

SEVENTH REPORT
OF THE
MONTREAL
HORTICULTURAL SOCIETY

AND
FRUIT GROWERS' ASSOCIATION OF THE
PROVINCE OF QUEBEC,

FOR THE
YEAR 1881.

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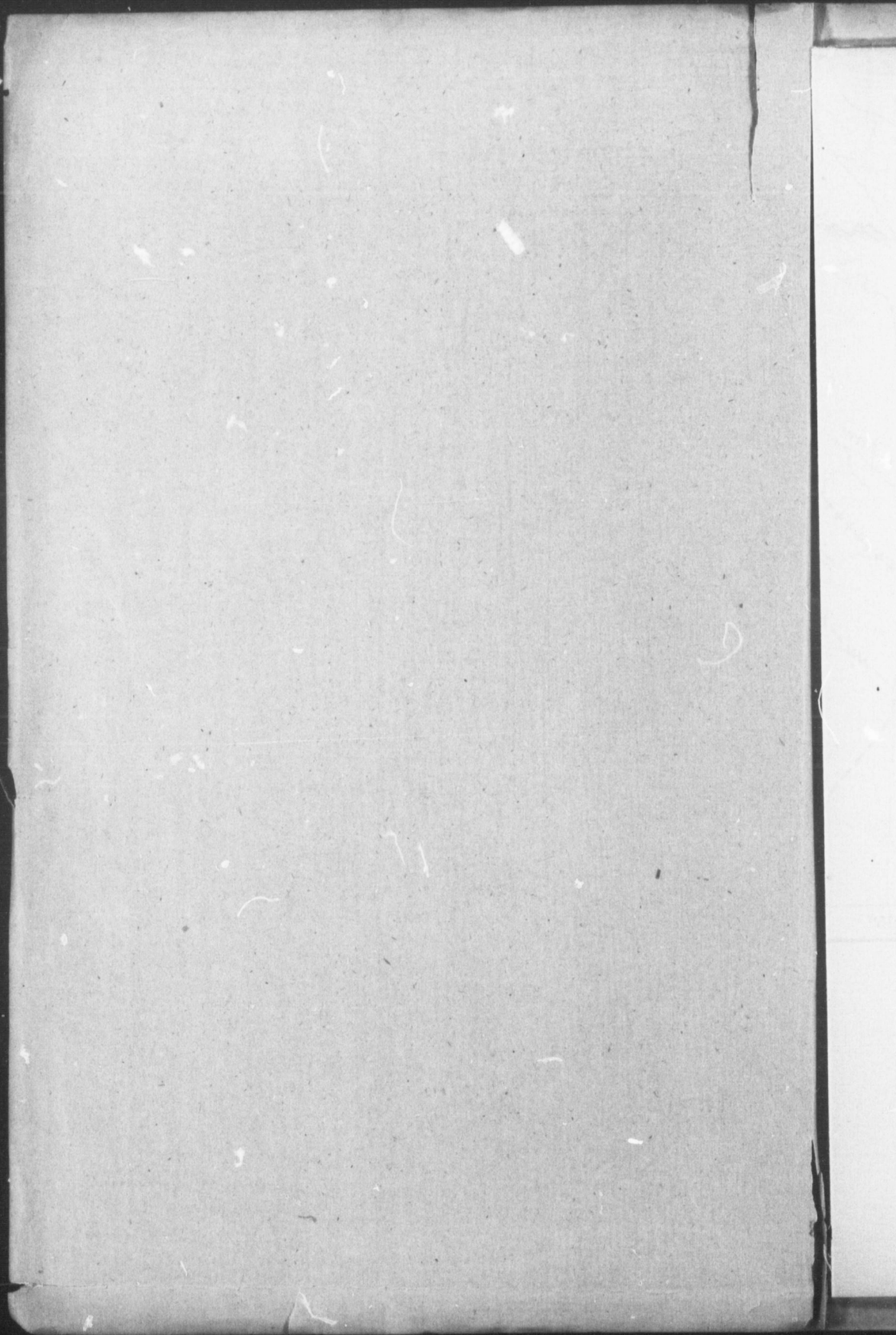
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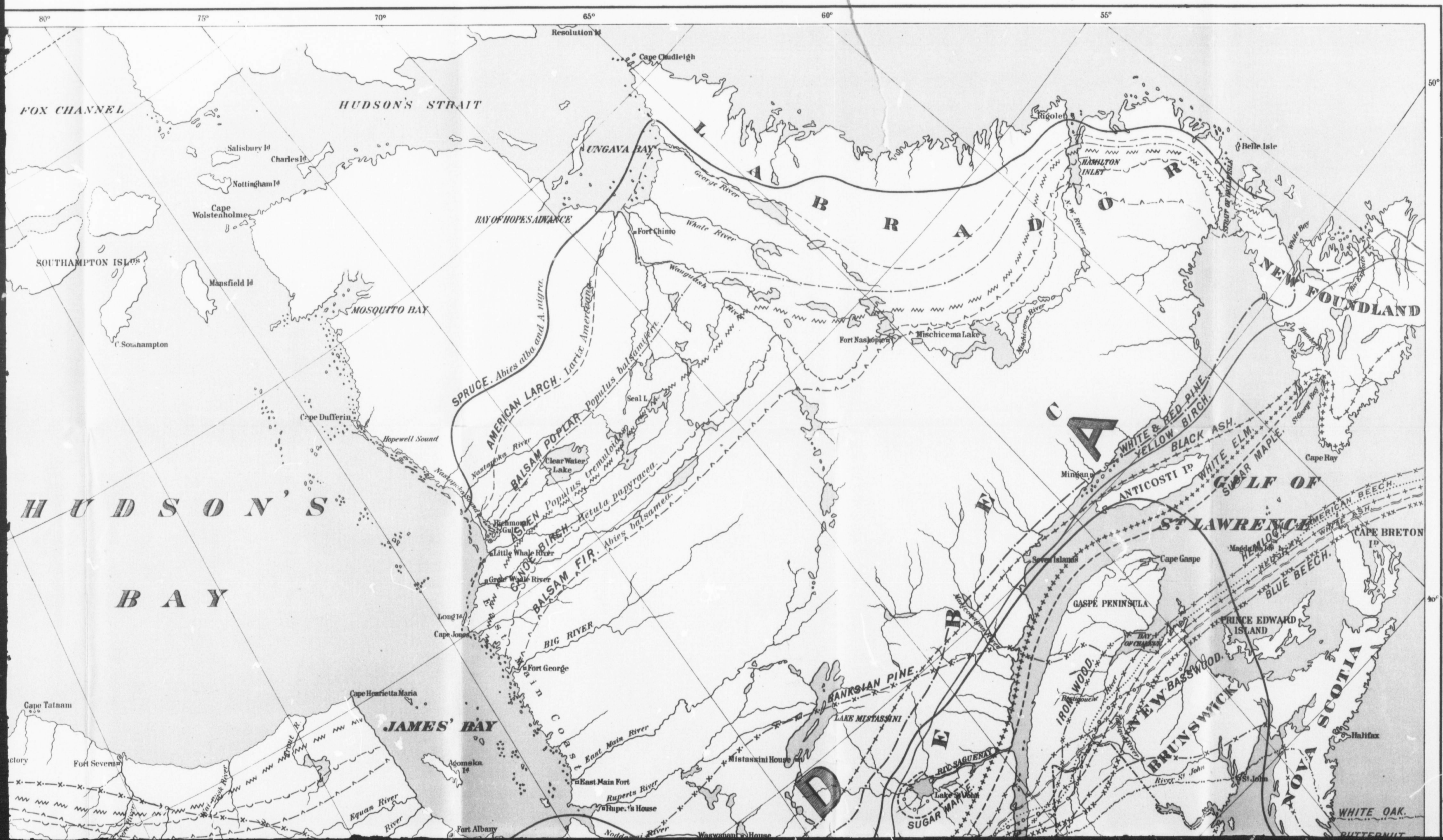
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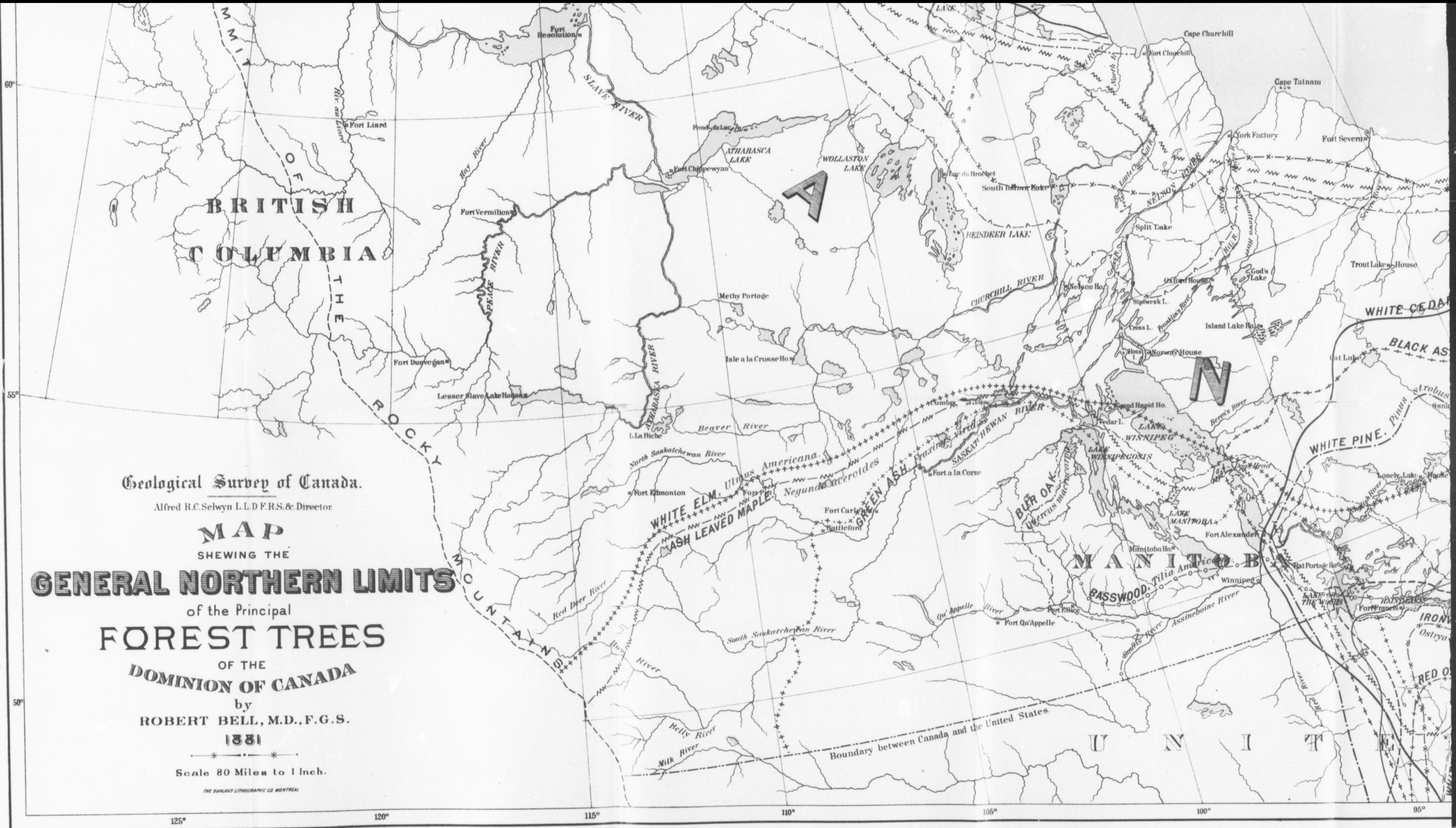
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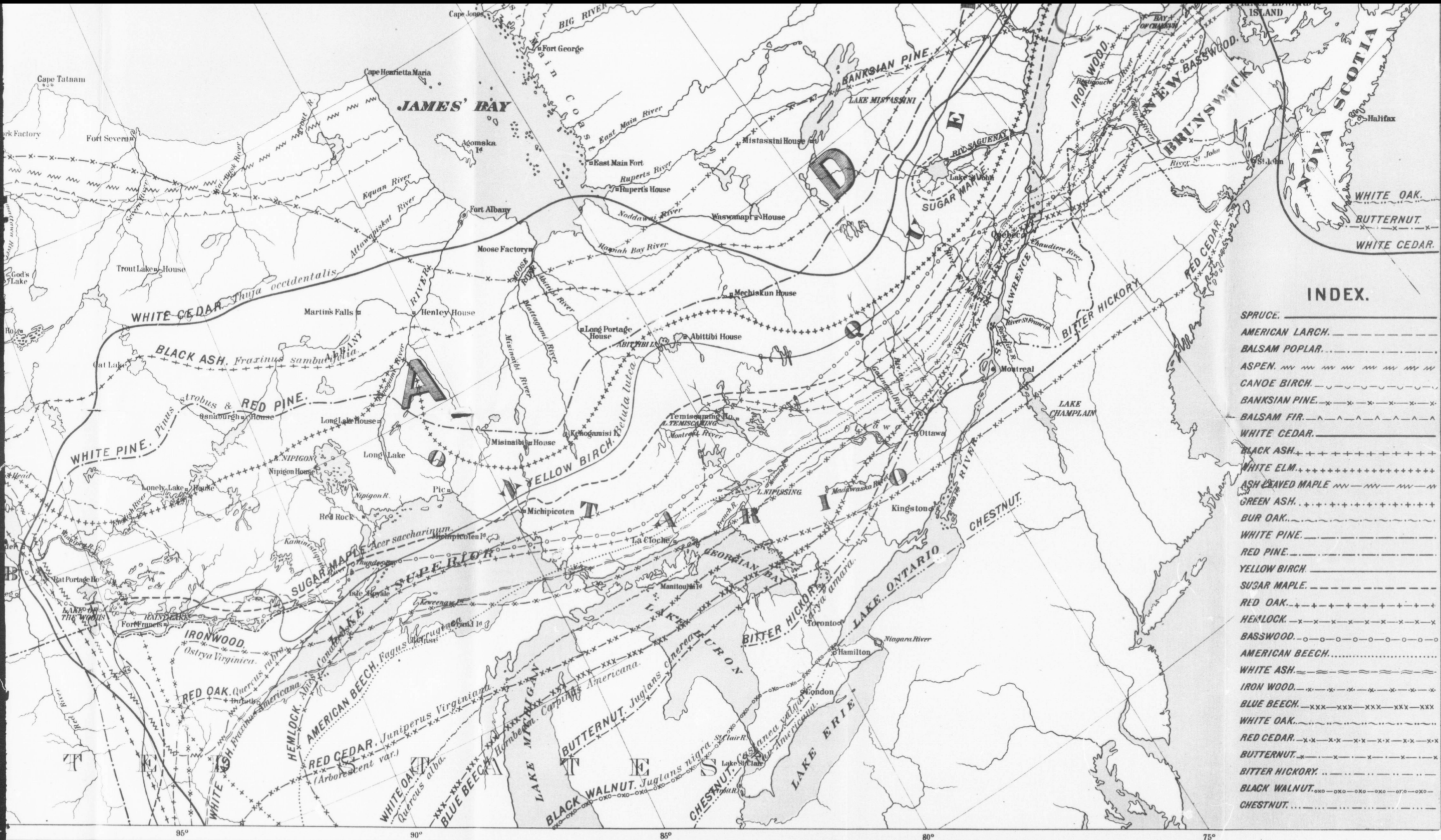
Geological Survey of Canada.
 Alfred R.C. Selwyn L.L.D. F.R.S. & Director

MAP
 SHEWING THE
GENERAL NORTHERN LIMITS
 of the Principal
FOREST TREES
 OF THE
DOMINION OF CANADA
 by
ROBERT BELL, M.D., F.G.S.
1881

Scale 80 Miles to 1 Inch.

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General
FORREST
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MONTREAL HORTICULTURAL SOCIETY.

ANNUAL MEETING.

The annual meeting of the Montreal Horticultural Society and Fruit Growers' Association of the Province of Quebec, was held at the Natural History Rooms on the 6th December, 1881. The chair was occupied by the President, Mr. N. S. Whitney, and there was a good attendance of members.

The minutes of the last annual meeting were read and confirmed.

MR. H. S. EVANS, the Secretary, then read the annual report and financial statement, which were as follows :—

The following report of the present condition of the Montreal Horticultural Society and its operations the past year is respectfully submitted: The Association having last year offered prizes for the best kept gentleman's greenhouse, best greenhouse kept by an amateur, and best kept window-garden, a number of entries were received, and though new, the idea was generally received with favor by the members. The judges appointed by the Society to make the awards have, however, made such a full and ample report, which is already in the hands of the members, that little reference need be made to it by me. The Board of Directors so far have made no arrangement for a repetition of the prizes the coming winter. Some action, however, will require to be taken immediately, M. H. Gault, Esq., M.P., having offered the sum of fifty dollars through the Society for the encouragement of window gardening the coming winter. The total expense to the Society the present year was about one hundred dollars, which amount in-

cludes prizes, judges' expenses and advertising. One good result at least was obtained by causing the opening of three greenhouses to the members of the Association, at stated dates during the past winter. These were Mr. Wm. Lunn's, Dr. T. Sterry Hunt's, and Mr. Andrew Allan's. The thanks of the Association are due these gentlemen for their consideration, and the Secretary ventures to hope that they will again open their conservatories the coming winter, and that others will be induced to follow their example. The annual exhibition of the Society took place in the Victoria Rink on the 20th, 21st, 22nd and 23rd September last, during the second week of the Provincial Exhibition. The exhibition as a whole was an exceedingly fine one, and in one or two respects, especially the outdoor grapes, was far ahead of any exhibit made in this city heretofore. There were 301 plates of outdoor grapes on exhibition, comprising about eighty varieties, many of them new and at least here comparatively unknown. Of the varieties twenty-six were white, twenty-one red and thirty-nine black. It was a pleasing evidence of the interest that the collection excited, to see from time to time visitors, note-book in hand, noting the names and appearance of varieties that interested them. The reason why the grape exhibit this year was so far in excess of that of any other year is owing to the fact that one particular section was open to the world. The sum of twenty-five dollars and the Society's diploma was offered as a first prize, and entries were received without fee. Circular letters were also written to leading grape growers and growers of special varieties in various parts of the United States and Ontario. Some parties responded favorably, and some, owing to the exhibitions in other parts of the country, were unable to do anything. The whole of the grapes exhibited in one section having become the property of the Society for the purpose of examination, a most interesting meeting was held in the Natural History Rooms on the evening of the 5th October. Addresses were delivered by the Rev. Dr. Burnett, of Pictou, N.S., formerly President of the Ontario Fruit Growers' Association; Dr. Hurlburt, of Chelsea, and other gentlemen. The fruit that had been on exhibition, and which, in the meantime, had been preserved in very perfect condition in Mr. George

Wait's refrigerator, was distributed among those present, Mr. Chas. Gibb, as each variety was handed round, making a few remarks as to origin, quality, productiveness and other characteristics. The meeting was very practical, and those present could not fail to gain instruction from the remarks made. In view of the undoubted success attending the plan adopted in this section, it is worthy of consideration as to whether the plan could not be extended in other directions.

The show of indoor grapes was exceedingly fine, probably the finest that has ever taken place in this Province, and numbered 118 plates. The liberality of one of our members in offering every year so liberal a prize is undoubtedly having an effect. The handsome silver cup which the winner, Mr. Cameron, chose instead of the money, should stimulate others and make this most attractive, and probably favorite department in the Exhibition a still greater success. There is an ample opening for any one interested in any particular branch of Horticulture to come forward and offer prizes through this Society, to take either the form of money, books, or in fact any articles. Will not some persons take a step in this direction, thereby encouraging objects in which they are interested, helping a most worthy society and benefiting the community in which they live? No one who makes this Province his home can justly say that he is not interested in the objects of this Society. Its aim and object is to elevate the taste, to help to develop the resources of the land in which we live, to endeavor to restrain the waste of our natural wealth, particularly timber. Any one who has read over some of the articles in the last reports of this Society, on this subject, can hardly fail to see the necessity of some association that interests itself in these matters.

The show of apples was very good indeed, between six and seven hundred plates being shown. The number of entries was probably larger than ever, but owing to the lack of competition for both classes of the county prizes, the number of plates of fruit exhibited was not so large as for the last two or three years. At the show of the Shefford and Abbotsford Association, a week later than the Montreal Exhibition, not very far from as many plates were shown. Though, perhaps, a matter of regret that

the Montreal display was not larger, it is a matter for congratulation that so large a show of fruit could be got together in one of the neighboring counties. Till quite recently, so large a display was never made at any exhibition in this Province, not excepting Montreal. For all this though, there is still a great deal of apathy shown, which it seems difficult indeed to overcome. Last year the Secretary addressed over fifty letters to the secretaries of the agricultural societies in the Province, inviting their cooperation, and there was not a single response. The only society that exhibited this year, as a society, was the Abbotsford Fruit Growers' Association, the fruit exhibited from Huntingdon having been collected by Mr. Edwards, of Covey Hill. His enterprise was rewarded, as he carried off the largest amount in prizes of any exhibitor, viz., \$94 50c., Mr. Cameron, the winner of the silver cup, coming second with about \$2 less in value. The Society has made special provision whereby any person residing outside the island of Montreal can become a member of the association on the payment of a very moderate fee of one dollar annually. This entitles them to the Society's reports, the *Agricultural Journal*, free admission to the exhibition, and also to compete for any prize offered by the Society without any extra fee. Notwithstanding all these privileges, out of a total membership of 815, only eighteen persons availed themselves of these privileges, though a few others, residing outside the district, paid the full fee of two dollars, receiving their extra tickets. Undoubtedly some of the fruit exhibited in the large county collections it is not profitable or desirable to cultivate. It might possibly be advisable to retain the county prizes, but limit the number of varieties shown in each section. If money can be found, prizes might be offered for twenty, forty, sixty, or even one hundred varieties, and by this means, a county totally unable to compete against one showing 140 varieties, might be able to compete successfully with twenty or forty varieties.

While on the subject of fruit I may note the fact that the Provincial Association this year also offered prizes for fruit. This may or may not have been much injury to the Society's show, but the receipts at the door were diminished between three

and four hundred dollars. The display made at the Mile End was certainly not such as to induce people to visit the Horticultural Society's display, as many strangers would naturally infer that being a smaller and somewhat local association, the display would be still smaller. It is regrettable, with so large a field left to the Provincial Association, that anything should be done that may injuriously affect the interests of this Society. This Association was reorganized with the object of doing Provincial work, and that work is being done in a manner that leaves little to be desired. Those gentlemen who give so much time, thought and energy to the work, do so without hope of receiving any fee or reward, save the consciousness of advancing the welfare of the country in which they live.

The display of vegetables, though good, was not so large as the previous year. Enough was shown though, to demonstrate that Montreal has not declined in her ability to grow a large number of the choicest vegetables in the greatest perfection.

Though rather late in the season the show of cut bloom was exceedingly large. The dahlias shown were magnificent, and our Quebec friends, as usual, carried off the palm in the different sections.

The display of plants was very large, and a marked improvement was noticeable in many of the sections. A splendid collection of calladiums was shown belonging to Mr. Lunn, and the gardener, Mr. Lamillier, was awarded a diploma and special prize. Mr. Bain also received a diploma for new varieties of coleus shown, and a special prize for a table of plants. An interesting collection of twenty-six varieties of the forest tree seeds of the country was shown by Mrs. Jack, of Chateauguay Basin, which was also awarded a diploma.

The exhibitors in the amateur departments deserve the greatest credit for some of the plants shown by them. The improvement within the last few years is most marked, and they deserve every encouragement by offering them as liberal prizes as the Society's funds will permit.

The Society, having brought into notice of late years, several varieties of apples of very considerable merit, it was decided to

send a small collection to the exhibition of the American Pomological Society, held in Boston in September last. I have the pleasure to announce that the Wilder silver medal was unanimously awarded by the judges. The varieties sent were: Strawberry of Montreal, Peach of Montreal, Decarie, Fameuse Sucre, Victoria, Winter St. Lawrence, late Strawberry, Canada Baldwin, Cellini and King of Pippins.

The Consul of the German Empire, W. C. Munderloh, Esq., called on the Secretary last month, accompanied by some gentlemen from Germany, who had been examining the country as to its merits as a field for immigration. They represented that they were very desirous of obtaining some specimens of apples grown in this Province. Though too late to get together as fine a collection as we would have wished, some thirty varieties were got together and forwarded to Germany. The contributors were Mr. Edwards, of Covey Hill; Mr. Jack, of Chateauguay Basin; the Abbotsford Fruit Growers' Association; Messrs. Shepherd, Whitney, Baker, Capt. Raynes and Miss Orkney, of Montreal. Some half-dozen counties were represented in the collection, and the thanks of the Society are due the donors for the trouble taken.

A communication has been sent to Dr. Arnold, Superintendent of an Agricultural College, at Petrovsk, near Moscow, Russia, inviting him to forward some scions of the hardiest varieties of pears for trial in this country. There has not been time, however, to receive a reply as yet, but if some good varieties could be procured from this source, considerable stimulus might be given to the pear culture in this Province.

The general condition of the Society, financial and otherwise, is very satisfactory. It is, however, only owing to the thoroughly business manner in which the Society's affairs have been conducted for years past, and the faithful attention and interest manifested by the officers in administering its affairs, that such a desirable state of affairs exists.

