T. Hall; 3, R. H. Hennessy.

Sec. 189. Parsnips: 1, P. Hennessy; 2, Hon. L. Beaubien; 3, P. McKenna.

Sec. 190. Peas, Green: 1, J. Betrix; 2, W. B. Davidson and Sons.

Sec. 191. Peppers: 1, A. Knight; 2, F. Ignace; 3, P. McKenna.

Sec. 192. Potatoes, collection: 1, T. Hall; 2, G. Trussell; 3, C. Smith.

Sec. 193. Potatoes, 4 varieties: 1, T. Hall; 2, G. Trussell.

Sec. 194. Pot Herbs; 1, F. Ignace; 2, W. B. Davidson and Sons; 3, W. Ross.

Sec. 195. Radishes: 1, W. B. Davidson and Sons; 2, H. Champ; 3, C. Smith.

Sec 196. Salsify: 1, F. Ignace; 2, C. Smith; 3, G. Trussell.

Sec. 197. Tomatoes: 1, J. Robson; 2, A. Knight; 3, W. Ross.

Sec. 198. Tomatoes, Red: 1, C. Smith; 2, W. Ross; 3, T. Hall.

Sec. 199. Tomatoes, Yellow: 1, D. Dunn.

Sec. 200. Turnips, White: 1, F. Ignace; 2, C. Smith; 3, W. Cagney.

Sec. 201. Turnips, Yellow: 1, W. Cagney; 2, D. McLauchlin, Petite Cote; 3, F. Ignace.

Sec. 202. Squash, Vegetable Marrow: 1, H. Champ; 2, W. B. Davidson and Sons.

Sec. 203. Squash, Hubbard: 1, C. Smith; 2, P. McKenna.

Sec. 204. Squash, Best Table: 1, P. McKenna; 2, Jules Sauriol, St. Therese.

Sec. 205. Vegetables, best collection: 1, T. Hall; 2, W. B. Davidson and Sons; 3, R. H. Hennessy.

Amateur Department.—Class D.

Fruits and Vegetables.

Sec. 206. Apples: 1, J. B. Goode; 2, A. H. Dunn.

Sec. 207. Grapes, 3 varieties, out-door: 1, T. A. Huot, Belœil; 2, P. A. Sommerville.

Sec. 208. Grapes, 2 bunches of any kind: 1, T. A. Huot; 2, P. A. Sommerville.

Sec. 210. Pears: 1, J Murray Smith, Bank of Toronto.

Sec. 211. Plums: 1, J. Murray Smith; 2, A. H. Dunn.

Sec. 212. Corn, Sweet: 1, T. A. Huot; 2, A. H. Dunn.

Sec. 213. Potatoes: 2, A. H. Dunn.

Sec. 214. Tomatoes: 1, A. H. Dunn.

Sec. 216. Carrots: 2, A. H. Dunn.

Sec. 217. Beet: 1, A. H. Dunn.

Sec. 219. Parsnips: 1, T. A. Huot.

PRIZE LIST, EXHIBITION SEPTEMBER, 1893.

CLASS A,—PLANTS.

Sec. 1. Collection of plants, 100 sq. ft: Special prize of $100 from Sir Donald A. Smith. 1, John Doyle, gardener to W. R. Elmenhorst; 2, Jules Betrix, gardener to Andrew Allan; 3, Frank Roy, Mount Royal Cemetery; 4, Joseph Bennett, florist.

Sec. 2. Collection of plants, 50 sq. f.: Special prize of $20 from Messrs. Warden King & Son. 1, J. Kirkwood, gardener to R. B. Angus; 2, John Walsh, gardener to W. W. Ogilvie; 3, Frank Roy; 4, Jules Betrix.

Sec. 3. 6 Adiantums: 1, W. J. Wilshire, gardener to Sir J. C. Abbott; 2, Frank Roy.

Sec. 4. 2 Anthuriums: 1, W. J. Wilshire; 2, Frank Roy.

Sec. 5. Am. Aloes, best 2: 1, John Eddy, gardener to Mrs. Redpath; 2, Frank Roy; 3, Jules Betrix.

Sec. 6. Am. Aloes, best specimen: 1, W. J. Horsman, gardener to Mrs. Robertson; 2, Frank Roy; 3, C. A. Smith, gardener to T. A. Dawes.

Sec. 7. 12 Begonias, Foliage: 1, C. A. Smith; 2, F. C. Smith, gardener to John Molson; 3. A. Pinoteau, city gardener.

Sec. 8. 12 Begonias. Tuberous: 1, James Morgan, Hy. Morgan & Co.; 2, A. Pinoteau.

Sec. 9. 6 Begonias Tuberous: 1, T. McHugh, Forest and Stream Club; 2, Geo. Trussell, gardener to J. H. R. Molson.

Sec. 10. 6 Caladiums: 1, John Doyle; 2, Frank Roy.

Sec. 11. 3 Caladiums: 1, Jules Betrix; 2, John Doyle; 3, Frank Roy.

Sec. 12. 6 Crotons: 1, W. J. Wilshire; 2, John Doyle.

Sec. 13. 3 Crotons: 1, John Doyle; 2, W. J. Wilshire; 3, Frank Roy.

Sec. 14. 1 Cycas: 1, John Walsh; 2, Pinoteau; 3, Jules Betrix.

Sec. 15. 4 Dracaenas: 1, John Doyle; 2, W. J. Wilshire.

Sec. 16. 1 Dracaena: 1, Geo. Copland, Botanic Gardens; 2, Frank Roy.

Sec. 17. 6 Ferns: 1, W. J. Wilshire; 2, Frank Roy.

Sec. 18. 3 Ferns: 1, W. J. Wilshire; 2, C. A. Smith; 3, J. Bland, gardener to James Burnett.

Sec. 19. 1 Fern: 1, Thomas McHugh; 2, John Doyle; 3, W. J. Wilshire.

Sec. 20. 1 Tree fern: 1, John Doyle; 2, Jules Betrix; 3, W. J. Wilshire.

Sec. 21. 6 Fuschias: 1, Frank Roy.

Sec. 22. 3 Fuschias: 1, Frank Roy.

Sec. 23. 1 Fuschia: 1, Frank Roy.

Sec. 24. Geraniums, Zonal, 9 varieties: 1, George Trussell; 2, Frank Roy.

Sec. 25. Geraniums, Double, 9 varieties: 1, Geo. Trussell; 2, Frank Roy.

Sec. 26. Geraniums, 3 Tricolas, and 3 bronze: 1, Geo. Trussell.

Sec. 27. Gloxinias, 12 varieties: 1, A. Pinoteau; 2, Thos. McHugh.

Sec. 28. Gloxinias, 6 varieties: 1, A. Pinoteau; 2, Frank Roy.

Sec. 29. 2 Ficus elastica: 1, John Doyle; 2, Frank Roy.

Sec. 30. 2 Ficus elastica variegata: 1, John Walsh; 2, Jos. Bennett.

Sec. 31. Hanging basket of plants: 1, Frank Roy; 2, A. Pinoteau.

Sec. 32. Hanging basket of ferns: 1, A. Pinoteau; 2, W. B. Davidson & Sons; 3, C. A. Smith.

Sec. 33. Lygodin Scandens: 1, Geo. Copland; 2, John Walsh.

Sec. 34. 3 Marantas: 1, W. J. Wilshire; 2, Frank Roy.

Sec. 35. 1 Marantas: 1, W. J. Wilshire; 2, Frank Roy.

Sec. 36. 3 Nepenthes: 1, W. J. Wilshire; 2, Frank Roy.

Sec. 37. 1 Nepenthes: 1, W. J. Wilshire; 2, Geo. Copland.

Sec. 38. 6 Orchids: 1, W. J. Wilshire.

Sec. 39. 3 Orchids: 1, W. J. Wilshire; 2, Frank Roy.

Sec. 40. 1 Orchid: 1, W. J. Wilshire; 2, Frank Roy.

Sec. 41. 6 Palms: 1, W. J. Wilshire; 2, John Walsh; 3, J. Bland.

Sec. 42. 3 Palms: 1, W. J. Wilshire; 2, John Walsh; 3, C. A. Smith.

Sec. 43. 6 Palms, not exceeding 6 in. pots: 1, W. J. Wilshire; 2, Frank Roy; 3, James Bennett.

Sec. 44. Palms, single specimen: 1, F. C. Smith; 2, Jules Betrix; 3, W. J. Wilshire.

Sec. 45. Plants, vase of: 1, B. T. Graves, Cote St. Antoine; 2, John Doyle; 3, Frank Roy.

Sec. 46. Plants for table decoration: 1, J. Kirkwood; 2, W. J. Wilshire; 3, John Walsh; 4, John Doyle; 5, J. Bennett.

Sec. 47. Selaginella: 1, Geo. Copland; 2, Frank Roy.

Sec. 48. 6 Stove or greenhouse flowering plants: 1. W. J. Wilshire; 2, F. Roy.

Sec. 49. 1 Stove or greenhouse flowering plant in bloom: 1, John Walsh; 2, W. J. Wilshire; 3, F. Roy.

Sec. 50. 6 Stove or greenhouse foliage plants: 1, W. J. Wilshire; 2, J. Kirkwood; 3, J. Walsh.

Sec. 51. 1 Stove or greenhouse foliage plant: 1, J. Bennett; 2, Geo. Copland.

Sec. 52. Cannas, French, 6 varieties (special prize of $30 from the directors and secretary): 1, F. Roy; 2, J. Doyle; 3, B. T. Graves; 4, J. Bennett.

Sec. 53. Cannas, French, 3 varieties, (special prize of $20 from the directors and secretary): 1, John Doyle; 2, F. Roy; 3, J. Bennett; 4, B. T. Graves; 5, Geo. Trussell.

Sec. 54. Coleus, 6 varieties: 1, C. A. Smith; 2, W. B. Davidson & Sons.

Sec. 55. Coleus, 3 varieties: 1, B. T. Baud, gardener to A. A. Ayer; 2, C. A. Smith; 3, W. B. Davidson & Sons.

Sec. 56. Liliums: 1, F. Roy; 2, Geo. Trussell.

Sec. 57. Asparagus plumosus nana (special prize of $3.00 from Mr. W. O. Roy): 1, J. Betrix; 2, J. Doyle.

Sec. 58. Growing model of a carpet bed: 1, W. O. Roy, M. R. Cemetery Co.; 2, F. Roy.

Sec. 59. Collection of bedding plants, etc. (special prize of $12.50 from Messrs. Wm. Ewing & Co.): 1, W. B. Davidson & Sons; 2, Geo. Trussell; 3, R. Jack, Chateauguay.

Sec. 60. Asters, 24 blooms: 1, John B. Goode Cote St. Antoine; 2, Geo. Trussell; 3. W. M. Ramsay, Merchants Bank; 4. John Mollitt, gardener to Judge Cross.

Sec. 61. Asters, 12 blooms: 1, J. B. Goode; 2, James Morgan; 3, W. M. Ramsay.

Sec. 66. Dianthus collection (special prize of $5 from W. M. Ramsay, Merchants Bank): 1, W. M. Ramsay; 2, B. T. Baud; 3, Geo. Trussell.

Sec. 67. Gladioli, 24 spikes (special prize of $30 from D. Williamson, 1270 Dorchester street): 1, F. Roy; 2, A. Pinoteau.

Sec. 68. Gladioli, 12 spikes (special prize of $20 from D. Williamson, 1270 Dorchester street): 1, Frank Roy; 2, W. B. Davidson & Sons; 3. A. Pinoteau.

Sec. 69. Pansies, 24: 1, W. J. Wilshire; 2, B. T. Graves; 3, Geo. Trussell.

Sec. 70. Pansies, 12: 1, W. J. Wilshire; 2, W. M. Ramsay; 3, Geo. Trussell.

Sec. 71. Petunias, single: 1, W. B. Davidson & Sons; 2. W. M. Ramsay; 3, A. Pinoteau.

Sec. 72. Petunias, double: 1, A. Pinoteau.

Sec. 73. Phlox Drummondi: 1, W. J. Horsman; 2, W. M. Ramsay; 3, B. T. Baud.

Sec. 74. Phlox, Perennial: 1, B. T. Graves; 2, Geo. Trussell; 3, W. B. Davidson & Sons.

Sec. 75. Sweet Peas, 50 pikes, (special prize of $10 from W. Evans): 1. J. Bland; 2, B. T. Graves; 3, C. A. Smith.

Sec. 76. Linnias: 1, Geo. Trussell; 2, C. A. Smith; 3, F. C. Smith.

Sec. 77. Holyhocks: 1, Geo. Trussell; 2, W. M. Ramsay.

Sec. 78. Canna: 1, J. Bland; 2, John Doyle; 3. B. T. Graves.

Sec. 79. Verbenas, 6 varieties (special prize of $5, from W. Woodhall, 91 Atwater avenne): 1, John B. Goode; 2, C. A. Smith; 3, W. B. Davidson & Sons.

Sec. 80. Bride's Bouquet 1, W. B. Davidson & Sons; 2, A. Pinoteau; 3, Geo. Trussell.

Sec. 81. Basket of Cut Flowers: 1, W. B. Davidson & Sons; 2, J. Bland; 3, Geo. Trussell.

Sec. 82. Vase or Epergne with Cut Flowers: 1, Geo. Trussell; 2, F. Roy.

Sec. 83. Vase of roses: 1, Geo. Trussell; 2, John Doyle; 3, J. Bland.

Sec. 84. Vase of Marguerite carnations, (special prize of $6, from Miss C. A. Springings and D. Springings): 1, F. Roy; 2, J. Bland; 3, B. T. Graves.

FRUITS.

Sec. 107. Apples, best collection, 25 varieties: 1, Geo. Nichol, Cataraqui; 2, Geo. B. Edmunds, Govey Hill; 3, A. Knight, Cataraqui; 4, R. W. Shepherd, jr., Como; 5. A. Aubertin, Cote St. Paul.

Sec. 108. Apples, Newer Russians, 10 varieties (special prize of $7, from Walter Paul, Esq., St, Catherine street): 1, R. Hamilton, Grenville.

Sec. 109. Apples, 3 varieties, new seedlings: 1, Geo. B. Edwards; 2, Rev. Canon Fulton, St. Vincent de Paul.

Sec. 110. Apples, 1 variety, new seedlings: 1, Geo. B. Edwards; 2, Robt. Jack; 3, Rev. Canon Fulton.

Sec. 111. Apples, 12 varieties, 3 each of summer, autume, early winter and later winter: 1, Geo. B. Edwards; 2, R. W. Shepherd, jr.; 3, A. Ducharme, St. Paul, Abbotsford.

Sec. 112. Apples, 6 varieties, Commercial,(special prize of $14 from Messrs. Hart & Tuckwell); 1, Jas. Robson, Outremont; 2, Jas. Morgan; 3, W. Greer, Grande Freniere, Q.; 4, Geo. B. Edwards.

Sec. 113. Apples, Fameuse, (special prize of $10 from the Montreal *Witness*: 1, James Coupland, Shefford Mountain; 2, Jas. Robson; 3, J. B. Edwards; 4, Geo. B. Edwards.

Sec. 114. Apples, St. Lawrence, (special prize of $10, from the Montreal *Witness*: 1, Rev. Canon Fulton; 2, R. W. Shepherd, jr.; 3, Jas. Coupland; 4, Jas. Robson.

Sec. 115. Apples, Duchess: 1, Geo. B. Edwards; 2, R. W. Shepherd, jr.; 3, Rev. Canon Fulton; 4, A. Ducharme.

Sec. 116. Apples, Wealthy: 1, Geo. B. Edwards; 2, R. W. Shepherd, jr.; 3. Jas. Robson.

Sec. 117. Apples, Alexander: 1, Geo. B. Edwards; 2, Jas. Robson; 3, O. Dagenais, Cote St. Michel.

Sec. 118. Apples, Ben Davis: 1, Jas. Coupland; 2, D. Dunn, Lachine; 3, R. Jack.

Sec. 119. Apples, Bethel: 1, Jos. Robson; 2, Geo. B. Edwards.

Sec 120. Apples, Bourassa: 1, Jules Betrix; 2, Rev. Canon Fulton.

Sec. 121. Apples, Blue Permain: 1, A. Ducharme; 2, A. Aubertin.

Sec. 122. Apples, Canada Baldwin: 1, Geo. B. Edwards; 2, James Coupland; 3, R. W. Shepherd, jr.

Sec. 123. Apples, Golden Russet: 1, Geo. B. Edwards; 2, B. T. Baud; 2, A. Ducharme

Sec. 124. Apples, Peach (of Montreal): 1, Jas. Robson; 2, Geo. B. Edwards; 3, A. Aubertin.

Sec. 125. Apples, Pawaukee: 1, Geo. B. Edwards; 2, Jas. Coupland, Shefford; 3. A. Aubertin.

Sec. 126. Apples, Pomme Grise: 1, Geo. Trussell, gardner to J. H. R. Molson; 2, Rev. Canon Fulton, St. Vincent de Paul; 3, Geo. B. Edwards.

Sec. 127. Apples, strawberry of Montreal: 1, George Copeland; 2, Geo. B Edwards; 3, F. Ignace, College Notre Dame des Neiges.

Sec. 128. Apples, winter St. Lawrence: 1, R. W. Shepherd, jun., Como.

Sec. 129. Apples, yellow, transparent: 1, Wm. Greer, Grand Freniere, Q.; 2, A. Ducharme, St. Paul, Abbottsford; 3, R. W. Shepherd, jun.

Sec. 131. Any other variety: 1, Wm. Gree; 2, R. W. Shepherd, jr.; 3, Geo. B. Edwards.

Sec. 132. Crab Apples, 5 varieties: 1, Jas. Robson; 2, R. W. Shepherd, jr.

Sec 133. Crab Apples, 1 variety: 1, G. B. Edwards, Outremont; 2, B. T. Baud, gardener to A. A. Ayer.

Sec. 134. Pears, 6 varieties, (Special prize of $11 from Messrs. Stone & Wellington, Toronto, per J. W. Beall, Esq., Montreal, manager): 1, John Eddy, gardener to Mrs. Redpath; 2, Jules Betrix, gardener to Andrew Allan; 3, Geo. Trussell, gardener to J. H. R. Molson.

Sec. 135. Pears, 3 varieties: 1, John Eddy; 2, Jules Betrix; 3, George Trussell.

Sec. 136. Pears, 1 variety: 1, Jules Betrix; 2, John Eddy; 3, George Trussell.

Sec. 137. Plums, collection, (Special prize of $10 from Messrs. Stone & Wellington, per J. W. Beall, Esq., Montreal, manager): 1, B. T. Graves, Côte St. Antoine; 2, W. B. Davidson & Sons, Côte St. Paul.

Sec. 138. Plums, two varieties, (Special prize of $4.50 from Messrs. Stone & Wellington, Toronto, per J. W. Beall, Esq., Montreal, manager): 1, B. T. Graves; 2, W. B. Davidson & Sons; 3, Robert Jack, Chateauguay.

Sec. 139. Plums, plate of one variety: 1, B. T. Graves; 2, Jules Betrix; 3, W. B. Davidson & Sons.

Sec. 141. Plums, wild of North Western States: 1, R. W. Shepherd, jr.; 2, R. Hamilton, Grenville.

BASKETS OF FRUIT.

Sec. 142. Basket of fruit for dessert: 1, John Eddy; 2, Jules Betrix; 3, Robert Jack; 4, George Trussell.

Sec. 143. Basket of out-door grown fruit: 1, Jules Betrix; 2, John Eddy; 3, Robert Jack; 4, Geo. Trussell.

OUT-DOOR GRAPES.

Sec, 144. Grapes, collection 12 varieties (special prize of $25 from James Morgan, Esq.): 1, Wm. Mead Pattison, Clarenceville; 2, Robert Jack.

Sec. 145. Grapes, 6 varieties: 1, Robt. Reid, city; 2, Robt. Jack; 3, Wm. Mead Pattison; 4, John Eddy.

Sec. 146. Grapes, three varieties white: 1, Wm. Mead Pattison; 2, Robt. Jack.

Sec. 147. Grapes, three varieties white: 1, Robt. Jack; 2, Wm. Mead Pattison.

Sec. 148. Grapes, three varieties red: 1, Wm. Mead Pattison; 2, Robt. Jack.

Sec. 149. Grapes, heaviest single bunch white: Robt. Reid; 2, Robt. Jack,

Sec. 150. Grapes heaviest single bunch black: 1, Wm. Mead Pattison; 2. Robt. Jack.

Sec. 151. Grapes, heaviest single bunch red: 1, Wm. Mead Pattison; 2, Robt. Jack.

GRAPES GROWN UNDER GLASS.

Sec. 152. Grapes, 8 varieties: 1, J. Kirkwood, gardener to R. B. Angus; 2, J. Bland, gardener to James Burnett; 3, J. Macguire, gardener to John Molson.

Sec. 153. Grapes, 5 varieties: 1, J. Kirkwook; 2, J. Maguire; 3, J. Bland.

Sec. 154 Grapes, 2 varieties white: 1, J. Kirkwood; 2, J. Maguire; 3, Jules Betrix.

Sec. 155. Grapes, 2 bunches black Hamburg: 1, J. Bland; 2, Jules Betrix.

Sec. 156. Grapes, best bunch any variety: 1, J. Bland; 2, J. Maguire; 3, J. Kirkwood.

NECTARINES AND OTHER FRUITS.

Sec. 158. Peaches, 6 varieties: 1, Jules Betrix.

Sec. 159. Peaches, best plate: 1, John Eddy.

Sec. 160. Melon, Water: 1, W. B. Davidson & Sons; 2, F Ignace.

Sec. 161. Melon, Musk: 1, J. Macguire; 2, F. Ignace; 3, Geo. Trussell.

Sec. 162. Melon, best new variety, Musk: 1, F. Ignace.

VEGETABLES.

Sec. 163. Artichokes, Jerusalem: 1, George Trussell; 2, Wm. Cagney Quebec.

Sec. 164. Beets, turnip blood: 1, O. Dagenais, Côte St. Michel; 2, George Trussell; 3, W. B. Davidson & Sons.

Sec. 165. Beets, long blood: 1, Thomas Hall, Outrement; 2, Dr. Elliott, Quebec; 3, C. A. Smith, gardener to T. A. Dawes, Lachine.

Sec. 166. Beans, Lima: 1, J. J. Gareau, St. Roch l'Achigan, Que.

Sec. 167. Beans, kidney yellow, podded: 1, Jas. Robson; 2, Geo. Trussell.

Sec. 168. Beans, kidney green, podded: 1, Geo. Trussell; 2, W. M. Ramsay, Merchants Bank.

Sec. 169. Borecole (kale): 1 Thos. Irving, Logan's Farm; 1, W. B. Davidson & Sons.

Sec. 170. Brussels Sprouts: 1, F. Ignace; 2, Thos. Hall.

Sec. 171. Cabbage, winter: 1, J. Mollitt, gardener to Judge Cross; 2, Thos. Hall.

Sec. 172. Cabbage, red: 1, W. B. Davidson & Sons; 2, Robert Holmes, Outremont.

Sec. 173. Cabbage, Savoy: 1, F. Ignace; 2, F. M. A. Charest, Deaf and Dumb Institut.

Sec. 174. Carrots, half long: 1, David Scott, Côte St. Michel; 2, B. T. Baud; 3, Geo. Trussell.

Sec. 175. Cauliflower, 3 heads, (special prize of $6, from William Evans, Esq, seedman): 1, Dr. Elliott; 2, W. A. Tozer, Quebec; 3, Robt. Holmes.

Sec. 176. Cauliflower, best head (special prize of $4.50 from William Evans, Esq., seedsman): 1, W. B. Davidson & Sons; 2, Geo. Trussell; 3, Frank Roy.

Sec. 177. Cucumber: 1, Thos. Hall; 2, F. Ignace.

Sec. 178. Celery, White: 1, Thos. Hall; F. Ignace; 3, O. Dagenais.

Sec. 179. Celery, red: 1, F. Ignace; 2, C. A. Smith; 3, Wm. Cagney.

Sec. 180. Celery, Yellow: 1, Thos. Hall; W. B. Davidson & Sons; 3, C. A. Smith.

Sec. 181. Corn, Sweet: 1, B. T. Baud; 2, C. A. Smith; 3, F. Ignace.

Sec. 182. Egg Plants, Purple: 1, F. Ignace; 2, C. A. Smith.

Sec. 183. Egg Rlants, White; 1, Geo. Trussell; 2, Jules Betrix.

Sec. 184. Leek's: 1, J. Ignace; 2, Thos. Hall.

Sec. 186. Onions, collection: 1, Thos. Hall; 2, C. A. Smith; 3, George Trussell.

Sec. 187. Onions, white: 1, O. Dagenais; 2, C. A. Smith; 3, F. Ignace.

Sec. 188. Parsnips: 1, B. T. Baud; 2. C. A. Smith; 3, John Nesbitt, Petite Côte.

Sec. 189. Peas, green, Special prize of $4.50, from W. Evans, Esq., seedsman: 1, John Walsh, gardener to W. W. Ogilvie; 2, Wm. Cagney; 3, John Eddy.

Sec. 190. Peppers: 1, F. Ignace; 2, C. A. Smith; 3, J. J. Careau.

Sec. 191. Potatoes, collection 10 varieties; 1, T. R. Hughes; 2, George Trussell; 3, W. Cagney.

Sec. 192. Potatoes, 4 varieties: 1, Geo. Trussell; 2, Thos. Hall.

Sec. 193. Pot Perbs: 1, D. Elliott; 2, C. A. Smith.

Sec. 194 Radishes: 1, Robt. Jack; 2, O. Dagenais; 3, W. B. Davidson & Sons.

Sec. 195. Lettuce: 1, O. Dagena s; 2, W. B. Davidson & Sons, Côte St. Antoine.

Sec. 196. Parsley: 1, O. Dagenais; 2, J. M. Nelson, Côte St. Antoine.

Sec. 197. Salsify: 1, C. A. Smith; 2, Wm. Cagney; B. T. Baud.

Sec. 198. Tomatoes, 3 varieties: 1, C. A. Smith; 2, Jules Betrix; 3, J. J. Gareau.

Sec. 199. Tomatoes, red; 1, C. A. Smith; 2, John Cassidy, city.

Sec. 200. Tomatoes, yellow: 1, C. A. Smith; 2, F. Ignace.

Sec. 201. Turnips, white: Wm. Greer; 2, W. Cagney; 3, D. M. McLachlan, Petite Côte.

Sec. 302. Turnips, yellow: 1, Wm. Greer; 2, W. B. Davidson & Sons; 3, W. Cagney.

Sec. 203. Squash, vegetable marrow: 1, Geo. Trussell; 2, W. B. Davidson & Sons.

Sec. 204. Squash, Hubbard: 1, W. B. Davidson & Sons; 2, Geo. Trussell.

Sec. 205. Squash, best table: 1, Wm. Greer; 2, W. B. Davidson & Sons.

Sec. 206. Vegetables, collection of 36 square feet. Special prize of $25, presented by W. W. Ogilvie, Esq.: 1, T. Hall, Outremont; 2, W. B. Davidson & Sons, Côte St. Paul; 3, W. Cagney, Quebec.

Sec. 207. Onions, 25 red and 25 yellow. Special prize of $12.50 from Messrs. Wm. Ewing æ Co.: 1, T. Hall; 2, C. A. Smith; 3, O. Dagenais; 4, F. Ignace.

AMATEUR DEPARTMENT.

PLANTS AND CUT BLOOM.

Sec. 86. 6 plants in bloom: 1, T. W. Burdon, city.

Sec. 87. 3 plants in bloom: T. W. Burdon.

Sec. 88. 1 plant in bloom: 1, T. W. Burdon; 2, P. A. Somerville, city.

Sec. 89. 12 foliage plants: 1, T. W. Burdon.

Sec. 90. 6 foliage plants: 1, T. W. Burdon.

Sec. 91. 3 foliage plants: 1, T. W. Burdon; 2, P. A. Somerville.

Sec. 92. 1 foliage plant: 1, T. W. Burdon; 2, P. A. Somerville.

Sec. 93. Annuals: 1, W. M. Ramsay, Merchants Bank; 2, R. Jack, Chateauguay; 3, John M. Nelson, Côte St. Antoine.

Sec. 94. Asters: 1, J. B. Goode, Côte St. Antoine; 2, W. M. Ramsay; 3, John M. Nelson.

Sec. 95. Bouquet or bunch cut flowers: 1, P. A. Somerville; 2, John M. Nelson.

Sec. 96. Basket cut flowers: 1, P. A. Somerville; 2, W. M. Ramsay.

Sec. 97. Vase or epergne cut flowers: 1, T. W. Burdon; 2, W. M. Ramsay.

Sec. 100. Gladioli: W. M. Ramsay; 2, R. Jack; 3, P. A. Somerville.

Sec. 101. Pansies: 1, R. Jack; 2, John M. Nelson.

Sec. 102. Petunias, double: 1, W. M. Ramsay.

Sec. 103. Petunias, single: 2, T. W. Burdon; 3, W. M. Ramsay.

Sec. 104. Phlox Drummondi: 1, John B. Goode; 2, W. M. Ramsay; 3, R. Jack.

Sec. 105. Sweet peas: 1, W. M. Ramsay; 2, John M. Nelson; 3, R. Jack.

Sec. 106. Zinnias: 1, W. M. Ramsay; 2, John B. Goode.

Sec. 106A. Pansies, 18 blooms, special prize of $5 from A. Joyce, confectioner: 1, W. M. Ramsay; 2, R. Jack; 3, John B. Goode.

Sec. 106B. Dianthus, 18 blooms, special prize of $5 from A. Joyce: 1, W. M. Ramsay.

Sec. 106C. Verbenas, 18 blooms: 2, W. M. Ramsay.

FRUITS AND VEGETABLES.

Sec. 209. Grapes, out-door: 1, Robt. Reid; 2, T. A. Hunt, Belœil; 3, P. A. Somerville.

Sec. 210. Grapes, in-door: 1, Robt. Reid; 2, P. A. Somerville; 3, T. A Huot.

Sec. 212. Pears: 1, W. Rawlings, city; 2, J. Murray Smith, city.

Sec. 213. Plums: 3, A. H. Dunn, Lachine.

Sec. 214. Corn, sweet: 1, T. Huot; 2, A. H. Dunn.

Sec. 215, Potatoes: 1, R. W. Shepherd, jnr.; 2, T. A: Huot.

Sec. 216. Tomatoes: 1, John M. Nelson; 2, T. A. Huot.

Sec. 217. Onions: 1, W. M. Ramsay; 2, John M. Nelson.

Sec. 218. Carrots: 1, W M. Ramsay; 2, O. Dagenais.

Sec. 219. Beets: 1, T. A. Huot; 2, W. M. Ramsay.