With the knowledge that a large exhibition was going to be held in Montreal this year, and considering that the receipts at the door would be fully up to last year, a liberal prize list, amounting to nearly \$1,600, was prepared. The receipts at

the door, instead of being equal to last year, only reached the sum of \$668.50, being about \$333 short of last year, while the prizes paid by the Society have been nearly \$200 in excess. The Society, so far, also have failed to obtain the two grants to which they are entitled in aid of publishing the reports. The sum of \$355.85 has been expended on this item alone the past year.

A committee was appointed lately by the Society to meet the Council of Agriculture and lay their case before them, it having been intimated that a favorable resolution from the Council would have weight with the Government. The deputation appointed were Messrs. N. S. Whitney (President),* Wm. Evans, Dr. Andres and the Secretary. After a very courteous hearing, the deputation retired, after which the Council passed the following resolution:—

“Mr. Browning moved, seconded by Mr. Somerville, that, considering the great importance of the publication of the reports of the Montreal Horticultural Society, the incalculable good that the Province received from the diffusion of these reports, the Government, through this Council, be respectfully prayed to favor the publication of the reports of the Society by a continuation of the annual grant of \$200, and that this Council would see with pleasure the translation and publication of these reports in the French language, and their distribution through the counties of this Province.”

A copy of this resolution has been forwarded to the Minister, the Hon. J. J. Ross, at Quebec, with what result remains to be seen. The report issued a short time since requires no words of commendation from me; that has been received from many and various sources, and it is clear that a work of such great importance cannot be abandoned. If the Government will not pay for the publication of it, the Society's expenditure will have to be curtailed in some other way. The Society is greatly indebted to Mr. R. W. Shepherd, Jr. for his valuable services as Secretary of the Report Committee, the whole of the work being done gratuitously.

The Society's exhibition this year was arranged in a somewhat different manner than usual, and presented a very fine appearance indeed. Owing to unforeseen difficulties, the attempt to light

the building, by means of the electric light, was not successful. The outside attractions in the evenings—combined with wet weather on the last day and evening, materially affected the financial result, by diminishing the receipts at the door.

The membership of the Society the past year was 815. This is the largest in the history of the Society, but only exceeds by one member that of 1876, which numbered 814. The labour of keeping together such a large Society is very great, and can only be managed by the active co-operation of the Directors and members in assisting the Secretary.

Nearly the entire cash balance on hand at the close of last year has been expended in the purchase and improvement of the plant and expenses connected with the fruit report, the figures being Plant, \$484.42; Report expenses, \$355.50. It is satisfactory to know that there is probably not a Society on the continent more thoroughly equipped than our own Society. In fact, so far as fixtures are concerned, the Society could go into a building any day and be amply provided with all the requirements; not even a carpenter would be a necessity. A large number of new tables have been provided, and a portion of the old ones have been used to make a shelter shed in which the Society's property is stored away.

Few of the members seem aware of the fact that a small but a good library is at their disposal. Though open two nights every week last winter, very few persons visited it. It is contemplated to have some sort of meeting this winter, at which one or two papers will be read, and the members of the Society meet together socially.

The total amount of money expended in prizes the present year was \$1,445.28. The sum of \$33.75 still remains in the Society's hands unclaimed. The Association has suffered considerable inconvenience by reason of the late payment of the Government grant. I would respectfully remark that the grant should always be in the Society's hands in the month of September of each year, as in that month the Exhibition is always held.

His Honor the Lieutenant-Governor of the Province and Madame Robitaille, Hon. J. J. Ross, Chas. Guilbault and other

ladies and gentlemen paid a visit to the Exhibition on one of the evenings it was open, by invitation. They were received by the president and other officers of the Association, and all seemed pleased and surprised at the magnificent and varied display that met their view.

The books have been audited by Messrs. Maxwell and Dunlop, and a financial statement of the affairs of the Society is annexed showing a balance of cash on hand of \$106.68, exclusive of any members' fees that have been collected for the coming year.

The Society's affairs have been conducted as economically as possible, but with an Association so active and almost constantly engaged in prosecuting some branch of their work, the outlay is necessarily very considerable. If the Society's work could only be spread out evenly over the year, a man would find himself pretty well employed for two-thirds of the time or more.

Mr. George A. Cochrane, a former resident of this city, has brought to the notice of the Society some patent cases of his invention for the proper preservation and safe carriage of the most delicate fruits to the English markets. The pears now shown to this meeting were put away on the 23rd of the month of September, and are apparently in beautiful condition. The apples were, I believe, put away about the same time. The tomatoes were put away on the 24th of September, but as they were taken out of baskets plucked for market, and were somewhat injured by frost, they are not in as good a condition as the other fruit. Mr. Cochrane says that the discoloration at the end is a disease caused by the accumulation of carbonic acid gas in the place where they were kept. Mr. Cochrane states that he has transported melons, tomatoes, and such like delicate fruit to the London market the past summer in perfect condition. We hope to have an address from this gentleman shortly, to the members of the Society, on the proper handling of fruit for the foreign markets, on which subject we have much to learn.

Gratifying as is the large membership of the Society the past year, I am convinced that, with a vigorous effort, the membership could be placed at one thousand. This would entail a

certain amount of extra work on some of the members, but with the co-operation of our fellow-citizens of French origin, it could be easily accomplished. In closing, I desire to express my thanks to the members generally for their consideration and for their very cordial co-operation in the somewhat laborious duties connected with the position I hold.

HENRY S. EVANS,
Secretary-Treasurer.

Montreal, 6th December, 1881.

THE FINANCIAL STATEMENT WAS AS FOLLOWS:

The Montreal Horticultural Society and Fruit Growers' Association of the Province of Quebec, in account with

Henry S. Evans, for year ending 30th November, 1881:—

Dr.

Cr.

To balance cash on hand.....	\$ 891 31	By paid postage.....	\$ 35 00
" Admissions to September Exhibition.....	668 85	" " Expenses of Reports.....	355 50
" Cash loaned by Secretary.....	300 00	" " for sundries on account of plant.....	484 42
" Dividend on bank stock.....	66 00	" " for paper, stationery, etc.....	22 52
" G. Cheney for special prize.....	25 00	" " Rents and insurance.....	288 57
" Sundries, permission to sell in building.....	15 00	" " Printing and advertising, etc.....	421 86
" Sundries, reports sold.....	5 95	" Assistance and sundry accounts connected with the Exhibition.....	276 62
" " Crockery sold.....	1 25	" Paid for music and decorating flink.....	195 00
" Government grant.....	22 20	" " Judges' expenses and lunch.....	98 25
" Members' fees, 797 at \$2.....	1,000 00	" " Sundry accounts, etc.....	55 66
" " " 18 at \$1.....	\$1,594 00	" " Prizes at Exhibition.....	\$1,355 50
	18 00	" " " for Greenhouse, etc.....	65 28
	1,612 00	" " " unclaimed last year.....	24 50
		" Secretary cash loaned.....	1,445 28
		" " Secretary's salary.....	300 00
		" Balance cash on hand.....	500 00
			106 68
	\$4,585 36		\$4,585 36

The report was adopted on the motion of Mr. G. Cheney, seconded by Mr. J. B. Goode.

Dr. BAKER EDWARDS suggested that at the annual exhibition it would be well to annex the scientific name of each plant, flower and fruit to it.

In reply to Dr Howard, Mr. Evans explained the method of preserving fruit.

The PRESIDENT said Mr. Cochrane was confident that his process would keep fruit for a twelve month.

There were on the table some specimens of apples, pears and grapes which had been satisfactorily preserved. Some tomatoes, which it had been attempted to preserve, were somewhat decayed, and the Secretary said Mr. Cochrane thought this was owing to the presence of a great quantity of carbonic acid gas in the room in which they were kept.

Several members spoke on the effect of carbonic gas in causing fruit to decay.

Dr. BAKER EDWARDS, being appealed to on the subject, said he did not think carbonic acid gas would cause fruit to decay; on the contrary, it had a preserving character providing the skin of the fruit was intact. It was well known that apples in ripening, after they were gathered, would give off carbonic acid gas, but the decay was not due to this, but, much more probably, to bruising.

The election of officers was then proceeded with.

A letter was read from Mr. M. H. Gault offering four prizes of the value of twenty, fifteen, ten, and five dollars for window gardening to be competed for during the winter by mechanics and workingmen.

It was resolved to accept the offer.

The following were elected as Directors:--

Messrs. N. S. Whitney, G. Cheney, J. Compton, J. Doyle, C. Gibb, R. W. Shepherd, Jr., W. Evans, J. Stantford and Dr. Andres.

A vote of thanks was passed to the Directors for their services, and to the press for reporting the proceedings of the Society.

At a meeting of the Board of Directors, Mr. N. S. Whitney was re-elected President, Dr. Andres, Vice-President, and Mr. H. S. Evans, Secretary-Treasurer.



THE NORTHERN LIMITS OF THE PRINCIPAL FOREST
TREES OF CANADA, EAST OF THE
ROCKY MOUNTAINS.

(Represented on the accompanying Map.)

BY ROBERT BELL, M.D., F.G.S., C.E., ASSISTANT DIRECTOR OF THE
GEOLOGICAL SURVEY OF CANADA.

On the accompanying map the general northern limits of the principal forest trees of Canada, east of the Rocky Mountains, are represented. The lines have been laid down chiefly from observations made by the writer during the last twenty-five years, extending from Newfoundland nearly to the Rocky Mountains, and from the northern United States to the eastern and western shores of Hudson's Bay. The limiting lines of the species which extend into the far North-west are drawn from information received from various officers of the Hudson's Bay Company, and from the data furnished by the accounts and maps of the different scientific travellers who have penetrated these regions. In the more southern regions, many details have been obtained from lumbermen and botanists which have helped to determine the lines with great accuracy in certain localities. Among the botanists may be mentioned Mr. A. T. Drummond, the late Dr. John Bell, Professors Lawson, Bailey, Macoun and N. H. Winchell, also the older botanists who have written on our flora. Thanks are due to my colleagues on the Geological Survey, Messrs. Richardson and Webster, for some facts on the distribution of trees in the Province of Quebec, and to Messrs. Fletcher, Ells and Broad, for others as to the Maritime Provinces, while Mr. A. S. Cochrane has made careful notes on this subject during our explorations in the North-west territories. To Captain William Kennedy, the Arctic explorer, now residing in Manitoba, thanks are due for

valuable information as to the trees of the peninsula of Labrador, in different parts of which he spent a number of years in the service of the Hudson's Bay Company. The Hon. D. A. Smith, Mr. Robert Crawford, and others who have resided in the Labrador country, have also given notes on the timber, which have greatly facilitated the approximate determination of the limits of the species found in that large peninsula. Nearly all the reports of the Geological Survey, from 1857 to 1879, contain more or less information on the distribution of timber trees, but previous to the former year the writer had studied the forest of southern Ontario and the Ottawa valley. In a paper on the "Trees and Shrubs of Lake Superior," published in the Transactions of the Botanical Society of Canada in 1861, he pointed out a number of facts in regard to the geographical distribution of trees in that region, which had not been previously observed. In 1873 the northern limits of our principal timber trees in the provinces of Ontario, Quebec, New Brunswick and Nova Scotia were laid down in colored lines on a large sheet, to illustrate a lecture before the Natural History Society of Montreal, by Mr. A. T. Drummond, on the distribution of plants in Canada. This sheet was loaned to the Department of the Interior, Ottawa, and some of the lines were transferred from it to the large map exhibited by the Department at the Paris International Exhibition of 1878. A reduction of the same sheet was published in 1879, to accompany a paper by Mr. Drummond in the report of the Montreal Horticultural Society and Fruit Growers' Association. In the portion of the present map which includes the four provinces referred to, the tree-lines are all carefully revised and corrected. The northern limits of thirty of the principal species of our forest trees are outlined on this map, being as large a number as can be conveniently represented on so small a scale. About forty other species, however, besides shrubs, occur within the limits of the Dominion east of the Rocky Mountains. A list of these, with notes on their geographical distribution, is added to that of the species mentioned on the map.

One of the principal uses of this map is to indicate the area within the Dominion throughout which each kind of timber exists,

The abundance and quality of each kind varies much, of course, within these boundaries. Occasional or chance trees and depauperated representatives of some of the species shown on the map, are known to occur beyond the limits laid down, but as these lines are intended to represent the general boundaries, they could not fairly be extended so as to include such cases. More or less extensive outliers or colonies of some trees occur in situations entirely separated from the main areas occupied by the species to which they belong. The southern boundaries of some of the more northern species, such as the white spruce, Banksian pine and balsam poplar, might be nearly included within the map, but to avoid confusion it is considered best to show only the northern limits. Most of our forest trees extend far to the south of the confines of Canada, so that at any point which we choose to select within the Dominion, we are apt to find in the forest nearly all the species whose northern limits lie to the north of it. Professor Charles S. Sargent, of Harvard College, a special commissioner in connection with the tenth census of the United States, is preparing maps illustrative of the distribution of the woods, prairies and barren grounds of North America, and at his request the writer has had much pleasure in assisting him in this work so far as Canada is concerned.

A knowledge of the limits of our different forest trees is also valuable as indicative of climate. Some of these will be found to correspond with the northern limits of the successful cultivation of particular crops. Certain trees cease to exist when they come to regions subject to severe spring or summer frosts, or where early autumn frosts prevent them from maturing their fruits. Locally, the presence of a particular group of trees is serviceable as a guide to the quality of the soil, but owing to differences in the character of the climate and other circumstances, it is obvious that such a test, although quite reliable within a limited area, may not be at all applicable to another region.

Some species appear to find their appropriate conditions in different latitudes by a change in their habitat: for example, the larch, balsam fir and white birch, which in the north grow freely on dry or hilly ground, towards the southern limits seek the cold

ground in swamps. The white cedar and white pine in some places manifest the same tendency.

The appropriate temperature for the growth of a number of species is carried far to the south of their normal latitudes, along the elevated parts of the continent, especially the Alleghanies and the Rocky Mountains.

The range of any species is evidently not governed entirely by the mean annual temperature. The extremes of heat and cold in the west, as compared with the milder winters and cooler summers in the east, with about the same mean temperature for the year, appear to be the chief cause of the marked difference in the character of the woods in the two regions, since there is not a sufficient disparity in the amount of the annual precipitation to account for it. A great difference in the moisture of the air in two regions, otherwise resembling each other in climatic conditions, has also a powerful effect upon the growth of forests; and the dryness of the air in the western prairie and arid regions is, no doubt, the chief cause of the absence of timber. The proximity of the sea, especially where fogs or cold winds are of frequent occurrence, has a great influence upon the kinds and the size of the timber, and, in the north, upon the very existence of trees near the coast. Differences in the composition of the soil appear to have only a local effect upon the distribution of forest trees.

The study of the geographical distribution of the various forest trees of North America possesses a certain interest to the geologist as bearing upon questions in regard to the condition of the continent in later geological times. The outlines of the areas occupied by the different species, and other circumstances connected with their character and distribution, may throw some light on their dispersion from certain centres or lines, or possibly, in some cases, their contraction from wider limits; or we may find that some of them have still a tendency to advance or retire.

The continent of North America possesses a great variety of forest trees. About 340 different species occur within the United States. All the kinds which we have in Canada, amounting to about ninety, including those of the Pacific slope, are also met with in that country. Some species are not only very widely dif-

fused, but are also persistent over great areas, being found almost everywhere within the limits of their distribution, while others, although having an extensive range, are nowhere very common, and are sometimes absent for considerable intervals. Others, again, are confined to comparatively small tracts. As a general rule, the more northern species occupy the greatest extent of country, while the southern ones are progressively more and more restricted, even in a more rapid ratio than would be implied by the narrowing of the continent from north to south. This is owing to the great differences experienced in climatic conditions in going from east to west in the more southern latitudes. Along the northern borders of the forests of the continent the elevation of the land above the sea is comparatively slight and regular, and the other physical conditions are tolerably uniform. As a consequence, we find the most northern group of trees extending from Newfoundland into Alaska, a distance of about 4,000 miles.

An inspection of the accompanying map will show some interesting features as to the general distribution of our forest trees, as well as regarding almost every individual species of timber. For example, it will be observed that there is no material change in the woods throughout the great triangular area embracing about 600,000 square miles, of which the national boundary line between the Rocky Mountains and Lake Superior forms the base, and the Rocky Mountains and Laurentian hills respectively the west and east sides, the apex being at the mouth of the Mackenzie River. In the southern part of this area, a number of species are added to the kinds which everywhere throughout make up the bulk of the forests, and again, few trees of any kind are found to the south of the North Saskatchewan; still, making allowance for local peculiarities of condition, there is a remarkable uniformity in the timber of this enormous area. It includes, however, only a few species, of which the aspen, balsam poplar and willows are more abundant towards the western, and the spruces, larch, balsam fir and Banksian pine towards the eastern side of the area.

It will be observed that the lines marking the northern limits of about a dozen species turn southward, and become their western limits on reaching the eastern side of the valley of Lake Winnipeg

and the Red River; while the boundaries of the species occurring next to the south of these also manifest a tendency to turn southward in approaching the prairies of the west. The species above referred to are the white cedar, black ash, white pine, red pine, sugar maple, yellow birch, red oak, white ash, hemlock, beech, ironwood, red cedar (arborescent variety) and white oak. They are to a great extent replaced by other species before the region of open plains is reached. Had the great forests originally extended further west, and been destroyed by fire or other causes, in comparatively recent times, we should have found the northern limits of these species continuing their general course to the prairie region, and ending abruptly there, instead of which they all curve gradually round, in a more or less concentric fashion, and other trees occupy the intervening ground. These well-marked features of forest distribution show that the present divisions of prairie and woodland are of very ancient date. The evidence of the smaller plants, and also of certain superficial geological conditions, all point to the same conclusion.

The State of Minnesota is situated in a very interesting region in regard to forest distribution. Here we find the northern limit of the group to which the most southern trees of Ontario belong, such as black walnut, shell-bark hickory, hackberry and Kentucky coffee tree; the north-western limit of the commoner trees of the northern states and of Quebec and Ontario, such as the white oak, red cedar (arborescent variety), ironwood, beech, hemlock, white ash, rock elm, red oak, yellow and black birch, sugar maple, red maple, wild plum, &c.; the western boundaries of some of the trees whose northern limits pass through northern Ontario, such as the white cedar, black ash, white pine and red pine; the southern limits of the most northern group, including the white spruce, the larch, Banksian pine, balsam fir, balsam poplar and canoe birch; and the general eastern limits of some of the western species, such as the ash-leaved maple, green ash, bur oak and cottonwood.

It will be observed that in the Labrador peninsula the tree-lines trend northward mid-way between the eastern and western shores. This is due partly to the unfavorable influence of the sea

on either side, and partly to the beneficial effect of the central depressions in which the rivers run northward into Ungava Bay. From Mingan to Lake Superior, the height of land, north of the St. Lawrence, is rudely parallel to the general course of the lines marking the northern boundaries of the trees, and it may have had some effect in limiting the northward range of a number of species. A southward curve in the watershed about the longitude of Ottawa is marked by a corresponding curve in the tree-lines. Again, where a great depression occurs in this dividing plateau, some of the trees, which in such places may be approaching their northern boundaries, are found to extend to the lower levels, beyond their general outline on either side. As examples of this, the Lake Temiscamingue and Abittibi district, and the valley of the Kenogami, or principal south branch of the Albany, may be mentioned. On the Missinaibi, or west branch of the Moose River, the white elm reappears 130 miles north of its general boundary on descending to a sufficiently low elevation above the sea. The Saguenay, for about 100 miles from the St. Lawrence, is really a narrow arm of the sea, and the country in the vicinity of Lake St. John, at the head of the river, is only slightly elevated above its level, and has a fertile soil, although surrounded by a mountainous region. Here we find an isolated colony of bass-wood, sugar maple, and other trees considerably removed from the rest of their species. On the north side of Lake Huron and to the north of the city of Quebec, the land rises somewhat rapidly, and in both instances the tree-lines near these latitudes are more closely crowded together than elsewhere.

Some kind of trees, in approaching their northern limits, show a tendency to diminish gradually in size, and to become more and more scattered, rendering it difficult to draw any definite boundary of the species, while others vanish abruptly. The latter habit is more characteristic of southern and northern species, as far as the Dominion is concerned. The various species appear to die out more gradually as they range northward, in the western than in the eastern regions.

Forest trees east of the Rocky Mountains may be divided into four groups, as regards their geographical distribution within the

Dominion: (1) A northern group, including the white and black spruces, larch, Banksian pine, balsam fir, aspen, balsam poplar, canoe birch, willows and alder. These cover the vast territory down to about the line of the white pine. (2) A central group of about forty species, occupying the belt of the country from the white pine line to that of the button-wood. (3) A southern group, embracing the button-wood, black walnut, the hickories, chestnut, tulip-tree, prickly ash, sour-gum, sassafras and flowering dog-wood, which are found only in a small area in the southern part of Ontario. (4) A western group, consisting of the ash-leaved maple, bur oak, cotton-wood and green ash, which are scattered sparingly over the prairie and wooded regions west of Red River and Lake Winnipeg.

In the western peninsula of Ontario the forests present a remarkable richness in the number of species to be found growing together. In some localities as many as fifty different kinds may be counted on a single farm lot. A more varied mixture is probably not to be met with in any other part of the continent, or perhaps in the world.

In tracing the tree-lines across the continent in the comprehensive manner shown on the map, it will be found that most of them afford interesting peculiarities for study. A few facts will now be given in regard to the geographical distribution of the thirty species whose northern limits, within the Dominion, are shown upon the map. They will be noticed in the order of their occurrence from north to south, and the lines traced from east to west. The common names used are those by which they are known in Canada.

1. WHITE SPRUCE, SINGLE SPRUCE, SEA SPRUCE—Pine of the Hudson's Bay Company's people—(*Albies alba*, Michx.).—This and the next are the most northern trees of North America. Abundant and of good size in Newfoundland and the Maritime Provinces, where it is sawn into deals. The Indians of these provinces call it "sea spruce," to distinguish it from the next. Captain Kennedy informs me that south of the limit shown on the map, it is common in valleys and sheltered places throughout the

Labrador peninsula. It nowhere reaches the Atlantic coast, receding further and further in going north. On the south side of Ungava Bay it is found at the mouths of Whale, George's and Ungava Rivers, large enough for building boats, but the trunks are short and apt to be knotty. In going up the east coast of Hudson's Bay it vanishes about latitude 57° , or a few miles above Richmond Gulf, but it is said to extend further north at a distance inland. On the west coast of the bay it extends to Seal River, in latitude 59° , from which the northward limit runs apparently almost directly north-west to near the mouth of the Mackenzie River, or about latitude 68° . According to both Hearne and Sir John Richardson, it is found on the Coppermine River to within twenty or thirty miles of the sea. Around James' Bay, and between this bay and Lakes Huron, Superior and Winnipeg, it attains a good size for lumber, and even on the Hayes and Nelson Rivers I have seen good, sound logs cut upwards of two feet in diameter, and showing from 100 to 140 lines of growth. Common throughout Quebec and Northern Ontario, but rare in the southern parts of the latter province. In the prairie country I have not seen it further south-west than Pine Creek, about 100 miles west of Winnipeg.

1a. BLACK SPRUCE, DOUBLE SPRUCE (*Abies nigra*, Poir.)—Professor Gray regards the white and black spruce as probably only varieties of one species, and there certainly appears to be every gradation between the two. The white spruce grows on rich intervale grounds, or near the shores of lakes and rivers; it becomes a moderately large tree, while the black spruce is brownish, and is always covered with small, loose scales, even when the trees are young. The two kinds have the same geographical range northward.

2. AMERICAN LARCH, TAMARAC, RED SPRUCE, JUNIPER (*Larix Americana*, Michx.)—All the way from Newfoundland to near the mouth of the Mackenzie River, the northern limit of this tree is only a little to the southward of that of the spruce. It is found along with this tree on the shores of Ungava Bay. In Newfound-

land, New Brunswick and the Gaspé peninsula it attains a good size, and is a valuable timber-tree on all the northern branches of the St. Lawrence and throughout the Ottawa valley, from which large quantities have been exported for ship-building, &c. It has an equally thrifty growth in the country to the south of James' Bay, and westward towards Lake Winnipeg. In this great region it attains its greatest perfection on the dry uplands and in good soil near the rivers, but smaller trees, with small black spruces, grow everywhere on the level or swampy grounds. South of the Ottawa it grows principally on low and level land.

3. BALSAM POPLAR, BALM OF GILEAD, ROUGH-BARKED POPLAR, COTTON TREE, WHITE-WOOD, &c., (*Populus balsamifera*, L.)—Abundant everywhere around the Gulf of St. Lawrence and throughout a great part of the Labrador peninsula. Luxuriant, but not of large size, along all the rivers of James' Bay and of the south-west side of Hudson's Bay, disappearing about Fort Churchill, from which its northern limit runs to about latitude 65° on the Mackenzie. On the east side of the bay small trees were seen as far north as Richmond Gulf. It is a very common tree, and of large size in the valley of the Mackenzie, especially on the Rivière aux Liards. It attains a considerable size around Lakes Huron and Superior, where the thick bark of old trees is used by the fishermen as a substitute for cork in making net floats.

4. ASPEN, COMMON POPLAR, TREMBLING-LEAVED POPLAR (*Populus tremuloides*, Michx.) A rather more southern tree than the last; very common throughout the whole region from the Gulf of St. Lawrence to near the mouth of the Mackenzie River. It extends over the southern half of the Labrador peninsula, and around James Bay. On the south-west side of Hudson's Bay it keeps some distance back from the coast. It is the commonest tree in the prairie and half-wooded parts of the North-West Territories. Throughout the Hudson's Bay Territory it is the principal fuel used by Indians and for open fires at the Company's posts, as it does not throw out sparks like the spruce and larch. In the Eastern Townships and elsewhere it is used for the manufacture of paper. Although the most widely diffused tree of North America,

it is relatively most abundant in the west, where it ranges from the Arctic regions to California. Professor Sargent remarks that it has "not yet been seen on the high peaks of the southern Alleghany Mountains, to which it might naturally extend."

5. CANOE BIRCH, WHITE BIRCH (*Betula Papyracea*, Ait.)—A very common tree along the northern tributaries of the St. Lawrence, and ranging as far north in the Labrador peninsula as Lake Naskopie, and to within 250 miles, or perhaps less, of Ungava Bay, on the river of the same name. It attains its greatest perfection around the Gulf of St. Lawrence and in the Ottawa valley, and is also found of large size near Lakes Huron and Superior. In Labrador, on both sides of James' Bay, and north-westward to the Mackenzie River, it affords sufficiently large sheets of bark for canoe-building. From James' Bay to the Mackenzie, which it strikes beyond the Arctic Circle, its northward boundary keeps near that of the aspen, being sometimes on one side of it and sometimes on the other. In the most southern parts of Ontario it is rare, of small size, and found only in swamps. In the Red River region it ranges as far south as the United States' boundary, and is found along the Assiniboine valley as far west as the Qu'Appelle lakes.

6. BANKSIAN PINE, SCRUB PINE, JACK PINE, CYPRESS (*Pinus Banksiana*, Lamk.)—This tree has not been noticed in Newfoundland, on the north shore of the Gulf of St. Lawrence, nor in the interior of Labrador beyond Lake Mistassini, although it may possibly have a somewhat more northern range in this peninsula than represented on the map. It occurs throughout Nova Scotia and New Brunswick. Starting from the head of the Bay of Chaleurs, its northward limit appears to cross the other tree lines to the lake just named, from which it runs west to the Moose River, keeping about 100 miles south of James' Bay. From Moose River it runs north-west to the Mackenzie, which it crosses about the Arctic Circle. It does not touch either James' or Hudson's Bay. Southwards it is common on the north shore of Lake Huron and around both shores of Lake Superior, whence it is met with all through the country to Lake Winnipeg. The area over which it is distri-

buted appears to be in the form of a belt, with a breadth equal to five or six degrees of latitude, running across the continent. Although a small and scrubby tree in the southern and eastern parts of its range, in the central part (both as regards latitude and longitude) it attains much greater perfection. On the southern branches of the Albany I have seen large groves of these trees about seventy feet in height, and two feet in diameter at the butt, with straight trunks nearly free from branches for the first twenty or thirty feet.

7. BALSAM FIR, FIR, VAR, SILVER PINE, BLISTER PINE—“Palm” in Cape Breton—(*Abies balsamea*, Marshall.)—The Maritime Provinces, Newfoundland and the southern half of the Labrador peninsula, its northern limits in this region being on Naskopie Lake and the Ungava River. It flourishes best in the Gaspé peninsula, where I have seen many trees from twenty inches to two feet in diameter, with trunks tall enough to afford one good sawlog—about fifteen feet. It occurs around James’ Bay, but its northern limit keeps to the south-west of Hudson’s Bay, where it passes between Fort Severn and Trout Lake, and reaches the neighbourhood of the junction of the Shammattawa and Steel Rivers, which form the Hayes’ River. From this point it turns south-west, and crosses the Nelson River at the outlet of Sipiwesk Lake, from which it runs north-west to the Mackenzie River, crossing it about latitude 65°. South-west of Hudson’s Bay it grows only in the warmest and best soils, and is entirely wanting in the cold, swampy tracts. In Ontario, where it is cultivated as an ornamental tree, I have not observed it growing naturally south of the latitude of Toronto. In the North-West Territories it appears to be absent to the south and west of Lake Winnipegosis.

8. WHITE CEDAR, CEDAR, ARBOR VITÆ (*Thuja occidentalis*, L.) The geographical distribution of this species presents some very interesting features. In the Gulf of St. Lawrence region its boundary runs south-east from Anticosti to the Bay of Fundy, directly across all the intervening tree-lines. It is absent from Newfoundland, Cape Breton, Nova Scotia, and the eastern half of Prince Edward Island, but is unusually large and fine in New

Brunswick and the Gaspé peninsula, in which the climate, soil, &c., are the same as in the adjacent regions, where not a trace of the species is to be found. From Anticosti the limit runs south-westward to a point about 200 miles north of Montreal. Thence it turns north-west and reaches Rupert's House, on James' Bay. From the neighbourhood of Moose Factory the line crosses the Albany River at some distance from the sea, and continues westwards to a point about seventy-five miles south-west of Trout Lake, where it turns south-west and reaches the southern extremity of Lake Winnipeg; thence it turns southward to the United States boundary, keeping to the east of the Red River all the way. There is a remarkable outlier of white cedar brushwood around Cedar Lake, on the lower part of the Saskatchewan River, at a distance of 190 miles to the north-west of the nearest point of the main area covered by the species, and a few cedar trees are said to occur on Lake Winnipeg, not far from the mouth of the Saskatchewan. Captain Kennedy informs me that he believes the white cedar occurs in Labrador west of the head of Hamilton Inlet. If so, this outlier would occupy a position with regard to the north-east promontory of the cedar-line which would correspond to that of the Cedar Lake one to its north-western promontory. We might account for the singular fact that the white cedar has not yet extended itself eastward into Newfoundland and Nova Scotia by supposing that, in comparatively late geological times, when the land was lower or the sea higher, the Arctic current, which now flows through the Straits of Belle Isle into the Gulf, passed on over the isthmus separating Nova Scotia from New Brunswick, and flowed through the Bay of Fundy. This steady current of Arctic water, which would itself carry no seeds or trees, might prevent those of the cedar from crossing to the islands beyond it. But on this hypothesis it would be difficult to understand why the white pine, yellow birch and other trees, which are even more southern in their general habit than the species in question, should be found in these provinces.

9. BLACK ASH, SWAMP ASH (*Fraxinus sambucifolia*, Lam.)—In Anticosti and southern Newfoundland. From the neighbourhood

of Seven Islands the northern limit runs west (curving slightly to the southward) to Lake Winnipeg. It is common, but of small size, along the different branches of the Moose River, especially towards the Height of Land. St. Peter's Portage, on the Missinaibi branch, is the most northern point at which I have seen it in this region. I have found small trees around the southern part of Lake Winnipeg, but have never noticed it further west.

10. WHITE ELM, SWAMP ELM, GREY ELM, AMERICAN ELM (*Ulnus Americana*, Willd.)—With the exception of the northern group, this species has the widest range of any tree in Canada. It extends from the southern part of Newfoundland to the base of the Rocky Mountains. It occurs at the head waters of all the principal branches of the Moose River, and on one of them, the Missinaibi, I found an outlier within 120 miles of James' Bay. On the Kenogami it extends to a point about half-way from Long Lake to the Albany. The northern limit intersects the east shore of Lake Winnipeg, and gains its highest latitude (about $54\frac{1}{2}^{\circ}$) on the main Saskatchewan, where Mr. A. S. Cochrane last summer observed some good-sized trees not far from Cumberland House. Professor Macoun says he has "found it on Tail Creek, which discharges Buffalo Lake into Red Deer River, a branch of Bow River." In the plain country, near the United States boundary line, the writer met with fair-sized trees in valleys in the Wood Mountains, and in different valleys to the northward of them. The trees in such situations are not visible from the table-lands until the brink of the valley is reached, and are locally known as "sly-woods." It grows to a large size along the Red and Assiniboine Rivers.

11. ASH-LEAVED MAPLE, BOX ELDER, RED RIVER MAPLE (*Negundo aceroides*, Moench.)—Does not appear to have been found native in Quebec or Ontario, although occurring in the Eastern States. Young trees raised at Montreal from seeds brought from Manitoba are growing very rapidly, and bearing seeds in the eighth year from sowing. In the North-West, Professor Winchell gives it as reaching the western extremity of Lake Superior. It is abundant in the Red River valley, and extends north to the Dog's

Head on Lake Winnipeg, beyond which the writer has not found it in that direction. It occurs along the main Saskatchewan and the south branch. The most westerly locality known is Tail Creek, which discharges into Buffalo Lake, where it was found by Prof. Macoun, along with the white elm. It is difficult to draw the geographical boundary of any tree in the prairie country, where timber of all kinds is so scarce, and therefore the lines on the map in this region are subject to correction.

12. GREEN ASH, WESTERN ASH (*Fraxinus viridis*, Michx.)—Common along the Red River in Manitoba, and extends north-westward as far as the Saskatchewan, in the neighbourhood of Cumberland House. Mr. A. S. Cochrane writes that he found it abundant, but of small size, at the Birch Portage, in this vicinity. I have met with it at the elbow of the South Saskatchewan, and Professor Macoun says he has not seen it west of the Cypress Hills, but that it extends east as far as Owen Sound, on the Georgian Bay. It occurs on the Lake of the Woods and along the Rainy River.

13. BUR OAK (*Quercus macrocarpa*, Michx.)—The limit of this species in Canada extends from the international boundary of Lake Superior north-westward to the north end of Lake Winnipegosis, from which it drops south to the Dakota line, in the vicinity of the Souris River. Professor Winchell writes that it is scattered all over the State of Minnesota. It attains a good size on the Rainy River and in the district between Lake of the Woods and Winnipeg River and the Red River; also along the Red and Assiniboine Rivers. On the English River it was first observed about half-way from Lonely Lake to the Winnipeg River. It extends northward on Lake Winnipeg as a tree to the Loon Straits, and as a bush to Beren's River. Small trees occur along the Swan River and north branch of the Assiniboine. Professor Macoun has not noticed it west of Spy Hill, near the Qu'Appelle River.

14. WHITE PINE—"Yellow Pine" of the British markets—(*Pinus strobus*, L.)—This and the next species have so nearly the same limit throughout the greater part of their northward range,

that they are represented on the map both by one line. The red pine, however, does not extend so far east as the white, so that in this direction the line represents only the boundary of the latter. Contrary to popular belief, the white pine is confined to a comparatively small part of the Dominion, as will be observed by an inspection of the map. Its northern limit in Canada extends east as far as Mingan, while to the west it does not reach Lake Winnipeg, or Red River. It reaches its lowest latitude opposite to Ottawa City, about $48\frac{3}{4}^{\circ}$, and its highest, about 52° , in the Lonely Lake region. It occurs in favorable situations throughout the greater part of Newfoundland, but it is of best quality and most abundant along the Gander and Exploit Rivers on the north, and the Humber on the west side of the island. On the last named stream, I have cut into the centres of several good-sized trees, and found the wood of excellent quality. In the country immediately north of Lake St. John, the Messrs. Price have cut large quantities of fine white pine timber for export. When coming from Lake Mistassini to Ottawa, by way of the Gatineau River, Mr. Richardson, of the Geological Survey, first met this species at 230 miles north of that city. It occurs of fair size on the head waters of all the principal branches of the Moose River, and in former times is said to have extended considerably further north along these streams; but having been entirely destroyed by extensive forest fires, it has been replaced by other trees. Owing to these fires it is now very scarce in most of the region north of Lake Superior, but small groves of it have been observed as far north as represented. It is scattered over the country between Lake Superior and the Winnipeg River and around Lonely Lake, but it is of rather small size. In approaching Lake Winnipeg, the limiting line of this tree curves south-westward, and crosses the Winnipeg River about fifteen miles above Fort Alexander, and then runs south to the United States boundary at some distance east of Red River.

15. RED PINE, NORWAY PINE (*Pinus resinosa*, Ait.)—As above stated, the northward range of this species and the white pine correspond so nearly, except toward the east, that for the present

their limit is represented by a single line. It is not so common a tree in Canada as the white pine, and is usually found in rather small groves, although in the Ottawa valley they are sometimes pretty extensive. The white pine, on the other hand, may be found mixed with all other kinds of trees. It begins to disappear from the northern part of the region of the white pine east of the longitude of Quebec, and is absent from Anticosti and Newfoundland. I have observed it in the Province of Quebec on the upper part of the Patapedia River, in the Gaspé peninsula, and Mr. Ells informs me that it is found on the Tobique River and on the New Brunswick and Canada railway fifty miles from St. Andrews.

16. YELLOW BIRCH (*Betula excelsa*, Ait.)—The 49th parallel forms the average northern limit of this species from Newfoundland to the Red River valley, in which it curves round and runs southward. It grows to a good size in Newfoundland and the Maritime Provinces, where it is used in ship-building. Some of the trees whose northern boundaries are near that of the yellow birch in the east, gain much higher latitudes in the west. It ranges north of the height of land at Lake Abittibi, but is not found on the north shore of Lake Superior from Michipicoten to the United States boundary, and only small trees are found on the Canadian side of the line from this point to the Rainy River.

17. SUGAR MAPLE, HARD MAPLE, ROCK MAPLE (*Acer saccharinum*, Wang.)—This tree, which was adopted as emblematic of Canada, is confined to the south-eastern borders of the Dominion. It is rather more southern in its tendency than the yellow birch. Some small trees have been noted at the head of Bay St. George, Newfoundland. It is found in sheltered places on the north side of the Gaspé peninsula, and is common in its southern parts, thrives well on the fertile limestone land of Lake St. John, and reaches Lake Temiscamingue on the Ottawa; it is abundant, but of a dwarfed description, on Michipicoten Island and the hills on the east side of Lake Superior. Going north in this region, the last trees were seen south of the Long Portage, on the Michipicoten River. It is absent from the northern parts of the shores of Lake

Superior and northward. On the west side of the lake it re-appears on the south side of the lower part of the valley of the Kaministiquia River, and thence the limit keeps westward, a little to the north of the boundary line, as far as Lake of the Woods, where it turns south. Sir John Richardson mentions this tree as occurring in the Saskatchewan region, but this is probably an error.

18. RED OAK (*Quercus rubra*, L.)—Nova Scotia, New Brunswick south of the Bay of Chaleurs, Province of Quebec south of the city of the same name, and in Ontario to latitude 46°. On the north side of Lake Huron it is found for only a short distance inland. South shore of Lake Superior and at the eastern and western extremities. It has been said by one writer to occur on Michipicoten Island, but others familiar with the island have not observed it.

19. HEMLOCK, HEMLOCK-SPRUCE (*Abies Canadensis*, Michx.) Eastward the northern limit of this species is at the Bay of Chaleurs, but it is scarce near the eastern sea coast of New Brunswick. Very abundant in the northern part of Nova Scotia. It crosses the St. Lawrence a short distance below Quebec, extending further down on the north than on the south side. Thence it reaches the north end of Lake Temiscamingue and the eastern extremity of Lake Superior at Agawa, south of the Michipicoten River. On the south shore of Lake Superior it does not reach the western extremity, turning southward in the neighbourhood of Ashland. I am informed, however, that there is an outlying grove of hemlock at Thompson, about twenty-five miles west of Duluth. This tree maintains a good size to the verge of its range, and always appears to terminate abruptly. Sir John Richardson states that it grows on the Kaministiquia River. This, however, appears to be an error. I have never seen it or heard of its occurrence near this locality.

20. BASSWOOD, LINDEN, WHITE WOOD (*Tilia Americana*, L.)—Common in Nova Scotia and New Brunswick, except the northern part, not having been noticed beyond the southern branches of the Restigouche. The northern limit seems to reach the Gulf south of Miscou, from which it runs west to near Quebec, and

thence in a pretty direct course to the eastern shore of Lake Superior. It is wanting around the northern parts of this lake, but re-appears just south of Thunder Bay, from which it nearly follows the international boundary to Lake of the Woods. Here it bends north-west, and almost gains the southern extremity of Lake Winnipeg, the last trees seen in that direction being at East Selkirk, on the Red River, where they are very small. Westward, it is found along the Assiniboine to a short distance above Fort Ellice.

21. BEECH (*Fagus ferruginea*, Ait.)—Throughout Nova Scotia and in New Brunswick to the Bay of Chaleurs, except on the coast of the Bay of Fundy. The northern boundary crosses the St. Lawrence a short distance below Quebec, and thence runs west to Lake Nipissing and the outlet of Lake Superior. On the south shore of this lake it occurs as far west as Grand Island, but it seems to disappear from the immediate neighbourhood of the lake before reaching L'Anse. Sir John Richardson says this tree occurs on Red River of Lake Winnipeg. If so, it must be south of the Canadian line.

22. WHITE ASH (*Fraxinus Americana*, L.)—Found throughout Nova Scotia and in New Brunswick, except the northern part; also in the southern parts of Quebec and Ontario, its northward range corresponding nearly with that of the beech. It occurs along the southern, but not on the northern side of Lake Superior.

23. IRON-WOOD, HOP HORNBEAM—Lever-wood of the Eastern Townships (*Ostrya Virginica*, Wild.)—Nova Scotia and the greater part of New Brunswick, the northern limit being on the Bay of Chaleurs, from which it runs to near the city of Quebec, and reaches Lake Huron at the mouth of the French River. It has been seen on the Manitoulin Islands, but not to the north of the Lake Huron. Sir John Richardson mentions it as occurring on the Winnipeg and Red Rivers, and I have noticed it on Lake of the Woods and the lower part of the Assiniboine River.

24. BLUE BEECH, AMERICAN HORNBEAM (*Carpinus Americana*, Michx.)—This small tree does not range quite so far north as the

last. It has not been noticed on the north side of Lake Huron, nor anywhere around Lake Superior.

25. WHITE OAK (*Quercus alba*, L.)—In the southern parts of Nova Scotia and New Brunswick, in both of which it is rare. More common in the southern districts of Quebec and Ontario. A very valuable timber tree in the Ottawa valley, below the Mattawa, and throughout south-western Ontario, from both of which regions large quantities have hitherto been exported to foreign markets.

26. RED CEDAR (*Juniperus Virginiana*, L.)—The arborescent form of this species is found in none of the provinces except Ontario. Its northern limit begins on the Atlantic coast about the eastern part of the state of Maine, and runs west near the parallel of latitude 45°, crossing the St. Lawrence about mid-way between Montreal and Lake Ontario, and reaching Lake Huron at Parry Sound. In the early days of the settlement of Upper Canada large quantities of this wood were cut in the neighborhood of Kingston and the Bay of Quinté, and shipped out of the country. The prostrate variety (*J. humilis*, Hook.) is found in all the provinces, and is common in sandy and gravelly soil in the North-west prairie country. It also occurs in dry and rocky places along rivers and lakes in the wooded regions of the Hudson's Bay Territories, as far north as the mouth of the Nelson River.

27. BUTTERNUT (*Juglans cinerea*, L.)—Said to be found in Nova Scotia on the east side of the Bay of Fundy. Occurs in the southern counties of New Brunswick, especially King's, and along the St. John River above Woodstock; absent from the coast and northern part of this province; in the St. Lawrence valley, nearly as far down as the city of Quebec, and along the Ottawa up to the Madawaska, from which the northern boundary runs to the Georgian Bay. Large trees are found in a few places in the county of Grey, not far from this Bay.

28. BITTER HICKORY (*Carya amara*, Nutt.)—Ranges over a much larger area in Canada than the shell-bark hickory, being found around Montreal, in the eastern Townships and along the

lower part of the Ottawa valley, and thence westward throughout the southern part of Ontario to Lake Huron.

29. BLACK WALNUT (*Juglans nigra*, L.)—This tree is confined to the tract lying south of a line drawn from the head of Lake Ontario to near the outlet of Lake Huron.

30. CHESTNUT (*Castanea vulgaris*, Lam., var. *Americana*, A. DC.)—In the district along the north side of Lake Erie, and north-eastward to the north shore of the head of Lake Ontario.

THE GEOGRAPHICAL DISTRIBUTION OF TREES OCCURRING IN
CANADA BUT NOT REPRESENTED UPON THE
ACCOMPANYING MAP.

1. TULIP TREE (*Liriodendron tulipifera*, L.)—At Niagara Falls and in some localities westward near Lake Erie.
2. SILVER MAPLE, WHITE MAPLE (*Acer dasycarpum*, Ehrh.)—Eastern Townships and province of Ontario south of latitude 45°. Generally confounded with the red or soft maple.
3. STRIPED MAPLE (*Acer Pennsylvanicum*, L.)—This small tree, although everywhere scarce, has much the same range in Canada as the sugar maple, being found from Gaspé to the outlet of Lake Superior; also with the sugar maple of Lake St. John.
4. MOUNTAIN MAPLE (*Acer spicatum*, Lam.)—The most northern species of maple. Ranges from Newfoundland to James' Bay, and north-westward to Island Lake on the waters which reach the sea at York Factory. The last locality at which it was seen in this direction is George's Island, in Lake Winnipeg.
5. BLACK MAPLE (var. *Acer nigrum*, Michx.)—Identified by the late Dr. John Bell as occurring at Grenville, on the Ottawa.
6. SOFT MAPLE, RED MAPLE (*Acer Rubrum*, L.)—A common tree throughout the Maritime Provinces, and in Quebec and Ontario south of latitude 49°; has a slightly more northern range than the sugar maple.
7. KENTUCKY COFFEE TREE (*Gymnocladus Canadensis*, Lam.)—Said to occur in southern Ontario. Professor Winchell informs me that it is found in the southern part of Minnesota.

8. WILD PLUM (*Prunus Americana*, Marshall.)—The northern limit runs from near the city of Quebec to the eastern extremity of Lake Superior. It occurs on the Rainy and the Red River and the lower part of the Assiniboine, and at the south end of Lake Manitoba.

9. PIGEON CHERRY, SMALL RED CHERRY (*Prunus Pennsylvanica*, L.)—Very widely diffused; has a high northern range, small examples extending in most regions nearly to the verge of the timber.

10. BLACK CHERRY (*Prunus serotina*, Ehrh.)—Formerly a valuable timber tree in the lower Ottawa region and south-western Ontario; very fine in the county of Bruce; now nearly exhausted.

11. MOUNTAIN ASH, ROWAN (*Pyrus Americana*, De C.)—Abundant and of good size in all the Maritime Provinces, Anticosti and Gaspé; thence it extends westward, the northern limit touching James' Bay. Further west it is found of small size as far west as Island Lake, on the Shamattawa, and to White Mud Falls, on the Nelson River, seventy or eighty miles below Lake Winnipeg. This tree, which is of northern habit, probably attains its greatest perfection around the Gulf of St. Lawrence and Lakes Huron and Superior.

12. SCARLET-FRUITED THORN (*Cratægus coccinea*, L.)—Common in the southern and central latitudes of Quebec and Ontario, but its northern limits have not been accurately ascertained. Between Lake Superior and Manitoba thorn bushes grow as far north as the international boundary, but not much beyond it. Thorn bushes, apparently belonging to this species, were found by Mr. Cochrane on the Grassberry River, twenty or thirty miles north-west of Pine Island Lake.

13. COCKSPUR THORN (*Cratægus crus-galli*, L.)—Ontario, except the more northern parts. In Manitoba a thorn which appears to be identical with this species is abundant.

14. BLACK THORN (*Cratægus tomentosa*, L.)—In the southern parts of Quebec and Ontario.

15. FLOWERING DOG-WOOD (*Cornus florida*, L.)—In southern

Ontario only. Most common apparently at Niagara Falls, and westward to the valley between Dundas and Ancaster, but rarer on the higher grounds.

16. SOUR-GUM (*Nyssa multiflora*, Wang.)—Dr. Hurlbert informs me that this tree grows in some parts of southern Ontario, but I have not observed it myself.

17. SASSAFRAS (*Sassafras officinale*, Nees.)—From Niagara River to Ancaster, near the head of Lake Ontario, and probably other parts of southern Ontario.

18. SLIPPERY ELM (*Ulmus fulva*, Michx.)—Southern parts of Quebec. Along the Ottawa River for 200 miles, above Montreal; small and rather scarce. In Ontario as far north as Georgian Bay.

19. ROCK ELM (*Ulmus racemosa*, Thomas.)—Eastern Townships, Lower Ottawa valley and province of Ontario south of latitude 46°. Formerly common, but most of the finest trees in all these regions have been cut for export.

20. BUTTONWOOD, AMERICAN PLANE-TREE (*Platanus occidentalis*, L.)—Around the head of Lake Ontario and in the western peninsula, especially along rivers such as the Grand, Thames and Saugeen.

21. SHELL-BARK HICKORY (*Carya alba*, Nutt.)—In the southern part of Ontario; rather common in some localities. The brown hickory (*C. porcina*) and the white-heart hickory (*C. tomentosa*) are also believed to occur in the same region.

22. SWAMP WHITE OAK (*Quercus bicolor*, Willd.)—The white oak of the low lands in the Ottawa valley and southern Ontario appears to belong to this species. Near Dundas I have also seen what I took to be the black oak (*Q. tinctoria*, Bartram.)

23. WHITE BIRCH (*Betula alba*, L.)—This species, which is often mistaken for the canoe birch, occurs both in the Maritime Provinces, and in Quebec as far west as Montreal, and probably further.