Sec. 221. Parsnips: 1, T. A. Huot; 2, A. H. Dunn.

SPECIAL EXHIBITS.

The following special exhibits, for which no prizes were offered in the catalogue, were also on view, viz.:

From Mount Royal Cemetery—Specimen of banana plant, pot of water hyacinthe, hydrangeas, and a collection of gladioli.

From Professor Jos. C. Carter, C. S. C., College de St. Laurent—A magnificent collection of dried Canadian hardy herbs.

From A. Pinoteau, city gardener—A very fine table, 6 x 6 feet, of seeding gloxinias, which were very much admired.

From G. A. Drolet, St. Aime, Que.—A table of globe artichokes, a vegetable which is a rare delicacy, usually imported, but which Mr. Drolet demonstrates can be grown to perfection at home.

From R. W. Whiting, gardener to J. H. Joseph, a plate of Okra, another uncommon vegetable.

From Michael Yon, florist, St. Catherine street, a floral design representing "Gates Ajar," and from W. B. Davidson & Sons, another design in the shape of a cross.

From Robert Hamilton, Grenville, a large collection (some 30 or 40 varieties) of Russian apples.

Last, but not by any means least, a large collection of out-door grapes, from Morris, Stone & Wellington, exhibited by Mr. Beall, their Montreal manager.

"STAR" SPECIAL PRIZE OF $50.

There was very keen competition for this prize, which was won by Mr. Frank Roy, superintendent Mount Royal Cemetery, with 115 points; Mr. George Trussell, gardener to J. R. Molson, being a close competitor, with 106.

EXHIBITION 1893.

AN EXPERT'S OPINION.

("The Gazette," 11th September, 1893.)

Mr. George Moore, who was deputed by the Minister of Agriculture, Hon. Louis Beaubien, to visit the horticultural sections of the Montreal and Toronto exhibitions and report on them to the Legislature, speaks as follows of that department at the Montreal exposition: "The good city of Montreal can boast of many improvements in late years, but none are more striking than her horticultural displays. The spirit of friendly emulation is evidently alive amongst her gardeners, and this was exemplified by the magnificent exhibition just closed, surpassing in every particular any previous one. The arrangement of the specimens and the decorations of the hall were in advance of anything before attempted here, and reflected the highest credit on all concerned. The asparagus, which few would recognize as such, placed as it was, formed graceful festoons of delicate green. The absence of bright-coloured flags, which never should be used in a floral display, was highly to be commended. We want no colours there but those with which nature gladdens us by her beautiful flowers, fruit or foliage, and immediately any other colouring matter is introduced the effect is marred. The artistic grouping of plants, introduced into flower exhibitions only a few years ago, is by far the most effective way in which their beauties can be displayed. The glorious groups, covering from 50 feet to 100 feet of space each, at this show were marvels of skill in their production and taste in their arrangement, and being ten in number they filled up the centre portion of the hall. The exhibitors were the following gardeners, whose names are given in the order in which the prizes were awarded: 100 feet, Messrs. Doyle, Beatrix, Roy and Bennett; 50 feet, Messrs. Kirkwood, Walsh, Roy, Beatrix, Smith and Davidson. The two first awards were so nearly equal that even the most careful experts found it difficult to decide. However, Mr. Doyle's group eventually carried the day. It certainly was as near perfection in clearness of culture, luxuriance of growth and correctness of arrangement as could well be desired. The rich colours of the perfect-leaved crotons, dracenas, caladiums and alocassias, and the brilliant flowers of the new French cannas contrasted and harmonized with the delicate green of the feathery palm, the fragile adiantum and the symetrical araucaria of Norfolk Island. The group that carried off the second prize was a really fine

display of horticultural skill; in fact, all these groups were above criticism, and did infinite credit to the gardeners of Montreal, and afforded a rich treat to all the lovers of flowers and to the general public, who crowded the building and expressed their delight by unequivocal expressions of admiration. Large as the hall was, it proved quite inadequate to contain all the specimens offered for exhibition, some of the fruit and vegetables having to find places under the table. Now that the horticultural department has proved such an unqualified success, it is to be hoped that the association will be able to enlarge the building before another season and light it from the roof, which would add greatly to the beauty of the show. The centre canopy was quite a leading feature of the decorations. The cool, refreshing water of the fountain, the fresh, green sod, dotted with choice cut flowers and potted plants of rare beauty, and hung round with the curious pitcher plants, added greatly to the beauty of the *tout ensemble*. It seems almost invidious to attempt to discriminate when all were so excellent. One could not refrain, however, from remarking the lovely orchids of Mr. Wilshire, the gloxinias from Mr. Pinoteau, the city gardener; a fine specimen of *araucaria excelsa*, and the climbing fern, *lygodium scandens*, from the Botanic gardens; a curious tree fern exhibited by Mr. Dawes, of Lachine, and a perfect *cycas renoluta* from Mr. W. W. Ogilvie's gardener, Mr. J. Walsh. Crotons, the most elegant of all ornamental foliage plants, never were so good in freshness and colouring; in fact, there was a freshness and perfection about all the productions. The tuberous-rooted begonias were never surpassed. The prizes offered by Messrs. Ewing & Co. brought out a very fine collection or two of cut flowers and wonderful onions. The *Star's* prize for the holder of the most prizes was won by Mr. F. Roy, and the prize offered for outdoor grapes by Messrs. Stone & Wellington was well contested. We want more public-spirited men who are willing to aid the good cause by offering special prizes for competition. The cut gladioli and hardy phloxes were unquestionably the finest ever exhibited in Montreal. Pansies, too, were exhibited as they should only be, with their stems and foliage, and, considering the season, they were very fine. The geraniums in pots, taking flowers and foliage into consideration, were as good as could be produced. A fine plant of the scarce lapagenualtra, with numerous flowers thereon, came from Rosemount. *Maranta regalis*, the largest of the marantas, was shown by Mr. Wilshire, also a number of palms of very scarce varieties. Table plants were beautifully represented, but some were too large for table decoration. Two very fine hydrangeas were added to the show, one from Mr. T. Holden and the other from Mr. W. W. Ogilvie, to which special prizes were awarded, as they richly deserved. Amongst vegetables, perhaps the most remarkable were the specimens of *tomato pondorosa*, from Mr. C. A. Smith. They were truly ponderous, but, nevertheless, solid and fleshy. The two collections of vegetables, one from Mr. Hall, and the other from Mr. W. B. Davidson, were fine, and there was

keen competition between them. There were a beautiful lot of cauliflowers, cabbages carrots, turnips, potatoes, etc., which more than filled the space allotted them. It was rather early for outdoor grapes, and the same may be said of pears. On the outside of the hall was a lovely display of palms, cannas and some models for carpet bedding by the sons of Mr. Roy. A prize of $50 to encourage the culture of the new French flowering cannas caused much competition between Messrs. Doyle, Roy, Trussell, Graves and Bennett, each holding his own well. The result was a victory for Messrs. Doyle and Roy. These cannas are proving very fine decorative plants either for the garden or the conservatory, as many of the varieties are perpetually in flower. In a word, the horticultural department was almost the leading feature of the exhibition."

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BROME COUNTY FRUIT-GROWERS' ASSOCIATION.

The twelfth annual exhibition of the Brome Fruit-Growers' Association was held at Brome Corner on September 11th and 12th, 1893, in connection with that of the Agricultural Society, in a large and commodious building erected expressly for the use of the Horticultural Association.

The show of fruit was large and of exceptionally good quality, there being more than 500 plates on exhibition. Mr. R. Hamilton, of Montreal, acted as judge of the same, and expressed surprise at seeing such a fine display.

In vegetables and flowers there was a fairly good exhibit, better than former years, with the single exception of potatoes, which were nearly a total failure here this season.

The society's membership has increased from 96 to 121 during the past year, and we have paid out this year in prizes the sum of $191.00, with a balance in the treasury of $26.69, besides distributing among the members over 200 apple-trees.

Our farmers seem to be taking an unusual interest at present in horticultural pursuits, which is certainly very encouraging, as there is no better place in the Province for fruit culture than in the County of Brome. I predict that in less than five years our society will have a membership of upwards of 200, and will be able to pay in prizes double the amount of former years.

Respectfully yours,

J. RAYMOND BALL,
Secretary-Treasurer.

QUEBEC HORTICULTURAL SOCIETY.

The annual general meeting of the Society was held on Saturday, 4th February, at the President's office, when the following annual report and financial statement were adopted, and ordered to be communicated to the press:

Annual Report, 1892-3.

Gentlemen,—One year more has rolled by, and the Quebec Horticultural Society has entered on its thirteenth year of existence, and though it goes on its way without making much noise, we are pleased to find that it is really doing some good, and is capable of doing a great deal more, if it only received the full encouragement it deserves at the hands of all those who have it in their power to encourage such institutions in various ways.

This year, for the first time since the Society has been started, the prize list has been issued in two languages, English and French, and the result has been that we obtained a few entries from the surrounding country. We had our usual annual exhibition in the month of September last, and were able to offer a better premium list than hitherto, covering more ground and having the prizes more equitably divided.

We feel sorry that all who have it in their power, and who have usually exhibited, did not do so this year, but trust that in future all will lend a helping hand.

Farm produce formed one of the classes for which premiums were offered, the Society aiming at covering the ground occupied formerly by the City Agricultural Society, and we are pleased to inform you that the Government recognized this in giving us assistance. Whilst we recognize the fact that Government lends material assistance to all such societies as tend to encourage agriculture and horticulture, we feel that some societies, under color of being provincial, receive much larger grants than we do, still we would welcome the day when all such societies become self-supporting, and this day will come when those who benefit by them learn to appreciate the efforts that are continually being made to their full extent. There should be interest enough shown in the concerns of our society by the public, the exhibitors and the members themselves to enable a society of this kind to do good work without calling upon the public funds, but until such time arrives we trust the Government will lend us the same helping hand that it has been doing up till now, and we feel confident the new Board of

Directors will so harbour our resources as to increase the Society's usefulness and expand the scope of its operations till we reach a state of self-support. The cost of our exhibition, this year, was $559.13, as against $647,53 the previous year, and we think it can be lessened still further without interfering with its usefulness or lessening the prizes. Three hundred and fifty dollars were paid out in prizes in 1891, and $335 in 1892. In 1891, 21 exhibitors made 335 entries, whilst in 1892, 20 exhibitors made 345 entries. The receipts at the door in 1891 amounted to $117.90, and in 1892 they amounted to $104.60. The number of subscribers to the Society is not large enough—they number about 62. The expenses of management are small, and have been kept as low as possible. We hope the Society will elect as Directors such persons as will take a real interest in its affairs, and thus endeavour to throw a little more life and interest into it. When it devolves upon a few to do everything, and those few are busy men, it becomes a tax to them, and the Society must suffer. We recommend you, gentlemen, not to consider us in electing your incoming Board, but to chose men, as far as possible, who are willing to give a certain amount of their time, and can afford to do so, in the interest of this Society.

On behalf of the Board of Directors,

R. CAMPBELL,
President Q. H. S.

Quebec, 4th February, 1893.

QUEBEC JOURNAL OF AGRICULTURE.

PAPERS BY MR. F. ROY.

The Society having obtained permission from the Honourable the Commissioner of Agriculture to edit a horticultural page in their *Journal of Agriculture*, to be devoted principally to the interests of the amateur-grower of fruits, flowers and vegetables, the work was intrusted to the care of one of our directors, Mr. Frank Roy, Superintendent Mount Royal Cemetery.

The *Journal of Agriculture* containing this horticultural page is being sent free of charge to every member of the Horticultural Society.

The following papers, contributed by Mr. Roy, appeared in the three first issues of the *Journal*.

A FEW OPENING REMARKS.

The very liberal manner in which the Minister of Agriculture, the Hon. Louis Beaubien, has responded to the request of the Montreal Horticultural Society and Fruit-Growers' Association of the Province of Quebec, in granting space in the *Journal of Agriculture* for a horticultural department, cannot be too highly appreciated. Such a department will fill a long felt want in the province, and will enable the Montreal Horticultural Society and Fruit-Growers' Association of the Province of Quebec to fulfil their provincial duties and obligations in a manner which otherwise it would be very difficult to accomplish. This space will be utilized to the best of our ability, and our chief aim will be to place before our readers clear and concise articles relating to the culture of fruits, flowers and vegetables. These articles will be devoted principally to the guidance of the amateur or beginner, and to try and encourage those who may have become somewhat disheartened from unsuccessful experiences in the past. The principal objects which we will keep in view of the readers of these pages will be to prevent failure, and insure success. This we will endeavour to accomplish by making the following articles plain enough to every one who may desire to grow fruits, flowers and vegetables to serve his own family, by giving plain but also very necessary instructions from the beginning of the preparations with regard to site, soil, shelter, fencing and drainage. Drainage, although here mentioned last, is by no means the least important. We will endeavour in the articles to follow on the different subjects to show the paramount necessity of properly preparing the

ground for the reception of the intended crop, whether it is an annual one such as onions or cabbages, or a permanent one such as the planting of an orchard, small or large. The proper preparation of the ground in every case lays the foundation for the success of the expected crop.

The necessary preparations required to put the soil in a proper state for fruit trees to succeed in should be well considered and not too hastily decided upon. From the many sad and unsuccessful attempts visible along the country roads in almost any direction, one would come to the conclusion that the trees had been first purchased, and then a make shift place allotted to them. Scarcely anything but failure could follow. Hurry in such a case is far from securing speed. Better make all preparations before purchasing trees, select the site where the soil is suitable, where shelter is natural, or make provision for it; fence it properly, and, above all, drain the place, so that at no time, winter or summer, water will lie within three feet of the surface. With these conditions, anything like perfect, almost every farmer would be safe in planting a few trees for his own use. There is nothing new in the lessons laid down here; they have been all taught over and over again, but the chances are that through this medium they may be presented to a new set of readers, and some of our Lower Canadian farmers who have tried fruit-tree growing and have failed, may take new courage and try again. If we can, through any directions in these pages, induce any one to try, and succeed in making one fruit tree grow where never fruit tree grew before, we will consider ourselves repaid for any trouble we may have.

CULTIVATION OF THE APPLE.

As the apple is our most valuable fruit, and as its culture so nearly corresponds to that of the pear, the plum and the cherry, the few general remarks which are to follow may be taken by the beginner as safe to adopt. The conditions to be decided before planting are: site, soil, shelter, fencing and drainage; these must have proper consideration, and a few simple directions under the above headings may serve the purpose intended. The site or position where apple trees are intended to be grown may perhaps be considered the least important of any of the above headings. It may be facing any point almost, and still succeed, with, perhaps, the exception of the north and on rising ground facing that point. East, south and west have been found equally advantageous for the purpose. Rising ground facing any of the points between east and west is preferable on account of the advantage it gives to fulfil the last and most important, perhaps, of any of the conditions alluded to, viz: drainage. If the site has been chosen, it may be made of sufficient extent as circumstances will admit, but it is advised that the experiment be tried on not too large a scale for beginners. It will be easy to extend when the hope of success is being realized. Select

a place if not larger than to hold six trees ; follow these instructions, and I hope that you will extend. The soil is the next condition to determine. This can be done with greater freedom than regards the site. We can make it, if it is not suitable, or improve it as necessity may require. To wholly make the soil will not be very often required, but when it would be imperative that it should be made, I would recommend to imitate a rather heavy calcareous loam. The calcareous or lime part need not be a condition, as that can be supplied separately. Three feet in depth of such a soil, all other conditions being favorable, failure need hardly enter into the considerations. The above I would rate as the best soil for almost any purpose provided with the proper fertilizers to suit the intended crops. To improve any soil it will be requisite to know about what are its parts, to be able to say what may be applied to improve it ; but a few general instructions may point out the direction to take. For instance, a sandy soil would require to be improved with clay, heavy loam and vegetable soil, or, what would be better still, an equal amount of the three, allowing the sandy part about equal to one-fourth of the whole. These different materials, well incorporated and mixed up, will grow almost any fruit tree. Other soils would require the materials in different proportions to arrive at or as near the criterion above mentioned as can be, which we may term a good all-round useful soil, and which, if it can be in any way nearly imitated, will be sure to give gratifying results. The depth of such a soil I would recommend to be about two feet, not less, more, if it can be conveniently had. As soils vary so much in their constituency, it is a safe guide to be advised by the sorts of forest trees growing in the neighbourhood. If elm, hard maple, white thorn, or oak grow especially well with proper preparations, most of our fruit trees would respond as far as the soil is concerned; but it always pays the planter to make sure he has the soil required, and to have it properly prepared. The subsoil, too, is a very important factor in the growing of any crop. A retentive subsoil is one of the very worst, as it keeps the soil on top in a too saturated condition, preventiug the passage of air and heat to enter into its composition, and practically shutting out the most useful agents to plant life. A too porous subsoil might meet with the opposite objection, but with sufficient depth of top soil properly prepared to receive and also retain the rains, it is seldom a porous subsoil is other than advantageous. Besides, it is not a very hard matter to supply a few newly planted trees with a few copious waterings the first season if it be a dry one, after which there will be very little danger. Where a dry soil has killed thousands of fruit trees with other bad management combined, wet soils have been the death of tens of thousands. These last remarks might be more correctly applied when we come to drainage, but their importance will, I hope, excuse thus being referred to here.

Shelter being next under consideration, will have to be left a good deal to the planter's necessities. Some will want to be better provided for than others

but all fruit trees will be immensely benefitted by proper shelter. Evergreens are the proper trees to use as a wind break, dispersed among decidious trees, planted on the west, north and east. They are better to be planted not too near the subjects they are intended to benefit, as crowding and sheltering are very different in their consequences. A screen or belt of about twenty or thirty feet wide, closely planted with fast-growing trees, such as soft maples, Norway spruce, tamarac, ash, elm, etc., could be made in a short time ornamental as well as useful. There is scarcely a farm but what would be benefitted by a pretty extensive tree-planting policy. In fact there should be some inducement from the government to get up model planted farms, some plans to induce the owners to improve the appearance, and, consequently, heighten the value of their farms. A pretty place would always draw a larger price if on the market than it would if it were merely a farm without the ornament of a single tree. How many such there are? and how easy it would be to improve them? There must be an inducement,—prizes or something to show the utility as well as the beauty of trees. Arbor day, without something to stimulate, does not seem to make the progress it should. Fencing may be left with the planter, with this injunction that fruit trees must be protected from the inroads of cattle by being securely (no matter by what plan) enclosed. This advice on fencing one would think superfluous; but how often do we see trees that might have otherwise succeeded, destroyed through want of this necessary precaution. Drainage is the next and principal condition that all fruit tree-growing so dependently hangs, so that we may be excused for dwelling on the subject for a little. Most of the ordinary farm crops, such as potatoes, turnips, mangolds, grains, etc., which have only an annual growth to mature, and whose roots seldom travel so far in search of the food required as trees do, can and are successfully grown on ground not underdrained. The proper cultivation of an orchard or a few fruit trees demand that the position they are planted in is underdrained to the depth of at least three feet. When drains are dug and filled again with tiles, or stones, or whatever they are made of, at regular intervals through the orchard, say 40 feet apart, then at least one part of the drainage is provided for,—that of the taking away of the bottom water or springs; but to make a success of these drains, the intervening spaces between the drains should be trenched or subsoil ploughed, the trenching to be at least two feet deep, subsoil ploughing as deep as it can be performed, bearing in mind, always, to keep the subsoil in the bottom; on no account bring it up to mix with the upper or soil proper. Then you have your place drained, for draining is intended not only to take superfluous water, but in a well drained and thoroughly cultivated soil the supply is more regular. Consequently, the necessity of drainage, and, also, of increasing the capacity of the ground at the same time by properly trenching it and loosening it to carry that better and steadier supply of plant food in the shape of vapour. A soil in a growing condition is always charged with this

vapour in a denser degree when too wet, or in a lighter degree when too dry. In this as in almost everything the medium or midway between wet and dry will be found to give the better results. Plant life depends on the earth, and its capacity to supply the proper elements of food in the shape of moisture and the gases necessary to form when assimilated the different productions in the vegetable world. It is wonderful how very little of the soil is taken up in all these productions. It is through this well drained and well cultivated medium that sufficient heat as well as moisture is brought to supply and stimulate the growth of the crop whose roots are travelling through it in search of the necessary nourishment to produce leaf, wood, flower and fruit, for these are all drawn from the same workshop. It is to be hoped that the foregoing remarks will show that to grow fruit trees the planter will have to comply, in a measure at least, with all the conditions which is repeated, viz: site, which should be the best at command; soil, which, if not up to the mark, can be made so. Shelter your trees, but do not suffocate them. Fence them properly and drain well your land as advised, and success will follow.

PLANTING.

If all the necessary preparations have been completed, as advised in the last issue of the *Journal*, and everything is in good order, the next step in the programme will be to prepare the places to receive the trees. It might be advisable to state here that when the ground is in the proper condition to proceed with such operations as the planting of potatoes or the harrowing in of the grain, then the operation of tree-planting can be judiciously taken in hand. This condition of the soil is important both to the operator and to the subject to be operated on. The earth, in that condition, will work clean, being neither wet nor dry (a condition that all soils should be in when being worked to the best advantage). The spring is perhaps the better time, taking everything into consideration, with the one exception that every sort of work on the farm requires all the attention that can be given to it in that short season. These hints are equally applicable to spring or fall planting.

If spring planting is to be proceeded with, it will be well to put the operation through as soon as the ground can be had in the proper state. If fall planting be decided upon (and the trees can be procured in the immediate vicinity), let the operation be performed early enough to allow the trees to take. Some time about the twentieth to the last of October being generally a suitable time, if all the other conditions are favourable then.

The places to be dug for the reception of the roots will require to be made sufficiently large to allow them to be stretched out to their fullest extent. It is poor practice to cramp or twist the roots into any other position than the most

natural one. Every root should be set in its own place without being entangled with any other as far as can be practically and carefully done. The aim of the planter should be to place the roots in as natural a position as possibie, which position should be almost horizontal in each individual case, allowing them to incline a little deeper as they extend outwards from the tree. The pit or place for the reception of the tree should be slightly convex in shape, having the highest point in the centre, where the stem of the tree will be placed directly above it. This incline from the centre will allow the dip to the roots advocated above. The proper depth to plant a tree is of the utmost importance to its well doing in after life. There is perhaps no better rule to adopt than the old one, that is, to plant as deep as the tree was growing previous to removal. To be accurate, however, the collar of a tree is the height that the earth should be made up to. This collar is the point from which the roots generally extend downwards and the same point from which the stem rises upward : the dividing line between root and top. The collar of a tree should never be covered deeper than an inch or so.

It will be well to examine the trees, and if any bruised or broken roots are attached, cut them off with a sharp knife. It will also be found very advantageous to puddle the roots of trees before planting ; and for the information of those who may not understand the process of puddling, I will here briefly explain it. The puddle consists of a mixture of clay, loam or road mud with sufficient water to make it of the consistency of thick paint or cream. When this is procured in sufficient quantity dip the roots into it. This puddle will form a thick coating all over the roots, and place within their grasp something to commence operations on.

On removing the roots from the puddle, they should be dredged all over with fine dust, such as road dust ; in fact, there is nothing better as a dredge than road dust ; this will firm up and increase the thickness of the puddle coating, forming a crust all over the surface of the roots, excluding the air and preventing the roots from becoming too dry while the operation of planting is being performed. This puddle actually supplies the young roots with the proper material in the proper place to commence a new start in life.

There is nothing I know of will encourage the growth of young roots on a newly transplanted tree better than the above puddling. When the tree is placed in its position and the roots properly placed, let it be held there while some of the finely pulverised good soil is placed among and over the roots. See that none of the roots are misplaced in this operation.

As the filling proceeds, it will be necessary to pack the earth among and over the roots. This packing process must not be carelessly or hurriedly performed. The packing must be done more firmly and the earth made harder than most of amateur tree-planters have any idea of. A good rammer for this purpose

is a cut of a young tree about five or six feet long and about four or five inches diameter at the larger end. The ground to be filled in and packed round the roots requires this packing process to bring the earth into contact with the roots; close, very close contact at that; so that, when the newly made roots make their first effort to extract nourishment from the earth, they will find the material to work upon close at hand for the purpose of supplying it, and also to keep them steady in their position.

Nothing in the shape of manure should come in contact with the roots of a newly planted tree. Manure can be much more profitably applied as a mulching than by incorporating it into the soil around newly planted tree roots.

As a mulch, the manure prevents the drying out of the soil and furnishes the food for the trees in an available form after the rains have washed down the proper fertilizing ingredients. Besides, the growth that has been forced with too much manure is very likely to withstand a hard winter with indifferent success.

PRUNING, THINNING, TRAINING AND REGULATING.

The proper care with regard to pruning, training and regulating fruit trees should commence the following spring after budding or grafting. We will take a budded tree as our example, the treatment being nearly the same as to training, trimming ete? The stock of a budded tree will require to be headed back, leaving about six inches above the bud for the purpose of supporting the young maiden shoot to prevent its being broken off. This heading back of the stock should be done in April before growth commences: and during spring and early summer it will be necessary to examine each and all such young trees for the purpose of removing robber shoots from the stock; or suckers as they are generally termed. The operation of removing these suckers is very easily performed when taken in time, as they can be rubbed off with the finger when young; to allow any other growth to come from the stock but the eye intended to form the stem of the tree is to weaken the growth of this stem considerably, or perhaps permanently injure its chance of ever fulfilling its mission to become a tree at all. When the maiden shoot is long enough to require support, tie it to the stump of the stock above the bud with something soft, such as cotton twine; this will be of great advantage until the young growth attains sufficient strength to stand without support; it will then be not so easily broken off by any of the thousand accidents which is likely to befall a young and tender growth.

It will be necessary to run over your young trees every week or oftener during the early and rapid growing season and rub off all robbers, as before intimated. Later in the season as the young shoot from the artificial bud developes there will be less tendency to send out suckers; but at all times suckers must be removed on sight.

About the middle or towards the end of July the projecting stump of the stock should be cut back with a sharp strong pruning knife in almost a line with the upper part of the growth from the bud. The cut should be a sloping one ; or as nearly corresponding to one half of a mitre joint as possible. For instance if the stock is three quarters of an inch thick the cut should extend upwards as far as the thickness of the stock. In heading back the snag at the time specified the wound will be healed completely before the end of the season. This constitutes the first stage in the pruning of fruit trees, or it might be better termed training as the term pruning is suggestive of the too frequent use of the surgical instruments. In fruit tree training it will be found an easier matter to keep them about right, rather than try to cure them when they have gone wrong, prevention being away above cure in this as in everything else. The next actual pruning operation is to head down the maiden shoot to the height required. It will be well to regulate that height not too high for trees intended to be grown in the colder or less favorable part of our Proviuce. Trees grown in the bush form often succeed where higher and more ambitious specimens would be sure to fail. As we proceed towards the North we find nearly every sort of tree more stunted until we reach the limit where it ceases to exist. We can always gain by translating Nature's lessons correctly. Where high stemmed standards would be sure to fail on account of our rigid climate, low grown dwarf bush forms would most likely succeed.

Many tender sorts of apples, pears and even peaches would succeed in our more favored positions if properly trained. In pruning as in almost every thing else a good beginning brings us a long distance on the road to success. After having headed down the maiden shoot to the desired height allow only as many shoots to spring from the stem as you require to form the commencement of the head ; say three branches ; let these be equally divided round the stem. These three branches should not be allowed to start too close to one another ; or in other words they should be allowed to come on the main stem from five to six inches apart. The head of any tree where the branches all radiate from nearly the same point on their stem is very liable to split in several pieces when loaded with even foliage. Five or six inches between these branches make them individually stronger and not liable to split when loaded with leaves and fruit. The above point is worth remembering in making a selection of trees from any nursery.

The following spring the three limbs left growing to form the head should be shortened half their length, and two shoots allowed to come from each, bearing in mind again not to let the branches come too close to each other for the reason before mentioned, splitting. The proper regulating of the growth of the trees will require very little after amputatiug ; in fact it is just about as useful to the tree to have some of its limbs amputated, as it would be for the pruner if

he had a finger or arm removed by the surgeon. Regulate your trees so that all the pruning they will require can be performed with your penknife ; or better still that you rub off the surplus shoots or buds with your finger. This will entail vigilance and constant attention on the part of the grower who intends to make his mark in fruit growing. Scarcely any obstacle can daunt those who are "eternally vigilant" ; nothing else will meet the requirements of good fruit cultivators. The eye of the tree trainer can see at a glance whether the shoot just coming will be well placed, if it would not it is an easy matter to rub it off. To allow a misplaced branch too grow large and then cut it off is fruit tree mismanagement It is lost energy on the part of the tree, it is lost time and lost profit to the owner. Allow nothing to start on your trees but *useful* limbs, branches, spurs, leaves and fruit; then, by so doing, you are directing all the powers and energies of your trees in the proper and natural channels of success.

It may be objected to that this doctrine will require too much attention and labor; intelligent labor at that. The time is approaching that haphazard fruit culture will be a matter of history. Those only who know the right principles will be able to remain in the business. The superior article is in demand, and he who can supply the superior article will be encouraged and will succeed. It is largely a matter of smaller orchards better attended to, with perhaps the same or a larger crop of finer fruit on the smaller space. Every country has been running a race to supply every thing of the cheapest. The demand in a great many instances now is to get the best, which is generally the cheapest in the end.

WINTER APPLES.

BY A. O. BAYLEY, DERBY, VERMONT.

Year by year, as the successive volumes of the report of the Montreal Horticultural Society come to hand, the first motion of the writer, on the receipt of a newly acquired volume, is to scan the index closely to learn what has been said about long-keeping winter apples, both new and old, suited to endure the rigors of a northern climate.

That others feel more than a passing interest in this matter is evinced by the frequent references in past volumes to the want of a first-class true winter apple that could be relied on for profitable planting in the province of Quebec.

To the expression of this want has been added by some the somewhat gloomy view that no such apple was in existence at the present time, and that there was but little reason to hope that such a one would ever be produced.

Reluctant as I am to accept as true so positive an assertion as that a large portion of North-eastern America is forever to be debarred from producing at least a home supply of choice winter apples, yet I am forced to admit that this discouraging view is but the deliberate expressed opinion of some of Quebec's largest and most experienced fruit growers.

Supposing we do admit that at the present time we do not have a satisfactory, well tested long-keeping apple, are we justified in forming the conclusion that such a one will never be produced? Human intelligence cannot guage the possibilities of nature; man cannot define the boundary line between the possible and the impossible in nature's work.

In support of the view that we have very good reasons to hope for the improvement in the winter apple that we so much desire, that nature may sometimes — when urged in the right direction — give us all that we can reasonably ask for, allow me to refer to a few well known instances of improvement in fruits and flowers that have been accomplished within the memory of living men.