24. BLACK BIRCH (*Betula lenta*, L.)—Often confounded with the yellow birch. Occurs in both Nova Scotia and New Bruns-

wick. Identified in Gaspé and other places in the Province of Quebec, and in Ontario as far west as the Manitoulin Islands.

25. BLACK ALDER (*Alnus incana*, Willd.)—Abundant along streams everywhere from Newfoundland to the Saskatchewan, and as far north as the forests extend, but not in the southern parts of Ontario. In the Hudson's Bay Territories it is often called "black willow." The green alder (*A. viridis*) has also been noticed, although not so common as the black, from Newfoundland to Lake Winnipeg, and northward to the verge of the forests around Hudson's Bay.

26. WILLOWS.—The willows have not been identified with sufficient specific accuracy in the various regions in which the aborescent forms occur to map the geographical range of the different species.

27. LARGE-TOOTHED POPLAR (*Populus grandidentata*, Michx.)—Of a southern habit compared with the aspen. Its northward range is somewhere between that of the sugar maple and the white pine. Abundant in New Brunswick and Gaspé. It does not extend west as far as Manitoba.

28. COTTON-WOOD (*Populus monilifera*, Ait.)—Large trees occur along the Assiniboine River.

29. *Pinus contorta* (Dougl.)—Western part of the North-west Territories.

30. PITCH PINE (*P rigida*, Mill.)—In some places in the Ottawa valley, and at the Thousand Islands on the St. Lawrence.

31. ENGELMANN'S SPRUCE (*Abies Engelmanni*, Parry.)—This tree, which is known to extend as far east as the Black Hills of Dakota, is said to occur also on the upper waters of the South Saskatchewan.

THE RETURNS OF FOREST TREE CULTURE.

BY HON. H. G. JOLY.

In an article written, last winter, for the Montreal Horticultural Society's Report for 1880, I attempted to awaken an interest in the culture of forest trees, and to show that it was fast becoming a necessity, and would prove a most profitable investment. The unexpected interest manifested on all sides, in that question, encourages me to lay before your readers the results of the last twelve months' experience.

First of all, I must begin by correcting a serious mistake in my paper of last year, which might have completely defeated the object I had in view, and discouraged, instead of promoted, the culture of forest trees. Speaking of the growth of the black walnut, I stated that it would take *seventy-five years to grow twenty-one inches in diameter*. Having recommended the culture of forest trees as a good investment, and laid aside every other *argument*, however powerful, in its favor, to narrow it down to a commercial issue, *the length of time before the investment could be realized became a matter of vital importance*. In fixing it last year at seventy-five years, I made it nearly double what it ought to have been; *thirty to forty*, under fair circumstances, are sufficient.

I am indebted to Mr. George Stanton, of Simcoe, for valuable and reliable information on the growth of the black walnut. Upon his remarking that he fancied, from reading my paper, that the black walnut trees must grow a great deal faster in his neighborhood than with us, I begged of him to measure a certain number of them, ascertaining their age as correctly as possible. I will now quote part of the interesting letter he wrote in answer:—

“ You know that this Long Point country was a great black walnut district, and on the Lake Shore there are still quite a few trees left. I have measured, to-day, some five trees, and got their ages as near as I can, relying on what the owners have told me.

“The first tree that I saw, measured 5 feet 8 inches, 4 feet from the ground, and is 24 years old ; it is growing on very rich black sand loam.

“The second measures 5 feet 4 inches, 3 feet from the ground, is 30 years old, on very light sand. The third and fourth measure 23½ and 24½ inches respectively, 3 feet from the ground, and both are 11 years old, on good clay ground, but were transplanted when young. The age of these trees the gentleman told me he was sure of.

“Number 5 measures 7 feet 8 inches, 5 feet above the ground, is 55 years old ; this tree is on very light sand soil. I mean in all the measurements, the *circumference* of the trees.

“You see from this, that the soil has everything to do with the growth of the tree ; the richer the soil, the more rapid the advance, and, therefore, I hope that by putting my trees on rich virgin clay soil, I shall have a *return in about twenty-five years.*”

And I may add, here, that Mr. Stanton has sown, last fall, twenty-five bushels of black walnut nuts in the beautiful soil he mentions ; all the friends of forest tree culture will join me in wishing that he may be spared to reap the crop he has sown.

I will now give, in a tabular form, for the purpose of comparison, the results of Mr. Stanton's measurements :—

No.	SOIL.	Age of tree.	Diameter.	Approximate annual growths.
1	Very rich black sand loam...	24 yrs.	22 in.	11-12, or very near 1 inch.
2	Very light sand.	30 “	21 “	About ⅔ of an inch.
3	Good clay ground (transpl'ted)	11 “	8 “	Over ⅔ do.
4	do do	11 “	8 “	do. do.
5	Very light sand.....	55 “	31 “	A little over ½ inch.

With the soil and climate of Ontario, and average fair play, black walnut can be safely expected to grow at least two-thirds of an inch in diameter, annually, say, *twenty inches in thirty years.* I am speaking of that average ; under exceptionally favorable circumstances, it would, of course, grow faster. I am taking the average of Mr. Stanton's report, between the trees growing on

very light sand and those growing on rich black loam and good clay ground.

With us, so far as I can judge, I should think the growth a little slower than in Ontario, and would call it half an inch in diameter, annually, say *twenty inches in forty years*.

Last fall I measured five of my young walnuts (seven years old), at one foot from the ground; one had fourteen inches circumference (four inches and two-thirds diameter), two had twelve inches circumference, or four inches diameter, and two nine inches circumference, or three inches diameter, showing an average of annual growth of half an inch in diameter.

Those trees are growing on good soil, about one foot of black vegetable mould over thick blue, stiff clay; but I would expect them to grow faster in deep mellow alluvial soil, such as Mr. Stanton alludes to. In fact, another lot of the same age, a few miles distance, growing on an island formed by river sand and the washings of the spring freshets, are nearly as thick, though they have been seriously checked by transplanting. Whatever beneficial effect it may have in the future, the stiff blue clay does not favor the rapid development of the very young plant.

As the trees advance in age, their annual growth appears to become greater. There is no saying how far we shall be able to stimulate the rapid growth of the black walnut with proper attention and care.

I need not apologize for laying so much stress on the rate of its growth, since it is one of the first considerations that recommend the black walnut, in preference to all other trees, combined with the value of its timber and the facility and safety of its culture.

Return of one superficial acre planted in black walnut. The Hon. J. B. Hough, Head of the Forestry Department of the United States, in his celebrated Report on Forestry of 1877 (page 37), allows 680 trees, 51 years old, to one superficial acre, eight feet distant from one another, on every side. At that rate, one superficial acre of good soil, planted to-day in black walnuts, and carefully looked after, would yield, in about thirty or forty years, according to circumstances, the sum of \$20,400.00, allowing 30

cubic feet (at one dollar a foot) for each tree, averaging 20 inches diameter; of course no one could rely upon such a result, which could only be achieved if none of the trees failed, but even after striking off fifty per cent. the return would still be such as no other legitimate investment could secure.

At first sight, it appears impossible that so many large trees should be able to thrive on one superficial acre, but in travelling through the woods, this winter, I have made a point of finding out, whenever practicable, how near to one another large trees could grow without interfering, and have found numerous instances where they stood nearer to one another than eight feet, especially evergreens.

The European writers on Forestry do not allow quite as many trees to the acre as Mr. Hough does. I would think it pretty safe to rely on about two-thirds of his number, and, with all confidence, will endorse his statement, that: "the amount of timber grown on a given area, in some of the governmental forests in Europe that have been planted and managed according to the rules of forestal science, *is very much greater* than the same soil would grow in wood, if left to itself."

In calculating the number of years to elapse before obtaining a profit from a black walnut plantation, I have supposed that the trees would not be cut down before they were twenty inches, at least, in diameter. If you cut them when they give twelve to fourteen inch logs, the average size of spruce logs, you will get a return much sooner, but it will be a waste of timber, except what you must cut for thinning.

Many people who are seriously concerned about the rapid destruction of our forests, advocate the planting of trees in the woods, in the place of those that are cut down; all practical lumbermen will agree that it is next to impossible to do that, and it would be useless, for the young trees would do very little under the shade of their big neighbors. We can make our forests last a long time by sparing all trees under a certain size, giving a chance to the young trees, &c.; but if we want to plant forest trees with a chance of success, we must start a whole lot of them together, about the same age and size.

HOW TO CULTIVATE THE BLACK WALNUT.—*Whenever practicable, avoid transplanting*, by sowing at once the nut, where the tree is to remain, in rows, four feet apart on every side. Instead of spreading lateral branches, (very fragile in the young wood, and liable to be torn off by snow, ice, wind, &c.,) at that distance they will grow up in length, with no under branches, and can be thinned in the course of time. The nut must be sunk about a couple of inches in the ground. The rows ought to be quite straight, set out by the line, and marked from place to place with pickets, so as to know exactly where the young plants are, the first year, and avoid hurting them when hoeing and weeding.

The ground must be well prepared for permanent sowing, the richer the ground the more rapid the growth. If your ground is not ready when you receive your nuts, sow them in the nursery. We have sown about ten thousand in that way last fall, not having sufficient ground ready for permanent sowing. The rows in the nursery are three feet apart, nuts eighteen inches from one another; the ground was laid out last summer as a potatoe field, and is in very good order; there is plenty of room between the rows to pass with a horse hoe; I hope to be able to transplant them permanently next fall.

Better sow the nuts in the fall, however late, even if you must shovel away the snow. The squirrels are more apt to steal them (as I know to my cost), when you sow them in the spring, than late in the fall. If you must winter them, do not keep them in the house; the slightest heat will make them turn rancid, and kill the germ. To satisfy myself on that point, I sowed this spring a couple of thousand nuts of the butternut, wintered in a cool garret. Not one came up, while several of the same nuts, lying where they fell in the fall, and spending all the winter without shelter, sprung up well in the spring, and a number of others, dragged by the squirrels or rolled under plank roads and piles of sawn lumber, grew up beautifully, some of them sending up their stems through such small cracks between the deals of the plank roads, that the stem grew as thin as a sheet of very coarse paper and wide in proportion while in the crack, and these rounded again and sent out branches and leaves in the regular way.

Those valuable trees have not yet been regularly cultivated on a large scale ; we have a great deal to learn from experience as to the best mode of dealing with them. I have tried some of the nuts with superphosphate, others with plaster, etc., and have placed boards, at a certain depth, under others in the nursery to stop the descent of the taproot and facilitate transplanting, and shall account in due form for the result of these experiments. I must acknowledge the kindness of a number of gentlemen who have procured me last fall large quantities of black walnut nuts from the west ; the quantity I thus received, nearly twenty five bushels, allowed me to extend my plantations considerably beyond my expectations.

ELM.—The seed of the elm ripens and falls about the middle of June. Last summer I collected some and sowed it the same day ; it must have been sown too deep, for very few came up, but one of them grew fourteen inches before the autumn ; the seed ought not to be covered, but spread on a damp shady spot, as in nature. It is better to take up the little seedlings growing as thick as grass at the foot of the trees on every favorable patch of ground where the wind may take the seeds. Out of a couple of hundred, no bigger than needles, and pulled up by bundles, with the moss on which they were growing, about the middle of July, and transplanted in rows in a corner of the garden, only half a dozen died. I kept them in complete shade for a few days, and damp. At the end of September they were over six inches high, and as stout and strong as could be wished. I expect they will grow very fast.

BOX ELDER OR ASH-LEAVED MAPLE (*Erable à Giguières*, *Acer Negundo*).—This autumn some of our people returning from a visit to their friends in Minnesota, brought a few seeds of a peculiar kind of maple growing there, which they called l' Erable à Giguières. They had been told that it grew so fast that it was fit to be tapped for sugar when only six years' old. It sounded very marvellous, but it was worth while trying, and I sent for some seed, which I sowed at once. Some of it, placed in a flower-pot, came up with wonderful rapidity and vigor.

I would strongly recommend all those who feel an interest in

the matter to try the introduction of foreign trees by seed. Those experiments cost next to nothing; the price of the seed is a trifle, and they can be sent by post, and the results obtained with such small outlay may be considerable.

Lately, on looking for information respecting that new (to us) kind of maple in our American Botanical Works, I met with rather contradictory opinions on the subject.

In an old work written by D. J. Browne in 1832, and entitled *Sylva Americana*, page 103, I find the tree described under the names of Ash-Leaved Maple, Box Elder, *Acer Negundo* and *Erable à Giguieres*, as it is said to be called by the French of Illinois. "It grows," says Browne, "most abundantly in the bottoms which skirt the rivers where the soil is deep, fertile, constantly moist and often inundated with water." He adds further on: "The proportion of the sap to the heart is large, except in very old trees," but does not say that sugar has ever been extracted from it. Speaking of its growth he says: "From its luxuriant growth it would afford a profitable product as fuel."

Michaux, in his *North American Sylva*, vol. 1, page 172, says that the ash-leaved maple, to obtain its full proportions, requires a climate three or four degrees milder than that of Philadelphia, confirming Browne's opinion that it is seldom found in the Northern States. The fact of its growing so well in Minnesota, where the cold is often intense in winter, contradicts them both.

Michaux adds that it has been erroneously asserted that sugar is made from its sap. The only point on which Michaux agrees with our people is about the *rapidity of growth* of this tree when young.

Nuttall, vol 2, page 38, says that the ash-leaved maple, *Acer Negundo*, extends *much further north* than was supposed by Michaux, and that it has been found in abundance about the Red River and Saskatchewan as far north as 54°. He says Crow Indians are reported to *manufacture sugar from its sap*, but it is not nearly as saccharine as that of the sugar maple.

It is a satisfaction to find that our travellers' reports are confirmed in the main by the latter of these two authors; as to the proportion of saccharine matter in the sap, perhaps we shall know

in six years time, or a little more, how it compares with that of the sugar maple. With our superior appliances we can safely expect to extract a greater proportion of sugar from the sap than the Crow Indians do.*

AN APPEAL TO MEN OF GOOD WILL.—Many people say that Government ought to take up forest tree culture, *because man's life is too short* for such work. Very true, but, unfortunately, Governments' lives are even shorter than men's lives, and they don't appear to have much time to devote to the cultivation of forest trees.

In the meantime let intelligent men, willing to work not only for themselves, but for the next generation, let them begin. It requires a small outlay in money; their time will not be lost, and they have no idea what source of pure enjoyment they will be creating for themselves. There is a charming fable written by Lafontaine a couple of centuries ago, which is so much to the point that I must give part of it here. I don't think it has ever been translated in English before. The Rector of the Quebec High School, Mr. J. Harper, has kindly undertaken the task in one of his rare leisure hours, and I now offer the result of his work, with grateful acknowledgment:—

An old man of eighty was planting some trees,
Three lusty young neighbors drew near—
"To build would be odd, but still stranger to plant,
Our friend has grown foolish, we fear!"

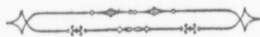
"In the name of all conscience," said they with a smile,
"What harvest for you will these bear?
Your age of four score has no future to boast,
Why cumber it thus with more care?
'Tis only for you to repent of the past,
Throw future designs to the air!"

The old man looked up and sagely replied:
"You speak of my hopes and your own;"

* Since writing the above, having ascertained that Mr. Pierre Brissette, of St. Barthelemy, P. Q., had been growing the Ash Leaved for six years past, I obtained from him a report of the results, and published it in the May number of the *Journal of Agriculture* (the English version). He has sent me some of the syrup manufactured from trees five years' old; it is very fine.—H. G. J.

Life's enterprise often is left incomplete,
 Though begun on the threshold of youth.
 For fate unrelenting may sport with your hopes,
 As much as it may with my years.
 The chances of life render equal its span,
 Though unequal to youth it appears.
 And which of us, think ye, the last of the four,
 Will behold the bright rays of that sun ?
 Does this moment assure you another is yours
 To finish your labors begun ?
 The shade of this tree,
 Tho' perchance not for me,
 For others a blessing may spread,
 As under its branches they tread.
 Nor would you forbid
 The prudent provide
 For others who follow. Howe'er you deride,
Such fruit of my toil, each day I enjoy,
 As daily for others my strength I employ ;
 And who can explore,
 What Fate has in store ?
 For old though I be, with regret I may see,
 And mourn over your premature graves."

In several of the States of the Union they have got a public
 holiday known as *Arbor* or *tree-planting day*. More than one
 million of trees were planted on Arbor-day in Minnesota in 1875.
 Why should we not follow that example ?



RUSSIAN APPLES.

BY A. WEBSTER.

EAST ROXBURY, Vt.

The name Russian is broadly applied to all variety of apples developed from the Russian or Astrachan species of crab, wherever they may have originated; and also to those descendants of other species that have originated in Russia or have been acclimated there.

The Astrachan class are noted for the large, thick foliage, stout but often short cions, and constitutional hardness to endure the extremes and sudden changes of temperature that mark our northern climate as well as that of Russia. Several of these varieties are already well-known and famous in our markets, and favorites in our gardens and orchards.

Tetofski, Red Astrachan, Duchess of Oldenburg and Alexander need only to be named here, every reader is familiar with them, or can find them described in standard works.

White Astrachan is beautiful, good and extremely hardy, and may take the place of Red Astrachan in the severest climates.

Peach, of Montreal, shows such marked characteristics of foliage, growth, hardiness and fruit, as to raise a presumption that it belongs to this class, although history is silent as to its parentage, and it was imported from France.

Of American varieties of this class, Haas and Ben Davis are best known; both have wonderful vigor and productiveness, with a good degree of hardiness, but the quality and flavor of the fruit is not such as to please tastes educated by the use of our best apples.

Of newer sorts that are attracting attention, Wolf River, a Wisconsin seedling of the Alexander type, has remarkable vigor and hardiness of tree, and most magnificent fruit of fair quality, in season from October to February. A good show apple, and fine for baking, but too bitter and astringent for dessert.

Pewaukee, also of Wisconsin, is a seedling of Duchess of Old-

denburg; is vigorous; an early and abundant bearer of fine large fair apples of good quality, in season from November to March. Likely to become popular and profitable.

McMahon's White, also of Wisconsin, is less known, and is claimed by the introducers to be the hardiest, handsomest and best winter apple known. A short trial here shows it to be vigorous and hardy, and a specimen from Wisconsin shows the fruit to be large and handsome, but the quality too much like Haas, and not so late as Pewaukee.

Of several others on trial it is too soon to speak yet.

Several hundred varieties have been lately imported from Russia by the U. S. Department of Agriculture, and by others. Of these I have tested several varieties, some of which are valuable; others of no especial merit, and some worthless. I give a few brief notes which I hope may be of some use to other experimenters. The numbers and names are those of the catalogue of the U. S. Department of Agriculture, some of which have evidently been misapplied.

60. ANASAPFEL ROTHER—(Red Duck apple.)—This proves to be a very hardy tree; an early and abundant bearer of medium sized, yellowish-white, sub-acid apples of very good quality, a few days earlier than Red Astrachan, and less acid than that variety, much like Yellow Transparent.

161. LANGERFELDSKOE—(Longfield's Apple.)—A hardy, productive, handsome and good winter apple that keeps until March. Size, small to medium. 584 Englisher Pepping, English Pippin, seems to be identical.

164. POLSATOE HEIDORNS—(Heidorns Streaked.)—Tree of slow growth, moderate bearer of small streaked, sweet apples, very beautiful, and of delicate texture. August.

166. APORT LETNY—(Summer Oporto.)—A large, flattened, angular, brown-cheeked apple, of fair quality, but of no special merit. September.

178. BARLOWSKOE—(Barloff's Apple.)—Large, good, but not of special value. October.

180. NEJOLOWSKOE—(Negoloff's Apple.)—Moderate grower, tardy bearer, of good size and fair quality. October.

206. ZARSKI ZARS—(Tars Thorn.)—Tree of moderate but strong growth, of upright spreading habit, the cions and spurs having a peculiar, stiff, thorny appearance, extremely hardy, fruit large, coarse, firm, watery, bitter and worthless. September.

210. RUBEZUINOGRADNI—(Cut Wine apple.)—Tree of spreading habit, fruit medium red, white fleshed, acid good. October.

225. GETMANSKI BOB—(Getman's Bean.)—Tree a slow grower of peculiar, irregular spreading habit, tardy bearer, fruit large to very large, striped, magnificent, flesh firm, crisp, of most excellent flavor. October.

247. POPALOKA POLASATAGA—(Popoff's Streaked.)—Tree moderately vigorous, upright habit, round head, fruit medium or small, somewhat irregular sutured, fine, tender, delicate, mild, sub-acid and aromatic. August.

262. CHARLAMOWSKOE—(Charlamoff.)—Tree of unrivalled vigor and hardness, spreading habit, good bearer, fruit large and handsome, resembling Duchess, but is more conical in form, less acid, and of much better flavor than Duchess, but like Telofski somewhat coarse, and must be used when firm, as it grows watery and turns black soon after ripening. September. Recommended for localities requiring extreme hardness.

275. SOTOROFSKA—(Zolotoreff's apple.)—A large, very productive, and good apple, ripe in October. Tree of fair vigor and hardness.

304. SUISLEPPER—(Switzer.)—Here we have a hardy, vigorous, upright, spreading tree, a good bearer of fine, fair, handsome apples, valuable for home use or market. Fruit medium to large, yellowish white, shaded and often covered with red, which is dark in the sun, juicy, half fine, rather tender, with a fine sub-acid, slightly quince-like flavor, more like French than Russian apples. A good keeper for its season, which is September and October.

317. GOLUBINOE BELOE—(White Pigeon.)—This I have not fruited here, but have seen it in the grounds of C. M. Howard, Esq., of Randolph. The tree is vigorous, hardy and an abundant bearer,

and is considered by Mr. H. one of the best and most profitable summer apples. The fruit is of good size, white, splashed with red, of good quality, mild sub-acid, with a peculiar flavor, which Dr. Hoskins characterizes as "a delightful mingling of apple, pear and banana flavor, very agreeable to a refined palate."

324. NEEMEZKI KALVILLE—(German Calville.)—Tree a fair grower, early and very abundant bearer, fruit large to very large, flattened ribbed, sub-acid, good. October.

334. SKWOSNOI SCHOTOI—(Yellow Transparent.)—This is a thrifty growing, very early and abundant bearing tree, the fruit medium yellowish, fine, tender, juicy, sub-acid of very good quality, ripens with the earliest. There are several varieties in this class, having a marked resemblance in tree and fruit, including White and Green Transparent, Red Duck, Charlottenhaler, Sweet Pear, Grand Sultan, Moscow Pear apple and probably others, all good, and some one at least of them should find a place in every garden.

335. SKWOSNOI SELENNOE—(Green Transparent.)—Much like Yellow Transparent, but smaller, more conical, and a less vigorous tree.

336. SKWOSNOI BELOE—(White Transparent.)—Tree, a slow grower, early and profuse bearer, fruit, small, white, often with a blush of red in the cavity around the stem, an elegant and excellent little dessert apple, but too small for market.

342. SCHARLOTTENHALER GOLBA—(Charlottenhaler Apple.)—This is a thrifty tree, an abundant bearer, and one of the most profitable early apples for home use or near by market. The fruit is medium, but may be grown large by thinning the small fruit, or better still, the buds. The color is very light and the flesh tender, and does not ship and keep very well when ripe, but is an excellent companion apple for Red Astrachan, for near by markets. Its season commences and closes ten or twelve days earlier than Red Astrachan.

343. WEINAPPEL ROTHER—(Red Wine Apple.)—A handsome apple, of good size and quality, acid. August.

351. PLOWOWITKA CUADKAJA—(Prolific Sweet.)—A most beautiful and excellent sweet apple, ripe in August and September.

364. **BEEL WOCHINS**—(White Wochins.)—Tree slow grower, early and good bearer of large, smooth, handsome sub-acid apples, ripe in September. Not equal to Duchess for general culture.

368. **MIRONE SACHARNI**—(Sugar Barbel.)—Tree of medium vigor; a good bearer; fruit medium, yellow striped with red, sweet and good. September.

372. **PETROWSKIE**—(St. Peter's.)—Tree moderately vigorous, good bearer, fruit handsome, small, striped with red, fine and tender for a Russian, of good flavor and quality, characterized by Dr. Hoskins as the Russian Early Joe.

393. **ZITSONNOE ZARSKOE**—(Imperial Citron.)—A good grower and great bearer, fruit of good size and fair quality, but not of special value. September.

398. **KRUPNEENA**—(Enormous.)—This is perhaps the largest of the August apples. Tree hardy, a spreading grower, with stout shoots, a good bearer. Fruit large to very large, of light color shaded with red, somewhat coarse but of fair quality for so large an apple, of good sub-acid flavor.

402. **BORSDORFER**—(Borsdorf.)—This is undoubtedly the best winter apple among the new Russians that I have fruited. The tree is hardy, a good grower, with a round bushy head; not a very early bearer but gives promise of sufficient productiveness as the trees grow older. The fruit is of small to medium size flattened, skin smooth and glossy yellowish green with a warm cheek in the sun, texture firm and fine, flavor mild, sub-acid, rich and good. It is rather firm for eating, but is one of the most elegant and delicious baked. It is in season all winter and spring, being a first-rate keeper, valuable for home use, but may be too small for the general market.

407. **TSCHERNOE DREWNOE**—(Blackwood.)—Bark very dark colored, fruit good but not of special value. Fall.

410. **REPKA MALENKA**—(Little Seedling.)—A very late keeper. Tree moderately vigorous, an enormous alternate bearer, so that the fruit is small; if thinned it attains a fair medium size. It is too hard to be eatable until warm weather in spring, when it

gradually ripens, and is tender, juicy, and of fair quality and flavor.

429. BOSKLONOWKA—(Bosklonoff's apple.)—This is a very fine hardy tree, a slow bearer, and the fruit of medium size, yellow, sweet, bitter and worthless. Shall regraft the trees in the spring.

444. REINETTE LUBSKI—(Lubsk Queen.)—A very beautiful little sweet apple of no value.

584. ERDBEERAPFEL—(Red Calville.)—A hardy enormous bearing tree, fruit red, rather small, acid and high-flavored. One of the best pie apples, lacking only size.

587. ENGLISHER PEPPING—(English Pippin.)—See No. 161.

600. DLIMOE—(Long apple.)—This variety evidently gets its name from the tree, which has few and long branches, thickly studded with short spurs, each of which is crowned in season with a rosette of beautiful little red apples of good flavor and quality. This variety may prove to be of special value for ornamental training.

965. GRUSCHEFFKA SLADKAJA—(Sweet Pear apple.)—This name is evidently misapplied as the apple is not sweet, but is a fine sub-acid apple of the Yellow Transparent Class.

973. STEKLEANNOE DUSCHESTOE—(Shining Aromatic.)—Tree slow in growth, and bearing of no value here.

975. TETNERKRASNOE—(Red Teat.)—This tree is a wonderful bearer. The fruit, if judiciously thinned, is large to very large, red, sub-acid and of fair quality and flavor only. September.

BELLE DE BOSKOOP.—This remarkable new apple was imported from France a few years ago by Charles Downing, the veteran pomologist, of Newburgh, N.Y. It is an enormous grower while young, and a prodigious bearer in alternate years. The fruit is of good size and color, with the smooth glossy skin that characterizes the Russians. It is remarkably solid, with very small core and few seeds, firm, crisp, brittle, and juicy, with the exquisite flavor that characterizes the best French apples. It seems to possess all the requisites of a popular and profitable market winter apple. But a short trial here does not give satisfactory evidence of hardiness, and

I mention it to caution cultivators in the cold north to test it prudently until more is known of its ability to endure our climate. I regret my inability to make a fuller and more conclusive report on this important class of apples, and hope your committee will be able to complete it from other sources, as it is very important that the long list of new Russian apples shall be thoroughly purged, and a few only of the best for our localities and purposes be allowed to go into general cultivation.

I cannot close without urging all cultivators, who can, to cross the hardiest and best of the Russian apples, with the hardiest, tenderest, finest, most juicy and high-flavored apples of other classes and raise seedlings. The field for improvement in this direction is very large and promising, and seems to be the next step in developing our pomology.

East Roxbury, Vt., Feb. 27th, 1882.



ORNAMENTAL AND TIMBER TREES.
(NOT NATIVES OF THE PROVINCE OF QUEBEC.)

BY CHARLES GIBB, ABBOTTSFORD.

Rural art has not received here the attention it deserves. That love of rural beauty, so strong even in the peasant classes in England, has done much to make England park-like, and loves so lasting, so hereditary, loves so closely related to our love of home, and our love of our native land should indeed be cherished.

We have not had a Downing to warm our hearts by his poetic pen, yet our need of road-side shade and shelter, our diminished rainfall and scarcity of forest growth, reasons strictly utilitarian, use other than that of beauty, may yet arouse an interest in arboriculture.

The American Forestry Association, which has lately held so successful a meeting at Cincinnati, will meet in Montreal during the last week in August, at the time of the session of the American Association for the Advancement of Science. Montreal is indeed most fortunate in having the opportunity of welcoming such distinguished scientists.

The great drawback to the planting of trees, not found in our forests, is the fact that so few are propagated by our local nursery men, hence extra cost; and besides this, importing, unless done with a fair knowledge of the kinds chosen, often results in the selecting of tender kinds.

All the trees in this paper except a few of the Pacific Conifers, are trees I have seen, unless stated otherwise, and the descriptions given are from my notes usually taken at the time, a number of them, at any rate,—120 varieties—I have on trial. I would say, however, that my little nursery is merely for my own use. I have never sold a tree or plant.

From Europe we have many species of value. From Asia we may expect much, especially from the northern districts of China,

and from Northern Turkestan. The trees of Japan, though so successful farther south, seem to lack hardiness until we get seed from their higher altitudes. We have hopes, too, of finding new species on the shores of those high temperate and arctic islands which, by elevation, are scattered even through the Torrid Zone.

To Dr. George M. Dawson, I am indebted for kindly placing in my hands his then unpublished notes and map, showing the distribution of the different trees of British Columbia, noting the severe climates in which some of these beautiful species are found. To Dr. Robert Bell, M.D., for his valuable map, then not yet published, showing the distribution of our forest trees northward. To Prof. C. S. Sargent, for his pamphlet on the "Forests of Nevada," and one on "Ornamental trees for Massachusetts's plantations," by Mr. J. Robinson of the Arnold Arboretum. To Dr. J. A. Warden, for pamphlet on trees for the open prairies of Northern Illinois. To Mr. Jackson Dawson, of Busy Institute, Jamaica Plain, I am indebted for my knowledge of the interesting collections under his care. To Mr. Wm. Brown, our largest experimenter, who many years ago, had the Marchmount nurseries at Côte des Neiges, I am indebted for the results of his long and expensive experience. The order I have followed is merely the alphabetic order of botanic names.

ACER.—Maple.

A. CAMPESTRE. *English or Cork barked maple.*—This may be seen in the grounds of McGill College, as a shrub; sometimes passing a winter with but little injury and more often a good deal hurt. The terminal buds never push properly.

Mr. Wm. Brown, many years ago, at his nursery, at Cote des Neige had 40 or 50 young trees of it. Some of these were planted about his grounds, and grew to a height of 10 or 12 feet, and sened hardy. There are hardy trees of the species as it is found growing in Northern Asia, and also along the shore of the gulf of inland, and about St. Petersburg.

A. COLCHICUM RUBRUM. *Red Colchicum maple.*—Is a native

of Japan. It has bright colored tips and is quite ornamental, but it suffers where the winters are less severe than here. I have seen it badly injured and even killed at London, Ontario.

A. DASYCARAUM. *Soft or Silver maple*.—Among a number of these trees, some will be erect, others drooping. It is from this tendency to sport that we have so many ornamental varieties of it. Further south, it is more pendulous than it usually is here ; though



WEIR'S CUT-LEAVED MAPLE.

this may be partly accounted for by longer growing seasons and often richer soils.

In Washington, I asked what variety of the soft maple they were planting in their streets and was told it was only their common kind. There is an avenue there four miles long and two avenues of three miles each, of this drooping soft maple, though, for street planting, it is not as great a favorite as either the Norway or the Sugar maple, partly because it is more brittle. These pendulous soft maples seem to be tending toward the mean, of which Weir's Cut-leaved is the extreme.

VAR. *Argenteum Striatum*.—Is a pendulous variegated leaved variety, but from the specimens I have seen, it did not appear to be constant.

A CIRCINATUM. *Vine maple*.—Is a really beautiful variety from British Columbia. Dr. George Dawson, however, says that it is strictly confined to the vicinity of the coast, and does not appear to go far north. These "coast flora" one would scarcely expect to prove hardy.

Var. HETEROPHYLLUM LACINIATUM. *New Cut-leaved Silver maple*.—Is a striking cut-leaved variety of upright habit. Likely to be hardy, as it is a seedling of the common silver maple. It was produced from seed by Ellwanger and Barry, Rochester, N.Y.

Var. RICII.—Is a new one whose beauty I have been struck with. Leaf small, and tree very pendulous. I believe this also to be a seedling of Messrs. E. and B.

Var. WAGNERI. *Wagner's Cut-leaved Silver maple*.—What young trees I have seen of it did not seem constant or equal in beauty to the following:—

Var. WIERII. *Weir's Cut-leaved Silver maple*.—This has been growing for several years in an exposed situation on the grounds of the Parliament buildings of Ottawa. I have seen it also in other places about Ottawa.

It seems quite hardy with me here, and Mr. Beall, general agent for Morris, Stone & Wellington, of Toronto, tells me that it is quite hardy at Quebec. It is not massive, as most maples are, but somewhat feathery in foliage, of eccentric and wayward habit

of growth. The foliage on the young shoots is remarkably slashed as may be seen by the cut given. It is an interesting and attractive tree, worthy of being planted freely.

A. MACROPHYLLUM. *Great leaved maple of Oregon*.—This is perhaps, the grandest of all maples, yet is not hardy much north of Philadelphia. However, Dr. George M. Dawson, has found it on the Pacific coast as high as latitude 51, so that it is possible that much more hardy varieties of it will be found; but whether hardy enough to stand this climate is probably doubtful.

A. NEGUNDO, NEGUNDO ACEROIDES. *Ash leaved maple or Box elder*.—This tree is indigenous in the West, and may be found as far north as latitude 53, on the little Saskatchewan. I got 100 young trees of it from Rochester, and also two from Ontario, which have proved by no means hardy, though some of them may yet make fair sized trees. The reason I will explain at length, as it shows the existence of some varieties not generally known.

In the streets of Washington, where there are several avenues three or four miles long of this tree, it was found that they had been planting two different species, one of southern origin, the other received from the West. The former is the more flexible in growth, so much so as to be often bent out of shape by the weight of its seeds, and unable to stand as severe cold as the other; that from the West is more rounded and more compact, is of larger leaf, and that with reddish stem; its seed capsules are larger, and seed has a larger percentage abortive; foliage light, lively green, and leaf convex and decidedly the more beautiful tree of the two. This species from the West is the same as that which has proved tender with me.

In my dilemma, Dr. Warder comes to my assistance, and tells me that, in the West, there is what is known as the Ohio Negundo, and that which is known as the Missouri Negundo, the latter that of the far west, and the one of most northern habit. This seems like that in the grounds of the McGill College, grown from seed from Winnipeg. This tree is of rapid growth, of medium beauty and perfectly hardy.

I am told by Mr. Thomas Douglas, of Robert Douglas & Son,

Waukegan, Ills., that the Ohio Negundo is scarcely hardy there. On the other hand, the Western form is a very popular tree upon the prairies of the North-West. In Winnipeg it is the only tree that has been planted as a street tree, and as growing there it certainly has a sturdy blizzard-resisting appearance, which it has not when making faster growth upon the prairies of Iowa and Minnesota. I would strongly urge the planting of this tree.

VAR. CALIFORNICUM seems to resemble what is grown in Washington as the Southern species.

VAR. FOLIIS AUREA VARIEGATA. *Golden variegated Negundo*.—This tree, I am led to believe, is not likely to prove hardy, and I have seen it suffer severely in Iowa.

A PLATANOIDES. *Norway maple*.—This is the hard maple of Central Europe, "next to the birch and trembling poplar, the most common tree in the Russian woods." It is even more dense than our own sugar maple, is slightly more spreading, and grows nearly as large.

It has proved hardy in Montreal, seems quite hardy with me, and of more rapid growth than the sugar maple.

It is a tree that has become quite a favorite in the States and has been grown largely for street planting. In Washington, next to the Oriental Plane this and the sugar maple seem their favorite street trees.

It does not seem to sport much, yet it is a tree of wide habitat, and there are many curious varieties of it of great beauty.

VAR. CUCULLATUM. *Curled-leaf Norway maple*.—Has leaves the lobes of which curl and turn inwards, giving it a singular and most unmaple-like look. It is well worthy of trial.

VAR. DISSECTUM. *Cut-leaved Norway maple*.—I have never seen a large specimen of this, and think it may be of somewhat dwarf habit of growth. It is one of the handsomest of cut-leaved trees, as may be supposed by the leaf in the annexed cut, which is of course, of a reduced size. This proved perfectly hardy with Mr. Brown, and with me has shown no signs of injury from the past winter.



NORWAY CUT-LEAVED MAPLE.

VAR. LACINIATUM. *Eagle's Claw Norway maple*.—Has leaves shaped as its name would suggest. Quite a curiosity but hardly equal to the above two.

VAR. SCHWERDLERII. *Schwerdler's Norway maple*.—This is an Asiatic variety, probably a native of Northern China, closely related to the Norway maple. Its beauty consists in the color of the leaves of the young shoots, which are often a bright crimson. This is said to be the case in spring. In July, I have seen young trees dotted all over with rich bouquets, as it were, of rich, rosy red leaves. As the tree gets old and slower in growth, this characteristic one would expect to become less *prononcé*. From what I have seen of it in Iowa and other places, I have little doubt as to its hardiness.

A. POLYMORPHUM ATROPURPUREUM.—The Japanese are the most beautiful of all maples; among the most beautifully tinted and lacinated of all trees.

Most of them must be looked upon as greenhouse plants, but the above, from its hardiness, is worthy of our notice. Several

plants of it have stood for the last three years in Forest Hill cemetery, near Boston, without injury, and also at Mr. Hunnewell's, at Welsley, Mass. It is a shrub of rich, somewhat purplish red foliage, rather deeply cut, and well worthy of such slight protection as it might need in this climate. I must add, however, that its richness of color fades very much about midsummer.

A. PSEUDO-PLATANUS. *European Sycamore maple*.—This tree is found largely in the central and milder parts of Europe. It is said to be found at an altitude of 3000 ft. in Switzerland, and so, possibly, there may be varieties of it that might prove hardy.

In Montreal it has proved far from hardy. I have tried the (*Aurea variegata*) *golden leaved*, and the (*purpurea*) *purple leaved*, three trees of each, but the first winter killed them all to the graft. The *tricolor* is one of the best of variegated trees, but too likely to prove tender to be worth trying.

A. TARTARICUM. *Tartarian maple*.—This is a small tree, growing to the height of 20 feet on the lower Volga, and is quite common in the southern parts of European Russia. Its leafage I forget, but it is said to be pretty. However, it suffered to the south of us during the severe winter of 1880-81.

Of native varieties *A. Pennsylvanicum* or *striatum*, the large leaved moose-wood or striped bark maple, and the *A. Spicatum*, are small sized trees, abundant in our woods, that are highly ornamental and deserve to be better known. The latter, Dr. Bell observes, is the most northern of our native maples.

ÆSCULUS—Horse Chestnut.

The European Horse Chesnut, as it is called, is perhaps the grandest flowering tree we have. In Montreal it does well; there are some specimens there nearly 18 inches in diameter, most of these on clay soil, but we are just upon its northern limit.

At Newport, Vt., Dr. Hoskins has failed so far with it through lack of hardiness, and in exposed situations in the country it has not been a success. I see, however, that Mr. Auguste Dupuis, at St. Roch des Aulnaies, 70 miles below Quebec, has found it hardy,

and at St. Jean Port Joly, I am told, there are several trees a foot and a half in diameter. If we had more local nurserymen, we should have these trees growing from nuts from our hardiest northern grown specimens, instead of from trees accustomed to milder winters.

VAR. ALBA FLORE PLENO. *Double white flowered horse chestnut.*
—I do not know if this has been tried. It is said to be very beautiful when in bloom.

VAR. RUBRA FLORE PLENO. *Double red flowering horse chestnut.*
—This Mr. Brown introduced from France, and grew a large number of them in nursery, and had them in his grounds 15 to 20 ft. in height. They appeared fairly hardy, yet it may be asked where are all those which were then planted about Montreal? It would appear that they have not lived. These double flowering varieties bear no nuts, a point in their favor where nut gatherers are troublesome.

Æ. RUBICUNDA. *Red flowering horse chestnut.*—Also imported from Scotland by Mr. Brown. It did not prove as hardy as the common white.

AILANTHUS.—Celestial Tree.

A large tropical looking tree from Japan with large butter-nut looking leaves.

Our winters are rather too severe for it, but it is one of those trees which, if cut to the ground in the fall, make rampant growth the next season. In this way I have seen it make a growth of at least 16 feet.

It has a habit of suckering, yet might still find a place in ornamental grounds.

ALNUS—Alder.

A. FIRMA.—A species from Japan rather pretty but curious as it has leaves like a morello cherry. It seems hardy on the grounds of the Agriculture College at Ames, Iowa.

A. GLUTINOSA. *Common European Alder.*—This is the most

aquatic of trees. It has not any more beauty about it than our native alder, but grows to a much larger size. I have seen a tree 35 ft. in height and nearly 2 ft. in diameter.

Captain Raynes, of Montreal, has trees of it about 25 ft. in height, which are quite hardy, and with me, during the last three years, it has not shown the slightest sign of tenderness. It is a tree found in high latitudes in Europe. It grows wild about St. Petersburg, where, under garden culture, it has attained a height of, at any rate, 67 ft.

VAR. LACINIATA. *Cut-leaved alder*.—This is really a strikingly pretty tree, a native of northern France, where it is said to be quite common, especially in Normandy. It seems of slightly slower growth than the above, and I had supposed it would not become so large a tree. The largest I had seen was but 25 feet, but I see that it is stated in Europe to have measured 63 ft. It is a tree of far more grace and beauty than one would expect in an alder, and has shown no lack of hardiness with me during the last three winters.

VAR. LACINIATA IMPERIALIS. *Imperial cut leaved alder*.—"Oh! what an aerial tree" exclaimed a friend as I showed him a specimen of this tree. It is dull in color, but of delicate graceful growth, quite unlike an alder or anything else, a rare though a frail, delicate looking beauty, indeed. I think this tree is hardy, at any rate in sheltered places. Some winters it has stood perfectly with me, sometimes it has been killed back.

The alder is a tree suited to damp or wet soils. I believe this killing back to have been caused by the very dry soil in which I had planted it.

A. INCANA LACINIATA.—Is a very pretty tree, with foliage much like the cut leaved, but rough on the upper side.

A. RUBRA.—On the lower Fraser, Dr. George Dawson finds this growing to a diameter of 2 ft. It also grows on Vancouver, but is of smaller size there. I have not seen it. Possibly it might be worthy of introduction.

A. TILIACA. *Linden leaved alder*.—Has large coarse leaves, and is a tree of medium beauty.



IMPERIAL CUT-LEAVED ALDER.

AMELANCHIER—June-berry.

This is a native bush, which bears a profusion of white blossoms in spring, and purplish berries in June, and is known under the various names of Indian pear, shad-berry, and sugar-plum, and the Indian name, Suskatum. It varies greatly both in foliage and in quality of fruit.

Prof. John Macoom, of Belleville, says that it is "collected in immense quantities on the upper Peace River, and forms quite an article of food and trade." He further adds that when he "was at Dunvegan, the Indian half-breeds were camped out collecting the berries, then in their prime, Aug. 6th." It is pressed by the Indian women into square cakes, and used, dried, by the Hudson Bay Co., in pemmican.

Prof. Budd, on the college farm at Ames, Iowa, has been gathering a collection of these June-berries from China, from Germany, and from the Rocky Mountains, and has varieties that bear fruit nearly as large as cherries and of good quality.

This is a tree of easy propagation. It grafts readily on apple roots. It is of high northern habitat. Like the high bush cranberry, it is found north of Manitoba in the regions of perpetually frozen ground.

AMYGDALUS.—Almond.

A. COMMUNIS FLORE PLENO. *Large double flowering almond.*—Bore a profusion of blossoms with Mr. Brown, but not hardy above the snow. However, we must not assume all varieties of the almond to be tender. There is a variety of the bitter almond which grows along the extreme limits of Northern China, on the confines of Siberia.

ARMENICA.—Apricot.

The apricot is said to be found in high altitudes in the Caucasus, and Grossia says "it covers the barren mountains west of Peking," and "that the double flowering varieties are largely grown for ornament." In still more severe climates we have the Siberian apricot, which has been grown for a long time in England as an ornamental tree or shrub. And of late, it is said, that a Menonite, released from exile in Siberia, came to Nebraska, bringing pits of this tree which are now fruiting there.

The apricot is of wide range of growth in Siberia, and there are neighborhoods in S. and S. W. Siberia where, isolated from other varieties, it reproduces itself from seed as readily as the prune plum does in some parts of Germany.

The trees I saw at Ames, Iowa, show every signs of hardiness as one would expect from their high northern habitat, and the fruit I am told is pretty good. Another interesting variety is the German Apricot which is grown largely, I am told, upon the Hartz Mountains, 60 miles south east of Hanover in Germany. This tree stood perfectly at Ames last winter, and alongside of it was the Hill's Chili peach, said to be the hardiest of the peaches grown in this country, badly injured.

Is it possible that we may yet have a hardy race of apricots, hybrids between the Siberian and the fine varieties of southern climes; just as we have hybrids between the little crab of Siberia and the common apple? Is this a field for reasonable hope?

BETULA—Birch.

This is a tree of even Arctic habitat. It is found as a bush in Greenland, and Iceland, and in Lapland, it is said, within 1,937 feet of the line of eternal snow. It is said to be found at Alten, in Lat. 70°, growing to large size.

The Birch varies greatly from seed. "In extensive birch forests, whether in the rocky scenery of Sweden, the bog in the north of Russia, or on the hills of Germany, full grown trees may be seen as various in their foliage and habit of growth as the young plants in seed beds." The same thing I have observed in our own woods, in the common white birch, that most nearly allied to the European. I have found cut-leaved kinds, though not equal in beauty to the European; and also what appeared crosses between the common white, which is the triangular leaved birch of our low lands, and the canoe birch.

B. ALBA. European White Birch.—This is the birch of northern Europe where it grows to a height of 50 or 60 feet. Dr. James Browne in his work, "The Forester," says that in Scotland there are two species, one erect, the other weeping; the latter the more rapid in growth and the more graceful.

In the grounds of Ellwanger and Barry, at Rochester, I was struck with the great beauty of a weeping birch, and was told that it was only the common European variety, but probably of that

weeping form spoken of by Dr. Browne. In England, it is said to be an amphibious tree, which means that it will stand any amount of moisture, for drought, as we know it, is unknown there. It also grows well on dry soils.

Three years ago I planted 85 of them. These are now the tallest, except some poplars, in a test plantation of 22 varieties of timber trees.

Of the European birch there are many grafted varieties of great beauty.

VAR. FASTIGIATA.—This, when young, is as erect in growth as the Lombardy poplar. Its leaves are glossy and large for a white birch, and it is a striking form of tree. The only query is—will it maintain this fastigiate form as it becomes older? I have seen but one tree of fair age, and that was showing a tendency to spread.

I need hardly say it seems quite hardy here. It has retained its leaves in color later than other varieties.

VAR. FOLIIS PURPUREIS. *Purple leaved birch.*—In spring and early summer the leaves of this variety are not green, but a deep, reddish purple. Not till later in the season does it become a dull green.

This tree ought to have special attention paid to it from the fact that we can hardly grow the copper beech. Purple leaved trees are such an addition to ornamental grounds, yet such trees should be massive as are the beech and hazel, not airy like a birch.

I fancy; from the look of what trees I have seen, that the tree does not attain large size.

It is hardy without doubt; no terminal bud seems even to hesitate.

VAR. PENDULA LACINIATA. *Cut leaved weeping larch.*—Scott in his beautifully illustrated work, "Suburban Homes," a book full of facts, yet written with a poetry of thought worthy of John Ruskin, considers this "the most exquisite of modern sylvan belles"; and says that "this tree stands the acknowledged queen of all the airy graces with which lightsome trees coquette with the sky and

summer air. Tall, slender, and graceful, it is becoming widely planted. There are no really fine trees of it about Montreal.



CUT-LEAVED WEEPING BIRCH.

One of the best is that in front of Bute House, on Sherbrooke St., facing the gates of McGill College.

VAR. *PENDULA ELEGANS*.—This I have not seen. A cut of it appeared in the August number of the *Journal of Agriculture*. When top-grafted, its branches hang round its stem in parallel lines.

VAR. *PENDULA YOUNGII*. *Young's weeping birch*.—Is a trailing birch found in England, which, when top-grafted, makes a tree of beautiful pendulous habit, but not of that special airy gracefulness that I had expected.

VAR. PUBESCENS. *Downy leaved birch*.—Said to be a native of Germany, not of special beauty, and like our common white birch.

VAR. TRISTIS.—Is a variety but little known. When young, it is the most graceful and charming of all young trees I know. The leaves are small, and not cut, but the ends of the branches are nearly as slender as a piece of thread.

I have never seen but one old specimen of it, a grand old tree, but one that hardly did it justice. It has stood with me for three years with no other injury than the pinching back of a few little side shoots.

VAR. URTICIFOLIA.—*Nettle leaved birch*.—Is another variety of medium beauty.

B. BHOJPUTRA. *Indian paper birch*.—This is the tree of highest elevation upon the Himalayas. How low down upon the mountains it is found I cannot say. It is the only birch I have whose leaves were killed by the cold snap at the end of October last, and I now find it is badly injured by winter.

B. COSTATA.—Is from the Amur, and said to be erect in growth. (I have not seen it.)

B. DALICARLICA.—Received from Paris by the Busy Institute, Jamaica Plains, Mass. It seems to be the fastest grower of all birches.

CASTANEA—Chestnut.

The American Chestnut is a fine tree and one which attains great size. An old tree on the Centennial grounds, in Philadelphia, is 6 ft. in diameter. It is highly ornamental, when in blossom, and bears nuts in large quantity, for which alone it would be well worth growing. Unfortunately we are rather beyond its northern limit. It is not hardy in Minnesota, but is a native tree in the milder portions of Ontario. Dr. Hoskins, of Newport, Vermont tells me that in the Connecticut River Valley it is not found much to the north of the mouth of the White River, at the station known as White River Junction. In the Champlain Valley, however, Dr. Hoskins tells me that the chestnut is indigenous up to the Canada line, but that it does not fruit well at the north. In central

Iowa, the forestry manual of the Iowa Horticultural Society recommends that the nut be always planted where the tree is intended to grow, and that it be mulched very heavily, in fact, almost covered up for the first three years.