The Concord Grape was grown from seed but a few generations removed from that which grew in a thicket on the banks of a Massachusetts stream. The Wealthy apple, which we all so much prize and which has done so much to advance fruit culture at the cold north, was evolved from the seed of a small and astringent crab.

As I sit writing I have before me a double Petunia, scarcely nine inches high, bearing three blossoms as large as a good-sized orange.

A few years since our florists would have scoffed at the suggestion that so great a change could be brought about by art in that unpretending flower

The question will be asked from whence is the apple that we seek to come; why have not the almost countless thousands of seedling trees that have been grown during the past century in the province of Quebec and adjacent states of New England already given us an apple of this class?

I will try and answer both questions together.

The few attempts at systematic, well directed efforts in the direction of improvement by the selection of seedling trees combining as many of the qualities needed as was found possible to secure, have been conducted on too small a scale for us to feel disappointment that no very encouraging results have as yet been obtained.

Peter Gideon, of Minnesota, the originator of the Wealthy, who has sowed apples for experimental purposes by the bushel, found that when seed of high class apples was planted, only one seedling in fifteen hundred would be equal to the parent. Thus it is seen that progress at the best is slow. One such apple as the Wealthy, however, amply repays for a lifetime of labor. The promiscuous sowing of fruit seeds, good, bad and indifferent, is almost certain to lead to the degeneration of that fruit, particularly when sown in a soil or in a climate unfavorable to the perfect development of that fruit.

This is amply illustrated by the history of apple culture in Northern Vermont. The first settlers came mostly from Southern New England; they brought and sowed in their new homes seeds of the fine varieties of apples which, even as long ago as the commencement of the present century, were to be found there. A colder climate, less favorable for the production of fruit, gave a product from this seed far inferior to the originals; yet I have been assured by persons whose memory went back to the commencement of the second quarter of the century, that there were to be found among those seedlings choice sorts that would not compare unfavorably with those in cultivation now. The art of grafting not being generally understood at that time, those fine apples were allowed to die unpropagated.

The improvement of the apple by sowing seed and waiting for the results is a slow process, so very slow that in this age, impatient for quick returns, but very few feel like taking it up.

The grafting of a seedling apple one year old into the top of a bearing tree will generally give in two or three years specimens of fruit by which we can learn as to appearance, quality and keeping properties of the newly created sort, but it will require years of patient waiting to discover the many things we wish to learn about the tree before we plant of the new variety largely.

An expert will judge with tolerable accuracy in many cases from observing the habit of a young tree what its future conduct will be, but even he is very

liable to be deceived. Some varieties, very hardy, vigorous and productive when young, run their natural course and die soon after becoming large enough to afford paying crops; others, decidedly unpromising, tender and unproductive while young, harden up as they become older, and make large-sized, long-lived, productive old trees. Of these two classes of trees Wealthy is a very good example of the first, while Bethel well represents the second.

Without doubt the line of experimental work which promises to give the best results in the improvement of the apple is by what is known as hybridization of varieties. A cross between such fine quality long-keepers as Northern Spy or Newton Pippin and some of our hardy and productive summer apples like Peach of Montreal or Oldenburgh, should give us an apple combining size, quality, keeping properties, productiveness and hardiness of tree. Some remarkable work has been done in recent years in the hybridization of fruits. Take the grape, for instance, T. V. Munson, of Texas, has produced,—perhaps it would be more proper to say created,—grapes possessed of almost every combination of qualities, and is ready to produce any kind of grape called for. Luther Burbank, of California, has obtained equally wonderful results with other fruits. Equal or more valuable results may be expected from this line of work done on the apple. The apple, on account of its importance, offers a most tempting field of labor to the hybridizer.

Canada has within her own border the skill to do such work. She may not have a climate as favorable for obtaining startling results, but even with that drawback we can reasonably expect for the creation of new fruits far better adapted for the purposes we want them than any that we have now.

Properly, this work does not belong to individual enterprise; its legitimate place is at the Experiment Station. Canada already has such a station at Ottawa, fully equipped to do such work.

I understand that it has already been commenced on a grand scale and will venture to predict that the next generation will eat fruits of home production that would surprise us of the present were we here to see and taste.

The pertinent and practical question which will be asked by the intending fruit grower of the present day: Have we now at this time varieties of winter apples that can safely be relied on for profitable planting in the Eastern Townships of Canada and other places with a similar rigorous climate?

This question, I believe, with this reserve—trees properly grown and given proper care—can be candidly and truthfully answered in the affirmative. While hoping and expecting for great improvement in hardy winter apples in the future, I confidently think that even now varieties can be selected from those we now have that may be planted with reasonable prospect of satisfactory returns.

Although I cannot point to any very marked success within the district mentioned, with winter apples, yet there are a few orchards scattered through the country that do grow winter apples profitably on a small scale.

Sufficient has already been accomplished in that way to attract the attention of careful and observing people who are catching on and beginning to plant quite extensively, and right here I wish to venture the remark that I believe that with the varieties we now have,—summer, fall and winter,—that orchard planting of apples in the cold north will prove as safe and profitable investment as people ordinarily can make.

I will not attempt to make out a list of the most desirable and profitable winter apples for northern planting, giving preference to any particular variety. Instead I will give notes from personal experience and observation on a few sorts that appear to be especially promising, adding to the number others that I have tested and found deficient in some respect.

Canada Baldwin.

This variety has been frequently referred to in past reports of the Society, sometimes with favor, at others with disfavor. I have three trees ten years planted; they have made a fine, vigorous growth, and are so far perfectly healthy. These three trees have never given me a peck of fruit all told, where Wealthys of the same age have yielded bushels.

The fruit with me is below medium in size, and scabs badly. I know of trees planted twenty years or more; they yield moderately of very inferior fruit. I do not feel like planting more or recommending it to others.

Bethel.

Twenty-five years of close observation of the Bethel, both at home and abroad, leads me to conclude that it is a valuable apple for northern planting, yet it has not until recently attracted much attention among those in search of a choice winter apple.

A few Canadian apple growers have discovered that it possesses merit and are studying its history.

In Vermont, the place of its origin, it has been planted but sparingly and has not generally received treatment calculated to bring out its good qualities.

With the nursery man whose sole object in life is to make all the money he can out of his business, regardless of customer's advantage, the Bethel is not a favorite; its straggling, awkward habit of growth in the nursery row makes it decidedly an unpromising subject to deal with. Perhaps, for this reason, no nurseryman has ever undertaken to push it into notice; consequently, what

popularity it has, has been of slow growth and gained solely by its own merits. The Bethel has another fault sufficient to excite distrust: young trees on very rich soil sometimes make a late autumn growth that does not winter perfectly if the season happens to be severe. The Bethel, when once well established in orchard, is as hardy as any pure American apple that we have among those descended from West of Europe stock. The Bethel is not an early bearer, but increases both in vigor and fruitfulness as the tree grows older. Trees twenty-five years planted have a diameter of trunk fully double of that of Fameuse of the same age. The Fameuse are past their prime, the Bethel gives promise of many years of usefulness.

To what extent the Bethel has been planted in Canada I cannot say. I know of a few scattering trees in the Eastern Townships which are much admired by those who grow them.

Winter St. Lawrence resembles Bethel much in fruit. I have sometimes thought that they were the same, modified somewhat by soil and climate. The Bethel, however, is a long-keeper, while Winter St. Lawrence, I have been told, is but an early winter sort.

Ben Davis.

In my first attempt to grow apples I planted largely of Ben Davis. They are all dead now, except one that stands in a sheltered spot.

The Ben Davis tree is tender and quite sure to die after producing one or two crops. Ben Davis is a poor apple in quality, even when grown where the summers are as long as they are in Southern Missouri; here, at the north, it fails to grow to maturity, and, consequently, is still poorer in flavor.

Scott's Winter.

This variety is a much better apple both in tree and fruit than Ben Davis for northern planting. This variety originated in Northern Vermont, within a few rods of the boundary line, in as cold and bleak a spot as we usually chance to find. It is an apple that has descended from West of Europe stock, and is a fine example of a gradual adaptation of an originally tender race of apples to the conditions of a severe climate.

Scott's Winter is an apple that has gained more celebrity abroad than at home; perhaps the richer soil and warmer sun of the prairie region of the West improve its size and quality. Although a good keeper when grown at home, it is too small in size and acid in flavor to ever become popular with the mass of consumers.

Arabka.

This is one of the very few among the new Russians that can, with any kind of propriety, be called a winter apple. The late Mr. Chas. Gibb has several times referred to Arabka in past reports of the society.

Its one great fault is poor quality. It is an apple that it is impossible to get up much enthusiasm over, especially after an attempt to eat one; yet it possesses nearly all the other properties we want in a market winter apple: hardiness, vigor and productiveness of tree, large size, good shape and fair appearance of fruit. The Arabka that I have is 257 of Professor Budd. I do not know if it is the same as that of Ellwanger & Barry. Mr. John Craig, of the Ottawa Station, says the same.

The Arabka keeps with us well into the month of May with common care. I cannot help thinking that this Arabka has a prominent future before it for northern planting.

Wealthy.

Like all the rest of the horticultural world I do homage to the Wealthy. Probably no one apple ever introduced has done so much to advance and make possible successful apple culture within the borders of that wide belt of territory where the growing of choice apples has been found so difficult and uncertain on account of a cold and unfavorable climate. The size, beauty, fine quality and productiveness of the Wealthy excite the admiration of all who behold it for the first time, and create the desire to grow so beautiful and good a fruit. Probably at the present time more Wealthy are being planted at the North than of all other kinds pnt together. It combines so many good qualities hitherto not found in any one apple that its faults have in a measure been overlooked. The Wealthy is very nearly climate proof, no fault can be found with the hardiness of the tree.

Its greatest merit in the eyes of some, the habit of excessive productiveness is really its most prominent fault. Overbearing causes the fruit to run too small for market, sometimes to drop badly before ripening, diminishes the vigor of the tree and induces disease of the trunk that shortens its days of usefulness.

The keeping qualities of the Wealthy have been a matter of some dispute; how it keeps depends upon where it is grown. Grown in Central Minnesota, it keeps all winter; further north, in Iowa, its season is early winter, while in Missouri it is classed with early autumn apples. At the East, elevation plays an important part as well as lines of latitude; with me it keeps until the middle of March with unimpaired flavor. In the St. Lawrence and Champlain valleys I should expect its usefulness would end with the month of January.

Peter.

A seedling of the Wealthy grown by Peter M. Gideon has not been before the public long enough to pass accurate judgment on its merits. I should not refer to it here were it not that Mr. Gideon personally assures me that it is a much better apple than the Wealthy, both in tree and fruit, and that he has kept the fruit until August with common care. I have it bearing heavily the present year, and hope soon to know more about it.

Fameuse.

Any reference to varieties would be incomplete that failed to mention that prime old favorite of the Montreal gardens. Except in sheltered locations throughout the colder and more elevated parts of the Province of Quebec, and also including quite an extent of territory in New England, the Fameuse belongs to the half hardy class of trees, the most worthless and disappointing of any because they encourage hopes that are never realized.

A few trees occasionally will live and bear for years, but the fruit is much smaller than that grown about Montreal, is inferior in flavor, and scabs as bad or worse than elsewhere. Along the shores of Lake Memphremagog are the summer residences of many wealthy Montreal people. In the gardens attached to their grounds the Fameuse has been planted to some extent with a fair measure of success.

In those places where the Fameuse fails on account of tenderness of tree, I have recommended the planting of the Switzer as a substitute. The Switzer is an apple that resembles the Fameuse much, is nearly as good a keeper, and grows on a tree of unrivalled hardiness and vigor. Neither Fameuse or Switzer, however, are true winter apples.

THE MOST VALUABLE "IRON CLADS."

BY DR. HOSKINS, NEWPORT, VT.

It is now about twenty years since this name, "Iron Clad," was applied to a section of our cultivated tree fruits. It was thus bestowed, no doubt, because of the contemporaneous application of iron armor to naval vessels, and it is supposed to indicate those tree fruits which are able to endure without injury the coldest winters of the States and of the Canadian Provinces. It is applied to apples, pears, cherries and plums, indifferently, and also to various ornamental trees and

shrubs that are planted about our houses, or in our parks and cemeteries. But, in this brief paper, its use will be limited to fruit trees, either native or foreign.

The first great impulse given to the search after this class of fruit trees was the widespread destruction of orchard trees in the Western American States,—especially in Minnesota, Wisconsin and Iowa,—which took place, I think, in the winter of 1867-68. These states, though then of recent organization, had taken much interest in fruit culture, and many orchards had been planted. These had thriven well for some ten or twelve years, and had begun to reward the enterprising men who had planted them, when an unusually low and long continued winter temperature, following a dry autumn, came near to working entire destruction of the fruit trees over a territory of 100,000 square miles.

While looking over these ruined orchards it was everywhere noted that two or three varieties had entirely escaped the general ruin; and when the unfortunate orchardists met together in their agricultural and horticultural assemblies, they found that these varieties of apples were those known as "Russian." Some of the interested parties were men of political importance, and were thus able to get an appropriation from Congress to the Agricultural Bureau for the importation of a large assortment of apple trees from Russia.

A good collection, indeed a very large and varied one, was made, under the directions of Russian officials, at the request of the American legation at St. Peterburgh; and these trees and scions arrived safely at Washington, whence they were distributed all along the northern borders, from Maine to Minnesota. The manner of distribution, however, was somewhat faulty, although very wide and general. The scions were sent, mainly, direct to the farmers, through their representatives in Congress; and, as farmers generally know nothing of the art of grafting, most of these Russian scions were doubtless flung into the fire. At the present time, scarcely so many as one-fourth of the varieties of apples imported at that time are known to exist in America. Enough, however, was learned from those which escaped and reached the colder regions of the country, to prove that the apples of Russia are much harder than the old stock mainly derived from England, and that many of them possessed desirable qualities, entitling them to wide propagation even in localities where their resistance to winter's cold was not an important consideration. And it is a rather singular fact that these Russian apples have shown themselves hardier against southern heat as well as northern cold than the older importations from England and France. Many of them succeed admirably, even down to the shores of the Mexican Gulf, although, of course, they there mature their fruit very early in the year.

As your society is well aware, the partial success of this enterprise gave rise, some ten years later, to what is known as the Budd–Gibb expedition, whereby

it was designed to make a wide personal examination of Russian orchards and gardens, and to bring back not only a full list of the best, and especially the longest-keeping apples, but also the other tree fruits, as well as of ornamental shrubs, trees and perennial garden plants. All this was successfully accomplished; and parties interested, all over the continent, have been growing and studying these importations with the view of making an intelligent selection from amongst them of such as are best suited to their own locality. In this work most valuable assistance has been and is still being rendered by the agricultural colleges of the United States and in the governmental experiment stations of Canada.

Time enough has now passed to enable us to judge somewhat of the results of this investigation of Russian fruits upon American soil, and it must be said that these results, so far as they have gone, are fully justifying the hopes of its promoters. The immense value of the work done is beginning to be appreciated, both in the United States and in Canada; and as it is more and more developed, I am myself, as are also so many others, moved to deep grief that the man without whom it is hardly probable that the work would ever have been so thoroughly accomplished is not alive to witness the results of his far-sighted, patriotic and benevolent ambition. The name of Charles Gibb must ever be enshrined among those who have well and nobly served their country and their time. Let it never be forgotten, or sink into obscurity through the neglect of those whom he has so grandly benefited.

Referring back to the title of this too hastily written paper, the manifest defects of which, I trust, may be pardoned, I will here make some special reference to the most important part of this subject, as it concerns the orchardists of our Northern States and the colder parts of the Dominion. Have we found amongst these importations any tree fruits, and especially any apples, that will completely "fill the bill" as market fruit for all seasons, both for home use and the home market, and for exportation? I am happy in the belief, the full belief, that we have accomplished that desired end. And yet it has come about in that strangely common way which so often attends a valuable discovery. As the great market apple of New England, the Baldwin, — more largely exported than any other single sort, — was found as an unheeded and long unrecognized chance seedling by a pasture fence, known long as the Woodpecker Apple, because so defaced, and finally killed, by that busy bird; so it has been my luck among a host of Russian trees sent to me by Mr. Gibb and Professor Budd to find an apple every way the equal of the Baldwin, and, I think, its superior in dessert quality. I regret very much that I am not able to say whence I got it, for it was among a number for which I could find no place, and which therefore I transferred to a neighbor, that they might not be lost. It has been planted

eight or nine years, but was only brought to my notice in October of last year, when I received a peck of the fruit for trial. The tree has been bearing three or four years, and last year it produced upwards of a barrel of fine apples. The samples that were sent to me were placed in a basket upon a shelf in my cellar and given no extra care. By midwinter it was evident, on trial, that it was a fine apple as to quality as well as appearance, and at that time it was just coming into eating condition. Without any decay or loss of quality it continued firm aud sound through March, and late in that month I forwarded samples of it to the well known Mr. E. S. Carman, so long the editor of the *Rural New Yorker*, than whom there is not a more competent nor a more critical judge of fruits in America. This is his judgment:—"This unknown apple was recei ed April 1st. It was in prime condition as to solidity, and in quality was fully as good as Baldwin at its best."—*Rural New Yorker*, April 29, p. 299.

It is a matter of much regret to me that neither by any of the printed observations of Mr. Gibb, nor by the judgment of Prof. Budd, has this apple been identified. It is certainly by far the most desirable apple, in every point, that has yet come under my notice amongst the importations of Messrs. Budd and Gibb. It ought to be in bearing somewhere in Canada. It can be easily identified by this description. Nothing very near like it have I found or heard of from Prof. Budd or elsewhere. I hope it is in existence on the old experimental ground of Mr. Gibb, at Abbottsford. With not the least doubt I hail it as the long sought-for export apple for Canada and northern New England. It is strange that this, among all the others, has not before attracted notice. It will be some time before a large number can be propagated from the single tree; but when I remember how quickly the Yellow Transparent spread from the single tree in my orchard (fruit from which was first exhibited at the fair of your Society in 1879), I anticipate a very rapid spread for this most remarkable, much desired and earnestly sought-for apple. I have never despaired of such an apple's being found at last, but, certainly, I never expected that it should have come unknown into my own hands and be given away. It cannot be that this single tree is the only one growing in America. Let it be carefully sought for through all the orchards where the Budd-Gibb importation has been distributed.

APPLE CULTURE AND THE ENEMIES OF THE APPLE,

BY REV. CANON FULTON, ST. VINCENT DE PAUL.

I do not write to induce anyone to plant a large orchard for profit, for, really, the question before us to-day, is not as to how we may grow more fruit, but how we can better handle, pack, transport, and distribute what fruit we have. For the benefit of amateurs I would say that you must realize this fact: that it takes ten years to bring an orchard to a state of profitable bearing, so that mistakes in planting is a serious matter. First, make choice of the highest and dryest land that you have, and plant not deeper than they are in the nursery bed, and give no protection to the north or west—in fact a north aspect is the best—and plant not less than 40 feet apart, the *Fameuse* 50 feet. Plant a tall-growing tree and one of a spreading habit alternately throughout the orchard, reversing the order with each row. Sorts: EARLY.—*Red Astrachan*,

Yellow Transparent

(these two are not for commercial purposes)

and *Duchess*.

AUTUMN.— *St. Lawrence*,

Alexanders and

Fameuse.

WINTER. — *Ben Davis*,

Golden Russet.

In order to keep the growing tree in proper shape, rub off any bud that if allowed to grow would interfere with the distance that the lateral branches ought to be when the fruit and leaves are on, likewise to keep the head of the tree open, and also to keep the stem free from suckers, thus obviating the necessity of cutting off branches. You will then have a smooth tree instead of a knotty one. The land may be cultivated with hoed or garden crop for eight years, care being taken to keep each year a proper distance from the outer branches, so as not to interfere with the spread of the fibrous roots of the tree. And they should not be cultivated through later than August to allow the buds to mature and harden. After eight years the land should be given up to the trees. I have found basswood bark peeled from trees as large again as the trees you require to protect to be a good cover for the trunks of the young trees to save them from sun scald, and also as a trap to catch the larvæ of insects. They ought to be slit (not separated) in three or four places to prevent the bark gripping too closely, and to enable its being opened at pleasure. No stock of any kind should be allowed in the orchard, not even in one full grown. To quote Judge Boggs: "There is no magic about hogs, as some seem to suppose, which makes the rooting up of the ground at haphazard, and here and there in holes by an old sow in search of food, better than system-

atic ploughing by an intelligent and thoughtful man. Besides, hogs are likely to rub and scratch themselves against the bodies of trees, which not only misplaces and loosens them in the ground if they are small, but the friction of the rapid rubbing of the body of the hog against the trunk heats and burns the bark of the trees." Now, as to spraying, the most important part is, the imperative necessity of procuring a good reliable force pump and spray nozzle and according to the size of the orchard, to have everything prepared to spray,—first, before the bud bursts, to kill the spores of the fungus that produces the apple spot; next, when the leaf is half out for the curling worm family, then codling moth, etc. I will try to put in plain words what I consider the proper remedies to use in spraying: First, blue stone and a small quantity of lime for the fungus spore before the bud opens; then, when the leaf is bursting out, spray with kerosene emulsion for the green aphis, and as soon as the leaf is half out, Paris Green or London Purple and lime for the curling worm, and keep this up until the bloom comes out. With respect to the curling worm, I cannot be too emphatic warning you to destroy it, for, if allowed to get covered in the leaf, it is very difficult to conquer;—the particular one I have reference to is like a cheese maggot. It passes from the leaves into the fruit spur and cuts off the stems of the bloom, or if any apples form it cuts the stems and causes them to fall. After the bloom is over, use the Paris Green and lime until the apple has turned down. From that time use the kerosene emulsion to keep insects off the leaves and fruits; for the leaves are the lungs of the trees, and unless they are healthy you cannot expect good fruit. If it is a wet season, and favourable to the growth of the fungus spot, use lime with the kerosene emulsion; and, if a little alum be added, it will prevent the lime from being too readily washed off.

To prepare lime for spraying mixtures, get fresh-burnt lime (Swanton is the best) and slack about a peck in a large tub; keep it well covered with water and well stirred, so as to allow the water to act on every part until it is properly slacked; then pour it into a barrel (an empty kerosine barrel), and repeat this until the barrel is full. It will settle down into the state that the plasterers call putty, and is then prepared for use in any quantity you may require, and will keep for more than one season, provided you keep it covered with water.

With the Boss Nozzle I had some large trees whitewashed to the topmost branches with both a thick and thin wash. I hope to have a large number of trees whitewashed before the bud comes out.

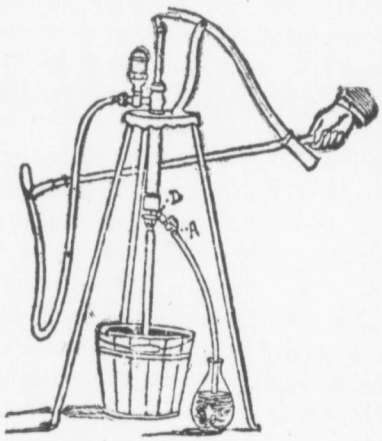
Bordeaux mixture is only blue stone (sulphate of copper) and lime. The diluted Bordeaux mixture formula, as given by Mr. Craig, is:

Copper sulphate (blue stone)	4 lbs.
Lime	4 lbs.
Paris green	4 oz.
Water	50 gall.

This is no doubt a good fungicide and insecticide, but as prevention is better than cure, I would only use the blue stone and lime in the above proportions before the leaf comes out. After the leaf comes out I would use 3½ oz. of Paris Green, or a like proportion of London Purple (I prefer Paris Green), to 40 gallons (a kerosine barrel) of water. From experience of eight or nine years, I have found it to answer well as an insecticide. In using the lime as prepared you ought to put one quart to represent one pound of lime; but a good guide would be to put in just sufficient to show white on the leaf.

I intend to depend this summer mainly on the lime without the blue stone, for, if each leaf is coated with lime, is it not sufficient to prevent the growth of the fungi? The Paris Green may be applied once after the bloom is over, for the codling moth; and if I can procure a pump to distribute the kerosine, as per cut annexed, I will depend on it and the lime to keep the leaves and fruit free from all insects; thus doing away with a grave objection some have of using poisons on the fruit. Try it, and then let us compare notes.

I find in the St. Johns News of the 14th of July, that Professor Goff has made experiments and perfected a kerosene spraying attachment that may be attached to any spraying pump, and as it is not patented and would be of great value to both fruit growers and florists, I hope you will find space for the article



THE PUMP WITH KEROSENE ATTACHMENT.

in your report, and that some reliable pump maker may be induced to manufacture them at a reasonable figure.

APPLYING KEROSENE FOR INSECTS.

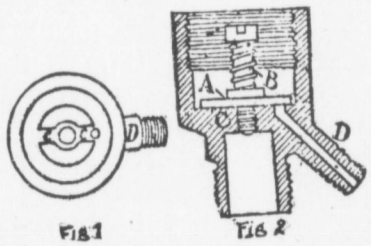
(Professor Goff's Method as described in a report from an Experiment Station.)

Kerosene emulsion, when properly made and applied, has proved a valuable

insecticide for a class of insects not readily destroyed by other means. The making of the emulsion is, however, accomplished with more or less difficulty. Professor Goff, in the hope of discovering a method by which the kerosene and water could be so intimately commingled during the spraying process as to do away with the necessity of preparing the emulsion separately, began experiments in this line which were continued through several seasons until satisfactory results were gained.

The method is very simple and consists in so constructing the lower valve seat of a pump that it allows the entrance of water through one opening and kerosene through another, the two liquids becoming mixed in passing through the valves and cylinder of the pump and finally broken up into an exceedingly fine spray by being forced through a good spraying nozzle.

The pump used by Professor Goff was the "Little Climax," but other spraying pumps on the market would, it is believed, answer as well with similar modifications. This pump, with its kerosene attachment, is shown in the first cut. The modification is illustrated in detail in the second cut, where the first figure represents a transverse and the second a vertical section of the valve seat. In the pump used the valve and valve seats are of brass. The lower valve shown at A, Fig. 2, is held in place by a screw, B, which fits in a bridge, C (Figs. 2 and 1), extending across the centre of the orifice for the entrance of the water. In the modification of the pump a new casting was made similar to the original one, except that it had a projection at one side (D, first cut) so placed that a hole drilled through it lengthwise passes through the centre of the bridge alluded to near one end. To this projection is attached by a screw coupling a stop cock (A, same cut), and from this a lead or rubber tube extends into a vessel holding kerosene, the regular suction tube of the pump being inserted into a pail of water.



TRANSVERSE AND VERTICAL SECTIONS OF ATTACHMENT.

The operation of the pump is plain. The water enters through the ordinary channel, the kerosene through the side channel, while the valve in closing closes both channels. The mechanical mixture secured by this apparatus, while not absolutely permanent, is sufficiently slow of separation for safe use on plants,

unless the amount of kerosene exceeds 10 per cent. If it is desired to change the proportion of kerosene, the stop cock is turned in the desired direction, and when one wants to spray with water only the stop cock may be closed or both tubes placed in the water. Farmers in possession of spraying pumps will appreciate this attachment, which is not patented, that secures a thorough and rapid mixture of kerosene and water during the spraying process. Bisulphide of carbon sprayed with water through this attachment makes a mixture that is sufficiently permanent for practical purposes.

NOTES ON APPLE-GROWING IN BARNSTON, QUE.

BY J. V. PAPINEAU.

Duchess.—Trees of this class are very hardy in fruit-buds as well as in limbs and trunk; need very little pruning; bear about annually and abundantly; good-sized fruits, not affected by black spots, well shaped, attractive in colour, having abundant red streaks on light green ground, with very few culls; bear young; good for cooking, even long before maturity; age of oldest trees, 25 or 30 years; Ironclad.

Peach.—Probably the most extensively grown here. Trees very hardy; upright growers; bear heavily, but not very young,—every alternate year; fruit, good desert and cooking quality, fair size, yellow colour, with darker cheek, sometimes red on sunny side, does not spot, shows its bruises very readily. Oldest trees about 30 years old. Ironclad.

Of the above two varieties there are more raised than for local demand.

Tetofsky.—Very hardy; upright grower; bear very young and profusely; needs very little pruning. Fruit, yellow, with little red mixed, showing its bruises; not large; flavour, good; quality, dessert and cooking; liable to spot, and fall before maturity. Oldest trees about 15 years old. Ironclad.

Wealthy.—Great bearers, commencing very young and bearing annually,—heavily in alternate years; need very little pruning. Fruit, fair size, deep red on light green ground, very showy; good quality, excellent for cooking, and a fair dessert fruit, having a little bitter aftertaste not disagreable; does not spot. Fruits, hanging mostly on the end of twigs, are a little too apt to fall prematurely, would probably be a very good kind to grow on the wall. Although these trees show several signs of short life, they should be planted as profitable. Oldest trees about 15 or 18 years old. As the trunk and forks of main limbs are the weak parts of these trees, perhaps grafting them on four or five years old sound trees would give good results.

Scott's Winter.—Very hardy; slow growers, maturing their wood to perfection; very healthy-looking, smooth bark, round-heading; need little pruning; bear annually, not very large crops. Fruit, deep red on dark green ground, hangs well to the tree; very sour and hard until about May or June, when it becomes a fair fruit for dessert and excellent for cooking; lacks a little in size. Not extensively grown. Ironclad.

I have limited this list to five well-known varieties that seem to be sure success here under good management. There are other kinds that succeeded well, as far as I know, the most prominent being Red and "White Astrachan"; "Yellow-Transparent," which is gradually taking the place of "Tetofsky"; "Switzer" is a type of hardiness, as well as "Gedeon"; Vargul," "Titovka," "Charlottenthaler," "Antonovka" and "Gipsey Girl" look thrifty, hardy and promising ironclads; "Fameuse" and "St. Lawrence" are only semi-hardy and spot badly; "Bethel" and "Blue Pearmain" are, by far, too shy bearers to be called profitable; "Kellogg," "Russet" and "Ben Davis" are not hardy enough and require too much pruning for our severe climate; "Northern Spy" is a complete failure.

I am conducting a few experiments in view of obtaining a winter variety having the following requisites: *Early and abundant yearly bearing on different soils, hardiness of tree in the cold north, natural growth, i.e., needing very little pruning; good size and evenness of fruit, with freeness of spot; sound, deep red, attractive colour, not showing bruises, and long-keeping, fair dessert and cooking quality.*

I use cross-breeding to obtain my object, and the following are the varieties I am operating upon:

Females.		Males.
Switzer,		Ben Davis,
Wealthy,		Bethel,
Duchess.		Scott's Winter, Vargul.

I have been very unlucky this year, as my cross-fertilized apples all fell to the ground, although not before they were advanced enough in maturity to use their seeds.