I wish I could offer stronger hopes of our being able to grow this beautiful tree.

C. VESCA. *Spanish Chestnut.*—Is a native of the central and milder parts of European and other countries; named Spanish, because the nuts were largely imported from thence into England. It bears a larger fruit, but is not as hardy as the American, nor does the tree seem to be found in as severe climates as our native species.

C. JAPONICA. *Japan Chestnut.*—A dwarf tree, and young bearer of large fine nuts, and has been considered a new introduction of great value. I have seen its terminal buds nipped a little on Long Island.

CARAGANA.—Siberian Pea Tree.

C. ARBORESCENS.—To this, the arborescent form of this shrub, I wish to draw attention. It is a native of high latitudes in Siberia; grows to the height of 30 ft., and is quite ornamental on the College grounds at Ames, Iowa.

CATALPA.

This tree I have already called attention to in the *Journal*. As an ornamental tree, it has large heart-shaped leaves, (I have measured a leaf on mine of young growth, fourteen inches long). It is of rapid growth, attains good size, and bears a profusion of white blossoms in summer. A singular fact about it is the difference of hardness of species which look so nearly alike. As an ornamental tree, it was planted in the South Eastern States and then northward into the Southern parts of New England, and followed the demand for ornamental trees westward.

Its value as a timber tree was just looming up, and it was being planted as far north as the northern boundary of Iowa, when the severe winter of 1865 revealed the fact that there were two species, a Western and an Eastern.

VAR. *BIGNONIOIDES*.—The northern limit of this tree is some distance to the south of us. Rochester is considered north of its usual range. It is thought to be hardy there only because subject to lake influence. Arthur Bryant, in his little book on "Forest Trees," a little book brimful of facts seen by himself, speaks of the *Bignonioides* as hardy at Princeton, Illinois. This was written in 1871, and it is since then that it has been traced that the trees from which Mr. Bryant gathered his seed were of the Western or hardy kind. Mr. Auguste Dupuis, at St. Roch des Aulnaies, 70 miles below Quebec, finds this tree hardy, but it would be difficult to prove his tree *Bignonioides*, unless the two kinds were growing side by side.

VAR. *SPECIOSA*. *Hardy Catalpa*.—This is the kind that stood the severe winter of 1865 in northern Iowa, and which since then has been known as the Hardy Catalpa. It is said to have been found on Lake Minitonka, in Minnesota, in latitude 45, and there cut for saw logs: yet this has been doubted. On the other hand, Col. John H. Stevens the pioneer of Minneapolis, I am told, declares that he knows the Catalpa, and, if necessary, can even find the stumps where he had cut the trees many years ago. Some also say that, if growing there, it must have been brought there by the early French settlers from farther south. In the spring of 1878, I planted 150 young trees from R. Douglas & Son, which have shown such proofs of hardiness in my bleak exposure, that I hope it will have further trial for ornamental purposes. In nursery it has been hardy enough to be quite satisfactory, but when planted in sod it makes a slower growth, which does not always ripen well. In the West it is in great demand for timber plantations, as it is a rapid grower and easily transplanted, and the wood is as indestructible as Mulberry or Locust. A gate post has been found sound enough to re-set after 90 years. Railroad companies are planting it and inducing farmers to plant it for sleepers and fence posts, and for inside finish of passenger cars. Only by its introduction for ornament can we ascertain its farther uses in this climate. I should like to refer those interested to "Relations of Forestry to Agriculture," by Dr. J. A. Warder, in the Journal of the Am. Ag. Asso. 1881, and "Additional facts in relation to the

Catalpa," by E. E. Barney, Dayton, Ohio, which latter may be had, per mail, for six cents.

CEDRELLA SINENSIS.—Satin wood (so called).

Is a tree of rapid growth, with dark butternut-like leaves, lately introduced from China, which my attention has been specially drawn to, but as I have seen it killed back somewhat, during the last two winters on Long Island, it is not likely to be of use to us.

CELTIS.—Nettle Tree.

There is a variety of this known upon the prairies of the West as the Hackberry. It attains large size, and is somewhat elm-like in growth, though less spreading. It is possibly worthy of trial here.

CERASUS.—Cherry.

Most of the ornamental varieties of the cherry are grown for the sake of their beautiful bloom. In testing any of them let us avoid those of the Bigarreau family as not likely to prove hardy.

C. PUMILA PENDULA. *Dwarf weeping cherry.*—This seems to be a variety of the Morello and, therefore, of probable hardiness. Grafted six feet from the ground, it forms an umbrella-like top, like the Kilmarnock Willow, through much more graceful. It has been used in the public gardens at Boston and is worthy of its place there. Mr. Beall tells me of a tree in Montreal which appears quite hardy.

Large double flowering cherry.—With Mr. Brown, this bore a profusion of large double flowers like little roses and grew to a height of 7 ft. The foliage seemed of Morello type and quite hardy. Mr. Brown prized this highly.

The Mahaleb.—Is very ornamental when young, but is said to become too branchy as it attains age. It seemed pretty hardy with Mr. Brown, and is hardy enough for a dwarf stock to graft upon, yet now that we have occasional winters with scarcely any snow, we must be careful to engraft upon hardy roots.

CERCIDIPHYLLUM.

This is one of the late introductions of Prof. Sargent, at the Busy Institute, Jamaica Plain, Mass., from the mountains of northern Japan, where it attains great height, with a trunk from six to ten feet in diameter. The foliage is quite small, and the twigs exceedingly slender.

I have seen a number of little trees of it about Boston and other places unhurt by the winter of 1880-81. I regret to say that two trees planted by me last spring have suffered severely.

CERCIS.—Judas Tree or Red Bud.

C. CANADENSIS.—A very ornamental flowering tree, native of the milder climates to the south of us.

At St. Catharines, Ont., it has not been quite hardy, and with Mr. Brown, not hardy above the snow.

C. JAPONICA.—Was hurt a good deal in Boston.

CLADASTRIS.—Yellow Wood.

C. TINCTORIA.—Is one of the finest of American flowering trees—but its hardiness I rather doubt. However, Prof. Budd tells me that there is a western form, hardy in Iowa, and which might prove hardy here. We have still farther hopes. Busy Institute has lately introduced a variety from Amur. Amur is that province of Siberia, which is north of the Amur River, north of Lat. 50, and 200 miles from the coast. This is a high latitude in the climate of extremes, and anything from thence should be hardy.

CORNUS.—Dogwood.

C. FLORIDA. *White flowering dogwood.*—I cannot find out whether this has been tried here. I have seen the ends of its shoots suffer in Boston, and therefore, have felt doubtful about it. However, Mr. Wm. Saunders has found a clump of the true Cornus Florida, growing within three miles of London, Ontario, suggesting increased hardiness.

We have beautiful varieties of the dogwood in our own woods, well worthy of garden room.

CORYLJS.—Hazel

C. AVELLANA ATROPURPUREA. *Purple hazel*—Next to the purple Beech, this is the most effective of dark foliage trees. It is a variety of the European Hazel. † has large massive foliage, dark purple in color during early summer. It forms a small tree of bushy form, but, unfortunately, its terminal shoots suffer somewhat even at Boston. It is, however, a tree that stands heavy cutting back, so that if winter killing here is confined to its yearling shoots, it may yet find a place in ornamental gardening.

CRATÆGUS—Thorn.

A most ornamental species, but the most beautiful are European and of doubtful hardiness.

C. OXYACANTHA—*Common Hawthorn Quick*.—This is the celebrated English hedge plant. Mr. Wm. Brown had many hundreds of the young plants, and had a hedge 4 or 5 feet high. The young shoots were invariably killed back. It seemed hardy only when covered by snow. With Capt. Raynes, in his sheltered position, it seemed to stand better, and his hedge grew to a height of 12 feet.

Double Scarlet.—Bore a few flowers with Mr. Brown. These were very beautiful, but though the tree grew to a height of 5 or 6 feet, it proved far from hardy.

With Mr. Wm. Evans, at Côte St. Paul, it has flowered freely and seemed much more hardy. A *Double Scarlet* from China is proving quite hardy at Ames, Iowa.

Double White.—Grew side by side with the above, with Mr. Brown, and seemed equally tender.

Our native thorns vary greatly. Some, when of fair age, have branches almost horizontal and parallel like a cedar of Lebanon, and are very effective.

In passing along the road, last summer, between Farnham and Stanbridge East, I observed some pretty cut-leaved thorns, near a farm house; on inquiry, I was told that there were more like them in the woods—yet I have seen no natives that could approach in beauty the blossom and the cut-leaved foliage of some foreign

kinds. Could we trace their habitat we might get some idea of their chances of success here.

FAGUS—Beech.

The beech is difficult to transplant, and it is unfortunate that the most ornamental varieties are European and less hardy than our natives.

F. SYLVATICA. *European Beech*—This is a native of the Northern parts of Europe, yet not of the severer climates, neither does it seem to approach the northern limit of the Norway maple any thing like as near as our own beech does to that of our sugar maple. Mr. Brown grew it in nursery, and it was quite hardy well covered up in snow, but where are the trees then sold and planted about town? They surely did not all die from transplanting, and I hear no word of any now living. The hardiness of this tree is not yet proved.

VAR. PENDULA *Weeping Beech*.—Scott speaks of this as “the most curious tree of our zone.” It is the very embodiment of all the odd freaks of growth that can make a tree picturesque. There is a tree on the grounds of the Parson’s nursery at Flushing, which must be about fifty feet across its greatest breadth. Branches starting from the trunk, twenty or thirty feet high, trail upon the ground on every side, making, as it were, a large tent under which, I suppose, fifty people could take shelter in a rain storm.

VAR. PURPUREA. *Purple leaved or Copper Beech*.—Is the most beautiful of all dark foliage trees, and, except the *Babylonica* willow, the one of all others which we may mourn the loss of from the severity of our climate.

It changes the character of ornamental grounds, wherever introduced. I got 14 trees of it; some I gave away, some died, and the behavior of those living is not altogether in favor of its standing our severe winters. Mr. Brown tried several dozen trees and got them up to 6 feet in height, but they proved quite tender. Mr. R. Spriggins, in Mount Royal Cemetery, has also tried it. Even after the roots had become thoroughly established, it continued to suffer. There is, however, one tree of medium size, 18 years plant-

ed in Montreal, in a very sheltered and overcrowded position. This may offer a faint ray of hope for sheltered city gardens.

VAR. PURPUREA RIVERSII.—Is even richer in color than the above, but with Mr. Brown proved equally tender.

VAR. INCISA —Is a rare and very striking cut-leaved tree, but not of hardy family.

FRAXINUS—Ash.

This is a species of much more varied beauty than our native kinds would lead us to expect; on the other hand, our native white ash seems to be the favorite for timber planting, and, for this purpose, is being propagated and planted by the forest schools of Europe.

F. AMERICANA. VAR. AUCUBÆFOLIA. *Aucuba-leaved Ash*.—This is the finest of all the variegated leaved trees, which we are likely to be able to grow in this climate. As a variety of the native Ash, one would expect it to be hardy. In all the young trees I have seen of it the gold blotching of leaf seemed to be permanent.

The foliage is very bright and showy, but, of course, like all other variegated leaved trees, largely loses this after midsummer.

VAR. BOSCI. *Bosc's Ash and the Var. Pannosa, or Carolina Cloth-like leaved ash*.—Do not seem to me to have points of special beauty when young. When older, I cannot say.

VAR. JUGLANDIFOLIA. *Walnut-leaved ash*.—Is pretty from its glossy peculiar tinted leaves.

VAR. PUNCTATA. *Gold-spotted-leaved ash*.—Has small gold dottings and is rather pretty, but is less permanent and not equal to the Aucubæfolia.

F. EXCELSIOR. *European ash*.—It is found in rather high latitudes in Europe; and has been grown to good size even at St. Petersburg, but as purchasable trees are very apt to be the offspring of English and Scotch trees, in this country, the question is, what is the hardiness of those already tried? Mr. Brown has trees about 30 ft. in height, seemingly quite hardy. Capt. Raynes also has three or four trees about 25 ft. which seem thoroughly at home in our climate.

VAR. ATROVIRENS. *Dwarf crisp-leaved ash.*—Is a great curiosity. Its leaves which are of the darkest possible green are curled and all huddled together along the stem. I am afraid to say how slowly it grows: some specimens certainly not more than an inch per year.

VAR. AUREA and AUREA PENDULA. *The golden barked, and golden barked weeping varieties* are pretty, but of doubtful hardiness.

VAR. CONCAVÆFOLIA VARIEGATA. *Variiegated leaved ash.*—Is a beautiful variety on account of the tinting of the various colors of its young shoots.

VAR. MONOPHYLLA. *Single leaved ash.*—This is the most solid and rich leaved of all these varieties. A tree I have of it no one seems to take for an ash. It is decidedly ornamental, but was slightly injured last winter.

VAR. MONOPHYLLA LACINIATA.—Is a rather rapid growing tree, with heavy cut-leaved foliage, quite striking and pretty, but like Monophylla shows symptoms of tenderness with me.

VAR. PENDULA. *Weeping European ash.*—A tree of rambling as well as pendulous habit. It is usually top-grafted and grows to a medium height, covers a good deal of space, and is one of the best of "arbor trees." It proved quite hardy with Mr. Brown. I have not heard of its being tried in bleak exposures.

VAR. SALICIFOLIA.—Seems to be a tree of delicate constitution with leaves not much broader than a blade of grass.

F. POTAMOPHILA.—This is a really beautiful small leaved ash, from either Siberia or Turkistan, lately introduced by Prof. Sargent.

GLEDITSCHIA.—Honey Locust.

G. MONOSPERMA. *American Water Locust.*—Is a tree of careless air with serpentine branches of wayward habit of growth. It is the most beautiful of all the locusts in the grounds of the Department of Agriculture at Washington, but probably not hardy here.

G. MACROCANTHA.—Suffered much last winter at Washington.

G. SIENSIS. *Chinese Honey Locust.*—I have seen this killed at Ames, Iowa, and other places, yet, as Mr. Budd observes, the

plants in cultivation are the offspring of those brought by Robert Fortune from the tropical climate of Canton, and are no proof of the general lack of hardiness of the Chinese Honey Locust.

G. TRIACANTHOS. *Honey Locust*.—Is a rapid growing tree with a profusion of strong spikes or thorns on its branches, and often on its trunk, with delicate graceful foliage, and branches in horizontal and parallel lines. It is specially effective when intermixed with trees of more solid outline. We seem to be pretty near its northern limit, yet it has proved quite hardy at Como, on the Ottawa. Its hardiness should be secured by growing trees from seed of hardy northern trees. There was once a fine row of grand old trees of it, at the West end of St. Joseph suburbs, Montreal, but few of which now remain; and in the Seminary gardens of Notre-Dame street, there are old trees which would make two or three saw-logs a-piece, and which bear a profusion of seed annually. If properly cut back it makes a hedge that not even a rabbit can get through, and as the Osage orange and the English quick are slender, we have no other plant for this purpose except our slow growing native thorns. The variety named "inermis," only differs in having fewer and shorter thorns.

VAR. BUJOTI PENDULA. *Bujot's Weeping Honey Locust*.—Pretty and graceful, but not likely to prove hardy.

GYMNOCLADUS.—Kentucky Coffee Tree.

G. CANADENSIS.—This is a fine ligat foliage tree, looking a good deal like the locust; quite ornamental, and used largely in the public gardens at Boston. Mr. R. Spriggins tells me it is doing well in Mount Royal Cemetery. From a few trees I have seen about Montreal, I notice that it differs in hardiness, some trees having their yearling shoots killed back three or four inches; others are seemingly quite hardy. The old tree at Mr. Leslie's in Parthenais street, near Hochelaga, Mr. Brown tells me must have been 40 years of age as much as 30 years ago. This tree, I am told, usually has its yearling shoots somewhat killed back, and that has made the tree more compact than it otherwise would be. Mr. Wm. Brown tells me that he has found it among cordwood

brought to Montreal, and that the grain of the wood and bark is unmistakable; yet I cannot hear of its having been found in our woods. In the West it is indigenous in Southern Minnesota, and has been grown as far north as St. Paul, Minnesota, where it has attained a height of 35 ft., and with a trunk 6 ft. 8 in. in diameter.

Let us be careful to get this tree from Northern grown seed.

JUGLANS.—Walnut.

J. NIGRA. *Black Walnut*.—This tree attains large size, but should not be planted where it overshadows others.

It is an indigenous tree at any rate, as far north as London, Ontario.

It has, however, proved quite hardy in many parts of our Province. The experiments of the Hon. G. Joly, 100 miles north-east of Montreal, given in the sixth report of the Mont. Hort. Society, gives some idea of the rapid growth of this tree from the nut. Mr. Joly has since planted four acres of Black Walnut. His experiments will be watched with great interest. The largest, after six summers' growth, was fifteen and a half feet in height. There is a fine tree at Capt. Rayne's, Cote St. Antoine, and a fine old tree at Abbotsford, showing that certain varieties of it are, without doubt, hardy in this Province. In the West, it is also found in cold climates. Mr. Wyman Elliot tells me that it is common in the woods in Carver County, Minnesota, about latitude 45.

J. REGIA. *European Walnut or Maderia-nut*.—Has even been fruited in Montreal, but the tree is by no means hardy, and in fact lacks hardiness some distance to the south of us.

The Cut-leaved Walnut.—Is a rather pretty tree, somewhat of Negundo or Elder like foliage; it has suffered somewhat at Washington last winter.

J. MANTCHURICA and J. JAPONICA.—Are recent introductions at Busy Institute, which it will be interesting to test alongside our own species. One of the varieties from Mantchuria, bears its fruit in clusters more than a foot in length: so it is said.

J. AILANTHIFOLIA is possibly the same as MANTCHURICA.—

I saw a young tree of it at Rochester. It had started to grow as rapidly and stoutly as our own Sumac.

KOLREUTERIA.

K. PANICULATA.—A small tree from China, with pretty yellow flowers in August, succeeded by a curious growth of bladder-like seed vessels. It was slightly hurt in Washington during the severe winter of 1880-81, also in the grounds of the "Rural New Yorker," not far from Jersey City. It usually stands without injury at London, Ontario, but suffered from the winter of 1880-81, when the thermometer sank to nearly 30 below zero. Its hardiness is doubtful.

LARIX—Larch or Tamarac.

This is a tree of somewhat formal outline, but of feathery foliage, and one that should be planted among massive roundheaded trees.

L. EUROPEA. *European Larch*.—Is a native of the mountains of Central Europe, and rather a faster grower than our native species. On this account it has been grown in preference to the native in enormous quantities on the prairies of the West. It is said to transplant readily if only planted early, very early. Three years ago I planted about 100 trees of it and poor little things they were, and taken up too early in the fall. However, I lost but few, and the largest are now six feet in height.

The value of this tree for extensive prairie planting, suggests the query as to its value for our prairie province—Manitoba. It is not a tree of northern habitat, it is unknown in the Scandinavian Peninsula or Russia, and confined only to the mountains of Central Europe, where it is found at an elevation of 5,000 ft., yet I am told by those who have planted it largely in Minnesota, that it is never known there to suffer from winter severity, although the heat of summer, the first season after planting, sometimes proves fatal.

VAR. PENDULA.—This is a variety of straggling and erratic habit and is always top-grafted five or six feet high on the common European Larch. It is said to be difficult to transplant, and it

has been so with me, for out of a dozen trees planted, not one is living. It is, however, only when grown thus to a large size, and with side branches trimmed up to the top-graft, that the larch is difficult to transplant.

There is a drooping variety of the Larch grown in some parts of England in general form like the common kind, but of drooping and almost weeping habit of growth. This was the tree I was trying to get when ordering the *Larix Pendula*.

VAR. PENDULA. *Tyrolese Larch*.—This, as described by Loudon, resembles that beautiful tree of weeping habit I have just spoken of. A tree well worthy of introduction by our American nurserymen.

VAR. SIBERICA. *Siberian Larch*.—Is the variety found in Russia and Northern Asia. Large men-of-war have been built of it at Archangel, though it is of smaller size than the common Larch. The Duke of Athol, who procured seed of it as early as 1806, found it slower in growth and inferior as a timber tree.

L. KEMPFERI.—From Japan. In Central Park there is a fine young specimen of this really beautiful tree, far more soft and fringy than a common Larch, and of a peculiar, almost tropical appearance. What is usually propagated as the *Kempferi* looks much like other Larches. There is some mistake somewhere.

L. LEPTOLEPSIS.—From Japan. On the grounds of the Busy Institute, this has proved the most rapid grower of all Larches. It is of late introduction and its ultimate size, I do not know. The Tamaracs among the White Mountains and about Boston have been attacked by some insect or fungus, causing them to droop their leaves, and threatening their destruction. The *Leptolepis* Larch, though growing in Boston quite close to native infected trees, shows, as yet, no signs of injury.

LIQUIDAMBAR.—Sweet Gum.

This is a really beautiful tree, native of the milder climates to the south of us. It suffers when young at Boston, and, with Mr. Brown, would not live above the snow line.

LIRIODENDRON.—Tulip Tree.

There are trees about Boston fifty feet in height, which, when in full bloom, are a sight worth seeing. A friend says, that the sight of one of these in full bloom is a sure cure for atheism. It also attains large size about Niagara. I planted a lot of little trees three years ago, thinking that they would grow and kill back, and that I might, in that way, grow it as a shrub on account of its large peculiar leaf. It is not one of those trees that can be grown in that way. But it has come through our winters almost all right. It seems nearly hardy.

MACLAURA—Osage Orange.

This is grown largely as a hedge plant where the winters are milder than ours. I have seen it at London, Ontario, making an impenetrable barrier around an orchard, growing rampantly one year, and killing back next, its dead spikes proving as formidable as the living. However, a friend writes that it has been found in the woods near London, suggesting increased hardiness. Those who have botanized the neighborhood of London, however, doubt this. One thing is strange, the difference in hardiness of different plants. It is not safe as a hedge plant in Central Iowa, yet there are large trees of it, I am told, in the extreme north of Iowa, which ripen their fruit regularly. This plant has been brought already very far from its semi-tropical habitat, and by selection of hardy plants may be brought farther north still. It forms an ornamental tree of great beauty.

MAGNOLIA.

This is a class of tree of stately form, heavy, massive foliage, and large fragrant flowers, but we have not dared to try them here as yet; still, as a class, they vary much in ability to stand cold. The evergreen *Magnolias* suffered severely last winter at Washington. In the botanic gardens of Harvard University, at Cambridge, there are *magnolias* at least thirty feet in height. I have been struck with the way in which some varieties shoot their terminal buds in

Boston, and think that they should be tried in some sheltered places about Montreal.

The Chinese varieties *Soulangea* and *Speciosa* and the *Fraseri* seemed the hardiest.

The *Acuminata* or Cucumber Magnolia is one of the hardiest of the native species. It seems hardy at London, Ontario, and also at Waukegan, Ills., near the Southern boundary of Wisconsin.

MORUS.—Mulberry.

There seems to be one variety of this tender tree of probable hardiness here. Last winter proved severe for most of the kinds in the experimental grounds in Washington. Of these, the *Alba* *Moreletiana* from China and the *Constantinopolitana* appeared the most hardy.

The *Broussonetia* or paper Mulberry is tender some distance to the south of us, and Downing's *Everbearing* is not perfectly hardy north of the city of New York.

Russian Mulberry.—It is to this I wish to draw special attention, and in this matter I have had some difficulty in getting at the facts.

This Mulberry was introduced by the Mennonites now settled in Jefferson County, Nebraska, yet this is in the most southern and mildest part of Nebraska in Lat. 40° and no proof of its hardiness here. However it has also been grown largely by the colony at Mountain Lake in Cottonwood County, Minnesota, in Lat 44° and a district, too, I am told, which is cold rather above its latitude. Fortunately Col. J. H. Stevens, the pioneer of Minneapolis and Agricultural Editor of the *Farmers' Union*, has lately visited this colony with a special view to ascertaining the value of this tree. Col. Stevens in the *Farmers' Union* of 13th April gives the account which I so largely quote from. He says "One of the members of the colony, an old man, informed us that the tree flourishes in his native country, to his knowledge, as far north as the province of Simbrisk, on the Volga, in latitude 55°." The report from Nebraska is that it had been introduced from Lat. 49° on the Volga, itself a climate, I am told, by a Russian gentleman, very nearly as severe as Montreal.

“Here in Minnesota,” the Mennonite added, “up to this time it has proven equally as hardy. It bears, commencing when two years old, large quantities of fruit, which they pronounce to be valuable. The shape of the fruit is much the same as that of the black-berry. They claim that the tree is a cross between the *Morus Tartarica*, a native Russian mulberry, and the *Morus Nigra*, a native of Persia.” This, I am glad to know, is a Mennonite idea. The same story comes from Nebraska. Does this point to the fact that they know the *Morus Tartarica* to be different?