I mention my plan of campaign so that others may follow and improve it, and, perhaps, make timely suggestions.

NEW FRUITS: VALUABLE AND OTHERWISE.

BY

JOHN CRAIG,

Horticulturist Central Experimental Farm, Ottawa.

The interest in and progress of horticulture are well marked by the number of new varieties constantly being brought before the public.

Some of these are destined to become of great service to planters, while others will prove a source of loss. It is a regrettable fact that the extent of advertisement which a plant receives is not always in direct proportion to its intrinsic value, but is chiefly dependent upon the enterprise of the nurseryman who is pushing its sale. In this way many plants are so frequently and so forcibly brought before the horticultural public that they are purchased and tried, with the result of experience gained at the cost of considerable pecuniary loss.

It is my purpose in this brief paper to draw attention to a few fruits in the different classes, which have been brought before the public in various ways, with a view of commending some, and discouraging the planting of others, as it is quite as valuable for us to know what not to plant, as it is to know what it is wise and advisable to set out.

Apples.

Among apples a variety called "Royal Table," described as follows in my report for 1890, will, I think, take a deservedly prominent place among our winter apples of the future: — "This apple is of North German origin, a later importation by Prof. Budd. The trees at Abbotsford are compact growers, with round topped heads, slender twigs and medium sized leaves; they have made vigorous growth, and seem to be perfectly hardy. Fruit, medium to large, conical, ribbed, greenish, with dull red stripes on the sunny side, calyx open, basin wide, wrinkled, stem short thick, cavity wide shallow, flesh greenish white, inclined to be tough, quality fair. Season: specimens stored in my cellar were firm and in good eating condition early in March last year. Unfortunately this year the tree has been considerably affected by blight, which has been injurious to an unprecedented extent on Crabs and Russian apples."

Another kind which will be principally valuable, probably on account of its great vigor and thrift, is "McMahan White": — The fruit of this was exhibited at the last meeting of the American Pomological Society at Washington, grown

both in Wisconsin and Minnesota. A large oblong waxy yellow apple, with a light blush on one side, flesh white, juicy and of fair quality. A dozen trees of this on the Experimental Farm are among the most vigorous and healthy in the orchard. Mr. A. L. Hatch, of Ithac, Wisconsin, writes me as follows:—"A seedling from Alexander was introduced here about 20 years ago, and is proving more valuable than any other. It will grow and bear apples next year, when other varieties are tired out. I had 80 barrels of it this year,—sold in Chicago and St. Paul higher than any other of its season."

"LaRue" is not a new variety, but is mentioned here with the object of emphasizing its value for planting in the province of Quebec. The tree is a strong grower of "Northern Spy" type. It is not a very young or heavy bearer, and should be planted on strong soil in order to get the best results. The fruit is large, oblate, red in color, somewhat mottled, very handsome; keeps till midwinter. It has been brought before the public already through the medium of the *Canadian Horticulturist*, in which a colored plate appeared in one of the late numbers. I have noticed, however, this year, that it has been subject to blight in the Ottawa Valley, to some extent.

Plums.

I will merely mention "DeSoto," without giving a description, taking it for granted that it is well known in most parts of the province. It certainly deserves careful attention by planters.

Other varieties of the same class, viz:—The American type are: "Hawk-eye," "Weaver" and "Wolf." These may briefly be described as follows:—"Hawk-eye,"—fruit almost round, dark red with lilac colored bloom; suture indistinctly marked; flesh deep yellow, firm, juicy; stone large flat, parts readily from the flesh, equal to "DeSota" in quality. Ripe, September 20th. A valuable late variety which originated under cultivation, and was introduced by H A. Terry, Crescent City, Iowa.

"Weaver."—Three trees of this variety planted in 1888 have borne fruit the past four seasons, the last three years very heavily. Fruit large, oblong, flattened, dark red, overlaid with a purplish bloom. Suture well marked; stone long, narrow and flat; semi-cling. Ripens at Ottawa about the end of September. Originated in Northern Iowa, and was introduced by Ennis and Patten, Charles City, Ia., in 1875. This, I believe, will be valuable wherever it will ripen. During the recent meeting of the Ontario Fruit Growers' Association at Brantford, the fact that another plum has been introduced in many portions under the name of "Weaver" was fully demonstrated. The variety fruiting in and about Grimsby, Ont., ripens early in August, whereas the true "Weaver" is one of the latest of the P. American family.

"Wolf."—Fruit round, medium to large, dark red, covered with dense purplish bloom; flesh yellow, tinged with red, firm, good quality. Stone separates readily from the flesh; a more attractive variety than "DeSoto," but hardly equal in quality. Tree perfectly hardy, quite distinct from other varieties, having the young shoots heavily covered with a thick pubescence; originated under cultivation in Iowa about forty years ago. This variety has been widely planted in recent years.

Another variety which has succeeded well on these grounds, and of which I have taken favorable notice in various parts of Eastern Ontario, is "Glass Seedling." This is almost, if not identical with "Quackenboss." Mr. W. W. Dunlop, of Montreal, a plum specialist, believes it to be identical with the above, and whenever I have examined the foliage I have come to the same opinion. The tree is a strong grower, with heavy glossy foliage. It rarely loses any of its wood by the severity of Ottawa winters, and usually bears moderately heavy crops, though sometimes very full crops.

Cherries.

Among cherries: We have a large number of cherries belonging to the "Morello" class on trial in the experimental orchards at the Farm. Many of these give promise of value and bid fair to supersede the "Early Richmond" and "Morello" varieties. I describe the following three varieties as valuable:—"Orel 25," "Amarelle Hative," or "Early Amarelle," and "Spate Amarelle."

Orel 25.

Professor Budd obtained from Orel, Russia, several varieties under number; these have been sent out in the same way. Varieties on trial include Nos. 23, 24, 25, 26 and 27. The following description applies to "Orel 25," which appears to be the most valuable. Fruit borne singly or in clusters, large, heart-shaped; skin light red; juice uncolored; stalk, an inch to an inch and a half long; flesh tender, very juicy, sub-acid; pit, medium to small; ripe this year the first week in August, but fruit allowed to remain on the tree was in good condition August 15th. Tree is a vigorous upright grower, hardy; an important addition to our late cherries.

"Amarelle Hative," (Early Amarelle).

Received from Prof. Budd in 1887. It has made fair growth, and, thus far, has not been injured by the cold winter. It began fruiting in 1890, bearing the present year a full crop. Fruit large, obtusely heart-shaped, with suture fairly

well defined. Skin dark red ; stalk long, slender, set in deep cavity ; flesh well tinged with red, quite rich and juicy ; pit, medium to large ; quality good. Ripe this year July 10th. This variety would appear to be valuable on account of earliness and productiveness. The name would indicate French origin, but it does not appear in the *Guide Pratique* of Frère Simon-Louis, of Metz, Germany.

Spate Amarelle.

Although the name indicates late, yet it is one of the earliest varieties in the collection, ripening this year with "Amarelle Hative," which it resembles so closely as to render description unnecessary. The tree is a model in point of vigor and hardiness.

Small Fruits.

Among the striking features of progress in the cultivation of raspberries may be mentioned the increase of varieties of the purple type. Many of these have gained additional firmness of fruit and are likely to be planted in preference to the red varieties in the future. "Columbia," "Heebner," "Older" are respectively purple, red and black. "Older" originated, I believe, with Mr. R. D. McGeehon, Atlantic City. I have had it on trial at Ottawa the past two years, and thus far it has proved to be the strongest grower, most prolific and heaviest bearer in the plantation. In season it is two weeks ahead of "Gregg." The berry, as stated before, is large, round, with the drupes much above medium size and the seeds not prominent. It strikes root at the tips very readily, and thus far has proved quite hardy.

"Columbia."—This has not fruited at Ottawa yet, and I speak of it as seen growing at the New York Experiment Station, at Geneva, where I was very much impressed with the vigor of the plant, quality and size of the fruit. It has also received favorable commendation at the hands of the able editor of the *Rural New Yorker*. It is believed to be a cross between the "Cuthbert" and "Gregg," and is intermediate in many characteristics, the fruit being purple and the cane striking root from the tips. Crosses of this parentage, by Mr. Saunders, exhibit the same peculiarities in regard to color of fruit and method of propagation ; it therefore is of the Shaffer type, but the berry is certainly firmer and of better quality, and I am told is a great bearer. This variety originated with Mr. J. T. Thompson, Oneida, N. Y., who, I believe, controls the stock at present.

"Heebner" is a large red berry of the Clark and Hornet type ; in quality it is first class, but not firm enough for distant shipment. It has been on trial at Ottawa for the past four years, having been planted in 1888 by the former Horticulturist (Mr. Hilborn), now of Leamington. The cane is vigorous, but not quite as hardy as "Cuthbert" ; the fine quality of the fruit, however, should give it a place in all amateur collections.

Among strawberries none have done better here than "Parker Earle" and "Beder Wood." The former is a very strong grower, with good foliage, and its staminate flowers furnish a large amount of pollen fairly early in the season. Its flowering and fruiting also extend over a considerable period. As a fertilizer for "Warfield" it is valuable. Berry is medium to large, dark red pointed, of fair quality, and moderately firm; very prolific. The foliage has shown a tendency to rust in sandy situations.

"Beder Wood" is another plant with remarkably good foliage. The blossom is staminate; berry round of "Manchester" type; it is also prolific and about a week earlier than "Parker Earle." These two varieties will undoubtedly be widely grown.

"Warfield No. 2" is already well known and superseding "Crescent" in many places. With "Beder Wood" as a fertilizer, large crops can be obtained.

Miscellaneous.

The following additions do not belong to the utilitarian section and should only be grown in the province of Quebec—if at all—in a small way; many of them have been widely advertised and heralded with a great flourish of trumpets; and growers have been persuaded into making a purchase, but few have reaped anything from their investment.

"Eleagnus Longipes."—This is a Japanese species of the wild Oleaster. Where the winters are mild it is useful as an ornamental plant, and may have some value as a fruit-bearing plant. Specimens of the fruit received this year, from British Columbia, are quite beautiful, being from a half, to three-quarters of an inch in length, and a quarter of an inch in diameter; bright scarlet, drupe-like berries. We have no place for this plant in our orchards or lawns in the province of Quebec. Not hardy.

"Japanese Wine Berry" has been very extensively advertised, and great numbers of plants have been sold. I have no objection to it being purchased in the light of an ornamental plant for the lawn, but it should not be sold as a fruit-bearing plant of merit, as the fruit will never compete with our cultivated raspberries. At the Experimental Farm it has been planted twice, but has killed out the first winter each time. It has succeeded, however, in some of the sheltered gardens of the city, where it is prized as an ornamental plant, the buds and young foliage being very pretty.

"Dew Berries."—In my experience I have seen only one or two commercial plantations of these which were said to be paying; but I have seen many plantings which had not justified the care and labor expended in cultivating them. "Lucretia" and "Whindon" are two of the best varieties, but they are quite uncertain in regard to fruitfulness. More satisfaction and remuneration can be obtained by planting "Snyder" and "Awagam" blackberries.

Russian Apricots.

Russian apricots also had a wide and extended advertisement throughout most of the provinces of Canada, some four or five years ago. In most cases they have grown, but up to date none have borne fruit to any extent, nor is it likely that they will improve in this respect, as most of the fruit-bearing wood is lost during the winter of each year. As ornamental plants, however, they are desirable. "Simon's Plum" (prunus Simonii), can only be considered half hardy in districts where the thermometer goes under 20° below zero. Six trees planted five years ago at the Experimental Farm have never succeeded in getting much above the snow line. Last fall they were very promising in appearance and had fine bushy tops to a height of six or seven feet, but this spring they were again cut down to mere stumps. In sheltered positions this also might be cultivated as an ornamental shrub.

"Japanese Plums."—I do not think it likely that Japanese plums can be grown as standards with any success in Quebec. There is no doubt that the fruit is very valuable and a worthy addition to our plum list wherever peaches thrive, but there is also no doubt that it would be waste of time and money to plant them in any portion of Quebec on a commercial basis. It is possible, by top grafting on hardy forms of the American type, that amateurs may succeed in growing these desirable varieties to a limited extent.

FRUIT-GROWING IN EASTERN QUEBEC.

BY AUGUSTE DUPUIS, L'ISLET.

Having been requested by the Secretary of the "Société d'Industrie Laitière" to attend this congress, and to contribute a paper on "Fruit-growing," I have prepared a few notes, as I am confident that those who appear in this congress are actuated by a desire to do good and to help the farming population of this Province, by suggesting the best means of fostering fruit-growing.

I desire to answer to the best of my ability the following two questions:

1. Does it pay to plant apple and plum orchards?

2. Do apple-trees and plum-trees grow around Quebec city and east, and do they stand the climate?

An answer is to be found to the first question in the reports of the pomological societies of France, United States, Nova Scotia, Ontario, and Montreal.

The farmers of the districts of Quebec, Montmagny and Kamouraska who own orchards, and take good care of them, derive a satisfactory income from them.

You often hear people say, "It is useless to plant fruit-trees, they die before yielding any profit." True, in certain cases that complaint has discouraged citizens desirous of making plantations. Allow me, gentlemen, to tell you, not for your own instruction, but for the information of those who may still be under this false impression, that orchards a hundred years old and in full growth exist even in those parts of the Province that are the least endowed as regards climate, soil and exposure.

Living seventy miles northeast of Quebec, I shall mention what I heard in my intercourse with the inhabitants living in the counties lying between Quebec and the Magdalen Islands.

History tells us that the earliest French settlers planted orchards in the counties of Montmagny, l'Islet and Kamouraska, which yielded fine apples, cherries and plums, and that the trees stood for very many years, bearing regularly.

Among the orchards more recently planted that of M. Morin, N.P.. more than seventy-five years old, is still very flourishing.

The trees bearing "Fameuses," "Germain," "St. Pierre" and "Calvilles" apples are yet vigorous and productive on the whole snrface of the orchard,

which covers from eight to ten arpents. This orchard is carefully looked after by M. Wm. Pelletier, its present owner.

The orchards belonging to Messrs. T. Francœur, Magloire FrancŒur and Frs. Bérubé, which are from seventy-five to eighty years old, are still yielding abundant crops. Apple-trees nearly a hundred years old are to be seen on M. J. D. Blanchet's farm, one of which bears winter apples of very fine colour and taste.

At St. Jean-Port-Joli, Messrs. Verreault, Fournier, Simard, M.D., and Duval, N.P., own apple-trees a hundred years old. There are also in the neighborhood Damascus plum-trees more than a hundred years old which are being renewed from the roots.

At St. Roch des Aulnaies, M. D. Pelletier's plum orchard of two and a half arpents yielded last year $306 worth of plums and over $100 worth of apples from a few apple-trees planted between the plum-trees.

It has been ascertained that the plum orchards of the districts of Montmagny and Kamouraska yield an average revenue of $100 per arpent when the crops sustain no injury.

The Rev. A. Chouinard, of Métis, county of Rimouski, informs me that there are in his parish fruit-trees forty years old in full life. For the last nineteen years M. Chouinard has striven to encourage in his parish the planting of fruit and ornamental trees.

The Rev. M. Hoffman, curé of Charlesbourg, informs me that horticulture is a paying business in his parish, where are to be found apple-trees seventy-five and one hundred years old in full life and bearing much fruit. He owns some twenty apple-trees planted before 1830, and manufactured excellent cider this year. During the last twenty years many apple-trees have been planted in that parish, and they have given general satisfaction.

At Ste. Anne la Pocatière and St. Denis are to be seen very old orchards. In 1858 I visited the orchard owned by M. Marchand, of St. Denis, and noticed among his old apple-trees a pear-tree loaded with fine pears. That orchard exists still. There are many others in fine condition and bearing varied and choice fruit. I was shown those belonging to Messrs. S. Dionne and J. C. Chapais. M. Chapais has many apple-trees and pear-trees of the finest varieties.

At Rivière du Loup, at Isle Verte and at Rimouski orchards planted twenty-five and thirty years ago have generally a fine appearance. At several points in the counties of Bonaventure and Gaspé are Siberian and Russian apple-trees of remarkable vigour.

At St. Pierre and Miquelon, M. Larue, Customs agent, planted, four years ago, an orchard of "Duchess" apple-trees and French cherry-trees, which have

so far stood well the hard climate of those islands. It is unnecessary to give other examples to show that fruit-growing is a practicable and paying industry even in the least favoured climates. This industry would be made more profitable by a careful choice of hardy and productive trees bearing summer, fall and winter apples.

The planting and cultivation of fruit trees must differ according to soil and climate. My ancestors, for example, succeeded in growing at Quebec and East the "Damascus" plum-trees and the "Reine Claude" of Montmorency by planting them in close clumps, or along fences and near houses and other buildings, so as to afford them protection. Nurserymen from the West, accustomed to plantations in the opon country, advised people to give up the old method. They were wrong, for all the plum-trees planted hy their advice in the open field, and placed from 16 to 20 feet apart, have died, Only those protected by fences have survived.

I have myself lost many trees by departing from the method followed by my ancestors. But wherever, for the last twenty years, I have planted plum-trees of the finest foreign varieties in clumps, and protected by apple-trees, elms or red spruce trees, they have become remarkably vigorous and productive. The crops of the last five years have been good, that of last year exceptionally so, many "Lombard," "Bradshaw" and "Imperial" plum-trees yielding $7 or $8 worth of fruit each.

The success obtained at L'Islet by Dr. N. Dion and Dr. N. Lavoie, and at St. Aubert by M. A. Blais, with some fine European varieties, is owing to care and protection given to plum-trees. Mrs. Justice Caron's plantation is very promising.

You may be surprised to hear that fourteen fine varieties of foreign plum-trees have been introduced here, and that their superb fruit is to be seen on the tables of the annual exhibitions of the Horticultural Society of L'Islet. The gathering season for the fruit lasts from seven to eight weeks. The prices realized have been from $15 to $22.50 per barrel, or from $200 to $300 the arpent.

His Excellency the Governor-General stated, in a letter dated September 26th, 1892, that he had not seen in Europe plums to excel in size, beauty and taste those he had just received from the county of L'Islet.

The honourable Ministers of this Province have written in the same strain.

Samples of our plums and apples have been sent to the Chicago Fair with other farm produce. They have shown the world that the Province of Quebec is not a snow and ice country, but a good country to live in.

If the efforts of the farmers and members of the Horticultural Society of the county of L'Islet have been at all successful, it must be acknowledged that

experiments have been costly, owing to want of knowledge in tree-growing We have neglected, or we have had no opportunity, to educate ourselves in this branch of industry.

What is to be done? Some have suggested to me:

1. That the first lessons should be taught in the elementary schools, and the teaching continued in commercial and classical colleges.

2. That every agricultural society should offer prizes at their exhibitions for the best fruits exhibited, allowing neighbouring counties to compete.

3. The extension of the work of the "Montreal Horticultural Society and Fruit-growers' Association of the Province of Quebec." The provincial work of the above society is being very intelligently (and as far as their opportunities will allow) attended to in several practical and beneficial ways not before attempted, but very much more remains to be done. It will remain with all those interested to try and further the fruit-growing interests, allowing nothing small or selfish to interfere with their whole duty.

4. The planting by the Government of experimental or model orchards in districts where they are most needed. This scheme, conceived by the Hon. Commissioner of Agricultare, should be supported as a really efficacious means of education on the choice of different kinds of trees, on planting and on the care of orchards. Everybody could then ascertain what trees can stand the climate and prove most hardy and productive. The experiments thus made would educate the public and save them thousands of dollars, thrown away on the purchase of such trees as "Baldwins" and "Greenings," that cannot stand our severe winters.

You are requested to say what you think of these means of education, and to suggest all other practical means you may judge efficacious to popularize the teaching of fruit-growing and to foster a taste for plantations among the rising generation. It is not likely that a young man who has planted a good orchard, has seen it grow and produce fruit, and has derived an income from it, will leave it and emigrate to the United States. Fruit-growing is not only profitable, it makes one cling to the soil, it produces a beneficent influence on the health, habits and tastes of the people.

Two years ago the Horticultural Society of the county of L'Islet recommended as hardy and profitable for the eastern and northeastern part of the city of Quebec six kinds or varieties of apples:

Duchess of Oldenburg,	Yellow Calville,
Wealthy,	Red Astracan,
St. Lawrence,	Fameuse.

And three kinds of Siberian apples:

Transceudent, Hyslop, Montreal Beauty.

And I would add Whitney.

Among the following kinds which have been tried the Society will, I hope, soon be able to recommend as equal, if not superior, the

Montreal Peach,	Bosbury Russet,
Golden Russet, English,	Canada Red,
McIntosh Red,	Swaar,
Alexander,	Seek-no-further,
Titofski,	Transparent of Russia,
	Roxbury Russet.

The plum-trees which have so far best stood the climate and given entire satisfaction in light and sandy lands are undoubtedly the Blue Damascus and Reine Claude of Montmorency (white). They yield delicious fruits. The trees are reproduced by shoots.

Among the foreign kinds that can be grafted on hardy roots and stand the climate the finest, largest and most profitable for the market are the

Lombard,	Philippe I.,
Bradshaw,	Washington,
India,	Goutte d'Or de Coe,
Imperial Reine Claude,	Purple Duane.

In light, sandy soil the Lombard plum-tree is the first to produce, and to produce most abundantly and most regularly.

Plum-trees, like apple-trees, do not all blossom at the same time, hence it is advantageous to plant early and late varieties. A bad frost will sometimes overtake the early kinds in the bloom and destroy the crop. The late kinds, blossoming a few days later, escape the frost and yield a crop.

THE CHERRY-TREE.

The old kiud called "Cerisier de France" or "Richmond" has no equal in the northern part of the Province.

All the sweet kinds imported here are too tender for our climate.

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GRAPE CULTURE IN THE PROVINCE OF QUEBEC.

BY WM. GRAHAM, MONTREAL.

It is related in history that Leif Erikson, an adventurous Norseman, with a crew of about thirty men, set sail from Greenland some four hundred years before Christopher Columbus started on his famous journey. At the time alluded to, this bold Norseman, like many of his predecessors, was on a voyage of discovery, and the first land he reached was an island which he named Helluland, known now as Newfoundland. The next land he sighted was a wooded coast which he called Markland, now supposed to have been Nova Scotia; then sailing southward for two days, he again sighted land about the latitude of what is now known as Massachusetts. To this country he gave the name of Vinland on account of the abundance of wild grape vines everywhere to be seen. These grape vines that so tickled the fancy of this daring navigator, that he named a continent in their honour, were probably of the species known as *Vitis Labrusca*, the Northern Fox Grape, and *Vitis riparia*, the Winter or Frost Grape, (although there are eight or nine species admitted by botanists throughout North America). The two species referred to, however, are the well known wild grapes which are to be found in several varieties nearly all over Canada, and are the grapes that have given rise to an important series of hardy table grapes, of which the best known and one of the oldest varieties is the Concord, and with which class of we have now to deal. It is not the object of this paper to discuss the origin of varieties, to claim superiority of one class over another, or, pessimistically, to lay down rules for their propagation and after treatment, but simply to state clearly our own experience of grape culture in the open air and in this latitude.

Judging from the almost universal dissemination of the wild grape on this continent, one is seriously led to think that it must have been part of the plan of the Almighty that the improved varieties should be, at least, as universally cultivated, and as we enjoy in the Province of Quebec a higher centigrade volume of heat in our growing season than is experienced in the centre of the wine producing region of Europe, there is no reason why their cultivation should not be more general than it is. The chief object of this paper, therefore, is a plea for the fostering, to some extent, of a more extended cultivation of the grape vine and for a more generous and practical treatment of the majority of the vines that are established, not so much with the view of growing for commercial pur-

poses as for private domestic use and wine making, which is the beverage that would suit the masses, would be wholesome and invigorating and would do inestimably less evil than the poisonous compounds that the bulk of the whiskies and brandies consumed unfortunately are.

The prime conditions for the successful cultivation of the vine are aspect, soil, the elements, generous methodical treatment and the planting of the right varieties in the right place.

Aspect.

In this latitude, it is imperative that the aspect should be a south or south-westerly slope, in order to secure the full advantages of the sun's rays. Husman (an acknowledged authority on grape growing in America), says: "The selection of a proper location for the vineyard is of the first importance and one of the main conditions of success; grapes grown on a large scale either for market or wine, good and paying results can only be reached in the best locations." If, therefore, the aspect is considered of so much importance even in the sunny south, it must be looked upon as one of the prime conditions to successful culture in this province.

Soil.

Nearly any soil will grow grapes fit for table use if it is well drained either naturally or artificially and the subsoil warm and porous. The vine does not like to have "wet feet." Our own vines are grown in a strong gravel, which, if in grass, would scarcely support one goat to the acre, and yet the results are, on the whole, gratifying. The soil should, however, be a light porous soil, not too sandy, and a tenacious clay should be avoided. The amateur who only wishes to grow a few vines for home use can easily make the soil light by an addition of sand and occasionally lime, and although he may not grow as rich grapes or mature them so well as he would on better material, yet he will grow them good enough and abundant enough if the other treatment they require is attended to.

The Elements.

Although we have sufficient heat in this latitude to mature grapes as fine in quality as any grown in the Dominion, and which fact the writer has repeatedly demonstrated at western exhibitions, still the elements in this province and in the eastern portion of Ontario are so fickle and exacting that what between late spring frosts and early autumn frosts added to the rigour of our winters, when laying the vines down and covering them for protection is a necessity, puts a bar on the cultivation of grapes in the province of Quebec for commercial purposes—on a large scale at least—and adds so seriously to the cost of treatment and

compels the necessity of dwarfing the vines so as to admit of their being easily handled and laid down for protection, that we are completely handicapped in this respect by western growers and makes all possibilities of commercial competition with them out of the question. Growers in this province, indeed, seem to be quite conscious of their inferiority in this particular branch of horticulture, and it has been the questionable policy of the Montreal Horticultural Society for years, to discourage and prevent all outside competition at their exhibitions.

We have, moreover, in the last few years had to cope with mildew and "birds eye rot" to no inconsiderable extent, but which can be combated and kept well in check by the treatment recommended by the horticulturist of the Central Experimental Farm at Ottawa, an institution that is doing more good to Canada than two-thirds of her politicians, and which treatment is explained under the following heading. The same treatment is worthy of trial on exotic vines under glass.

We will say nothing about the insect pests that have to be fought. The grape vine flee beetle, the thrip, wasps, robins and cat birds, and last but not least, the small boy. The ravages of the small boy are probably the most difficult to contend with, and are always felt most in the best vineyards.

Training and Treatment.

Our vines are planted on a southerly slope, in rows running from north to south and trained on trellises. The vines are planted twelve feet apart in the rows, and the rows are the same distance apart. This distance is looked upon by many as a waste of land; but if grapes are worth growing, they are worth growing well and are worth the land they are growing on, and one row shading another should be avoided.

We have always trained them on and followed a *strict renewal system* with six vertical canes on a full grown vine, and, judging from results, we claim that it is the best, insomuch that the vine can be kept more manageable, that the canes are more likely to be robust and well matured, and that, consequently, the better the wood the better the fruit.

The first thing to do in spring — generally about the 5th May — is to raise the vines from their winter bed and spray them with a solution of sulphate of copper, 2 lbs. to 50 gallons of water, then tie the vertical canes, proceeding from the horizontal arms to the six vertical pickets on the trellis. Before the vines are in bloom, they are again sprayed with the Bordeaux mixture composed of sulphate of copper, 6 lbs., unslacked lime, 4 lbs., dissolved and mixed with 50 gallons of water. Until recent years we always 'rubbed' the vines, leaving only one bud at each eye; but the late spring frosts can so frequently be depended upon to do the 'rubbing', that we have discontinued performing the operation

ourselves. The next operation is pinching back all the young shoots just after the bloom appears, leaving oniy one leaf past the last bunch on the shoot excepting always the shoots that are intended to develope into canes for next year's fruiting; these are carefully selected from the horizontal arms, or as near it as a strong shoot is found, and tied to the pickets when they are long enough to handle, and the following season they 'renew' or take the place of their predecessors, which are cut off in the autumn and the new canes cut back to four feet. Whenever the lateral shoots from the new wood throw out three leaves, they are pinched back to one leaf, and if the season is a growing one and the vines vigourous, the sub laterals arising from the lateral shoots are pinched back in the same manner.

During the summer the vines are occasionally treated to a spraying of the "ammonical solution," composed of 5 ounces of copper carbonate and 5 pints of aqua ammonia, mixed with 50 gallons of water. The carbonate can be made into a paste with water, and the ammonia slowly added until the liquid becomes clear, when it can be kept indefinitely and diluted with water as required.

We manure liberally with barnyard manure one year, and as much wood-ash as we can get hold of the next, and keep the ground thoroughly cultivated throughout the season, until the grapes begin to colour, with an Acme horse hoe, using hand hoes under the vines, to keep down all weeds and keep the ground open and mellow. Notwi hstanding all this liberal treatment, some varieties are again becoming affected with leaf blight this season; all of which goes to show that the vineyardist can only raise a crop (when that is vouch-safed unto him) by constant toil.

Varieties.

It would be as true to say that any particular variety of grape is the best all-round sort for general cultivation, as to say that any one particular breed of cattle, or any particular variety of wheat, rose or carnation are the best. So much depends on aspect, soil and treatment, that one variety, succeeding well in one locality and under one grower's management, may be unsatisfactory under different circumstances. The Central Experimental Farm at Ottawa, in their report for 1891, enumerates 119 varieties (chiefly of the Labrusca and Riparia class) as being under cultivation on their grounds, and it would be safe to say that one-half of this number are good grapes, if properly handled on the right soil. But, for all practical purposes, it would be safer to say that 110 of them might more profitably be left on government experimental stations. We have under cultivation some thirty-six varieties, and they have all, more or less, some points of excellence and eccentricities of growth and habit peculiarly their own. If, however, we again had to plant a vineyard, with the view of obtaining the

best possible financial results therefrom, we would have no hesitation in discarding thirty of the thirty-six alluded to, and including all the alleged early, large, luscious, mildew proof and ne plus ultra novelties that have of late years, with high-sounding names and higher prices, been pushed by importunate "tree-peddlers" on a credulous public. The six sorts, then, that have given us the greatest satisfaction and borne the steadiest crops of marketable fruit are, first and foremost, the "Champion," which is a paradoxical variety, inasmuch as that, while it is one of the very worst, it is one of the very best. It is the worst, because no one who knows what a grape is and whose palate forms a part of his system would be induced to eat it, and it is the best because it ripens the earliest, escapes early frosts, and brings, because of its earliness, a good price from people who have not yet arrived at the stage of classifying varieties. Second in importance comes the "Merrimac" (Rogers 19), which is the best black variety for general crop grown by us. It is excellent in quality, a heavy cropper, a vigorous grower, and has hardly ever failed to mature its fruit. The "Barry" (Rogers 43) and "Wilder" (Rogers 4) are very similar in appearance, but their fruit is not so luscious as the "Merrimac." Then comes the "Delaware," of unknown origin, that has seldom failed to do its duty by us, and whose fine qualities are too well known to require description. It requires very generous treatment, however. The "Concord" comes next, and is also too well known by all who know anything about grapes to require description. Although the fruit is only of fair quality, it has a fine appearance, and the vine is a strong grower, remarkably healthy and clean, and is a steady cropper. Then comes the "Agawam" (Rogers 15), a strong grower, and yielding excellent pale pink coloured fruit, but is not so sure a cropper as some mentioned. And lastly the "Niagara," which is the best white we have tried, and being a cross between the "Concord" and the "Cassady" (an old and almost extinct variety), it possesses many of the characteristics of its parent the "Concord," and is a healthy, strong and vigorous grower—qualities not often obtained in a white variety. There are, of course, some sorts, like old friends, that we could not part with without at least saying a good word for them. These are the "Salem," the "Brighton," the "Lindley" and the "Hartford Prolific."

OUTDOOR GRAPES.

BY WM. MEAD PATTISON, CLARENCEVILLE, QUE.

Since my last contribution to the annual report of the Montreal Horticultural Society in this department of fruit-growing, there is little can be added. Of the new varieties introduced by propagators and nurserymen for the past

four years, none have been tested here, for the reason that the Central Experimental Farm at Ottawa has entered on the search and trial of varieties of grapes giving any promise of value to our Province.

I have the satisfaction, however, to again report favourably of several early blacks, viz., Rommel's "Early Black," "Standard" (Burr), "Metterny" (Caywood), and Garber's "Seedling," all of which have been described in former reports. These have fruited here for several years, and prove valuable to us from their earliness, excellence and vigour. The first three are of Delaware parentage, and partake of its good qualities; besides, in the size of berry and cluster, are an improvement. Garber's "Seedling," though colouring the first of any grape, requires to be left on the vine some time before it is eatable. It has two points which can only recommend it. From its hardiness and rapid growth it is adapted for summer-houses and places where a screen is desired; it is a regular and abundant bearer; stands our winter without protection, but does better with. Second, it is valuable as a wine grape, not specially alone, but to mix with others to give colour where a red wine is desired.

On retiring from the experimental field and reviewing the past twenty years engaged therein, the best adviee I can give those inclined to seize upon anything because of its novelty and being glibly praised, is to await results of trial at the Experimental Farm at Ottawa. Since first entering on the work of seeking for grapes that would prove an acquisition to us in this Province, I have to acknowledge the kind assistance received from many engaged in similar work, both in the United States and Canada, prominent amongst whom were Judge Samuel Miller, of Missouri, discoverer of the "Martha" grape; Hon. G. W. Campbell, of Ohio; the late John Burr, of Kansas; Professor Husmann, of Missouri, now of California, author of "Grape-growing and Wine-making"; the late A. J. Caywood, of New York; E. Williams, Secretary of the New Jersey State Horticultural Society, and the late Peter C. Dempsey, of Ontario.

Several of the new varieties tested here were of Canadian origin, but the greater part were discovered in the Uniied States. The species botanically known as the Vitis Labrusca has proved of greatest value, while some of its hybrids with Vitis Vinifera (of which Regers' hybrids and probably the "Delaware" are the outcome) have proved more or less successful, but in proportion to the predominance of the Labrusca. While this cross gave us grapes improved in flavour, the process gradually diminished the hardiness of foliage. As to the Riparia species of American grapes, the most widely diffused through the United States, and of which the "Clinton" is the most prominent of its cultivated varieties, Mr. Ricketts, of Newburgh, N. Y., has given us some fine specimens in "Peabody," "Bacchus" and others, which are not subject as much to mildew, but their delicate leaves are injured by the puncture of insects. Some of his

varieties of this parentage did well here for a few years, then became unhealthy and valueless, "Bacchus" has so far proved an exception, and in favoured localities in the Province would be valuable for wine for its producer's family supply.

From several years' experience it has proved of value here for this purpose. Its must has ranged from 65° to 80° by the saccharometer, according to the season, with other suitable varieties added, and an admixture to the crushed grapes of sufficient refined sugar to bring the must to desired gravity, fomenting on the husks, and after wine has refined and been clarified, the summer following, by Pasteurizing (the discovery of the eminent French scientist for destroying the living ferment germs by heat in a suitable tightly closed vessel), bottling, and in a few months a good bodied and wholesome product (aged by the process some two years) has been the result. There is no reason why any one inclined possessing a few suitable wine grapes cannot have a small supply of their own wine for medicinal, advanced age, and other occasions. I make this statement as a temperance advocate, believing that as a substitute for the strong alcoholic spirits, unfortunately so much in use, a wholesome, pure domestic wine would be a powerful reformer, as any one who has visited the wine districts of southern Europe can testify. For some readers who might not agree in this sentiment I will quote from Othello: "Come, come, good wine is a good familiar creature if it be well used; exclaim no more against it." Am often asked, "What grapes are your favourites"? As readers of the annual report for some years past have been given full details of all varieties worthy of note will here name a few that have given most satisfaction in the family. In Black, "Champion" fills a place till something better comes in; quite close on it ripens Rommel's "Early Black," then "Standard," Moore's "Early," "Metterny," "Barry," "Herbert," "Peabody," "Bacchus" and "Burnett." In White, "Lady," "El Dorado," "Duchess," "Belinda," "Martha," "Purity," "Peter Wylie" and "Lady Washington." In Red, is the old unmarketable "Northern Muscadine"; then "Massasoit" comes in, followed by "Gaertner" (Rogers' Hybrid No. 14), "Brighton," "Walter," "Ulster," "Delaware," "Lindley" and "Jefferson." "Salem," "Vergennes" and "Mary" affording us the finest winter keepers. The late varieties which should only be cultivated in sections specially exempt from fall frosts are "Burnett," "Peter Wylie," "Lady Washington" and "Jefferson."

Garbers' seedling fills a place already described. As parting advice to those cultivating a few outdoor grapes, or contemplating doing so, will say: carelessness in grape culture is sure to lead to grief and disappointment. Grape vines cannot flourish choked with barn grass and weeds; success with them demands thorough cultivation, constant watchfulness and timely treatment. No small fruit can, by its various uses, be made to contribute so much to the comforts of

the home as the outdoor grape. Our markets, in season, now supply them at prices within the means of all; yet, when one has the space in city or country, makes good selection of well tried varieties and is willing to give a little attention to them, he will be amply rewarded, will have the satisfaction of many varieties which cannot be procured in market, more appreciated as the result of his own labour. If he has in his collection a few good keeping varieties he can gratify his family and friends all through the winter.

FORCING GRAPES.

BY J. BLAND.

Any means that may be adopted for forwarding the growth of any plant to a greater extent than would take place naturally, may be termed forcing. Heat is the motive power. The vine growing in a house not heated artificially, is forced by solar heat to a certain degree. Some vines are forced in spring to induce them to commence growth early; others require forcing in the autumn to ripen their fruit.

Vines may be forced into growth and to bear fruit at any season of the year, provided always that the wood is properly ripened. Early forced vines of one season force more easily the following year, and established vines always more easily than young ones. Young vines (excepting pot vines) should not be hard forced at any time. The time required from the commencement of growth to the ripening of the fruit is, for "Black Hamburgh," about five months. Thus, vines started in March should have ripe fruit in July, and those coming naturally into growth by the middle of April, should ripen their fruit from the beginning to the end of September.

The "Muscat of Alexandria," "Black Alicante," "Lady Downe's" seedling and other late grapes require nearly six months to ripen and finish properly. All vines should be started sufficiently early to have the fruit ripe by the early part of September, for grapes ripened later than September require a great amount of firing to finish them, and do not keep well through the winter. The grapes ripened in September are the latest that arrive at maturity, with the exception of "Gros Colman."

If we say on February 1st, we take as an example a vinery from which ripe grapes are required in the month of July; the treatment necessary to secure this end may be stated in general terms as follows:—

1st. *Temperature.*—At the commencement a night temperature of about 50° to 55° will be sufficient until the vines have started into growth.

The heat should be raised gradually to 70° by the time they come into flower. When the grapes are fairly set, a lower temperature may be maintained until the stoning period, when, if necessary, a rise of a few degrees may be allowed.

2nd. *Ventilation.*—The object sought to be obtained by ventilation is not merely the maintenance or regulation of temperature, but also the admission of fresh air, which is a most important factor in the well being of the vine.

The night temperatures are mostly regulated by the amount of firing applied, but the day temperature or amount of sun heat is regulated by ventila-

tion. In vineries a little air should be given at the top ventilators early in the morning, or as early as it may be observed that the temperature has risen or is rising above the required point; and this air should be gradually increased as the day advances and the temperature rises, and later on should also be reduced in like manner, endeavouring, if possible, to shut up early enough to secure a slight rise in the temperature after doing so. I prefer shutting up early at all times, and bottling up as it were the sun's warm rays, to the rigid rule of keeping to a given temperature.

As the grapes begin to color, air must be given freely, both by day and by night, on both sides of the house, so that a bracing atmosphere may be secured.

3rd. *Moisture.*—This, in its relation to the atmosphere, is of the greatest importance to the healthy progress of the vine, and demands special attention. A close moist atmosphere is necessary to induce the buds to break freely, and, afterwards it is necessary to assist in supplying nutriment to the vine through its leaves. Moisture is also necessary to prevent the destruction of the leaves by the inroad of insects such as red spider.

From the commencement then a moist atmosphere must be maintained, and the higher temperature the greater evaporation, and the greater the amount of moisture required.

When the vines are started they should be syringed regularly several times a day, especially when the weather is bright and warm, beginning as soon as the temperature is rising and so on, varying as to time according to season.

This treatment may be continued until the grapes come into flower, at which time a drier atmosphere should be maintained until they are fairly set. Syringing the vines from this time, overhead, must be discontinued, as, on account of the lime that is in the water, the grapes become spotted by its use. Every other portion of the house and border should be freely syringed at all times, and the atmosphere thus kept well charged with moisture.

When the grapes begin to colour, a somewhat drier atmosphere should be kept, and by the time they are ripe the atmosphere should be kept as dry and bracing as possible.

After the grapes are cut, if it be during the growing season, the syringe should be again freely employed, and its use continued until the vines are thoroughly ripened off.

All vines and vineries, at whatever period they may be started into growth, will require treatment somewhat similar to that here laid down.

It is the custom of most writers on the cultivation of the grape vine to give tables of temperatures for both day and night, to be followed strictly during the season; but, never having derived any benefit from the use of such tables, I prefer to state general principles that may be understood and followed out by all, as circumstances may admit.

OUTDOOR SMALL FRUITS.

BY JOHN EDDY.

I will take the strawberry first, as it is the first small fruit to ripen. Coming in at a time when we have no other fruit to take its place, it is consequently a favourite with all classes.

The strawberry likes a moist rich soil (but not a wet one), which has been thoroughly worked. It is also very necessary that the ground should be free from weeds, as it is no easy matter to clean a bed of strawberries after they have grown together.

After you have prepared the ground, place the plants in rows from two to three feet apart, with the plants from 12 to 15 inches apart in the rows. I think a good time to plant is about the middle of August.

After planting keep all the runners cut off to allow the plants to become strong and vigorous, and you will have a nice crop of fruit the following summer.

Some growers allow the runners to grow, so as to form beds, about four feet wide. This system has its advantages in keeping the soil cool and moist by shading the ground with the foliage of the plants, but has also its disadvantages in getting the beds very weedy, as you cannot cultivate between and all the weeds have to be pulled by hand.

The larger varieties, such as Sharpless, Manchester, Jersey Queen and Cumberland are the best for private gardens, but perhaps the medium-sized varieties, such as Wilson's and Crescent would be best for market.

The raspberry comes in next, and some of the finer varieties are really good fruit. It is a fruit we do not see the market overstocked with. Of course, we see plenty of the wild ones, but fine berries like Golden Queen, Brinkles Orange, Caroline, Cuthbert, and Shaffer's Colossal are always in demand and bring good prices.

Most raspberries reproduce themselves from suckers. Some varieties require layering, which should be done about September, as they root freely at that season.

Before planting, the ground should be well manured and worked as for strawberries. Select strong plants or canes, and plant in rows from four to six feet apart, according to variety, with the plants three feet apart in the rows. Shorten the canes to about twelve inches, so as to send the whole strength to

produce new canes for the next year. These canes should be pinched when they are two or three feet high, but after the first year they may be allowed to grow to four or six feet, according to the vigour of the variety, the laterals to be shortened to about twelve inches.

Most of the finer varieties require some sort of protection during winter, unless grown in sheltered places, a good plan being to bend the canes down and put a spadeful of soil on them; the snow generally does the rest.

In the spring they should be lifted and neatly tied to stakes having five or six strong canes to each and fork in short manure between the rows, for which they will give you larger and better fruit.

The varieties we grow are Cuthbert and Turners for red, and Shaffer's Colossal, which is a reddish purple, one of the largest berries, and a very strong grower. This variety, however, does not throw suckers and must be propagated from layering the tips as advised. For yellow we grow Golden Queen, Brinkles Orange and Caroline. The black varieties I do not know much about, but understand there are some varieties well worth cultivating.

Currants.

Currants ripen with the raspberry, but remain longer on the bushes. They should be planted in prepared ground about four feet apart. Prune in the spring, cutting out all old and spent wood and shortening all long shoots, so as to form nice-shaped bushes.

Most currants stand lots of pruning, although some of the black varieties are impatient to very severe pruning. The best black varieties are the Black Naples and Black Champion, and of reds, I think the Cherry, Moore's Ruby and Lee's Prolific are the best The white grape is a fine white currant.

Gooseberries require about the same treatment as currants, but in our hot summers they are very subject to mildew, particularly the English varieties. A good plan is to mulch with manure, straw or lawn sweepings, which retains the moisture and keeps the roots cool, besides protecting the lower fruit from the dirt.

STRAWBERRY FORCING.

BY HENRY STOCKING.

While layering is not a forcing operation, yet so much of the after success depends upon a good start that I am tempted to say a few words upon this subject. It is best, when practicable, to secure layers from young plants. Have prepared a sufficient number of three-inch pots, filled with a compost of two-thirds light loam and one-third well-decayed manure, thoroughly mixed. Select the best and strongest runners, removing from the parent plant all those not desired, so that all the strength of the plant may be devoted to the runners to be layered. Place the runner carefully in the pot of soil, fastening it in, either by a small peg or a stone placed upon the stem of the runner. The pots may be plunged to the rim in the soil, which will help to keep the soil moist in the pots. Never let them want for water, and in three weeks' time from layering they should be sufficiently rooted to be severed from the parent plant. Stand them in a shady place for a few days supplying them liberally with water, and they will soon recover from the check and will then be ready for potting.

For a compost for potting take of good turfy loam that has been stacked a year or thereabouts, two-thirds, and of well decayed cow manure and leaf soil, in equal proportions, one third, with a liberal sprinkling of small crushed bones added to the whole. Mix thoroughly some weeks before being required, taking care not to let it become saturated with moisture. If the soil is of a stiff nature, reduce the amount of loam in proportion, and add some sharp sand or hard coal ashes, which will help to keep the soil open and porous. A layer of half inch bones and charcoal instead of crocks in the bottom of the pots will amply repay, in, after results, any first expense. For very early forcing, pot the plants singly in five-inch pots, while for later work six-inch pots should be used, or three plants may be placed in a seven or eight-inch pot. Single potting, however, is preferable. Pot the plants very firmly, and place in a shady position for a few days. Water very sparingly for a few days, and sprinkle over, morning, noon, and night, during bright weather. In about a week's time they may be brought out to the place where they are to stand to make their growth. This should be an open spot, where they get the sun all day. A good ash bottom rammed solid is the best for them to stand on. Careful attention in watering must be given, never letting them suffer for want of water. Syringe regularly to keep down red spider, which is the strawberry grower's worst insect enemy. By the middle

of September the crowns should be well developed and as solid as nuts, at which period diminish the supply of water, and by the end of October they should be ripened quite off, when the leaf stalks should be browned and the foliage tough and leathery in appearance. Remove to their winter quarters before severe frosts come on. Any cool light place will do for this purpose. They will need very little attention at this stage, merely prevent them from becoming dust dry. By the end of November, if early forcing is intended, make up a hot-bed with leaves, plunge the pots desired to be forced, two-thirds of their depth in the leaves, keeping the temperature of the frame as near 50° as possible without risking draughts which would cause mildew. By the end of December they will have made a lot of fresh roots, and growth will correspond. They will soon begin to show their flower spikes, and as soon as they are visible they should be removed to a light airy place, such as the shelves often used for this purpose in vineries and peach houses. The plants must not be subjected to any hard forcing at this stage; a night temperature of 50° to 55° at most will be hot enough. As the flower buds open be careful not to wet them at all, as at the dull season of the year, dampness will easily take hold of them. A camel's hair brush passed carefully over the flowers occasionally, will prove of great assistance in securing a good set of fruit, although this is perfectly unnecessary later on in the season, when there is no trouble in setting the flowers.

After the fruit is set, and just beginning to swell, go over them carefully and thin to from 5 to 10 fruit to each plant, according to variety and strength of plant. The temperature may now be increased to 60° or 65° at night, with a rise of 15° to 20° in the day time. Liquid manure may now be liberally supplied and a somewhat moister atmosphere maintained. As soon as the fruit is half coloured, withold the liquid manure and water with only clear water. When the fruit is nearly ripe, remove to a cooler temperature and supply only with sufficient water to keep from flagging. This will greatly improve the flavour of the fruit. For successional batches follow precisely the same treatment, excepting that after the first two lots are brought in there need be no more use of the hot-bed, unless there is no other place to use for the purpose. Of course, as the season advances and the days lengthen, some slight changes of treatment are unavoidable, but with the same amount of attention far better results will be secured.

Great care must be observed not to break or bend the fruit stems, as if this is done the fruit will become sour and insipid. It is safer to furnish them with a light support, such as small branched twigs of birch or something similar, which is quicker to use and quite as effective as stakes and matting. The earliest date I ever saw strawberries ripe was on the 11th of February, but they were not a profitable crop at that season. It is comparatively easy to secure them by the first week of March. Many strawberries are forced with no other means at dis-

posal than hotbeds right through; and although I have had no experience in this way, yet I have seen good results obtained. Wherever there are houses especially devoted to strawberry forcing, it is, of course, far easier to control the temperature and atmospheric conditions. The fact, however, remains, that in the great exhibitions where prizes are offerred for strawberries, it is oftener the case that the first premiums go to those who have no other places than vineries or peach houses to force them in.

Strawberries may be forced late as well as early. I have gathered good strawberries in October from pots. By using the following method anyone can do the same: Make a careful selection of all the earliest forced plants, and harden them off; place them in such a position that they will not get the midday sun, keeping them on the dry side. About the end of May, shake out and repot in the compost recommended. Stand back in the same place, treating as for young plants. By the end of August they will begin to show their flower spikes, and will continue to do so for the next two weeks or thereabouts. As they open, remove the plants to a light airy place under glass, where they get plenty of sunlight. If the weather is good they will set freely, and will amply repay for the trouble taken.

If early forced plants are not too much weakened they may be hardened off and planted on a warm south aspect, and if the season is not too wet a good crop of fruit may be gathered during September and October.

I once saw, in a wet season, a good crop of fine strawberries at the end of October, which were planted out in a well drained border and protected by cold frames. The only variety I have seen used for these late crops is the "Vicomtesse Hericart De Thury," but I see no reason why any variety that will force early should not do as well.

EXPERIMENTS WITH NEW ORCHARD FRUITS, TREES AND SHRUBS.

BY PROF. J. L. BUDD, IOWA AGRICULTURAL COLLEGE, AMES, IOWA.

In the spring of 1883 a Bulletin was issued giving an outline of our experiments with, and investigations of, some of the fruits and ligneous plants of the steppe sections of East Europe and North Central Asia. Since that time we have made several importations of scions and rooted plants from the parts of East Europe where the summer heat is nearly or quite equal to ours, and we have sent out many thousands of plants for trial across the continent on our northern borders. The present notes are a summary of the reports received from our trial stations and of our observations on the College grounds up to date, of a part of the varieties and species which we now have in nursery for distribution in the spring of 1893. But we also have in stock, in limited quantity, a large number of other varities and species which have been favourably reported and propagated at other times. We do not graft and bud a full list of our valuable varieties at one time, as it would extend our propagating work to a greater extent than our other College duties permit.

APPLES.

SUMMER VARIETIES.

Yellow Transparent. (No. 60 and No. 334.) · · This has become popular across the continent. At the West it blights on certain soils, but usually only on the tips Fruit is earlier, larger, handsomer and better than the "Early Harvest."

Blushed Calville. (22 M.) · · · This at the West will prove more valuable than "Yellow Transparent." The tree is much hardier, more nearly free from blight, and the fruit is about as early, as large in size, is handsomely blushed, and it is less perishable and better in quality.

Breskovka. (152 M.) · · · Some later than the above and a very regular and full bearer. Fruit in size, colour and shape much like "Grimes Golden." Quality best for kitchen use and very good for dessert.

Plodovitka. · · · Very early and profitable at the North.

Voronesh Arkad. · · Fruit medium to large, yellow with blush on sunny side. Flesh fine-grained, tender and sweet.

Anisette. (No. 185.) · · · Of the "Duchess" family, and hardier at the North. An annual and full bearer of fruit like the "Duchess," but finer in grain, less acid and earlier. Will prove valuable over a large part of the United States.

Revel Pear. (No. 379.) · · · A heavy bearer of fair-sized handsome fruit for home use or market.

Borovinka. (No. 245.) · · · Of the "Duchess" family. Fruit almost identical with "Duchess," but a better keeper.

Lubsk Queen. (No. 444.) · · · As hardy as "Duchess" and noted for heavy and continuous bearing. Fruit large, smooth, with varied shades of red and pink. Flesh fine-grained, sub-acid, and very good for so large a fruit. This is placed with the summer apples, because it colours up early and ships well at an early date, but it keeps well at the fruit stands and can be easily kept through September.

Early Sweet. · · This is proving very valuable in all parts of the state. Fruit medium to large, bright yellow, smooth, even and perfect. Flesh tender and very sweet. Season, here—early September.

AUTUMN APPLES.

Revel Borsdorf. (No. 122.) · · An early bearer of very handsome apples of medium size and excellent quality, that take well in market for table and dessert use. Season, here—last of September.

Longfield. (No. 161 and 57 M.) · · Tree not hardier than "Wealthy," but not so liable to sunscald. On dry ground will prove very profitable up to north line of the state. An annual and full bearer of medium-sized yellow fruit, handsomely blushed. Will be popular, as it never fails to bear; is not excelled for cooking and jelly making, and pleases all for dessert use. After it has borne two or three heavy crops, it should be manured or the heavy crops of fruit will run too small. Season—autumn, but by early picking it will keep nearly as well as "Jonathan."

Rosy Repka. (No. 200.) · · · An iron clad tree everywhere. Fruit large, even sized, handsomely coloured, sub-acid, and excellent in quality. Will be a popular market apple. Season—autumn, or early winter on the north limit of its possible growth.

Repka Aport. (No. 261.) · · Of the "Alexander" family. Tree does well up to the north line of the state on dry soil and in unsheltered position. Fruit very large, handsome and good in quality. Season, late fall and early winter.

Green Crimean. (No. 399.) · · On dry ground hardier than "Wealthy." Fruit large, conical, yellow. Season—late fall, and early winter farther north. Most valuable for market and culinary use.

Hibernal. (No. 378.) · · · Hardier than "Duchess" and fully equal in bearing and perfection of tree on varied soils. Fruit large, even sized, handsomely coloured, and of best quality for culinary use. This will prove a popular market apple for kitchen use during the fall and early winter. It has some value for dessert use when fully matured, and the skin, which has a crab-like flavour, is removed.

Keiv Reinette. (No. 447.) · · · Hardier than "Duchess" at the North. Fruit large, smooth, yellow with crimson splashes and a rich bloom. Valuable for all uses. Season—late fall and early winter.

Gipsy Girl. (56 Vor.) A fine tree in nursery and orchard. Fruit large, smooth and remarkably handsome. A famous train-boy apple in East Europe. Will be prized over a large part of the country. Season—late fall.

Mallett. (No. 980.) · · · As imported by the Department of Agriculture this has the name of "White Pelikanoff." The fruit is not white, but is much like "Wealthy" in size, shape, colour and quality. Its true name is "Mallett." Though classed with the fall apples it is a remarkable keeper after it becomes tender enough for dessert use. As grown at the North, we have eaten the fruit in fine condition in March.

Large Anis. (No. 413 Department.) · · · This was imported by the Department of Agriculture under the name of "Cross" apple. It is an iron clad tree in all respects, a heavy and continuous bearer, and a valuable late fall and early winter apple of good size and excellent quality.

Antonovka. · · · This is an iron clad tree and an early and continuous bearer of large yellow apples that will take well in market and prove valuable for home use. Its fault is tendency to blight on black soils and in sheltered localities, but it is not more subject to blight than the "Yellow Transparent." Season—late fall and early winter.

Aport Orient. · · · This is one of the most valuable of the varieties of the "Alexander" family. Fruit very large, gorgeously coloured, and of excellent quality for an apple of its size.

Golden Reinette. · · · This has not proven true to name as received from the Bogdanoff estates, in Russia. It is a member of the "Anis" family, of fine size and excellent quality. Season—late fall, and early winter North.

Posarts Nalivia. · · · Of the "Antonovka" family and less subject to blight and a better keeper. Season, here—December, and much later on its north limit of growth. Fruit much like the "Antonovka," but it averages larger in size and is better in quality.

Kursk Reinette. (20 M.) · · · Of the "Longfield" family, with the same habit of early and continuous bearing. Fruit more conical than "Longfield," of same colour, flesh fine-grained, tender and sweet. This promises to be very valuable over a large part of the United States.

Sandy Glass. (24 M.) · · Tree not much hardier than "Wealthy." Does best on dry soil in unsheltered position. Fruit large, yellow, with blush on sunny side. Flesh fine-grained, tender, melting, sub-acid, very good. If picked early will keep into mid-winter here.

Rambour Queen. (No. 502. · · Tree a fine grower, but not quite as hardy as "Duchess." It succeeds, however, where "Wealthy" fails. Fruit large to very large, yellow, splashed with rich crimson, remarkably handsome. Flesh fine-grained, tender, and of excellent quality for so large an apple. Season—late fall.

Silken Leaf. (No. 327.) · · · This is one of the hardiest of the 'Hibernal" family. A great and continuous bearer of smooth, handsome apples; specially valuable for culinary use. Season—late fall, and mid-winter at the North.

Pointed Pipka. (No. 361.) · · · A true iron clad and perfect tree on varied soils. Fruit large, conical, coming to a point at the narrow basin, yellow, covered with stripes and splashes of crimson, with much bloom. Flesh fine-grained, sub-acid and very good Season, here—late fall, and late winter on its north limit of growth.

Bergamot. (No. 424.) · · · This is of the "Antonovka" family and is classed as winter apple by J. B. Mitchell, of Cresco, and other northern growers. The fruit is later with us than "Antonovka" or "Posarts Nalivia," but does not keep later than December with ordinary care. A remarkable bearer and perfect tree in every way. Fruit large, even in size, bright yellow and good in quality for every use.

Harry Kaump. · · This originated in Wisconsin and is now very popular in Sac and other counties in Northern Iowa. An early and continuous bearer. Fruit medium, green, with show of colour on sunny side; flesh fine-grained, mildly acid and fine in quality for dessert use. Season—late fall and early winter.

WINTER APPLES.

Aport Voronesh. · · · We introduced the "Aport" of Central Russia from several points. It has been sent out as "Aport, 23 M., 4 Vor.," and "12 Orel." We have kept these importations separate, but they all appear to be identical. Fruit large, smooth, yellow, with much red in broken stripes and splashes. Flesh

yellowish white, slightly coarse, sub-acid, aromatic; quality very good for any use. Mid-winter here, and will keep through winter at the North.

Arabskoe. (No. 257.) · · On dry soil this is much hardier than "Wealthy" at the North. Fruit large and much like "Blue Pearmain." Quality much better than "Willow." Mid-winter here, and much later north.

Bogdanoff. · · Tree nearly as hardy as "Duchess" on dry soil at the North. Fruit large, smooth, finely coloured, with much bloom. Flesh fine-grained, tender, sub-acid, and nearly best in quality. Season—late winter.

Bogdanoff White. · · Of the same family as "24 M." Fruit large, yellowish white, fine-grained, tender and excellent in quality. Season, here—early winter.

Sklanka Bogdanoff. · · · This is an iron clad tree on dry soils, and an early and continuous bearer. Fruit medium in size, yellow, conical; quality better than "Baldwin." Season—mid-winter, and very late on its north limit of growth.

Volga Cross. · · · A perfect tree on varied soils. Fruit of size of Rhode Island "Greening" and a much better keeper. Quality better than "Baldwin."

Cross. (15 M. and No. 413.) · · · This is the true "Cross" apple of Central Russia. In close sheltered positions on black soils, it is subject to blight, but, like the "Yellow Transparent," it blights only on points of growth. On dry soils and in airy positions it will prove very valuable, as it is a heavy and continuous bearer. Fruit medium to large, oblate, ribbed, yellow, with red and crimson stripes. Flesh firm, sub-acid, very good. Season, here—mid-winter, and it will keep as grown in North Iowa until spring.

Marmalade. (88 Vor.) · · · A perfect tree on varied soils. Fruit large, yellow, blush on sunny side. It is especially valuable for jellies, marmalades and other culinary uses requiring much grape sugar. Season, here—mid-winter.

Ostrakoff. (4 M.) · · · This is hardier than "Duchess" and less subject to blight. An early, heavy and continuous bearer, and needs manuring to keep up size of fruit after it has borne heavy crops. Fruit medium to large, even in size, yellow. Flesh firm, sub-acid and fine in quality. Mid-winter here, and will keep until May on its north limit of growth.

Ledenets. (30 M.) · · · An iron clad tree, succeeding best on dry soils without shelter at the north and west. A heavy and continuous bearer. Fruit medium to large, yellow, oblate, with blush on sunny side. Flesh fine-grained, sub-acid, very good. Season—mid-winter here, and very late on its north limit of growth.

Lead. (3 M.) · · · This also does best on dry soils without shelter. Fruit large, oblate, conical, yellow, with red on sunny side, acid and most valuable for cooking, but when ripe it is better for dessert use than "Willow" or "Ben Davis." Mid-winter here, and much later north.