They say further that the timber makes good wood, is valuable for building purposes, makes good axe helms and hoe handles, and is good and lasts a long time when made into fence posts and fence rails, while the leaves are the best food in the world for silk worms. They also insist that for shade and ornamental purposes it cannot be excelled, and answers about as well as the hawthorn for a hedge or line fence. It is raised from the seed and can also be propagated from cuttings and layers the same as currants. It can be pruned into almost any shape. The tree is a prolific grower and we were assured by one of the oldest members of the colony that it frequently, in Russia, reaches fifty feet high, and from three to five feet in diameter. When at Ames, Iowa, I asked Prof. Budd if this were likely to be the case. He then showed me the plants in the College nursery; these had thrown out numerous large side branches close to the ground, quite bush-like, not tree-like in habit of growth, and compared them with Loudon's description of the *Morus Tartarica*. When at Minneapolis, Mr. Wyman Elliot showed me a tree six or seven feet high which was a model of growth, and grown at Mountain Lake. Mr. Pearce who accompanied Col. Stevens upon his journey, tells me that the plants when two years old should be cut back to the ground, and that they will then make a strong straight stem.

“We saw in the possession of Mr. Penner splendid specimens of silk, the result of last year's experiments made by one of their number who resides some ten or twelve miles north of Mountain Lake. Mr. Penner will, in about six or eight weeks, have silk-worms of his own at work. He considers that the industry must prove profitable, and from the experiments already made in Cottonwood

county, that there is no fear to be entertained that it is not healthy for the worms in regard to the climate, nor has he any doubts, in relation to its hardiness; that the culture of the silk industry by the Mennonites throughout Cottonwood county will become general, and as most every member of the colony was acquainted with the industry in Russia, and all or nearly all have already the trees growing, and have made the necessary arrangements to secure silk worms, he does not apprehend there is any danger of a failure in the new enterprise."

"Mr. Penner informed us that the fruit is highly prized by his people. We should judge that the color of the berries is a jet black. He says they have a fine aromatic flavor—sub-acid sweet taste, and are largely used in the same manner as blackberries and raspberries are. So much for the bright side in relation to the merits of this tree. In regard to its foliage, we are satisfied that it is not a universal cut-leaved variety, as formerly represented, because those in our own garden last year threw out leaves of most every form and shape. The foliage on the lower branches are exclusively cut-leaved. Then again, we were disappointed in regard to its crooked and irregular growth. We should say that its habits were much the same as the box elder. The Mennonites insist that when the tree is a year old, if it is cut back they will throw up erect forms. If this is so, this objection will be removed. It looked to us that there was a tendency on the part of the trees to throw out stout and numberless shoots from the roots. This would not be an objection, if the object was to feed silkworms, or for a live fence or hedge, but for shade and ornamental purposes it would require considerable attention to check the growth of these shoots.

"In relation to its hardiness as a prairie tree, there does not seem to be much doubt. At least it has proven hardy thus far. As yet we do not know that it has been grown long enough in Minnesota to prove its hardiness; neither can we determine by past experiments the probable longevity of the tree. We do know, however, that our native red mulberry, *Morus rubra*, won't stand one of our warmest winters, much less one of our coldest. We have tried that, and here right on the cold, bleak prairie, without a native forest in the borders of the country, the Russian mulberry has withstood

the frosts of six or seven years—and as far as we could learn of this variety, up to this time there has never been a tree that has been killed by the cold weather in that country." Plants and cuttings may be obtained of Pearce and Chowin, 9223 5th street, S. E. Minneapolis, or Carpenter and Gage Bower, Neb. I hope this tree will be introduced for trial.

PAULOWNIA.

P. IMPERIALIS.—This is a striking tropical-looking tree, from Japan, with large catalpa-like leaves. It is a favorite street tree in Brooklyn. In Boston there is a medium-sized tree of it in the Public Gardens, but I am told, there is scarcely another in the neighborhood. At Rochester it is said to stand, though its flower-buds are often hurt. We cannot hope to grow it as a tree, yet if cut to the ground in the autumn, and heavily mulched it makes a growth of six or eight feet the following season. It was grown in this way by the Hon. L. J. A. Papineau, at his late residence in St. Mary's Suburbs, Montreal. It has thrown up shoots ten feet in height, and some of the leaves, Mr. Papineau tells me, were two feet in diameter.

PAIRA.—Smooth Fruited Horse Chestnut.

This native tree, allied to the foreign Horse Chestnut, is worthy of trial. I have seen trees of it at London, Ontario, showing no signs of tenderness there.

PHELLODENDRON.

P. MANTCHURICA.—This tree was introduced a few years ago by Prof. Sargent, at Busy Institute, Jamaica Plains, Mass. It has large Butternut-like foliage, and grows to a height of sixty feet in its native land. Mantchuria is that province of China which runs northward into Siberia, as Maine does into Lower Canada, and lies between latitude 42 and 53. It is a country whose climate is much like our own, but with flora very different, a country from which we may expect a great many useful and interesting plants. All trees, however, from the Southern part of

this Province may not be quite hardy here, and I regret to say the yearling shoots of *Phellodendron* killed back somewhat with me during last two winter.

P. JAPONICA.—More recently introduced at Busy Institute, is a good grower, and shoots its terminal buds *there* without hesitation.

PLATANUS—Plane

P. OCCIDENTALIS. *American Plane or Buttonwood*.—This is a tree of large size, and of colossal diameter of trunk, common in the milder portions of Ontario and the States. It thrives best in a deep, loose, moist soil.

Mr. Drummond mentions that trees of it used to grow about London, Ont., which measured 15-20 feet in girth. And Scott mentions a tree in Cayuga Co., N. Y., with a hollow interior of fifteen feet diameter. It was formerly planted a good deal as a street tree. This is a really beautiful wood for inside finish, for which purpose it is coming into demand.

I only know of one tree of it in Montreal. It is on the West side of St. Lawrence Street, just above Sherbrooke, a tree some thirty feet in height and apparently hardy. It should be tried for the sake of variety.

P. ORIENTALIS. *Eastern Plane*.—This is the tree that has been chosen to line the avenue leading to the Horticultural Hall on the Centennial grounds at Philadelphia, and the front avenues to the Capitol at Washington. It is intended also to plant it along the boundary road on the four sides of the District of Columbia, which would make a drive of forty miles under the shade of this beautiful tree. It is a native of the Levant, Asia Minor, and Persia. However, I regret to say, it proved quite tender with Mr. James Morgan, jr., at Hochelaga. It is tender at London, Ontario, and tender even at Rochester.

POPULUS—Poplar.

This is a race of rapid growers, especially useful for re-treesing our treeless country. Kinds from Southern climates, as a rule, do not suffer from the severity of our winters.

P. ALBA. *White or Silver Poplar or Abele*.—This is a very common tree in Europe, where it is found growing to a height of eighty or ninety feet. It is a tree of Northern habitat, being found as high as latitude 57, but it is also found plentiful in Northern Africa, Persia and the Caucasus. There are also extensive tracts of it in France, and its wood is that commonly sold in Paris as the "*bois blanc*." It is of very rapid growth, and, as a young tree or shrub, its silver-lined leaves are very ornamental. It is "The Poplar that with silver lines its leaf." When older it cannot be suffered in gardens on account of its pernicious habit of suckering. I have seen its suckers growing as thick as oats in an oat field, yet, as Prof. Budd suggests, this might be overcome by grafting upon the cottonwood. As a street tree it is said to stand dust and smoke well, but its growth is rather spreading except for wide avenues. It soon becomes bowed with age. A tree in the Public Gardens at Boston, only twenty years old, appears to have been planted for at least half a century. On very dry soils the leaf is small, and the tree quite loses its ornamental character, but in moist soils, closely grouped with trees of dark foliage, and especially in windy situations, it forms one of the finest contrasts with other trees. There is an avenue planted with this tree in Washington. The trees are certainly two feet in diameter of trunk, very spreading, but not at all drooping. Those in the public gardens at Boston, droop as if bowed with age. Trees on the College grounds at Ames, Iowa, are quite erect. Surely trees of diverse growth are propagated under this one name. The road from Astrachan, north toward Moscow, I am told, is planted with this Silver Poplar, and these trees are quite erect.

VAR. CANE CENS is much like the above, but is less white on the under side of the leaf, and, therefore, less ornamental.

VAR. NIVEA.—I can see no difference between this and the common Abele, though I have them growing side by side.

P. ANGUSTIFOLIA is a narrow-leaved variety from Utah, where it grows to a large size. Its diminished leaf-surface seems adapted to those dry regions.

P. BALSAMIFERA. *Balm of Gilead* is a well-known native

tree. It is rapid grower, but not equal to the Cottonwood in this respect. As a rule it does not become so large a tree. In the Peace River district, however, and north even as far as Fort Simpson on the Mackenzie, in latitude 62, the Balm of Gilead, says Prof. Macoom, attains a diameter of trunk of from six to ten feet. I especially wish to call attention to a variety growing in Longueuil with leaves as large as the basswood. One tree is in the main road, half way between the parish church and the road leading to the wharf.

P. CAROLINIANA. Carolina Poplar.—This tree is a favorite in the streets of Washington, especially for damp soils, where it is called a sanitary tree, on account of the amount of evaporation from its large leaf surface. It is one of the best of the Poplars for a street tree. In Washington, thirteen miles of street have been planted with Poplar, the larger part of these with this variety. In leaf and growth it is much like our own Cottonwood. There are two fine trees of it in Montreal, introduced from the South some years ago. They may be seen about 100 yards west of the west end of Belmont street.

The Carolina Poplar has also been grown at Minneapolis, where it is perfectly hardy. During the past year Prof. Porter, of the Minnesota State Agricultural College, has been carefully comparing this variety with the Western Cottonwood (*P. Monilifera*), which is also a native of our Province, and he finds that they are the same.

P. CRISPA LINDLEYII is a rapid grower, with leaves long and very narrow, yet like those of an elongated Balm of Gilead.

P. FASTIGIATA. Lombardy Poplar.—Scott speaks of this as "A sylvan sentinel," its tall, spiral form being especially effective when grouped with round-headed trees. It is perhaps difficult to say of where it is a native. It has been planted in Lombardy and France and in other places, as a road side tree, to a most monotonous extent. There, it is altogether over-planted. But *here* under-planted. Those who have come from old France, and brought their "Lares" with them should plant this tree.

P. GRÆCA PENDULA. Athenian Weeping Poplar.—A native of

the Archipelago, is, in leaf, like our common trembling Poplar, but of weeping growth.

P. GRANDIDENTATA is a native tree, growing to a height of thirty to forty feet, having large massive leaves with indented margins.

P. GRANDIDENTATA PENDULA. *Weeping Tooth-leaved Poplar.*—This is the finest of the Weeping Poplars that I have seen. When top-grafted it hangs in graceful parallel lines around the stem. I planted three trees of it, which after the first winter began pushing their buds without any injury, but, in each case, they were unfortunately grafted on some tender stock, which winter killed. Poplars like moist soil, and the very dry place in which they were planted may account for their failure.

P. MONILIFERA. *Cotton-wood.*—This tree, so common and so popular in the West, is also a native of our Province. It is a very rapid grower, more so even than the Balm of Gilead. It also grows to larger size and is more graceful in form. What fine specimens of it may be seen at St. Paul and Minneapolis!

A variety of it found on the Missouri, is known as the Yellow Cotton-wood. A piece of this wood was shown to me by Hon. L. B. Hodges at St. Paul, and I was very much struck by its weight, its hardness and its straight grain; but what this yellow cotton-wood is, does not seem clearly known. Isolated trees, I am told, are usually white; those growing in dense thickets, yellow. It has been suggested, too, that the yellow may be the staminate and the white the pistillate tree, for the staminate is often the harder and the more durable wood. An important query is, will the cuttings from the yellow produce the yellow? Unless this yellow heartedness is owing to some peculiarity of soil, one would expect that it would.

The stranger who goes to Manitoba in winter, cannot help feeling how difficult it is to follow the trails during or even after snow storms. To lose the trail during a blizzard is too often to perish miserably. Yet, the loss of life has been rare—the people have known the danger and guarded against it. In future it will be very different. An enormous immigration is flowing into that country not accustomed to winter prairie travel.

In Southern Russia, there are vast uninhabited steppes or treeless plains, treeless, except for the trees along the road sides, which mark the way to the distant horizon. Cabins, too, have been built at certain distances for shelter in case of storm. Should not the Government, and even the municipalities of our own prairie Province, endeavor to do what has been done upon the prairies of Southern Russia? There are difficulties, I admit. There are places where the soil is most unsuitable to tree growth. I have seen a Bur Oak nearly eighteen inches across the stump, and not more than eighteen or twenty feet in height. This Oak was centuries old, yet farther south it grows rapidly, and to a height of sixty feet. I was told that its stunted form was owing to the soil it was growing upon, most probably a few inches of black loam, and underneath it impenetrable clay. Mr. Hodges will be planting this spring in Minnesota, upon soil very similar, and the results will be of great interest. I mention this matter here, because the tree likely to be used for treeing the trails is the Cotton-wood, or Balm of Gilead, or the Silver Poplar, which has been used along some of the roads in Russia; perhaps the Negundo Maple on some soils; and I urge the matter because trees along these trails are as necessary as the "balise" which marks the roads across our own frozen lakes and rivers.

P. NIGRA PENDULA is, in leaf, much like some others, but more pendulous than any except *grandidentata*.

Parasol de St. Julien is a variety from France much like *Græca*.

P. ROTUNDIFOLIA. *Round-leaved Poplar*.—A species from Japan, with roundish leaf, and rather pretty. Promising to prove valuable in Iowa.

P. SUAVOLENS, is a narrow-leaved, thick-leaved variety from Northern Asia, received through Dr. Regel, of St. Petersburg, by Prof. Sargent. It is a variety of *Balsamifera*.

—————A species from Turkestan, also received from Dr. Regel. It has a leaf much like the *Abele*, but in the nursery is as erect as a *Lombardy*. The tree is now too young to predict its form in middle and old age, but a silver-leaved tree as erect as a *Lombardy* would be an acquisition indeed.

—————Another variety of unknown name I have already described in the Journal. Grand old trees of it may be seen between Longueuil and Varennes, which, as I was going down by steamer, I mistook for Elms. At a distance it certainly does rival the White Elm in both size and grandeur. However, it is clumsy in twig, and has rough bark, even on branches but three inches in diameter, and has a leaf like Cotton-wood. I am told that it is not a native, and suppose it may have been brought out from Europe, by the early French settlers along with the Lombardy and Abele.

PRUNUS.—Plum and Cherry.

The ornamental varieties of the Plum I know but little about. Late introductions from Eastern Asia are very promising. The *P. Maackü*, from Japan, at Busy Institute, has very pretty curious foliage. The *P. Triloba*, which I am told is remarkably handsome when in bloom, seems quite hardy at Ames, Iowa. The *P. Simonü* fruited last year by Ellwanger & Barry, at Rochester, seems to be neither a Plum nor a Nectarine, yet a good little fruit, and the tree stood last winter without the slightest injury at Ames.

C. PADUS. *European Bird Cherry*.—I am not aware that this has been tried here. It is of a hardy species indigenous in Lapland and near St. Petersburg. Our native species, Dr. Bell tells us, is of high northern range, small specimens being found nearly on the verge of tree growth.

VAR. AUCUBÆFOLIA. *Aucuba-leaved Bird Cherry*.—The foliage of this is dotted with white and in the early part of the season is quite pretty.

VAR. VARIEGATA. *Variiegated-leaved Bird Cherry*.—Less distinct in its marking than the above, and so loses beauty earlier in the season.

PTEROCARYA.

P. FRAXINIFOLIA is a tree related to the Walnuts and Hickories. It does not seem to have been long known in this country; yet it was introduced into Europe long ago from the Caucasus, as the *Juglans fraxinifolia*. It proved only just hardy at Paris, and I

have been led to believe that those more recently brought to the States are not likely to prove hardy here.

PYRUS SORBUS.—Mountain Ash.

This is a highly ornamental species of tree. It is very pretty in leaf, and flower, and still more so when bearing a profusion of bright red berries in the autumn. It is also a tree of high northern habitat. Our native species grows north of the Nipigon region, and is found about 200 miles north of Winnipeg. One fault, however, this tree has; it is affected with borers; and this borer, Mr. Wm. Saunders, of London, tells me is usually the flat-headed apple tree borer (*Chrysobothris femorata*.) Let apple growers bear this in mind.

P. ARIA. *White Beam Tree*.—This is found in Europe, from Norway to the Mediterranean; also, in Siberia and southward in Western Asia. It grows to a height of thirty or forty feet, and is said to be a good tree for exposed positions. The downy underside of the leaf is shown to better advantage in such situations.

This tree is said to be a nearer relation of the *Pyrus* than the common Mountain Ash, and a better stock for the pear. This is important, in view of the possible introduction here of the pears of Central Russia. A specimen of this tree on the college grounds at Ames, Iowa, shows every sign of perfect hardiness and attracts a good deal of attention.

P. AUCUPARIA. *European Mountain Ash*.—This is a larger tree than our native species, it has finer foliage, and is, I should say, decidedly more ornamental. It is to be found in very cold districts in high latitudes in Norway, and Sweden, and Kamtchatka, and on the shores of the Gulf of Finland, near St. Petersburg.

It is also the only tree or brush besides the white birch which grows in Iceland.

The tree is, of course, quite hardy in the milder parts of this province. A few trees I have seen in Winnipeg, seemed to have stood the last few winters without injury, though during unusual winters it has sometimes suffered a little at Minneapolis.

VAR. LATIFOLIA. *Broad-leaved Mountain Ash*.—This has broad

leaves downy underneath. I have not seen it in fruit, but its foliage is quite striking. There are several other varieties of curious foliage, well worthy of a trial.

VAR. PENDULA. *Weeping European Mountain Ash*.—This is always budded or grafted, six feet from the ground, and forms a curious drooping tree, very effective if properly shaped. It is just as hardy as other species. It, too, seems pretty hardy at Winnipeg.

P. AUREA HYBRIDA, *Golden Hybrid Mountain Ash*.—Seems a vigorous grower and has large cordate leaves, very downy and whitish beneath, well worthy of trial.

P. DOMESTICA. *True sort, or Service tree*.—Is a native of parts of Middle and Southern Europe. I have not seen it, but it is said to have foliage like our native, and to bear larger berries, which are often eaten as are medlars, when partly decayed. Mr. Brown tells me that there are trees of it in good health on the Côte des Neiges Road.

P. HYBRIDA QUERCIFOLIA. *Oak-leaved Mountain Ash*.—This is a variety of the White Beam tree, a vigorous grower with leaves lobed like an oak. It grows to a good size, and bears flowers and fruit like other varieties. A tree at Como in a very exposed position has proved perfectly hardy.

QUERCUS—Oak.

“It is a fact,” says Scott, “that not more than one American out of every thousand has ever seen the full expansion of a white oak grown to maturity in the open ground.”

Are there any such trees in this Province? I might ask. If not, centuries must pass before they can be seen here. In England there are oaks believed to have been old in the time of William the Conqueror. The largest specimens mentioned by Loudon are from forty-eight to seventy-eight feet in circumference of trunk. No wonder it is spoken of as

“Jove’s own tree

That holds the woods in awful Sovereignty.”

The oak is often planted in England as a boundary tree, to mark boundries between counties or properties. If such were the

custom here, how much more beautiful our country would be a century hence, and how easy it is to drop a few acorns here and there.

The oak is a tree of very varied form and foliage. In the group of oaks in the grounds of the Department of Agriculture at Washington, Q. Daimio is as massive in leaf as a magnolia; another (Q. Pedunculata pterophylla dissecta of Britain) has long, thread-like leaves with thread-like laterals, more fringy, and not less aerial or feathery than an Imperial cutleaved alder. The Willow oak (Q. Phellos) has leaves much like a willow, the Q. R. Pedunculata fastigiata as erect as a Lombardy Poplar.

Of European oaks Q. Pedunculata and Q. Sessilifolia are found as far north as lat. 6° in Finland, and lat. 5° in Russia. The Q. Robur known as the Royal oak of Britain, is found from Sweden to Barbary, so that its habitat gives no clue to its hardiness. Mr. Brown, many years ago, grew a number of young trees from Scotland, which proved quite hardy in nursery. Yet I can only hear of two or three trees about Montreal, and these are in a very sheltered situation.

Q. Cerris or Turkey oak has proved hardy in Montreal, though a very, very slow grower. In Washington it was killed to the ground. The fact is, Q. Cerris is a species of great variety found throughout Central and Southern Europe, and parts of Asia, of very varied beauty, and varied hardiness. Some are even ever-green. The Q. R. Pendun, taraxicifolia of Britain, has pretty purple foliage, but was hurt by winter in Washington, while the Q. Sideroxylon of Mexico, along side of it, was not injured.

Our first experiment should be made with our American species. Our own White Oak has scarcely a rival, though slow of growth. Mr. John Mathers, of Ottawa, once cut a White Oak on the Desert River, a branch of the Gatineau, which was but three feet three inches across the stump, and yet showed 400 annual rings. Our Red Oak grows much more quickly into a large spreading round-headed tree. One planted as a sapling at Abbotsford, fifty-five years ago, is now twenty-six inches in diameter of trunk, and measures over forty feet across its extended branches.

The Mossy Cup, or Over Cup Oak (Q. Macrocarpa) is "a beautiful tree, more than sixty feet high," says Michaux, "with

"leaves often fifteen inches long, and very much indented." It is a fast grower and very ornamental. As Mr. George Dawson observes, that found in Manitoba seems almost a different species, so much shorter in leaf and acorn, and seldom reaching more than thirty feet in height. Specimens from the Black Hills shown to me by Mr. Thomas Douglas, at Waukegan, Ills., seemed like this species. When making enquiries in Minnesota, I was led to believe that this oak gradually changed in its form as it grows northward, until we find it in its diminutive form in our Prairie Province. One of the most admired varieties seems to be the Scarlet Oak, (*Q. Coccinea*) a tree I do not know, though it is a native of our own Province. The white Chestnut Oak (*Q. Prinus palustris*) does not seem to be of northern habitat, but the Rock Chestnut Oak (*Prinus monticola*) grows in groups in dry rocky places on the shores of Lake Champlain. Downing considers it "the finest of our Northern Oaks," though it does not attain large size. The Pin Oak (*Q. Palustris*) is a tall pyramidal tree of rapid growth, which makes a fine street tree. There is a fine avenue of it at Flushing, Long Island. However, it is not a tree of northern habitat. The Willow-leaved Oak (*Q. Phellos*) is seldom seen north of New York. One foreign Oak I must speak of,—the Japanese Oak (*Q. Daimio*). It has dense massive foliage, and is a good strong grower, and the specimens I saw in Washington and Long Island suffered no injury from the winter of 1880-81, a winter there of previously unknown severity.

ROBINIA.—Locust or Acacia.

The airy lightness of foliage, and long clusters of blossom of the Locusts would make them general favorites, if these advantages were not counter-balanced by weak points. They all sucker badly and are affected by borers. This borer, however, Mr. Saunders, of London, tells me, is quite distinct from any borer that attacks the Mountain Ash or the Apple tree.

R. HISPIDA. *Moss or Rose Acacia*.—This tree has very attractive foliage, and long clusters of rose-colored flowers, in the early summer. It is of rapid, spreading growth, seems hardy for a few

years, and then dies suddenly. It, however, replaces itself in a very short time. It is quite common in some parts of the Province.

VAR. GRANDIFLORA.—Is a pretty dwarf tree with larger leaves, and is said to have larger flowers. It has not yet been tried here.

R. PSEUDO-ACACIA. *Yellow Locust*.—This is quite a pretty tree when young, but lacks beauty as it becomes old. When old it has, as Scott says, a look of seedy gentility about it. It has too, a most pernicious habit of suckering, so that, as an ornamental tree I do not recommend it; as a rail and fence-post tree it is worthy of our thought. Capt. Raynes has several trees of it near the Cote St. Antoine road; one of them is the finest tree, I think, I have ever seen of it. Mr. William Brown had some of these trees forty feet in height, and thirty years planted, which seemed quite hardy, and I see some old trees of it about Montreal. Forty little trees which I planted in the spring of 1880, have made a growth during the last two years very nearly equal to the Poplars of different kinds alongside of them. The durability of the wood is well-known, and it is of easy and of rapid growth, and on that account the fences on all the best farms, in Pennsylvania and other States, are made of it. It grows at Minneapolis, but is not considered there to be perfectly hardy. In Iowa and some other prairie states, it had been planted in large quantity for fencing, but it has become almost extinct owing to the attacks of the borers.

VAR. UMBRACULIFERA. *Globe or Parasol Acacia*.—This is a pretty little lawn tree, of dense foliage, and globular outline, well worthy of trial.

R. GLUTINOSA OR VISCOSA. *Gum or Clammy Locust*.—Is a smaller tree than the yellow Locust and of more southern habitat. Mr. Brown had some of these trees ten feet in height, and fifteen years of age, which seemed quite hardy.

White Flowering Locust, is a variety brought from Southern Russia, by the Mennonites in Jefferson Co., Nebraska. It grows on the college farm at Ames, Iowa, and its terminal buds seemed remarkably fresh and green.

SALISBURIA.—Ginkgo or Maiden Hair Tree.