Royal Table. (5 M.) · · · Also needs dry soil and open exposure. An early and continuous bearer. Fruit medium to large, conical, ribbed, yellow, with red on sunny side. Flesh white, fine-grained, sub-acid, nearly best in quality. Mid-winter here, and late winter at the North.

Aport. (No. 252.) · · This was sent us by Dr. Regel as the true "Winter Aport." It is not identical with the "Aport Voronesh" above noted. It is proving to be an early and continuous bearer and promises to be very valuable. Fruit medium to large, oblate, yellow, with plashes and stripes of red and crimson. Flesh fine-grained, sub-acid, nearly best in quality.

Borsdorf. (No. 356.) · · This is the best bearer of the Russian "Borsdorf" family and the hardiest and best tree. Fruit small, russeted and best in quality. Season, all winter.

Repka Malenka. (No. 410.) · · On dry soil this is hardier than "Wealthy." Fruit medium in size, yellow, with crimson splashes and broken stripes. Quality, very good. Season, late winter.

Regel. (No. 169.) · · · This was received by the College from Dr. Regel, of St. Petersburg, under the name of "Green Sweet." But a mistake was evidently made as this is not sweet, has a fine colour, and is a late-keeping winter apple. It much resembles "Repka Malenka" in shape and colour, but it is larger in size and of better quality. In season and flavour it is much like Rawle's "Janet."

Zozoff's Winter. (No. 585.) · · In the Bulletin of 1890 we did not credit this as a very hardy variety. Our recent reports show it to be as hardy as "Wealthy" and less subject to blight. It is an annual bearer on account of its very late period of blossoming in the spring. Fruit large to very large, beautifully coloured, fine-grained, tender, mildly acid and nearly equal to "Northern Spy" in quality. Season—about that of "Grimes Golden." In tree it is not hardier than "Wealthy," and it should be top-worked in trying positions in North Iowa.

Romna. (No. 599 and 11 M.) · · · This succeeds best on dry soil, where its roots run very deep. Fruit medium in size, conical, smooth, handsomely coloured; but when matured it is much better for dessert use than "Willow," or "Missouri Pippin," or other coarse sorts found in our markets. Season—mid-winter here, and late winter north of 43rd parallel.

Voronesh Rosy. (No. 1277.) · · The stars only indicate this to be as hardy as "Wealthy," yet it stands better at the North, as it is less liable to sun-

scald and to injury of its forks. It will prove a very valuable variety for top-working on "Hibernal," north of the 44th parallel. Fruit large, even-sized, yellow, with rosy red and bloom on sunny side, and often over the whole surface. Flesh fine-grained, tender, sub-acid, and nearly best for dessert use. Season at Ames—February.

Grandmother. (No. 469, 6 M., 84 Vor.) · · As imported by the Department (No. 469) it is not true to name. It is hardier than "Wealthy" and an early bearer. Fruit medium in size, oblate, ribbed, yellow, with fine red and crimson on sunny side. Stem thick and strong. Flesh firm and quality nearly best. Season—mid-winter at Ames, and late winter on high divides in North Iowa.

Swinsovka. (No. 277.) · · · The Department No. 277 is labeled "Vargul," but is not true to name. The "Swinsovka" is of the "Lead" apple family, but is not identical with "3 M." Fruit medium to large, green, with yellow on sunny side. Flesh fine-grained, firm, sub-acid, juicy and excellent for dessert use. Season—mid-winter at Ames, and late winter north.

Red Queen. No. 316.) · · As hardy as "Wealthy," and doing remarkably well on dry soils up to the 43rd parallel. Will prove most valuable at the north top-worked on "Hibernal." Fruit medium to large, smooth, even-sized, coloured late in season. At the North, it is usually picked before it is much coloured. Flesh firm, fine-grained, sub-acid and better than "Ben Davis" in quality. Season, late winter. Like the "Cross" apple, this should only be planted on dry soils and in unsheltered positions.

Boiken. · · A variety imported from Transylvania. It is now a favourite variety in Eastern France. The tree seems to be as hardy as "Wealthy," and is an early and continuous bearer. Fruit medium to large, yellow, with handsome carmine stripes and splashes. Flesh snow white, fine-grained, sub-acid and best in quality. Season—late winter. Will be very valuable for top-working at the North.

Citron. · About as hardy as "Roman Stem." Fruit large, yellow, finely coloured; quality best. Season, late winter. Will prove most valuable for top-working.

Battulen. · Also from Transylvania, and is much grown in Europe from cuttings. It is a poor grower in nursery and should be top-worked. Fruit large, peculiarly handsome. Flesh white, fine-grained, and best in quality. Season—late winter.

Winsted Pippin. · · This originated in Minnesota. E. R. Heisz, of Nora Springs, in North Iowa, says it is nearly as hardy as "Duchess." On the College grounds it has proved a perfect tree and a good bearer. Fruit medium to large, mildly acid, fairly well coloured, and much better than "Willow" in quality. Season—late winter.

Burlington. An Iowa seedling, about as hardy as "Roman Stem." Fruit medium, fine-grained, sub-acid and nearly best in quality. Season—mid-winter.

THE CRAB APPLES.

In the past we have propagated and sent out for trial some of the most promising varieties and hybrids of the Siberian crabs. But at this time we have decided that their place is taken by such varieties of the Russian apples as the "Longfield," "Marble," "Recumbent" and other sorts.

The "Longfield," for instance, is superior to any of the crabs for jelly, marmalade, pies, sauce, etc. It is also a better bearer, and its fruit has a value for dessert use. The only crab we now pronounce valuable is the one known as Virginia crab, which is only valuable as a stock for top-working, but it is not as valuable for this use as the members of the "Hibernal" family.

We have recommended the "Boone" crab, but with farther experience we find that it is a shy bearer, and its foliage and fruits have been attacked by scab to a ruinous extent.

General Notes.

It will be urged by friends who have had considerable experience in growing and fruiting the East European fruits that we have omitted some of the varieties they have found most valuable, and included a number with which they have not been wholly satisfied on account of blight or some other cause.

But it must be kept in mind that this is a report on the varieties and species we will distribute at this time, and that varied soils, elevations and exposures bring us varying reports. The notes as now given are a summary of the behaviour on our own grounds and on the grounds of a large proportion of our reporters over an immense area of our country.

In the autumn list we have included a number of varieties which are proving mid-winter apples on their north limit of growth, such as "Longfield," "Rosy Repka," "Repka Aport," "Hibernal," "Mallett," "Large Anis," "Posarts Nalivia," "Silken Leaf," "Pointed Pipka," "Bergamot" and "Harry Kaump."

We cannot too strongly impress the importance of planting apple trees on the highest and driest land available, and furnishing no protection on the north and west. If the elevation is not more than ten feet above the general level of the adjacent lands, it is a great advantage in furnishing air drainage, equalizing the temperature in summer and lessening the danger from frosts in the blossoming period.

Another benefit resulting from the selection of dry soil is that it permits deeper setting, which is a protection to the tender roots we are compelled to use in root grafting.

If compelled to set the family orchard on low, black-coloured soil, get our selection of best varieties for such soil, set the trees shallow and ridge up for drainage and root protection.

We send out low-headed trees, and our advice is to keep them low. In setting, lean the trees at a strong angle toward the one o'clock sun. They will have an awkward appearance at first, but they will soon become erect.

The best crop for a young orchard is buckwheat. Plow the ground very shallow about the middle of June and seed at once. The buckwheat keeps the ground loose, porous and relatively moist, permitting the roots to come up near the surface where the moist of the nitrogenous plant food is found. The buckwheat can be cut, or allowed to rot on the ground. Bank the trees in the fall to pretect the crowns and to prevent damage by mice. To guard against rabbits, wash the stems with thin whitewash, thickened with copperas and sulphur. If washed off by rains, renew the wash as often as necessary.

In the above lists, three stars (· · ·) indicate the variety to be hardier on suitable soils than the "Duchess"; two stars (· ·) indicate the variety to be hardier than "Wealthy," except as noted in special cases. One star (·) indicates the variety to be as hardy as "Roman Stem," except as noted in special cases.

PEARS.

Prior to 1882 the writer, in common with all experienced orchardists, believed that pear growing would never prove profitable west of Lake Michigan, except at a few favoured points.

The varieties from Southwest Europe and their American seedlings had failed with us completely as had the grapes, strawberries, raspberries, etc., from from that equable climate. Hence, we were astonished to find healthy pear orchards loaded with fruit in the parts of East Europe where our native "Black Locust" winter-kills as the common peach does with us. We were still more surprised to find the pear used as a street tree on the Volga, where the "Duchess" apple will not endure the winters, and where, with scanty snowfalls, the thermometer often goes down fifty or more degrees below zero. We at once decided that some of these varieties were worthy of trial. The present notes are con-

fined to the varieties which have fruited in our state and have shown the fewest defects of tree and foliage. All of the varieties from South Central Russia have proven as hardy as the "Duchess" apple in tree, but many of them are far more subject to blight, except when planted on ridges in wholly unsheltered positions.

Bessemianka. (No. 508 and 3 M.) On dry soils, where it can be planted deeply to protect the tender roots on which we are compelled to graft all our varieties, this is doing well up to the 44th parallel. Fruit medium in size, Bergamot shaped, and is nearly or quite seedless. Flesh tender, juicy, sub-acid, almost buttery, and very satisfactory for dessert use. Season—last of August.

Limber Twig. (No. 513 and 14 M.) Much like the above in hardiness and habits of growth. Fruit larger than "Bessemianka," and about the same in quality and season.

Gakovsky. (No. 347.) This variety can be grown on dry soil at the far North. The fruit in our climate is not as large as we reported in 1890, and it is not as firm in flesh as was reported. It proves to have fair quality for dessert use, and is very valuable for cooking. Season—September.

Autumn Bergamot. (No. 122.) A very vigourous grower in orchard and nursery, and has done better on common prairie soils than the above noted varieties. Fruit small to medium in size, nearly sweet, very juicy, and would be called good in quality in pear growing regions.

Kurskaya. (No. 392.) A very hardy tree and has been very free from blight on all soils. Fruit medium in size, Bergamot shaped and excellent in quality. This has fruited very freely even during the past peculiar season.

Victorina. (No. 361 and 106 Vor.) This, by mistake, has been sent out largely as No. 391. It is a very hardy tree and free from blight on soils suitable in any climate for pear growing. Fruit medium size, pyriform, fine-grained, tender, and very good in quality when ripened in the house. Season—early September.

Early Bergamot. (No. 418 and 103 Vor.) A fine healthy tree, much hardier than the "Wealthy" apple. An early summer variety, larger in size and better in quality than the old "Summer Begamot" grown in Wisconsin previous to our recent test winters.

Flat Bergamot. (No. 396.) About like the above in hardiness of tree and quality of fruit, but its fruit matures early in September.

Winter Pear. (9 M.) We have very favourable reports of this variety as to hardiness of tree and freedom from blight. Fruit larger than the "Bessemianka," as good in quality and three weeks later in season.

Dula. (4 M.) The foliage of this variety indicates close relationship with the "Snow Pears" of Mongolia. Fruit "Bergamot"-shaped and most valuable for culinary use. Season, September.

Saccharine. (12 M.) This appears to be identical with the "Zuckerbirn" ("Sugar Pear") of Northeast Germany. It appears to be hardier than the "Wealthy" apple, and has shown no trace of blight on the College grounds. Fruit "Bergamot"-shaped, tender, juicy, nearly melting and sweet. Season, early September.

Lemon. (No. 516 and 7 M.) A very hardy tree, which Dr. Shroeder says is most valuable for culinary use. I have not seen the fruit as yet when fully ripe.

Mongolian Snow Pear. This is hardier in tree than "Flemish Beauty," and its leaves are always clean, handsome and perfect. On dry soil it will prove valuable up to the 42nd porallel. It is a regular bearer, even such unfavourable seasons as that of 1892. Fruit above medium in size, and when ripened in the house it is much better in quality than "Kieffer," "Le Conte" or any of the Chinese pears we have tested grown in the South. It should be ripened in the house, and can be kept until late in autum.

Golden Russet. We suspect this to be identical with the "Golden Russet" pear of Japan, recently figured and reported upon very favourably in eastern journals. But of this we are not certain, as our trees were received from Northwest China. It is an early and continuous bearer of peculiar, flattened, russeted fruit, maturing in autumn, and may be kept into early winter. This is not an ironclad at Ames, but if injured at its points of growth during severe winters, it starts vigorous shoots from below and continues its usual habit of free bearing. Valuable for culinary use.

General Notes.

As a rule in all countries the pear thrives best on rather high and dry soil, and in our State it has succeeded best on prairie ridges, knolls and bluffs wholly unsheltered at the north and west. Plant on a ridge, even if not more than ten feet above the general level. With us the main trouble is from blight with the ironclad varieties, which is not often seen when planted on dry ground in wholly unsheltered positions.

We are compelled to use the seedlings of the French pears in grafting, which in our climate are apt to be injured in open winters unless the trees are planted deeply. On dry ground plant fully six inches deeper than they stood in nursery. In nine cases out of ten, these deeply planted trees will throw out roots from the scion within two years after planting.

We send out and plant for our own use trees one or two years old from the graft. Even In Michigan, the veteran grower, T. T. Lyon, loses no opportunity for urging the planting of what he calls "maiden trees," *i. e.*, one year old trees.

These small trees are more certain to make a good growth the first season, and will make larger and better trees four years after planting than older trees planted at the same time. Again, the little trees will permit very low heading and the shaping of the top so as to have a central ascending stem without forking branches.

CHERRIES.

In the summer of 1882 the writer had a fine opportunity for studying the European cherries from the valley of the Moselle, in France, eastward to North Central Asia. In the spring of 1883 we imported one year old trees of the varieties which we decided to be the most promising for trial in the Prairie States and in the far North. These little trees were set out in the orchard on the College grounds, and have had hard usage. They have been exposed to the recent trying summers and winters that have killed our trees, young and old, of the grade of hardiness of "Early Richmond," Montmorency" and "English Morello." Since their first year of growth they have also been mercilessly cut for scions in autumn and buds in summer, which we need not say is a serious damage to any stone fruits.

A better opportunity for determining the relative hardiness of trees and perfection of foliage has not been given in the history of our prairie horticulture.

After this severe ordeal on the College grounds and the extended tests on the grounds of experimenters over the North and West, we are now pleased to report that many of the varieties appear to be as hardy as our native plums.

These East European varieties are also hardier in fruit, bud and blossom than any of our old varieties.

We are also pleased to report that the fruit has fully realized our European estimates as to the quality, colour and size after the trees come into heavy bearing. But the first fruits on young trees are small on account of being robbed by the rapid growth of the young wood. In the following list, the varieties are given very nearly in the order of maturing their fruit.

Early Morello. (23 Orel.) · · · A neat round-topped tree, with firm thick leaves. An early and regular bearer. Fruit much like "Early Richmond" in size and colour, but the pit is smaller, the flesh firmer, has more grape sugar, and it is a little earlier in season. Juice uncoloured.

June Morello. · · A neat round-topped variety of the eastern "Griotte" race. Fruit much like the "Richmond" in size, colour and season, but firmer in flesh and much better in quality for dessert use or canning. Juice uncoloured.

Griotte précoce. · · Much like the above in size, colour and quality of fruit, but ten days later in season. Uncoloured juice.

Boquet Morello. · · Another variety of the same family, still later in season and with much grape sugar. Uncoloured juice.

King's Morello. · · This belongs to a class of the "Griottes," with stronger growth. Fruit round, truncate at both ends; flesh white, soft, juicy pit very small. Juice slightly coloured when fully ripe.

Griotte du Nord. · · Of the same class as the above. A good tree, with fine foliage, Fruit large, nearly black when fully ripe. Flesh firm and of fine quality.

Sklanka. · · A handsome round-topped tree, with pendent habit and the best of foliage. This does well on low, black soil, where most varieties of cherries fail, but it succeeds still better on higher, drier land. Fruit large, yellow, with red on sunny side. Flesh firm, juicy and very mildly sub-acid when fully ripe; pit very small. Uncoloured juice.

Orel Sweet. (26 Orel.) . . This is the hardiest of the strictly sweet cherries of East Europe. It is twenty per cent hardier than the "Early Richmond," with good foliage. Fruit medium in size, black; very small pit. Flesh firm, rich and decidedly sweet. Juice coloured.

Strauss Weichsel. · · · A strong, vigorous tree, with good foliage. Fruit large, nearly black when ripe. Flesh firm, juicy, refreshing, mildly sub-acid. Uncoloured juice.

Bessarabian. (No. 62.) · · · Our reports on this variety continue to be very favourable on all soils, and about all locations over a great area of the Northwest. Fruit large, dark red, firm-fleshed, and of excellent quality for any use. Juice uncoloured.

Frauendorfer Weichsel. · · · A strong growing tree, with weeping habit and fine foliage. Fruit large, dark red, truncate. Flesh tender, juicy, sub-acid. This variety is criticised at first, as the first fruits are small and poor, on account of the rapid growth of the new wood. Juice uncoloured.

Cerise de Ostheim. · · · A round-topped tree, with pendulous habit. It is the best variety of the "Ostheim" family. Fruit medium in size and nearly black when ripe. Pit small; flesh firm, and is tender, juicy and very rich in grape sugar. This also is condemned when the trees are bearing their first fruits. Juice highly coloured.

George Glass. · · This variety was introduced into Marshall County, Iowa, from North Germany. It has fine foliage and is proving a good bearer. Fruit large, firm and well stocked with grape sugar. Uncoloured juice.

Double Natte. · · This variety was mixed when received. At first we sent out some trees of a spurious variety that has no value. Fruit large and nearly black when ripe. Flesh dark red, firm, and of high quality for canning. Juice highly coloured.

Lithauer Weichsel. · · Much grown in Southwest Russia for drying and the making of cherry wine. A strong, vigorous tree. Fruit medium in size, with very small pit. Flesh quite acid, but with much grape sugar. Only valuable for canning. Highly coloured juice.

Lutovka. · · A strong growing tree, with fine foliage. Fruit very large, dark red. Flesh white, firm, pure flavoured. Uncoloured juice.

24 Orel. · · · The name of this variety is not known, as the invoice was lost. It is much like the "Lutovka" in all respects, and may prove to be identical. Uncoloured juice.

Vladimir. (25 Orel.) · · · A medium-sized tree that promises to be very valuable. Fruit as large as "Montmorency," black when ripe. Flesh firm, juicy, refreshing and nearly sweet. Highly coloured juice.

Brusseler Braune. · · A larger grower than "Richmond," with good foliage. It does not succeed well on low, black soil, but is a remarkable bearer on dry upland. Fruit large, nearly black when fully ripe. Flesh firm, juicy and fine flavoured. Mildly sub-acid when fully ripe. Juice highly coloured.

27 Orel. · · The name of this variety was also lost. It appears to be almost identical with "Brusseler Braune," yet we have more favourable reports in regard to hardiness of tree at the North than we have of the latter variety.

Orel. · · · This is a dwarf growing variety of the "Vladimir" family. It bears good crops when the plants are not more than four feet in height. Fruit large, black, and quite acid. Will be very valuable for the far North. Coloured juice.

Shubianca. (6 M.) · · · Another dwarf variety of the "Vladimir" family. Fruit much like the "Orel," but some later in season. Coloured juice.

Shadow Morello. · · This is a dwarf variety, remarkable for its heavy and continued bearing. Fruit large and nearly black when ripe. When first coloured red, the fruit has a bitter flavour. At this stage of development it is excellent for canning, and when black and fully matured it is excellent for dessert use. Highly coloured juice.

Spate Morello. · · Another variety of the same dwarf family of "Griottes." Also a remarkable bearer. Fruit much like the above, but some later in season. Highly coloured juice.

Large Long Late. · · Still another variety of the same dwarf family. It is known in North Silesia as "Double Shadow Morello." Fruit much like the above, but some later in season. Highly coloured juice.

SOME VARIETIES FOR SOUTH IOWA.

While all the varieties above noted, except perhaps "Orel" and "Shubianca," will prove valuable in South Iowa, the following varieties of high quality will have special value on dry upland soils south of the 42nd parallel.

Heart-Shaped Weichsel. This is an evident cross between the sweet cherries of the East and the "Dukes." It is admitted as a lawn-tree in North Germany, on account of its symmetric habit of growth and handsome striped leaves. Fruit large, heart-shaped, purplish-black when fully ripe. Flesh firm, juicy, refreshing and almost sweet. Uncoloured juice.

Red Oranien. Of the "Red Duke" family, with fine foliage. It blossoms late, and promises to be a good bearer. Fruit large, dark-red, and in quality much like the above.

Bunte Morello. This is not a "Morello," though grown in North Silesia under this name. A vigorous grower, fully as hardy as "Early Richmond." Fruit large, heart-shaped, purplish-red, and sweet. The success of this variety hinges on planting on high grounds, as its blossoms come out quite early in the spring.

Yellow Glass. A variety introduced from North Silesia A fine grower, with perfect leaf. Fruit very large and bright-yellow in colour. Flesh firm, fine-grained, juicy and sweet. This promises to be very valuable. It fruited on the College grounds even the past unfavourable year.

Vilne Sweet. From Vilne in Southwest Russia. Fruit large, firm-fleshed and sweet. This variety should be tested by all who have good cherry soil in the South district, as the tree promises to be a good bearer, and the fruit would be called of excellent quality in California.

GENERAL NOTES.

1. Dry ridge soil with porous subsoil is most favourable for cherry-growing. On such soil the trees should be set four to six inches deeper than they stood in the nursery. By deep setting, roots will be thrown out from the scion or from a point above the bud in two or three years. Indeed the Russian and North German varieties often emit roots from the scion the first year after setting the root-grafts in nursery. Another benefit resulting deep setting is protection of the tender roots we are obliged to use in propagation.

2. Even in West Europe low cordon and bush-training of the cherry is becoming common among commercial growers. In East Europe, in sections remote from the ocean, all stone fruits are headed very low. In the Volga region the cherry is grown in bush form, with several stems, like the currant and

gooseberry. Experience has also favoured very low stems of the stone fruits in the Prairie States. With high stems all varieties are liable to sun-scald and stem injury Fortunately many of the Russian varieties favour the shading of stems by their pendant habit of growth. But even with these it is best to have very low stems.

3. We send out one year old cherry trees exclusively. Many who receive them, we find, set them in nursery rows with a view of planting them in orchard when they attain proper size. This is wrong, as they should be planted at once where they are to stand permanently. It will be found that the one year old cherry tree set in orchard will be larger, thriftier, better shaped and more fruitful than the three year old tree set at the same time.

4. Root-grafting the cherry is far better for the planter than those propagated by budding. The root-grafts are set down in nursery to the top bud of the scion, thus placing the tender root considerably below the surface and favouring the emission of roots from the scion. When set still deeper in the orchard, such trees are not liable to root-killing.

5. Observations in Europe and in this country favour the belief that alternating varieties in the cherry and plum orchard favours regular and continued bearing. A variety that proves a poor bearer when dependidg on its own pollen supply, is often regularly fruitful when intermingled with other sorts. In our climate, if the weather during the blossoming period is hot and windy, a variety may mature and waste its pollen before the stigmas are ready to receive it. With such varieties, the pollen of adjacent sorts may perform the needed work with the aid of insects and the wind.

6. In planting a cherry orchard we have much to favour the belief that planting the trees quite thickly in the rows running north and south is an advantage; giving a wider space than usual between the rows to let in the sun at mid-day and to favour free circulation of air. Orchards planted with trees only ten feet apart in the rows and with a space between the rows of twenty-four feet have fruited more regularly than those planted in the usual way.

7. In the above list the varieties marked with three stars (· · ·) are hardy enough to be grown on dry soil up to the 44th parallel. Some of them, such as "Orel," "Shubianca," "Vladimir," and possibly "Bessarabian," will succeed on hardy roots far north of that line. The hardy root for the far north is the native "Pin Chery" or "Red Wild Cherry" (*Prunus Pennsylvanica*), on which all cherries make a good union by either budding or grafting.

The varieties marked with two stars (· ·) are hardier on dry soil than any variety of the old list, and may be safely planted up to the 43rd parallel.

8. The name "Amarelle," previously used, means "Morello." Hence the change in some of the names.

PLUMS.

NATIVE VARIETIES.

Some of our native varieties can only be called "new" in the sense that they are not generally known over the West, though many of them have been prized locally during the past quarter of a century. We are distributing the following varieties:

De Soto. This is more generally known than any of our native sorts, and is generally popular. It does not stand drouth well, hence it should not be planted on dry ridges. Fruit larger than "Miner" and much better in quality for any use.

Wolf. Fully equal to the "De Soto" as a bearer, and the fruit is larger in size. In quality, however, it does not quite equal the "De Soto" for dessert use and canning. Its fruit, in a very dry season, is much superior to the "De Soto."

Wyant. Known locally on the Cedar River, near Jamesville, Iowa, for many years, but only recently sent out for trial to other points. A beautiful bearer of fruit as large as "De Soto," free stone, and the best in quality for dessert use, uncooked, with cream and sugar, that we have tested. Taking all things into consideration, we regard this the most valuable of the native varieties.

Rollingstone. A heavy and continuous bearer when the tree attains some size and age. Fruit round, firm-fleshed and valuable for dessert use. For cooking, it is not superior to the "De Soto."

Cheney. This has been prized for many years near La Crosse, Wisconsin. Fruit averages larger than that of any of the preceding sorts. Flesh firm, free from astringency, and valuable for market or dessert use. We have not yet tested it for cooking. The two past years this variety has been seriously attacked by the fungus known as the Plum Pocket. If it continues, it will seriously lessen its value.

Hawkeye. This has not been tested to any great extent outside of the home growth of H. A. Terry, at Crescent, Iowa. Fruit as large as "Cheney," and excellent in quality. Very promising for trial.

Chippewa. A dwarf variety from Chippewa Falls, Wisconsin. It often bears when only two feet in height, and the crops of fair-sized fruit it carries when only four or five feet in height is surprising.

Pottawattamie. An annual and early bearer of medium-sized, bright red fruit of excellent quality for any use. It will prove hardy north of the 42nd parallel, except in favoured spots.

Forest Rose. Much like the above in hardiness and quality of fruit, but will sell better on account of larger size. It has proven an excellent bearer at Ames and at many other points south of the 42nd parallel.

Maquoketa. This was found on the Maquoketa River, in Eastern Iowa. Fruit larger than "Miner," and better in quality for dessert use or cooking.

The three last named are varieties of the "Chicasa" species, and at present they appear to be the hardiest in tree and the most regular in bearing of the "Chickasaw" family yet tested.

Other Native Plums. We are sending out in a small way some other fine native plums for trial, which have been locally prized. Some of these in the near future may take the place of a part of those noted at this time.

EAST EUROPEAN VARIETIES.

The varieties introduced from Southwest Europe and their American seedlings, which have been grown with greater or less profit in the states east of the lakes, have wholly failed on the College grounds at Ames. The varieties noted at this time were selected by the writer on the steppes of East Europe in 1882, with the exception of the three last named on the list, which have come to us as strays from the same source. The opinions here expressed in regard to their value, are founded on our home experience with trees badly injured by scion-cutting, and on the reports from our trial stations scattered over the Northwest and cold North.

Early Red. This was sent out quite extensively eight years ago, marked "Mixed Arab." The sorts mixed were "Early Red," "White Nicholas" and "Black Arab," now called "Black Prune." But nearly all the trees thus sent out have proven to be "Early Red," which is our No. 3 from St. Petersburg. The tree has proven hardy as far north as any of the native plums we have noted, and an early bearer of purplish-red fruit nearly as large as "Lombard," better in quality and two weeks earlier. It has also proven nearly free from the attacks of the curculio and plum-gouger.

Moldavka. This is a South Russian variety, which has proven hardy up to the 44th parallel. Fruit large, oblong oval, free stone, and bright yellow in colour. Very good in quality for any use. Will be very valuable at the North, as the fruit ripens in August. Among the sprouts first received were two or three spurious ones, bearing large blue fruits. These were mixed with those first sent out under this name.

Voronesh Yellow. This was selected by Dr. Fischer, of the Voronesh Agricultural College, as one of the hardiest and best varieties for dessert use. Fruit

large, bright yellow in colour, free stone and nearly best in quality for any use. Season, August.

Leipzig. (113 Riga.) This will prove most valuable in the south half of the State, yet on dry soil it may be grown up to the 43rd parallel. Fruit very large, blue, with much bloom and much superior to Lombard in quality.

Dame Aubert This is a favourite variety over the black soil sections of South Russia. Fruit medium in size, bright yellow in colour, free stone, and excellent in quality. Season, August.

Hungarian Prune. A very hardy tree and an early and continuous bearer. Fruit of medium size, prune-shaped, blue, and free stone. So far, this variety has been less injured by curculio and plum-gouger than any other variety on the grounds.

Ungarish Prune. A low-spreading tree, that has proven hardy on dry ground up to the 43rd parallel. Fruit medium in size, with a deep suture, dark blue, with much bloom, is prune-shaped, a perfect free stone and of high quality when fully ripe. But if tested when it first colours, is very sour. When fully ripe it has the flavour and quality of the Italian prunelles.

Hungarian No. 1. This was mixed with the sprouts of the "Hungarian Prune" above noted, and has proven very valuable. Fruit medium in size, prune-shaped, bright yellow, free stone, and fine in quality.

Black Prune No. 1. This is a true prune of excellent quality. Fruit medium in size, and when ripe excellent in quality for dessert use or cooking. Though sweet to the taste when eaten as picked from the tree, it develops much acid in cooking.

Beer Plum. This also belongs to the prune family, and has proven a remarkable bearer. Like the "Black Prune," it is nearly sweet when fully ripe, but develops enough acidity when cooked for delicious sauce.

Wyserka. We have many favourable reports in regard to this variety from the central and southern districts. The fruit is large, blue, with much bloom, and is of good quality.

Long Red. (Orel 19.) A very hardy tree, with perfect foliage. Fruit medium in size, oblong, purplish-red, and mainly valuable for culinary purposes. Yet when fully ripe it is good for dessert use.

Long Blue. (Ozel 20.) This is a true ironclad, and a bountiful bearer of showy blue plums, with much bloom. Fair in quality for dessert use and best for cooking.

Minnesota. This was introduced into Minnesota from Sweden. It is a strong growing tree, with fine foliage, and so far has proven a perfect ironclad. We have not yet tested the fruit, but it is said to be large, dark-blue in colour,

a perfect free stone, and one of the best in quality of the plums grown in Northern Sweden. It is very promising for trial.

Communia. This is a stray from East Europe, introduced by the Communia Colony of Northeast Iowa. A fine grower, with large, perfect foliage, and is an early and continuous bearer of quite large blue fruit, with deep suture and much bloom, which is excellent in quality for any use. On dry soil it will prove quite hardy up to the north line of the State

Richland. This has been long known in parts of Pennsylvania, and is now popular in parts of Indiana. Beyond doubt, it was originally introduced from East Europe. It is perfectly hardy at Ames, and a good bearer of medium-sized, copper-coloured fruit of excellent quality.

Prunus Simoni. This is now quite widely known as "Simon's Plum." It is included with the plums, yet it appears to be a cross between the peach and plum. Fruit large to very large, red in colour, and is shaped much like a smooth tomato. Its fault is in the way of too early blossoming in the spring. It will pay to grow this fine fruit by laying down in winter as recommended for the peach on a future page. This tree is not fully hardy at Ames without winter protection.

Shense Apricot. This is also classed with the plums, as it bears best when planted with them. It is a true apricot, grown from a pit received by the College from a missionary in Northwest China. In Nebraska it is grown under the name of Acme, but this is a misnomer. It is a fine grower with perfect foliage, and with low stems will prove hardy on dry soil up to the 42nd parallel. The fruit is much better in size, appearance and quality than any of the Russian apricots.

General Notes.

1. Where possible select a north slope with rich soil for the plum orchard. If shelter is given, let it be on the east side, as protection from east storms during the blooming period appears to be an advantage.

2. In practice in our state the best results have been reached by planting rather thickly in the rows running north and south, and giving more room the other way for letting in the sun between the rows, and air circulation. Trees planted ten feet apart in the rows, with space between the rows of twenty-four feet, have given the best results.

3. The alternating of varieties in the rows, with a view to more perfect fertilization of the blossoms is also an advantage. With some varieties the mingling of varieties is absolutely essential, and I believe it to be an advantage in all cases.

4. The need of very low tops is quite as apparent as with ths cherry. I

know of no variety of the native or foreign plums that will prove long-lived and fruitful with a high exposed stem. If it does not develop the fatal gumming on the south side, the main growth of wood of stem and top will soon be on the north side.

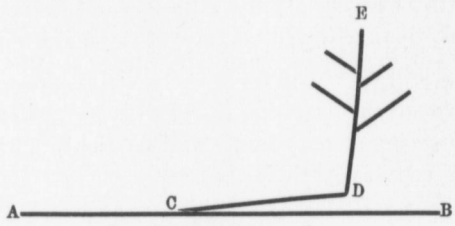
5. It never pays to market plums in rough tubs, baskets or boxes, as is so often practised. The commercial crates and boxes are now too cheap to be dispensed with in shipping any of the stone fruits.

PEACHES.

In 1885 it was stated in Bulletin that we had sent out for trial some varieties of the peach from Northwest China and Bokara. As then noted, they have proven much hardier than any of the varieties hitherto tried in the West, and we are now pleased to report that several of them have been well loaded with peaches of good size and quality at many points in the south half of Iowa during the past four years. In tree these are about as hardy as the "Early Richmond," but, like this cherry, they are not as hardy in fruit, bud and blossom as we could wish. Even with these hardy varieties it will pay best to lay them down in winter. If properly grown it is easier to lay down an acre of peach trees than an acre of blackberries. Our peach trees, one year old from bud, are from four to six feet in height. These are planted in orchard and are given good care. In the fall they average fully six feet in height. Trim them up late in the fall to a single cane and lay them down flat on the surface of the earth, and cover with straw or old prairie hay with enough earth to hold the covering in place. About the 20th of April, remove the covering, but permitting the stem to lie prostrate. When growth begins to start, turn up the extreme top and tie to a stake Keep off all shoots from the prostrate stem and encourage upward growth of the erect portion. In the fall, before the ground freezes, cut the tree loose from the stake and press it down to the earth to the right or left and cover as before. The spring of the stem will permit the laying down of the trees with very little pressure.

The prostrate stem will soon take root if left in contact with the earth. To avoid this place stones or billets of wood under it.

The accompanying diagram will show clearly the mode of procedure.



A B :—Surface of ground.
D C :—Prostrate stem.
D E :—Erect portion of stem.

The hardy peaches are more valuable for laying down than the common varieties, for the reason that they ripen their wood perfectly in the autumn. If unripe wood is covered the fruit buds are usually rotted or fatally injured during the winter.

DWARF JUNEBERRIES.

During the past ten years we have been experimenting with several varieties of the Dwarf Juneberry. The "Osage," "Greene County," "Williams" and "Alpina" have borne the best crops of the largest and best fruits, hence we are sending them out for trial. When grown in a small way, the fruit is mainly taken by the birds, but, as with cherries, when grown by the acre, the quantity taken by the birds is scarcely missed. In size and quality these Juneberries compare favourably with the large bush huckleberry.

PROTECTION FROM BIRDS.

In this connection, a note on the protection of juneberries, cherries and other fruits from birds will have some interest. In this country this subject has been much neglected, and, so far as I know, we have no manufactory of suitable netting for this purpose in the United States. But in Europe such netting is used for hundreds of purposes by gardeners and fruit-growers. The netting used has meshes close enough exclude birds, and is made from strong linen twine soaked in tanning liquid to make it very durable. Neighbourhoods wishing to import this twine can order it from George Robinson, Rye, Sussex, England. It will cost, laid down in Iowa, about three cents per yard, and, with good care when not in use, will last twenty years or more.

To favour the covering of many plants of the juneberry or cherry trees, it is well to select varieties ripening in succession. As an instance, in an orchard of one hundred and fifty cherry-trees, the whole can be covered with thirty tree-covers if five varieties are planted, putting out thirty trees of each variety ripening in constant succession, as noted in our cherry list.

With juneberries we will have the same succession with the varieties above noted.

SMALL FRUITS

Our small fruit growers are wideawake in the work of testing and sending out, at moderate prices, the best of the grapes, strawberries, raspberries and blackberries. Hence we do not propagate any of them for distribution, yet we test all promising new varieties, with a view to reporting upon their prospective value.

TREES FOR SHELTER-BELTS AND TIMBER.

The need of quick-growing trees on the storm-swept prairies of the Northwest has long been apparent. The cottonwood and white willow have been extensively planted, but on high, dry prairies they have failed, on account of leaf rust and other troubles. To meet this want, the College introduced, in 1882, some of the quick-growing poplars and willows of East Europe, which are more valuable for fuel and timber than any of our quick-growing trees. Of the species which have been given extended trial, the following are proving satisfactory, where the native trees of our river and creek bottoms fail wholly or in part:

White Poplar. (Populus alba.) This is the true "White Poplar" of East Europe, and is far more valuable than the "Gray Poplar" ("Abele"), which has been known as a great sprouter. It is upright in habit, a very rapid grower, and is peculiar and beautiful in foliage. Its timber is close-grained and valuable for many uses, including house finishing.

Silver-White Poplar. (Populus alba argentea.) Standing singly, this is spreading in habit, but it is upright in groves. A very rapid grower, with tim-

ber quite as valuable as the above. This beautiful silvery-leaved tree will grow where all native trees fail in the dry parts of the West and Northwest.

Asiatic Poplar. (Populus Certinensis.) This is a very rapid grower, where even the "Box Elder" fails. Its leaves are large and thick, with wavy edges, and furnish a fine shade. Its timber is closer grained than any of our native soft woods, and it does not warp, shrink or crack after it has become dried. It is much used for house finishing, flooring, joists, etc., in the far East.

Petrovsk Poplar. (Populus Petrovsky.) A variety of the above originated near Moscow. In East Europe it is much used as a shade tree on large lawns and on the roadsides. It is also largely used in timber plantations. It thrives on the dry ridges of the Northwest, where our native trees fail.

Red Willow. (Salix fragilis.) This is the famous "Red Willow" of East Europe and Asia, used for tanning the Russian glove leather and upper leather, and for about all the purposes for which we use "White Pine." Loudon says of it: "The 'Redwood Willow' produces timber superior to that of any other tree willow." A very rapid, upright grower, with handsome silvery foliage.

Golden Willow. (Salix aurea) This is wholly distinct from our common "Golden Willow." In 1885 it was placed with the ornamental willows. This will prove very valuable for shelter-belts and timber.

Pointed-leaved Willow. (Salix acutifolia.) This has no comparative value as a timber tree, except on very dry soils where other trees fail. It is known in the far East as the "Desert Willow," and is peculiar in having palisades cells on both sides of the leaves, like our native "Compass" plant. Hence it will thrive with very little water at the roots.

General Notes.

1. The two first noted above do not grow readily from cuttings of the young wood, but will grow very readily from root cuttings.

2. The other poplars and willows named grow as readily from cuttings of the young wood as any of our native poplars and willows.

ORNAMENTAL TREES.

Bolle's Poplar. (Populus Bolleana.) On dry soil this very handsome tree, with upright habit, silvery bark and cut leaves, with the brightest shade of green above and a silvery pubescence below, is proving very valuable. It is propagated like the white poplars from root-cuttings.

Laurel-leaved Willow. (Salix laurifolia.) This is not identical with the "Laurel-leaved Willow" of some Eastern nurseries. It is a neat round-topped tree of medium size, with laurel-like, shining leaves that few will recognize as those of a willow. It is specially valuable for certain positions in the background of lawns and for ornamental wind-breaks.

Napoleon Willow. (Salix Napoleonis.) Grown from cuttings, this is almost a trailer, but top-worked six feet from the ground on *Salix aurea*, it forms the finest weeping willow I have seen in the West, and one that is perfectly hardy anywhere. Its foliage has a peculiar bluish-green tinge which is very pleasing.

Silver-leaved Willow. (Salix alba argentea.) A silvery-leaved form of the "White Willow" from East Europe. In contrast with the "Laurel-leaved Willow," it has a very pleasing expreesion.

Rosemary-leaved Willow. (Salix rosemarinifolia.) This is not the "Rosemary Willow" of Eastern nurseries, which will not endure our summers or winters. It is a shrub variety from Central Asia, with narrow, fern-like, dark-green leaves, which are decidedly ornamental. Top-worked on *Salix aurea*, it makes a beautiful pendulous tree of small size for the lawn.

Wild Olive. (Elæagnus angustifolia.) A medium-sized tree, with silvery shoots and leaves. It is remarkably similar in leaf and habit to the olive-trees of California. Its flowers are not excelled in delicacy of fragrance, and its silvery fruits are ornamental in autumn.

Prunus Maacki. A small-sized tree, with spreading top and dense green foliage, that is fully expanded earlier in spring than any tree in our collection, native or foreign. In East Europe it is known as the "May-Day Tree," around which the party gathers to crown the May Queen. Its pure white blossoms are in long racemes, and are useful in forming the first handsome bouquets for the parlor vase.

Bird Cherry. (Prunus padus.) The variety of this handsome small tree that we propagate is weeping in habit. Its racemes of pure white flowers are handsome and fragrant in early spring, and are followed by an abundant crop of dark-purple fruit, of which the birds are very fond.

Acer ginnala. A dwarf variety of the "Maple," with cut leaves, which assume all the colours of the rainbow in autumn. It is a small tree, for the lawn, very closely allied to the "Japan Maples," which are becoming very popular in the Eastern States.

Alnus incana. This form of the "Alder" is a native of East Europe, and thrives well on dry upland soil, unlike the "Alders" of West Europe. It is a round-topped, handsome tree, with silvery foliage.

ORNAMENTAL SHRUBS.

Amur Tamarix. (Tamarix Amurensis.) The ordinary "Tamarix," so popular on Eastern lawns, is not hardy at the West. But the still more beautiful species, from the valley of the Amur, is perfect up to the 43rd parallel, and when properly pruned, it is almost a perpetual bloomer. Like the hardy "Hydrangea," this handsome shrub must be annually cut back at its points of growth, to preserve symmetry of form and free blossoming.

Viburnum lantana. The rare beauty of foliage, flowers and fruit of this member of the "Snowball" family, places it well at the head of the list of hardy varieties.

Russian Snowball. This is a variety of the common "Snowball" found in Central Russia. The bush is smaller and more pendent in habit than the common variety, but the flower trusses are larger and handsomer.

Mock Orange. As the best varieties of the "Mock Orange" (Philadelphus) are not common in Iowa, we are propagating the best of them, and send out two fine varieties imported from East Europe. The flowers of some of the species are pure white, fully two inches in diameter, and very fragrant. All of them are hardy in any part of the state.

Amur Barberry. (Berberis Amurensis.) This is a much larger grower than our common species. Grown as single specimens on the lawn, it forms a large, spreading bush fifteen to eighteen feet in height. It is free from the attacks of the cluster cup fungus, and is the most valuable species for stock barriers, or, if properly pruned, for ornamental hedges. Its immense load of dark purple fruit is decidedly ornamental, and is useful for the making of healthful marmalades and jellies.

Chinese Barberry. (Berberis Thunbergii.) This is low-growing species, with thick, rounded leaves, which change into varied shades of red and purple in autumn. Its load of bright red fruit hangs on well into winter. This is a favourite species in the eastern states, and we are pleased to report it perfectly hardy and still more beautiful at the West. Very valuable as single specimens and for low divisions on the lawn.

We have also a dozen or more varieties and species of the barberry from East Europe and North Asia, which have much interest, most of which are free from cluster cup fungus.

Privet. (Lingustrum vulgare.) The West European "Privet," so much prized in the eastern and southern states, is not hardy in Iowa, but the still more

beautiful varieties from Poland and Central Asia are proving hardy in all parts of the state. These have pure white and very fragrant blossoms, resembling those of the lilac, and are loaded in autumn with dark-coloured berries.

Lonicera splendens. This species of the "Bush Honeysuckle" is much handsomer in form of bush, in foliage, in blossom and in berries, than the common species.

Lonicera Xylosteum. A species of "Bush Honeysuckle," with large dark green leaves and pendent habit. In form and expression it is the handsomest of its family, and its large dark red berries are as long as small cherries, and hang on late in autumn.

Lonicera Alberti. A trailing species, with partially upright center. Each year the central part extends upward with all the lateral branches trailing downward to the earth. On the lawn it attracks much attention when in flower and through the growing season.

We have about a dozen other varieties and species of the "Bush Honeysuckles," all of which are interesting in a shrub collection.

Climbing Honeysuckles. We have three species of "Climbing Honeysuckles" from East Europe, which are proving perfectly hardy in our climate, and are very handsome in foliage, blossoms and berries. These are decided acquisitions, as the eastern varieties are mostly tender with us.

Rosa rugosa. The varieties of this unique and beautiful species we send out were imported by the College from Russia and North Central Asia. In habit, flower buds, flowers and foliage they are handsomer than the varieties introduced from Japan. We propagate single red and white varieties, and one red variety which is half double in flower.

Spiræas. We distribute all the hardy varieties and species common in the East, such as *S. triloba, S. Van Houttei, S. Douglasii* and *S. Nobleana,* and also some hardy varieties of *S. callosa* and other species from East Europe.

General Notes.

We have on the College grounds very many desirable flowering shrubs, many of them introduced by the College from the most trying positions of the Eastern Continent. Many of these not noted in the above list are propagated in a small way for sending out to our trial stations.

College Nursery.

The impression seems common that our limited nursery grounds are commercial in character. Very often we receive orders for the common varieties of fruits, shrubs, etc., grown in our nurseries. Our real purposes are :

1. To familiarize students with the modes and methods of propagation and culture.

2. To furnish object lessons as to variations in leaf, bud and habit of growth of varieties and species.

3. To test and send out for trial the hardiest known and most promising varieties of the apple, pear, cherry, plum, prune, apricot, peach, forest trees, ornamental trees, shrubs, etc.

4. To send trees for trial only to those who agree to preserve the names and numbers, and in due time to report the relative value of each for general culture.

THE CHEMISTRY OF THE BORDEAUX MIXTURE.

BY FRANK T. SHUTT, M.A., F.C.S., F.I.C.,

Chief Chemist, Dominion Experimental Farms.

The preservation of orchards, small fruit plantations and vineyards, from their minute and often microscopic foes, is a matter of great importance to those engaged in the fruit industry of Canada, and a subject not without interest to all lovers of a garden.

The value of certain copper and arsenical compounds for destroying these insect and fungus pests, is every year becoming better known, so that the practice of spraying is now no longer looked upon by fruit growers as a scientific fad of doubtful efficacy, but rather as a sure and safe means of keeping both trees and fruit free from injurious attacks. Two years ago I wrote as follows, and the words will bear reiteration to-day :—

" Properly applied, i.e., at the right time and in the correct proportions, the copper fungicides have proved and are proving themselves to be of inestimable benefit in the orchard and in the vineyard. The increased value of the fruit has more than repaid, by a large margin, the outlay for spraying apparatus and materials and cost of application, and I believe the time has come when no fruit grower can afford to ignore this useful means of preventing fungus diseases. Not the least important element in successful fruit growing, now-a-days, is the keeping in check fungus growths and destructive insects, and, for this purpose, our present hope lies in the application of arsenical and copper solutions. The hope is confidently entertained that by the more extended use of them the loss occasioned by injurious insects and fungi will be greatly lessened year by year throughout the Dominion."

The intelligent manufacture and application of these spraying solutions is better carried out if the fruit grower understands, at least in the outline, the chemistry involved in their preparation. The object of the present note is therefore to state, though very briefly, the reactions which take place in making the most popular of the spraying fluids, that known as the Bordeaux mixture. The source of the copper, i. e., the compound used in this preparation, is copper sulphate or bluestone—a deep blue, crystalline salt, easily soluble in water, the chemical formula of which is $CuSO_4$, $5H_2O$.

Since the efficacy of copper sulphate as a fungicide has been well established —as illustrated by its beneficial action on seed wheat infected by smut spores— and since it is the basis of the copper in the spraying mixtures, and is a material easily and cheaply obtained, the question is often asked, " Why cannot a simple solution of bluestone in water be used in spraying ?" The answer may be briefly stated. A solution of copper sulphate sufficiently strong to prevent the growth of fungus diseases would, so far as our present experience shows, prove injurious to the foliage. The corrosive character of this chemical must, by some chemical means—precipitation or neutralization,—be rendered innocuous before it can be of practical value for spraying when the leaves are out. For the initial treatment of apple and pear spot, Mr. Craig, Horticulturist of the Central Experimental Farm, Ottawa, says :

" Before growth begins in spring, spray with a solution of copper sulphate 1 lb. to 50 gallons of water."

But he also states :—

" On no account should this be applied after the foliage has appeared, as it will severely injure it." And, again, for certain diseases of the grape, e.g., Downy mildew, Black rot and Anthracnose, the same authority says :—

" Spray the canes with copper sulphate 1 lb. to 50 gallons before growth begins."

It is therefore evident that, save in exceptional cases, a solution of copper sulphate strong enough to be efficacious in destroying or preventing fungus diseases, cannot be safely applied after the foliage has appeared. The Bordeaux mixture, about to be described, allows the application of an adequate amount of copper, which is at the same time innocuous to foliage and effective as a fungicide.

Bordeaux Mixture.

This is perhaps the best known and the most highly valued and most widely used of all the copper-compound fungicides. Its formula, as now advocated, is as follows :—

Copper sulphate (Bluestone).....	4 lbs.
Lime.....	4 lbs.
Water.....	50 gallons.

Briefly, the directions for manufacture are :—

The freshly burnt lime is slaked and then well stirred with sufficient water to make a thin creamy mixture. This is now strained through coarse sacking into a barrel containing the dissolved copper sulphate, and the whole stirred and made up with water to 50 gallons.

The lime in solution precipitates the copper from the solution of bluestone as an insoluble material (cupric hydrate), the sulphuric acid combining with the

lime to form sulphate of lime, which, on account of its sparse solubility, remains to a very large extent in suspension.

The reaction is represented by the following chemical equation :—

$CuSO_4,5H_2O$	+	$Ca(OH)_2$	=	$Cu(OH)_2$	+	$CaSO_4$	+	$5H_2O$
Copper sulphate.		Slaked lime.		Cupric hydrate.		Sulphate of lime.		Water.

By reason of the slight solubility of lime — 1 part in 750 parts of water — the fifty gallons cannot hold in solution at once the amount of lime necessary to precipitate or throw out of solution the 4 lbs. of bluestone. Since, however, the calcium sulphate for the most part separates out as it is formed, the same water again takes up lime, which further precipitates cupric hydrate. This reaction is continuous and rapid until all the copper is precipitated. Finally, we have cupric hydrate, lime (from the excess used) and sulphate of lime suspended in a liquid containing small quantities of the two latter materials in solution. If sufficient lime has been added and the reaction is complete, the liquid, after allowing the precipitate to settle, is colourless, and does not give any brown precipitate if to a few drops a like quantity of solution of ferrocyanide of potash be added, showing that all the copper has been converted into an insoluble form.

To precipitate a definite amount of copper sulphate, a definite amount of lime is necessary—at least 3·5 ozs. of freshly burnt lime for each 1 lb. bluestone. In practice, however, in order to insure the complete precipitation of the copper, and since impurities always exist in the commercial article, an excess of lime is always used. No element of danger is in this way introduced, as the excess of lime is not injurious to foliage. It will not answer, as some have suggested, to use the supernatant lime water which can be poured off the undissolved lime, for precipitating the copper in making Bordeaux mixture. Fifty gallons of such saturated lime water can only hold in solution sufficient lime to precipitate (practically) 2 lbs. of copper sulphate. As already remarked, it is owing to the sulphate of lime separating as formed, that fresh quantities of lime are dissolved and can therefore react with the copper compound.

By the evaporation of the spraying liquid, the copper is left upon the foliage as copper hydrate.

CHRYSANTHEMUM CULTURE.

BY GEO. A. COPLAND,

Botanic Gardens, Cote des Neiges.

To cultivate the chrysanthemum successfully it is absolutely necessary to make a proper start by selecting the best varieties, and chosing good cuttings, as, unless a good foundation is laid success cannot follow.

After the old plants have finished blooming they should be cut down, and placed in a cool house in order to make sturdy growths; some varieties do not produce cuttings freely; they should not be cut down so low as those of freer growth, a little of the surface soil should be removed and replaced with rich sandy soil and the plants placed in a warmer house.

Cuttings may be struck any time from December to August inclusive, according to the purposes for which they are intended; from the beginning of December till the end of February for large specimen plants: from December till May for large blooms: and from May till September for small plants.

In taking the cuttings it is necessary to seleet firm growths in preference to those which are thick and soft; take them off about three inches long, insert them singly in two inch pots filled with sandy soil; they root quickly in a sand bed, but I prefer the pot system as their roots are not disturbed in repotting; they should be placed in a cool house and shifted into larger pots as required, using rather light sandy soil for the first and second shifts.

Those intended for specimen plants should have their points pinched out occasionally up to the first of July; about a week after the last pinching they get their final shift into ten or twelve inch pots, using a mixture of fibry loam, half decomposed stable manure, two parts of the former to one of the later, a good dash of sand, also a little bone meal or dissolved bones; this soil should be rather dry and ought to be pressed firmly down; care should be taken not to overdose them with water until the pots are well filled with roots.

About the month of August they will show the crown bud which should be removed; three or more shoots will start under this bud, and they should be retained. Each of these shoots will produce a cluster of flower buds, known as the terminal buds, which can either be thinned out to one bud to each shoot, or all left on to form flowers as may suit the taste of the cultivator.

Manure water should be freely used from this time until the blooms are rather more than half expanded, after which it should be discontinued ; for this purpose cow manure, in my opinion is the best ; three or four spadefuls should be put in a bag and dipped in a tank of water, a little of this water should be mixed with clean water before applying it to the plants ; soot used in a similar way is also beneficial ; as regards artificial manures, they are no doubt valuable, but should be carefully used, as they are almost certain to force the flower buds to open prematurely ; from May till September these plants should be standing on a bed of ashes out of doors.

Those intended to produce barge blooms should be grown on till the middle of May and then cut down to within three or four inches of the surface of the soil ; three shoots should then be trained up, on each of which a bud will appear in August or early in September which should be retained ; the shoots springing from under this bud should be rubbed off ; should the crown bud appear before the first week in August it should be removed, and a young shoot just under this bud should be encouraged which will in time produce a bud that should be retained.

All side shoots should be removed from these plants during the whole season ; and they can either be grown in pots, boxes, or greenhouse benches, the later about five inches deep ; in either case they will require manure water, when the buds appear, as directed for specimen plants.

Plants rooted from the first of May onward should, if large blooms is the object, be grown to single stems in pots, boxes, or planted on greenhouse benches ; if small bush plants are desired they should be grown in pots ; and I think that, for commercial purposes at least, these late rooted plants will be the most profitable.

Spring struck plants turned out of their pots, and planted in the open border about the end of May and potted up in September make splendid bushes for cutting, or for staging in the conservatory.

Some growers object to this method on the ground that the plants receive a severe check on being lifted ; to a certain extent this is the case, but the plants will suffer little if two days previous to lifting the soil receive a thorough soaking of water and the spade be run round each plant at a distance from the stem so to leave the balls of soil a little smaller than the pots into which they are to be placed.

Some growers lift the plants when the soil is dry, shake all, or most of the soil from the roots and place them in small pots ; this may answer well, but I fancy the roots will be too much bunched up and in consequence will be of little use to the plant.

As regards blind shoots, some varieties are more subject to blindness than others; and I think it is principally caused by the extreme heat we occasionally experience in the month of July; but these plants should not be thrown away; if a young shoot is allowed to grow from under the blind bud it will produce flowers, which coming in late will prove valuable. I have at present (December 13th) four plants of the "Lillian B. Bird" that were blind and have now blooms nine inches in diameter.

I give below a list of the best sorts which I grew during the past season.

Yellow.—W. H. Lincoln; H. E. Widener; Sunflower; Kioto; Mr. H. Cannell Mrs. Libbie Allan; Gloriosum.

Crimsom.—E. Molyneux; Cullinfordii; Tokio.

Bronze.—Harry May; John Dyer; La ebouriffee.

White.—Mrs. A. Hardy; Mad. Barry; Geo. Savage; Flora Piercy; T. H. Spaulding; Elaine; Mrs. E. D. Adams; Domination.

Pink.—Mrs. G. N. Gerard; Ada Spaulding; Lillian B. Bird.

Lilac and Purple.—Mons. Bernard; Gol. W. M. Boies; La Triomphant; Louis Boehmar.

CYCLAMEN

BY WALTER WILSHIRE.

The Cyclamen seems to be coming more to the front the last few winters than it has done, and is likely to make a most honourable place for itself among our winter flowering plants. The wonder is that it has remained in the background so long as its merits, understood and appreciated, would certainly make it more widely appreciated.

To ensure a succession of bloom throughout the winter, the first batch of seeds should be sown in September, and others may follow as required till March.

As soon as the seedlings are ready to transplant (which will be when they have made bulbs about the size of small peas), prick them off into boxes about an inch apart and allow them to remain until they have made good roots and formed three or four leaves, when they may be potted into 2 inch pots, and potted on into larger ones as required, until they are given their final shift into 6 or 7-inch pots.

The soil is of importance: a good mixture for the seed is well rotted leaf-mould and sand; for the boxes a mixture of leaf-mould, well rotted manure, sand and a little loam.

Increase the loam to each successive potting, so that by the time they are potted into their blooming pots you will give them about one half loam and the rest a mixture of leaf-mould, manure, sand and bone dust.

The temperature should be as temperate as possible. The seeds will germinate better in a temperature of 55° than one of 70°. They may take a little longer, but they come more regular and stronger. Through the summer it is hard to keep the temperature as Cyclamen like it, and I find the best place to keep them is in a well shaded greenhouse, where they can have plenty of air and be syringed frequently. In September they get the temperature they enjoy and make more growth then than they have made through all the previous months, and I find that by taking advantage of that period of growth and giving them all necessary attention as regards watering and potting, seeds that were sown in March will make fine plants for blooming from Christmas on. The watering should always be carefully done. When the plants are growing freely they require a plentiful supply; but there are times when they need to be watered sparingly, or the bulbs will rot.

When the plants have plenty of roots liquid manure in some form is very beneficial, but give it weak and often rather than in strong doses, or it will do more harm than good.

Great care should be taken not to allow green fly or red spider to infest the plants. These are the two great enemies of the Cyclamen, and if not checked at their first appearance, will cripple the growth and spoil both foliage and flowers. Keep the spider down by syringing. and fumigate often with tobacco to prevent the green fly. An ounce of prevention is better than ten pounds of cure in this case.

I do not keep the plants after the first year, as I find the young plants give finer flowers and the foliage is much better than on the old plants.

BEDDING-PLANTS.

BY ALFRED WILSHIRE.

Although the growing of this class of plant does not require any very great skill, and every professional gardener is supposed to know pretty much all there is to know on the question, I feel sure as much thought is not given to the subject as its importance demands. We are apt to expect bedding-plants to grow themselves, and to look upon the growing of them as the lowest part of our work; whereas, considering it is preparing for the decoration of our gardens at the best and brightest time of the year, to grow them well should receive a very considerable portion of our care and attention.

I do not expect to give you anything new, and must necessarily treat the question largely from the standpoint of a florist, as it is with this that I am most familiar.

It has been a question of serious doubt among the florists of this city as to whether bedding-plants pay to grow, and two or three of the largest establishments have ceased to grow them almost entirely. My own opinion is that they pay as well as anything else a florist *can* grow, for the following reasons: That the demand for good stuff always exceeds the supply, and this demand is ever increasing; that keeping a stock of this kind brings trade for other articles, and that it is sold at a time when the other part of our business is beginning to fail, and helps to shorten the summer season of stagnation. I also believe that if the same pains were taken to raise good bedding stuff as are taken with roses, carnations, etc., as good returns for money and trouble would be received as with them.

It is not a wise thing to mix bedding-plants up with other stock; when kept by themselves they can be grown better, and the other stock will do better without them.

To grow bedding-plants successfully, you need to look constantly ahead and prepare for the future. When selling your stock in spring, do not allow yourself to run out of everything, but put aside as much as you are likely to need of each kind, for propagating, the following season. Some things, such as "Geraniums," may be planted out, while other more tender things are better put into shallow boxes and kept out of doors. In the fall they can be brought in quickly, if necessary, and will be found to winter over better, and be shorter jointed and better for propagating.

Fall struck cuttings should be taken early, say at the end of August, and if put thickly into shallow boxes and kept rather dry and near the glass, a large quantity can be carried over in a comparatively small amount of greenhouse space. Cuttings from these and the old plants may be rooted in the propagating-bench or in boxes of sand (if the house is warm) from the first of January to the end of March, and pricked out into boxes and kept so till put into the hotbed.

This treatment applies to "Geraniums," "Heliotrope," "Bridal Rose," "Double Petunias," "Alternantheras," "Ageratum" and "Mesembranthemum"; while "Pansies," "Single Petunias," "Lobelia," "Centaurea" and "Pyrethreum" are best raised from seed, the seed being sown from the middle of January to middle of February. "Verbenas" raised from seed I haven't much use for; it is better to buy rooted cuttings of named varieties from some of the growers who make a specialty of growing them. It is not an easy matter to carry them through a winter in this climate in a clean and healthy condition, especially when a number of other plants are grown in the same house.

Care should be taken to keep all bedding-plants well aired and as near the glass as possible. If this is not done, it will became drawn and unsaleable. Neither should it be overcrowded; it is better to have a smaller quantity and have it bushy.

The 10th of April is, I think, plenty early enough to put down hotbeds; the plants will be better inside until after that time, and, besides, so much manure will not be required, and consequently not so much expense incurred. Half hardy stuff, such as "Pansies" and "Daisies," should not be put into hotbeds at all, but potted and plunged in the open ground as soon as the ground is free from frost and ready to receive them. By being treated so they are less trouble, and will be perfectly clean, which means everything with these plants.

As soon as the weather will permit, the sashes should be gradually left off the hotbeds, so as not to have the plants too tender at bedding-out time.

THE TUBEROUS BEGONIA.

BY A. PINOTEAU,

City Gardener.

I will commence with the seed sowing, which is the first operation in "Begonia" growing. This should be done in January, or even in December, if good flowers are to be obtained the first year. I fill a pan with light soil composed of well rotted leaf-mould and sand. I do not cover the seed with soil, but press it firmly down to make the seed adhere to the earth. Watering the seed is a delicate operation; I prefer to immerse the pan in water, allowing the soil to become gradually saturated, but never allowing the water to rise high enough to cover the surface of the soil. This method of watering I continue until the plants are strong enough to bear surface watering. I cover the pan with a piece of glass and let it remain until the seed has germinated, after which I gradually give more air as the plants gain strength, until I remove it altogether. As soon as large enough I have the little plants pricked off into boxes or thumb pots. Until they commence root action, great care must be observed in watering, as they very easily rot off at this stage.

When the plants are ready for repotting I use three or four-inch pots. The following mixture is what I prefer for a soil to grow them in: good rotted turfy loam, leaf-mould, well decayed cow manure and sharp sand. Repot as needed, giving all due care to watering, and by July they are good plants in six-inch pots, and well covered with blooms.

When vegetation ceases in October and they commence to decay at the leaves and stems, I withhold water and place the pots on their sides in a perfectly dry part of the greenhouse, leaving them there until March, when I shake them out and repot into four-inch pots or five-inch, if necessary, although I prefer the smaller size to *start them* in. Water carefully, as the tubers will easily rot at this stage. A little bottom heat is desirable at this time.

I repot as the plants require it, and water them, when sufficiently rooted, with weak liquid manure made from cow dung. I may add that at this date (September 13th), I have about hundred plants grown in this way that are well worth looking at.

THE GLOXINIA.

BY WALTER WARD.

The "Gloxinia" is one of the most useful plants that we have, whether used for table plants, conservatory decoration or for cut flowers, and it should be more extensively grown than it is at present.

I know of very few plants that will give better returns for the amount of time and labour expended on it than the "Gloxinia," and few subjects make a better show.

The rich and handsome foliage, which will in most cases completely hide the pot in which the plant is growing; the great beauty and variety of colour in the flowers; the length of time the flowers retain their beauty after being cut (if given reasonable care), and the comparatively easy manner in which they are grown, all point to its being one of the best subjects for the private gardener to cultivate.

Whether the commercial growers would find it profitable is a question I will leave them to decide. For shipping to any distance, it would need very careful packing, either as plants or cut-flowers, as both are very easily damaged.

There are several ways of propagating the "Gloxinia"—by seed-sowing, rooting the leaves, and by division of the tuber or bulb. Seed-sowing is undoubtedly the best method, as, with a good strain, you are sure to get a diversity of colours; but if it is desired to propagate any particular variety, the other methods are the best to follow.

If the seed is sown in February, in light, rich soil, and placed in a gentle bottom heat, it will soon germinate. It is best to cover the seed-pot or pan, to prevent the soil from drying out too quickly. As soon as large enough to handle, prick off into small pots or boxes, using the same kind of soil; place them again in a gentle bottom heat, where they will grow rapidly, providing that a nice, moist atmosphere is kept up with a temperature of from 60° to 65°. Pot into larger pots when ready, protecting from bright sunshine, and by the end of September they should be good blooming plants. For a potting compost take a good, fibrous loam, with a little peat and leaf-mould, and a sprinkling of sharp sand. It is better not to put any manure in the soil, but to apply it in the form of liquid manure, when the plants are well rooted. A little soot-water will prove beneficial when they are flowering; it brightens the flowers and gives a rich green to the foliage. For spring blooming, start the old plants in October or November, and as soon as fairly breaking, shake them out and re-pot in the mixture recommended; treating in other respects about the same as young plants.

After they have finished flowering and the foliage shows signs of decay, gradually reduce the amount of water, and place the plants in a cooler and more airy place.

When the foliage is all gone, put them away in their pots, in a dry place where the temperature remains about 50°. Look over them occasionally to see that they do not become too dry, and they will be all right until growth commences again naturally.

By starting a few plants at different times, a succession of bloom may be secured nearly the whole year through. They are not subject to any insect pest, provided they are kept from any other plants that are dirty; but if the temperature is allowed to become too hot and the atmosphere too dry, look out for the red spider.

FRENCH CANNAS.

At the request of your committee I have prepared a few lines on the "Canna." I will endeavour to tell you as plainly as possible what I think of that very beautiful plant and how they may be grown.

The "Canna" has been in cultivation for over 300 years, the variety "Indica" having been introduced into England from India in the year 1570. There are several distinct species which, with their varieties, reach away up in the thousands.

The tall-growing variety "Indica," or the dark-leaved varieties "Nigræans" or "Metallica" as plants for lawn decoration, whether used in single or in combination with "Caladeums" or other foliage plants, cannot be excelled in a landscape, especially where a subtropical effect is desired.

One remark I will make right here is the necessity of judgment where a large quantity of Cannas are used, care should be taken not to use too many of the dark-leaved varieties; if used to excess, I think they have a wearying effect on the eye.

Some of you, gentlemen, who visited Boston in 1890, on the occasion of the S. A. F., can probably recall such a sensation after gazing for an hour or so at the many beautifully decorated pieces of landscape in the vicinity of that very cultured city; "Blue Hydrangeas" and "Bronze Cannas" met the eye at every turn; I think "Green Cannas," to the same excess, would be much more pleasing.

While in the city of Buffalo, during the convention of the S. A. F. in 1889, I was struck with the distinct style of decoration of the fronts of the many fine villas to be seen on the fashionable avenues. Beautiful lawns of the greenest and smoothest grass it has ever been my fortune to see, but a flower bed was very rarely seen; the decoration consisted of vases on the lawn, boxes on the verandahs, window sills and balconies, the plants used being 50 per cent "Cannas," and the balance "Caladeums" and creepers, blooming plants being the exception, the "Cannas" all being of the tall-growing kinds, the dark-foliage ones predominating.

While I admire the old-fashioned tall-growing "Cannas," it is the new French hybrid class I am most interested in, some of these having just as fine foliage as the older varieties with their magnificent spikes of bloom added.

Take the French variety "Echmanii"; its foliage is unexcelled by any other sort, and when in bloom, its drooping spikes of crimson flowers gives it grand effect.

But what production of the landscape decorator's art can excel a row of "Alphonse Bouvier" or "Paul Marquant" flanked with "Mme Crozy" along a drive in front of a shrubbery, or a circular bed on a lawn of the same varieties.

While the three varieties I have just mentioned are the cream, there are about a dozen other varieties of French hybrids grown in our neigbourhood, which deserve to be more generally known and cultivated. There are among the latest introductions a few yellows which are very showy, the best I had last year being "Gen. Boulanger" and "Emile Leclere." I have heard of a few others, but have not seen them, which are said to excel these.

There are also a few dark-foliage varieties among the French ones, "Ed. Andrea" pleasing me best.

By far the dwarfest of the class is "Star of 91," it never growing over two feet high; it is a very free bloomer, and is very useful for indoor cultivation.

The "Canna," as an indoor blooming plant, is destined to attract a great deal of attention in the near future. I don't know any plant which will light up a conservatory as well as a few plants of such sorts as "Alphonse Bouvier," "Mdme Crozy," "Paul Marquant" or "Star of 91," and they may be had in bloom the whole year through, with very little trouble, in a temperature of from 60° to 75°.

The relative heights of some of the varieties I have mentioned are as follows: "Star of '91," 2 ft.; "Madame Crazy," 3 ft.; "Paul Marquant," 4 ft.; "Alp. Bouvier," 4 ft. 6 in.; "Ehmanii," 6 ft.; "Nautonii," 6 ft.; "Boulanger," 5 ft.; "B. Andrea," 3 ft.

Propagation may be done either by division of the tubers or from seed. Before sowing the seed I take a sharp knife and cut out a small bit of the shell. I then cover with about one inch of soil, and keep in a temperature of about 65°. I have had them peeping through the soil in two weeks after sowing, and in bloom in five months from sowing.

Propagation by division may be done at any time by severing the shoots with a knife below the surface of the soil, but the usual way we do it is as follows. When the frost kills the foliage in the fall, we dig up the clumps and place them on a dry shelf in the cellar, without shaking off any soil. In two or three months the soil will be dust dry. We then shake them out and break them into single crowns, and put them into four-inch pots, and stand them under a greenhouse bench until they start to grow, when we put them in the light in a warm place. In five or six weeks they will have the pots of roots and some showing flower. We then shift into six-inch pots, where they remain till planting-out time.

The "Canna," which planted outdoors, like a pretty deep, light and rather moist soil. It may be moderately rich, but for the French varieties the best results will be had from a rather poor soil, provided it is moist They should never be planted in the shade. I find they do best in a position where they will have the sun all day long.

When growing them in pots, during the earlier stages of their growth, we use the lightest soil we have for them, but when putting them into eight or nine inch pots we use a soil much heavier. A compost such as this will do nicely: three parts loam, two parts old rotten manure, and less than one part sand.

Now, I think about all that remains for me to say about the Canna is that since the introduction of the French hybrids, or "Crazy Class," as they are sometimes called, it is the most useful plant we have, especially for the private gardener.

And, in conclusion, I would advise each one of you to procure a few of the very best varieties, and, when they are in bloom, cross-fertilize a couple of good ones, and you may be rewarded by getting some still better varieties from the seed than any in existence to-day.

JAMES McKENNA.

WINTER FLOWERING PLANTS.

BY R. W. WHITING.

The first plant that I will mention is the Camellia; and, from the beauty of its evergreen foliage and its magnificent flowers, which are freely produced in the winter and early spring months, it is, I think, one of the most conspicuous of our flowering plants. I think the best method of growing it is to plant it out. I have seen excellent specimens in pots, but nothing to equal the quantity and quality of the flowers as when planted out.

In Devonshire, England, I have seen the Camellia planted outside and flower very freely, and they will stand through a smart frost uninjured when so treated.

The Camellia will not stand being forced, as the buds are apt to drop. In order to have plants in flower early it is necessary to get an early growth upon them as soon as they have done flowering. A mixture of loam peat and sand is the best to grow them in. The following are some of the best: Whites,—"Alba Plena," "Frimbruata Alba"; Blush,—"Lady Hume"; Bright Rose,—"Marchioness of Exeter"; Carmine,—"Reine des Fleurs," and Delicate Rose,—"Augustina superba."

Few plants are more useful than the "Chrysanthemum" for the decoration of the conservatory in the winter months, lasting as they do right up to Christmas. The fantastic forms of the Japanese varieties, as well as the varied colours of the flowers, tends to make them such general favourites amongst the public at the season when they can be seen in all their beauty. Our "Chrysanthemum" exhibitions are every year becoming more and more popular, as it is then they can be seen in all their grace and freshness. Of the "Primula" I need not say much. The large numbers that are grown, show what useful and favourite plants they prove themselves to be. I wish here to say a few words in favour of a more extended use of the double varieties. Their usefulness and lasting qualities make them worthy of the extra attention they require.

"Poinsettia Pulcherrima" is another grand winter flowering plant, and the bright colour of their bracts, added to the time they last. makes them conspicuous objects in conservatory decoration during the dull winter months. They are largely grown in 6-inch pots, on a single stem from a foot to a foot and a half in height, for the London markets, and are very useful for all purposes of decoration, etc. They are easily propagated, but want careful watering to keep the foliage in good condition, as with the foliage gone they lose a great addition to their conspicuous attractiveness.

Another plant that I consider well worth growing for the dull winter months is the "Salvia." Nothing can be more effective than a few well grown plants of the old "S. Splendens." Other good varieties are: "Betholdi," rose-shaded white; "Rutilans," magenta; "Mons. Issanchon," white and scarlet; "Hoveyi," purple, and "Elegans," scarlet. They are all easily propagated, and require no special attention to secure fine plants.

Of the many varieties of the "Begonias,' some are especially winter flowering and, with their delicately coloured flowers, form a most important class for winter decoration. Of the older varieties the following are the best: "Weltoniensis," "Nitida," "Fuchsioides," "Ingramii" and "Sutherlandii." Of later introduction are 'Coccinea," of a dwarf compact habit, producing its bright flowers in great profusion. "Gloire de Sceaux," flowering as it does from January to the end of April with its bright rose-coloured flowers, will be found a most useful addition to our winter blooming "Begonias." I must not omit that free flowering variety of a pink colour, and which is so well known and grown in this city, but the name of which I do not know.

No winter flowering plant is more useful than the "Bouvardia." The many uses that its flowers can be put to, and the graceful forms and purity of colours (more especially of the single varieties), easily accounts for the high favour in which they are held.

The "Cyclamen" is another winter flowering gem. Their easy culture and great variety of beautiful colours, lasting as they do from November to April, always renders them great favourites.

The various orchids also give a great help to brighten up the conservatory during winter. The "Cattleyas," "Cypripeduims," "Cologynes," "Calanthes" and "Dendrobuims" all furnish varieties that flower at thie season. I must not omit that gem of hardy flowers Helliborus Niger — "The Christmas Rose," fine chumps of which may be easily secured from Holland, and with cool treatment will, I think, flower without much trouble other than watering.

COMPOSTS.

BY WILLIAM WILSHIRE.

Any one with the least knowledge of plants will know that to understand what kind of soil to use in cultivating the various kinds of plants which iuhabit our gardens and greenhouses is one of the main points which lead to success. It would be absurd to lay down cast iron rules to always use a certain kind of soil for a certain class of plants, as one gardener will grow a plant equally as well as another, although using an entirely different soil in its cultivation. Subsequent treatment of the plant, difference of situation, climate, etc., may have something to do with this. But if one gardener does not grow a plant as strong as another for a while, he will undoubtedly keep it in health a good deal longer by a knowledge of the soil most suitable to its requirements.

In preparing soil for any kind of plants, especially pot plants, it is of the first importance to see that the different materials forming the compost are thoroughly mixed together before using, and that the soil is not too wet nor too dry, as success or failure depends a great deal upon this. Yellow loam that is full of fibre which has been stacked long enough to kill all live vegetable matter is best for plants requiring heavy soil; or, to form part of a mixture for those which like a lighter composition, it should be broken fine or rough according to the size of the pots to be used. Leaf soil should be well rotted and free from sticks and other rubbish likely to breed fungus; otherwise its use will do more harm than good.

As unfortunately we have to import all our peat, it is generally old enough (sometimes a great deal too old) to use by the time we get it; but if it be not sour, it can all be used, and should be broken up as advised for loam. Manure

should be well rotted, but should not be used in a wet state nor in too large quantities, except for strong-growing plants, of which "Caladiums" and "Alosasias," etc., form the type, and which have to be shaken free of all soil at least once a year.

As the presence of earth worms is very injurious and often fatal to pot plants, they should be got rid of before the soil is used. For this purpose I find it a good plan to build a fire outside and bank it up with the loam sods, turning them once or twice, and removing them from the fire as soon as they become sufficiently heated through to kill all animal life. For manure or leaf soil I use an old evaporating-pan, with the ends resting on bricks, and a fire built underneath, filling the pan three parts full of the material, and turning it as recommended for loam. It should afterwards be placed where worms will not enter it again, until it is needed for use.

The nature of the roots of the plant to be potted should always be taken into consideration in mixing a soil to grow it in; also whether they are to remain for a long or short time in the same pots. Loam produces ranker roots, and consequently ranker growth; therefore it is not so suitable for growing plants for any length of time in small pots as is a mixture of lighter soil, which tends to form more fibrous roots.

Palms growing in loam in small pots have a tendency to rise out of the pot, and when they are standing on these roots five inches above the rim of the pot, they are not very ornamental. This cannot always be helped with large plants, but the trouble may be greatly modified by using a soil of which peat forms the principal part when the plants are in a smaller state.

As all plants which have fibrous and hair-like roots like a peaty soil, it is a good rule to use two parts peat, one of loam and one of sand for large plants of this class, and, if possible, all peat and sand for small ones. This may be dearer in the beginning, but I am sure it will be cheaper in the end. Small plants, such as "Ferns," "Marantas," "Dracænas," "Dieffenbachias" and many others, grow well for a while in heavy soil, if kept in a high temperature; but there seems to be a difficulty in getting them to take to new soil when shifted to larger pots, and if left for any length of time in the small pots they get sickly, and generally have to be shaken out and put into a lighter soil to bright them back to health.

Different soils have different effects upon the colouring of foliage plants. Thus "Crotons" colour better when potted in all loam, while "Dracænas," if we except "Dracæna Lindenii," colour better and grow more compact if grown in nearly all peat and sand, with a sprinkling of coal-soot. "Dracænas" are the only plants I find to be much benefited by using soot with the soil. Some things positively dislike it in that way, but will take it without injury, if given in a weak liquid state.

Chopped sphagnum can be used to great advantage, mixed with turfy loam and manure, for "Alocasias," and makes a very good substitute for peat for these plants, as they require an open compost to drain off the abundance of water they need when growing.

It would take up too much time to more than mention the different composts I have found answer very well for the following plants:

'Caladiums."—Fibrous loam and some fresh horse droppings.

"Flowering Anthuriums."—Rough peat and chopped moss in about equal parts, with a sprinkle of broken crocks.

"Foliage Anthurium."—The same, with the addition of one part loam.

"Dieffenbachias."—Two parts loam, one part leaf-soil, one part rotten manure, potted rather loose.

"Adiantum Farleyense."—All loam.

"Ixonas" and "Gardenias."—Peat, with plenty of sand.

And for most hard-wooded, stone or greenhouse flowering plants the compost may range from all peat and sand to about equal parts of peat and loam, according to the nature of the roots, as before stated. And for those that are, like myself, "Orchid" cranks, I will mention that "Cattleyas" and "Laelias" should be grown in peat, with all the fine soil shaken out, and a little chopped moss and broken crocks made very firm.

"Dandrobiums."—The same, with more moss than for "Cattleyas."

"Vandas," "Aerides," and all "Orchids" of that class.—All chopped like moss and plenty of drainage.

"Cypripedium."—Peat and moss for these plants; the peat need not have all the fine soil shaken out, but should be kept open by using plenty of broken crocks and charcoal.

The last mentioned compost will also answer well for "Lycastes," "Adontoglossums," "Oneidums," and many other kinds too numerous to mention.

In preparing material for "Orchids" the main point is not so much the different proportions used as to see that the compost is sweet and fresh, as if it is not, you may save yourself the trouble of potting the plants.

All "Orchids" like the soil to be made firm and neat; loose potting will result in nothing but failure.

LILLIUM HARRISII.

BY J. BLAND.

My experience in growing "Lillium Harrisii" is limited to the growing of about three dozen bulbs each year for the last five years; I have not, therefore, the experience of our florist friends, who grow hundreds for the winter and Easter trade.

I get my bulbs early in September, mostly of the second size, which I find the most useful. I also usually get a few of the largest size.

I pot them in four or five-inch pots, according to size; stand them in a cold frame, cover them with ashes, and leave them there until they have made a growth of about four inches in length. I then repot them into six or seven-inch pots and stand them on a shelf near the glass in the greenhouse. I keep them in the same house all winter, where they have a night temperature of about 50 degrees. I keep them close to the glass through their growth.

I have always had them in bloom at Easter time. If I want them earlier I put them in the forcing house, where the temperature is from seventy to seventy-five degrees. When the pots are filled with roots, I give liquid manure once a week. I pot them in rich soil, using about one third part of old decayed manure with plenty of sharp sand.

My plants are always tall, with good thick foliage, the leaves lying close one over another. They are not drawn. Plants that are drawn up have leaves wide apart.

EXHIBITIONS.

BY WALTER WILSHIRE.

The chief objects of exhibitions are to encourage such advancement and to educate those who visit our shows. It is well, therefore, in arranging the prize list, to make it as comprehensive as possible. The list should contain plants which demand the highest skill on the part of the intending exhibitor, giving a place also to those plants with which everyone is familiar, as it is only by comparison that the visitors can see the difference between the common and the uncommon in the world of horticulture.

The list should also give scope for the display of as large a number of species as possible, as there is always more interest shown by the public if they see something different at every turn than if the show consists of a few species only.

If you expect to get a good exhibition the prize money should be as high as possible, in order to ensure keener competition, and awarding the prizes by points and giving each competitor according to the points awarded, is certainly more satisfactory than giving only 1st, 2nd and 3rd prizes.

Plants and flowers to be shown in sections should be at their very best if possible, and I think we sometimes make a mistake in not demanding a higher standard of excellence at our flower shows. Offer good prizes and insist on the exhibits being up to a certain standard, as, unless our coming exhibitions are something in advance of previous ones, we miss the objects for which exhibitions should be held and need not expect to draw a larger amount of patronage.

Do everything possible to keep up the interest both to exhibitors and the public. Encourage the introduction of good novelties by awarding certificates of merit, and every good plant available should be brought to exhibition, whether there is a place in the prize list for it or not, as special prizes should always be given for worthy objects.

One difficulty that generally arises is finding cash for the prizes and expenses, and is one that give the committee a lot of trouble. The best way to get money is to spend money. If you want people to come to your exhibitions you must let them know there is one being held, as it is foolish to expect people to come to see a thing they have never heard of.

Find out from the best advertisers the best way of advertising and then spend your money freely, as to every dollar you save in the advertisement you lose ten or more in the attendance, and insufficient advertising is the chief cause of financial failure.

When you have your plants, etc., grown and the exhibition well advertised, see that the exhibition is in perfect order for the opening. Have an arrangement committee who are men of taste and judgment and can give time to arranging everything in harmony and to the best possible advantage. Remember the object we start with, viz: education, and few things refine the tastes and feelings of the public like beautiful flowers and plants well arranged; and remember too that a great many of the visitors are highly educated as regards arrangements of colour and form, and to such bad combinations are an eye-sore.

If possible find out what plants are likely to be bronght for exhibition and arrange the whole to harmonize as far as possible, as the first impression goes a good way with the visitors, and if they are pleased at the entrance, they are likely to be better pleased before they get through the exhibition.

PROPAGATION.

BY HENRY STOCKING.

A good knowledge of the methods of propagating the various classes of plants entrusted to his care is undoubtedly one of the most important parts of a successful florist's or gardener's professional education ; and nothing can be more interesting to the thoughtful observer.

When we consider the variety of methods and the diversity of conditions necessary to produce such a large and varied assortment of plants as will be found in the large establishments that supply all kinds of stock for all branches of our profession, then we realize the fact that the propagator is of necessity the most important man in that establishment.

By propagation we mean the reproduction and increasing of the various species and varieties of the vegetable kingdom. The methods employed are seed-sowing, cutting, layering, division of roots and of crowns, offsets, budding, grafting and inarching.

Seed-sowing is undoubtedly the most extensive method employed in propagating, and it is also the simplest method in use. When practised under glass, great care is necessary at all times. All seeds sown for use under glass, and many for open air cultivation, will germinate readily in a moist, warm atmosphere, which may generally be secured where there is a greenhouse, or a hotbed will supply the needed conditions. The soil used for this purpose should be of a light sandy nature, and nothing is better than a mixture of loam, leaf-soil and sand. It is a good general rule to adopt in sowing to cover the seed to about its own thickness with finely-sifted soil, as this is found to be sufficient to ensure rapid germination, and if buried too deep, the seeds are sure to lose their vitality before very long.

Very small seeds, such as "Begonia" and "Gloxinia," and also Fern spores should be sown immediately after the pan or box of soil has been watered ; covering afterwards with a piece of glass, to prevent drying by evaporation If any soil is used to cover thom, let it be very thin and of the lightest nature possible. Good drainage must be always provided, and the seeds never allowed to get dry. At the first signs of growth they must be gradually inured to the light and a drier atmosphere, or damping-off will be sure to follow. Shade from bright sun until the seedlings will gain strength enough to bear full exposure.

Some seeds have very hard shells, and these may be assisted in germination by carefully cutting through the outer shell with a knife or file, but the safest plan is to soak the seeds in water for some hours previous to sowing. Of this

kind the "Canna" gives us a good example. For others, it is almost a matter of necessity to place the seeds in a certain position, as, for instance, the "Cobæ" and "Grevillea." To secure good results from these it is best to sow by placing them on edge, as the young plants are not strong enough to lift the weight of soil that will press upon it, if the seed is laid flat; and when placed upon edge it is not so liable to rot, as there is less surface exposed to the water, which must be of necessity supplied.

The after care of the seedling scarcely falls under this heading.

Next in importance comes the cutting. Cuttings are of many kinds. Some require to be of ripened wood, some of half-ripened, and some of soft wood. Some need to be taken with a heel or portion of the old wood attached; others must be cut just below a joint, while with some it is a matter of indifference where they are cut, or whether they are cut at all. Some plants propagate freely from the leaves, as the "Begonia," "Gloxinia," "Echeveria," etc. Then there is the root-cutting, which is the quickest and best way to propagate the "Bouvardia" and others. Eyes are another kind of cutting; as, for instance, in grape vines.

The best kind of propagating-bed is as follows: About three inches of clean, sharp sand, well drained, with a bottom heat of from 75° to 85°, and a top heat 10° or 15° lower. Early spring is the general season for propagating, but the individual requirements must be the guide with regard to season. All cuttings from soft-wooded plants should be as short and firm as can be secured, as a sturdy cutting is half the battle, and weak, sappy cuttings are almost sure to fail, or at any rate give unsatisfactory results. All kinds of bedding stuff strike readily in a bed of sand, or they may be as easily rooted in pots or boxes filled with light, sandy soil, and placed in a gentle hotbed. Care should be taken that they do not become wilted; but as little shading as possible should be used. The great object is always to get roots formed as quickly as possible. For striking roses a bed of sand is the best method, with a gentle bottom heat, and the temperature above should be as near as possible the same as that in which the plants are growing in from which the cuttings are to be taken. The cuttings may be of one or more joints. The best are the first two or three joints of a growth taken off with a heel. The wood should be moderately firm at the time of taking the cutting; although a heel is not altogether necessary, yet better plants and quicker rooting will be secured from them. The cuttings, after insertion, should never be allowed to become dry, and, with good care, will be ready for potting up in four weeks at most.

The "Carnation" will strike root readily under similar conditions, although a little cooler temperature is just as well.

The "Carnation" used to be propagated by layering, but that method has fallen into disuse, owing to the large numbers now required to keep up a general supply.

The best cuttings are the young shoots that burst from the sides of the flower stem, taken when about three inches long from tip of shoot to the first joint, when they will have two or three pairs of perfected leaves. They may be drawn out carefully by the hand, and will then need no more making. Some persons trim off the ends of the leaves, but this is more for economising space than for any other reason.

The "Carnation" takes rather longer than the rose to form roots.

There are many methods for striùing "Chrysanthemums." Some prefer pots, others the sand bed. Some persons prefer heat for striking them, others a cool temperature. Undoubtedly the best method is the one that produces roots the quickest. "Crotons," "Dracœnas," "Gardenias" and other stove plants strike in sand or light sandy soil with the greatest ease, if only snfficient heat is at command. "Azaleas," "Camellias" and other hard-wooded plants will strike readily if taken with a heel. The months of July and August are the best for the purpose, but the state of the wood, in these as in other things, must be the principal guide in propagating.

For such plants as can be propagated by root cutting, all that is necessary is to cut the roots into small pieces, and treat otherwise as for seeds, and good results ought to follow.

"Begonias" of the Rex type may be propagated by division, but the best and quickest method is to strike from the leaf. This may be done by cutting the leaf into small pieces containing a portion of the fleshy rib, and inserting in the sand like other cuttings, or the whole leaf may be laid upon the sand, and it will root and form plants without any cutting at all. The "Gloxinia" will propagate in a similar manner. Echeverias will grow freely if treated in the same way; but boxes or pans will be the best to insert them in, as they can be put in almost any place to root, no particular conditions, save very spare watering being necessary.

"Diffenbachias," "Dracœnas," "Grape Vines" and many other plants may be propagated by eyes or by cutting up the stems into small pieces, and treating as recommended for ordinary stove plants.

Ferns and other plants propagate freely by division of the crown or rhizome. The early spring months are the best for dividing ferns, as they are then starting into growth. They should be shaken out and cut into small pieces with a sharp knife, taking care to preserve some roots with each piece, potted firmly into small pots, and placed in a warm moist atmosphere, and kept on the dry side at the root, until they get somewhat established. Ferns are also propagated by sowing the spores or seed capsules.

Layering is a method of rooting the cutting before separating it from the parent plant. Many hardy shrubs, conifirs, etc., are propagated by this method as well as by seeds and cuttings.

For this purpose it is necessary to remove a portion of the bark, peg down the shoot required, and bury with soil the portion which has had the bark removed. This may be done at any season, but the best time is when growth is about to commence. Strawberry layering is too familiar to need any further mention.

Grafting is perhaps the most important method of propagation next to seeding. Most of our commercial fruits are propagated by this method. It would take too long to go into this subject thoroughly, at least in this paper. The essential conditions, however, may be briefly stated as : clean, healthy stocks and scions, a sharp knife, and a steady hand. One of the most important things to be observed is the careful placing of the respective portions of bark, so as to secure perfect union between scion and stock.

There are many kinds of grafting, as whip or tongue grafting, saddle grafting, cleft grafting, notch or chink grafting, and crown grafting. The first and last are doubtless the two best methods to follow. The proper season for grafting is when the sap is just beginning to flow, but before leaf growth has commenced.

Budding partakes largely of the nature of the former method ; but in this case, only bark is transferred to the stock, while in grafting, both wood and bark is transferred.

The principal methods of budding are shield or T budding, flute and ring budding. There is also a system of shield budding practised, where all the wood is not removed. Budding is generally practised on the rose, cherry, orange and plum trees.

Inarching or grafting by approach, while sometimes used as a method of propagation, is, in reality, nothing more than a mode of transferrence, as the union of the portions is secured before any separation is made.

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