S. ADANTIFOLIA.—It is a botanical curiosity. It is a resinous tree, and yet has a leaf, and is unlike that of any other tree, resembling the maiden hair fern. It is a native of China and Japan where it attains large size. The largest tree I have seen of it is in the Boston Common,—a tree about fifteen inches in diameter, and thirty-five feet in height. This tree has been chosen for the avenue leading up to the Department of Agriculture at Washington. We seem to be upon the extreme northern limit of its culture, and yet a tree has stood with me in a very exposed place unhurt during the last two winters. It was, however, making very slow growth; last summer it made better growth, but suffered severely from the past winter. I am also told by Mr. Beall that there is one in Durocher street about ten feet in height, and this tree I have since seen and it appeared to be doing well. Mr. Papineau, at his late residence in St. Mary's suburbs, had a tree which must have been of fair age, and, which he states, was perfectly hardy, but slow of growth. I would suggest that it be planted in soils not likely to force it into too great growth.

SALIX.—Willow.

The Willow family embraces an immense number of varieties of all sizes and forms, from creeping-plants to gigantic trees. Some are not hardy with us, while some are of even Arctic habitat. *S. Herbacea* and *S. Artica*, says Loudon, approach nearer to the Pole than any other ligneous plant.

S. ALBA. *White Willow*.—This is found over the greater part of Europe and Northern Asia. It is probably the fastest grower of all our northern trees, and grows to large size. If well cut back, it soon makes a "live fence," especially useful in swamps where posts heave with the frost. It is also the best wind-break tree, and yields a large amount of fuel within a few years.

It has, however, another use as a snow-break tree. For this purpose Hon. L. B. Hodges, who is superintendent of tree planting upon the First Division of the St. Paul and Pacific R. R., has planted between fifteen and twenty millions of cuttings, and these

miles of snow-break have been an immense saving to the Company, and a great comfort to those who travel upon that road.

Last March I spent four nights in the cars in a snow drift at Reaburn, thirty-three miles west of Winnipeg, and while there I used to think how easy it would be to plant snow-breaks, and lead the drift, which now accumulates around the switches, to where it would not impede travel. The Canadian Pacific may do much by raising their track and widening their snow-plows; yet they will, in time, find that snow-breaks either of board or of living timber are absolutely necessary. The increased price of lumber in this Province may soon cause our own railroads to use White Willow instead of board fences.

S. BABYLONICA. *Babylonian Weeping Willow*.—This is one of the most beautiful of all trees, and a great favorite wherever the climate is not too severe. It is a native of the north of Africa, America, Japan and China. Chinese pictures are always introducing it, showing it to be a favorite there. It grows well about Niagara. It has been tried here, but will not stand.

S. CAPREA VAR. PENDULA. *Kilmarnock Weeping Willow*.—Is pretty well known. Grafted five or six feet from the ground, it forms an umbrella-shaped head unlike almost any other tree. Mr. Brown imported it from Scotland, just as it was beginning to be propagated, and it proved quite hardy with him. I have seen it in many places showing no signs of winter injury, yet it sometimes dies suddenly. Colonel Rhodes tells me that it has been short-lived and unsatisfactory with him at Quebec.

Dry soils are not suited to most Willows, though the English Goat Willow is said to be found in the dryest pastures. In the States it is largely planted on a great variety of soils, yet is not spoken of there as of uncertain life. I fancy that it is sometimes grafted upon unsuitable stock, and that both our dry summer heat and winter cold are against it.

I would recommend that this variety be grown also upon its own root, and tied to a stake to keep its leading shoot erect. I saw a tree of it grown in this way at Flushing,—a tree of striking eccentric form.

VAR. TRICOLOR. *Tri-colored Goat Willow*.—This tree has leaves clouded and shaded with white, and is quite pretty in contrast with others. It should be top-grafted.

S. LAURIFOLIA. *Laurel-leaved Willow*.—Is probably a native of Britain. It has large and very dark glossy leaves, and is appropriately named. I have seen large bushes of it, thirty feet in height, in Central Park, where it was very effective. At Abbotsford it has not been injured at all during the last four winters in my bleak exposure, and I do strongly recommend its trial.

S. LONGIFOLIA.—I took a fancy to this in the Botanic Gardens at Cambridge, Mass., and they kindly sent me cuttings. It has a long glossy leaf, and reddish stem. It is a faster grower and less leafy, and only on that account less ornamental than the Laurel-leaved.

S. PALMÆFOLIA. *Palm-leaved Willow*.—This has small deep green leaves, and very red twigs. It is a fast grower, and seems quite hardy.

S. PENTANDRA.—Has broad, thick leaves, and is not to say pretty.

S. PURPUREA PENDULA. *American Weeping, or Fountain Willow*.—Is probably of European origin. Grafted standard high, its head forms the centre from which radiate innumerable slender branches with slender little leaves. It is feathery and graceful and very unlike others. It proved hardy with Mr. Brown many years ago, and I have seen trees of it near Montreal. It, too, is well worthy of trial.

S. REGALIS. *Royal Willow*.—This I saw for the first time in the grounds of Ellwanger and Barry, at Rochester. It was not green, but looked just like frosted silver. It needs dry weather to make it appear to the best advantage. In Central Park, I was struck by a fine contrast in color in the distance. A tree of whitish foliage was grouped with others that were unusually dark. It was this Willow and the Laurel-leaved. It was one of the finest contrasts to be seen there. I have never seen plants of it higher than twenty or twenty-five feet. At Abbotsford it killed back with me, somewhat, the first winter, but less, or hardly at all since then. Those

I have on moist ground seem hardy. It is hardy enough I should think for sheltered places about Montreal.

Oh! how beautiful some parts of our Mount Royal Park could be made by the planting of trees like these of easy culture.

S. ROSMARINIFOLIA. *Rosemary-leaved Willow.*—Is a graceful feathery tree, sometimes light in color of leaf, sometimes dark. In the public gardens in Boston, where it has been planted freely, and with good effect, the leaf is so much darker than mine that I supposed it was some other variety. I have the light kind, and it seems pretty hardy. At St. Pie, there are some street trees of the dark sort, which are very effective. It is a native of Sweden and Finland, North Germany and Britain, and of the States from Pennsylvania to Carolina. Whether one of these is native and the other European, or not, I cannot say. The dark colored is, I think, the hardier of the two, and I think also, grows to be a larger tree.

S. VITELLINA. *Golden Willow.*—This grows to large size, and is planted on account of the bright yellow color of its young shoots toward spring.

S. Wisconsin Weeping.—We cannot grow the *Babylonica*, but it seemed likely that we could grow this instead. Wishing to fill up a corner in my garden, I planted some, but they failed from dryness of soil. This willow needs more moisture than *Regalis* or the *Laurel* or *Rosemary-leaved*. Mr. John M. Fisk, at Abbotsford, has about forty trees of it in nursery; they seemed quite hardy and had grown to be from seven to twelve feet high. However, that sudden cold during the last few days of October last, found them unprepared and killed them all to the ground. Many other young trees at Abbotsford were also badly injured. Even the *Lombard plum* was unprepared, and perished.

Mr Wyman Elliot tells me that it has been grown at Minneapolis, has attained a diameter of trunk of ten inches, that it is usually hardy there, but that it has suffered a good deal during winters of extra severity.

SHEPHERDIA.

S. ARGENTEA. *Buffalo Berry.*—This is a highly ornamental tree, a native of the banks of the upper Missouri and other rivers

of the North Western States. In cultivation it becomes a tree twenty-five or thirty feet in height. It has narrow silvery leaves, and bears a profusion of small berries like small red currants but richer in flavor. Fuller looks forward to its being grown some day as a market fruit. I think I have seen this tree in Montreal, but bearing no fruit, as the Staminate and Pistillate trees were planted in the remote ends of the garden. In getting this tree, be sure and procure both sexes to ensure fruitfulness. It is said that, "it is becoming a favorite in Europe, on account of its rare beauty of foliage and fruit."

TAXODIUM—Deciduous Cypress.

This is the tree so common in the Alligator swamps of Mississippi, where it grows thickly, often in five feet deep of water. I have seen fine specimens of it in Forest Hill cemetery, near Boston, also in Central Park, New York. It has been grown even in Northern Illinois; and at London, Ontario. Mr. Saunders showed me young trees which seemed quite hardy; it has been grown, too, in the Niagara peninsula, but Mr. Beall tells me, it has failed at Toronto. We need scarcely try it here.

TILIA—Basswood or Linden.

This tree is not planted as largely as it deserves. It is not common in Montreal. In Washington there is an avenue six miles long, with four trees abreast, of our native Basswood, an "Underden Linden" of which that capital may well be proud. In Washington ten and a half miles have been planted with Linden, and that mostly with our native species.

T. EUROPEA. *European Linden or Lime.*—This is a tree of smaller and smoother leaf than our native species, and is a favorite tree for street planting in the cities to the South of us. Some prefer it to our native species, others prefer our larger but coarser-leaved native. It is a tree of high northern latitude, especially the variety *Parvifolia* which is indigenous in Norway up to sixty-two. It grows in high latitudes in the interior of Russia, and is common in a large part of Siberia. It is this variety which grows about St. Petersburg. Loudon says that, in Sweden, the Lime is met with for

miles together with twigs bright red, or yellow, or quite green. The red and yellow twigged varieties are also natives of Britain, so that we must not assume hardiness from their Swedish habitat. Mr. Brown has trees of it thirty feet in height, so have Captain Raynes and others. It seems to be quite hardy.

VAR. ALBA. *White-leaved European Linden*.—This tree is said to be from Hungary. It has thick leaves, white and downy on the under side. It is as yet a rare tree. I have never seen one more than twenty-five feet in height. It stood rather a severe test of hardiness with me last winter. It is a tree of great ornamental value, well worthy of being introduced.

There is also a native white-leaved Basswood, and whether mine is native or not I cannot say. Prof. Porter, of Minneapolis, tells me that it is indigenous on the Hennepin Islands in Minnesota, and grows to large size. These white-leaved Lindens should be introduced.

VAR. ALBA PENDULA. *White-leaved Weeping Willow*.—This tree is much like the above, but in its weeping habit of growth. I have only seen small trees of it, and cannot tell its ultimate size. Two trees planted last fall, are badly winter-killed, while trees of many other varieties are not injured.

Of other European varieties which I have seen, LACINIATA (*cut or fern-leaved*) seems the least likely to prove hardy. LACINIATA RUBRA (*red fern-leaved*) is a slow-grower, and not of the same rugged health as those that follow. PLATIPHYLLA (*broad-leaved*), which is indigenous from Sweden to Spain, has larger and rougher leaves than the common kind. VITIFOLIA (*grape-leaved*) is a vigorous grower with large thick smooth leaves like a grape vine. Trees planted last fall did not show the slightest tenderness. It is a very interesting variety which should be tried. DASYLYLA is a vigorous grower with smooth glossy foliage also well worthy of being tested. Trees planted last fall would suggest that it is not as hardy as Vitifolia.

ULMUS.—Elm.

Our native species are so beautiful that we have experimented but little with foreign sorts, yet Europe can boast of fine trees

also; still Michaud gives us the palm and describes the White Elm as the most magnificent vegetable of the temperate zone.

U. CAMPESTRIS. *English Elm*.—Is also a noble tree. Were the grand old trees of this kind on Boston Common suddenly replaced by trees of equal size of our American species, the Common would lose much of its varied beauty. The Campestris is found from the shores of Finland to the coast of Barbary, but as to the hardiness of the trees imported from the nurseries of Scotland, or the States, I can say nothing. North of the McGill College grounds there are two trees about twenty-five feet in height, and their little side shoots suffer from our winters. They are so very slender in twig that I do not think they are the common variety of the Campestris.

VAR. PURPUREA. *Purple-leaved English Elm*.—With me it has proved a failure as a purple-leaved tree. The few I have seen in the States had foliage slightly more tinted, but the name Purple-leaved is quite misleading. However, three of these trees have stood perfectly with me for the last three winters, and promise to be fine trees some day.

VAR. SERRATIFOLIA. *Serrated-leaved Elm*.—Is curious, but I think quite cut out by the following.

VAR. URTICÆFOLIA. *Nettle-leaved Elm*.—Is well worth trying on account of the extreme peculiarity of its crinkled saw-edged leaves.

U. MONTANA. *Scotch or Wych Elm*.—Is a native of the northern and middle parts of Europe. It is large in leaf, and of rapid growth, but does not attain a height of more than forty or fifty feet, except when drawn up by other trees. Captain Raynes has some trees of this kind about thirty feet in height which are quite hardy. Mr. Jas. Morgan, jr., at Hochelaga, had several trees which suffered severely. They were, however, in a very rich soil which caused excessive growth and in a bleak exposure.

VAR. CAMPERDOWNII PENDULA. *Camperdown Weeping Elm*.—This forms one of the most picturesque of drooping trees grafted on a stock of erect growth, say six or eight feet from the ground. I have seen young trees of this kind at the Beaconsfield Vineyards, near Point Claire, which seemed quite hardy. Mine seemed

quite hardy, but the sudden cold of last October killed them. It is one of the best lawn trees as a shade for a rustic seat, and deserves to be planted widely, and has been planted for this purpose largely in parks and gardens in the States.

U. SIBERICA.—What a lovely little thing this is, one may judge from the annexed cut. I have only seen young trees of it, and cannot state its ultimate size.



SIBERIAN ELM.

U. SUBEROSA. *European Cork-barked Elm*.—I cannot tell if this has been grown about Montreal. There are a certain number of Cork-barked Elms, but possibly of our native species (*U. Racemosa*), a curious tree but little known, an Elm adapted to narrow avenues.

EVERGREENS.

CONIFEROUS TREES AND SHRUBS.

Evergreens are among the most arctic of trees. Strange this, if we consider the deciduous tree a novelty upon our planet, owing to the cooling of the earth's surface since the deposit of the eocene earths, many hundreds of thousands of years ago.

An evergreen, to be ornamental at all, must be perfectly hardy. If a catalpa kills back a few inches, its large leafage hides all defects, but if an evergreen is "scorched" by our dry winter winds or by the heat of our winter sun, it ceases to be ornamental.

Young evergreens under cultivation are often exposed to conditions of life far more trying than those in the woods, where they are mulched by leaves and covered with snow. An evergreen after its first season of growth *must* be mulched, that is, it *must* have leaves or straw, or some non-conductor scattered around it to prevent the frost from penetrating deeper than its roots.

Some of the western conifers when first introduced into the Eastern States were from seed from the mild moist climate of the Pacific coast, and proved quite tender in the middle States. Seed of these same varieties, from elevated regions in Colorado proved quite hardy. To insure still greater hardiness, seed should be procured from the dry interior districts of British Columbia, where some of our eastern trees are found among them.

The "Book of Evergreens" by Mr. Josiah Hoopes, of West Chester, Pa., I shall often quote from. It is a very valuable work and the only complete one upon the conifers published on this continent.

ABIES—Spruce.

The spruce is one of the most arctic of trees; our own White and Black Spruce reach the extreme limits of arborescent vegeta-

tion, at Ungava Bay, and at the mouth of the Mackenzie on the Arctic ocean, as may be seen by that most valuable tree line map by Dr. Bell, published by the Geological Survey of Canada.

In high northern latitudes where the ground is perpetually frozen to a great depth, and only thaws out a few feet upon the surface during the summer, there, even, the spruce is found.

Upon the West side of Hudson Bay there is a low lying tract of closely growing Spruce and Tamarac about five or six inches in diameter, into which the sun's rays but feebly penetrate. On the surface of the ground is a covering of moss three or four inches in thickness which acts as a non-conductor. A friend who has been there, three different years, during the last few days of August, or the beginning of September, the very end of the summer in that region, finds the ground solidly frozen underneath this moss.

In the far North trees are very sensitive to any approach toward spring. The Spruce sometimes pushes its new growth, and even the Willow has been seen to have burst into leaf when the snow was yet lying deep upon the ground, and the ground solidly frozen. This I am assured by those who have seen it, but how far trees under such circumstances can make growth, and how far their annual rings record their age, it would be interesting to know.

The Spruce, whether White, Black, or Norway, is one of our best evergreens for hedges, only let us be careful not to plant both Black and White in the same hedge. The Norway is the fastest grower.

A. ALBA VAR: AUREA.—In grouping evergreens, one must study their tones of color, as well as their form. The little plants of this, at Flushing, have a lively golden tint which is quite striking. Whether of dwarf habit, or not, I cannot say. Being a variety of our common white spruce there should be no doubt as to its hardiness.

VAR. CÆRULEA.—The young trees I have seen are of light bluish tint, and decidedly ornamental.

A. ALCOQUIANA. *Alcock's Spruce*.—Found, says M. Hoopes, by Veitch, growing at elevations of 6,000 and 7,000 feet, on Fusi Yami, the mountain we see upon the Japanese tea-chests. It is

in latitude 36, yet trees from these high elevations might be worth trying; but it is usually from the milder climates at the bases of these mountains that the plants in cultivation are obtained.

A. CANADENSIS. *Hemlock*, and A. DOUGLASHII: See TSUGA.—
A. ENGLEMANNI, see PICEA ENGLEMANNI.

A. EXCELSA. *Norway Spruce*.—I know of no foreign tree that I should so like to see largely planted throughout our country. Loudon speaks of it as "the loftiest of European trees, attaining a height of 125 to 150 feet, and even, in some cases 180 feet, with a very straight trunk of from two to six feet in diameter." Mr. Thomas Douglas showed me a stump at Waukegan, thirty-three inches across. It is the common spruce of Northern and Central Europe, and of North-western Asia, and in Lapland it reaches latitude 69½. Its beauty, its perfect hardiness, its rapid growth, the ease with which it can be transplanted, all show its value for extensive planting. About seven years ago, I planted seventy, received from Ontario. They all grew, and are now from ten to twelve feet in height, with very massive lower branches. Three years ago, I planted about 110, received from Illinois, and only two of these died. Of Austrian and Scotch Pine received at the same time, I lost over one-third. These plants may be had in Scotland at very low rates, sometimes for about \$4 per thousand, and I have known those who have imported them from there with comparatively small loss. First trials often prove failures. Three years ago, a friend imported 1,000 trees which cost him \$4 with \$5 for freight, and heeled them in, late in fall. The ground froze at once, and deeply, and but ten per cent survived. Next fall he imported 1,000 more. Half of these he heeled in, in his cellar, of which only four or five lived. The remaining 500 he heeled in as the year before, but covered over with a foot deep of leaves. On the top of these leaves fell heavy snows, and by spring, the trees were all completely rotten. Let those not accustomed to "heeling in" trees buy their evergreens in spring.

Can this tree be safely planted in the climate of Manitoba upon such soils as suit it? I have been making enquiries at St. Paul and Minneapolis, as to its hardiness there, and find that it seems

perfectly hardy if properly mulched for the first year or two after planting. The hardiness of our native species leads us to expect like hardiness in the Spruce of Northern Europe. Still, let us remember that it is not the evergreen of highest elevation upon the Alps, and in South-eastern Lapland, at an elevation of 500 feet, it becomes scarce and confined only to very sheltered valleys, and finally gives place to the *Sylvestris* Pine.

The Norway Spruce varies a good deal from seed. To a few grafted varieties I should like to draw attention. *ELLWANGERII*, a seedling of Messrs E. and B., a very compact grower, dwarfish in growth, and very distinct. *GREGORIANA*, dark in color, and as dense as it is possible for an evergreen to grow. In shape, like a huge plum-pudding, slightly flattened. *INVERTA* has its branches all bending directly to the ground. Its leader should be tied to a stake to insure its growing erect. *MONSTROSA*, a coarse, strong grower, with awkward, long, naked limbs, either grotesquely pretty or otherwise, and at any rate curious. It needs ample space.

A. *MORINDA*. *Himalayan Spruce*.—Although found in Bhotan at elevations of from 7,000 to 12,000 feet, the plants in cultivation are very uncertain north of Philadelphia. Three years ago I knew no better than to try it. This shows the necessity of lists like this. It was badly injured on the Centennial grounds, in Philadelphia.

A. *ORIENTALIS*. *Eastern Spruce*.—A native of the shores of the Black Sea, and adjacent mountains, a region as far north as we are, but of far milder climate. It has unusually short, shining green foliage, and is decidedly ornamental. I have seen it in the experimental grounds of the Rural New Yorker, near Jersey City, at Flushing, and at other places. And I could hardly say that it was hurt. It is well worth trying, but we must not assume it to be as hardy as the Norway, for I see it is not so.

A. *POLITA*.—Is sometimes, but perhaps wrongly, known as the *Tiger Tail Spruce*. It is a native of Japan, and has long, stiff, sharp-pointed foliage. I have seen it in a number of places; it had stood as well as *Orientalis*.

ARAUCARIA.

A. IMBRICATA. *Chili Pine*.—To one species of this tender genus I wish to draw attention. There are vast forests of it covering the slopes of parts of the Andes, from near the basis of these mountains to far up toward their snow lines, between 36 and 46 south latitude. I have seen it struggling for life in sheltered positions in Central Park, and, in the Middle States, the plants in cultivation are far from hardy; but, as Mr. Scott observes, the seeds of these plants were brought from Conception Bay, in latitude 37 and near the sea, where Scott says the *Fuschia* grows wild. Any one who reads Loudon's description of the different altitudes, and high southern latitudes, in which this tree is found, will have some hopes than when we get seeds from the right quarter, we shall be able to grow it here, so that some day, we may be as proud of our Araucarias as the Parisians are of their Puzzle-monkeys in the Jardin des Plantes.

BIOTA.—Eastern Arbor Vitæ.

All these are found by Messrs Ellwanger and Barry to be tender and requiring winter protection, at Rochester. They are, however, very ornamental, and worthy of extra protection.

CEDRUS.—Cedar.

C. ATLANTICA. *Mount Atlas Cedar*.—Is said by Mr. Hoopes to be specifically distinct from the Cedar of Lebanon. It is found, says Dr. James Brown, on the Atlas Range at elevations of from 7,000 to 9,000 feet. The trees seem hardier than those of Lebanon, but of doubtful hardiness here. This tree I have not seen.

C. DEODARA. *Indian or Deodar Cedar*.—Is a native of the mountains of north-eastern India, at elevations of from 7,000 to 11,500 feet, and, according to Loudon, 12,000 feet; and Loudon seems to be correct, for I have spoken to those who have seen fine forests of it at fully 12,000 feet.

The line of perpetual snows on the southern side of this part of the Himalayas is said to be 15,500 feet, and the progeny of plants but 3,500 feet below should stand the winters here. Yet

the plants in cultivation are far from hardy. Mr. Brown had 100 plants of it. Of course they died, as the tree is not hardy at some distance to the south of us. Hon. H. G. Joly has two young Deodars grown from seed received from Vilmorin, of France. They have been planted out about five years, and seem quite hardy.

In Lapland, according to Henfrey, the Norway Spruce grows within 3,100 feet of the line of perpetual snow. The Deodar we find upon the Himalayas within 3,500 feet of that line. Montreal I should suppose to be about 8,000 feet below perpetual snow.

Without assuming an equal winter temperature of snow-line in high and low latitudes, and making a fair allowance for unknown facts not taken into account, I cannot see why Deodar from the higher Himalayas should not stand low winter temperature.

Mr. Hoopes quotes Dr. Griffith, who speaks of its "gigantic dimensions...where for nearly half the year it is enveloped in snow." The rarity of the air and the heavy rain-fall of the higher Himalayas are conditions very different from what we have here, yet, as in so many cases, the plants in cultivation are the offspring of the trees of the lower levels, and were not collected with a view to the needs of northern regions.

C. LIBANI. *Cedar of Lebanon*.—It is often said, that there are more Cedars within fifty miles of St. Paul's in London, than upon all the Lebanon. This seems now to be far from true. Yet what noble trees may be seen in England, already in a state of decay, planted toward the close of the 15th century.

The little group at the head of the Wady Kadisha, so long known to pilgrims, comprises about 400 trees, and is the only tree of any kind about there. This group is noted in the S. P. C. K. maps as being 6,315 feet above the Mediterranean, but the altitude of the different groups found by the travellers further north is not noted, nor can I state its altitude on the Taurus, or other ranges. I am told by Col. Granville, who has resided in Cyprus, that it is growing there upon the Troados Mountain at an elevation of very nearly 7,000 feet, certainly at 6,800 feet, and that there are far grander specimens of it on that Island than upon the Lebanon.

If our first European trees came from this Wady Kadisha, the

extreme tenderness of their offspring seems difficult to account for. It proved quite tender, of course, with Mr. Brown. It is not hardy much north of Philadelphia. Its habitat in the past cannot now be determined, on account of the almost total destruction of all tree-life in these regions. If the traveller forgets to get a switch, when he mounts his horse at Java, he may not be able to cut one till he arrives at the bush on the banks of the Jordan. With the exception of the few plantations of orange and mulberry, and the scattered groves of olive and fig, there is no tree-life whatever. Let a man travel through those eastern treeless countries, journeying day by day over their barren hills, and along those dry water-courses, marked on our maps as rivers, let him note the richness of the soils of these arid wastes, and the ruins which show the populations they once sustained, and if he has any love for his native land, he will do his little best to prevent it from becoming treeless likewise. For, after a country becomes treeless, when, from its geographical position, it is at all so pre-disposed, it soon becomes dry and barren, and, ceasing to support its population, becomes waste.

CRYPTOMERIA.

C. JAPONICA. *Japan Cedar.*—This is a tender plant, also tried by Mr. Brown. Mr. Hoopes says it is a perfect success at Baltimore and Washington, in favorable situations. It is less sure about Philadelphia. I have seen it injured by winter in Central Park.

CUPRESSES—Cypress.

The evergreen Cypress is a native of the milder climates of this and the old world. The upright Cypress (*C. sempervirens*), that dark, gloomy, columnar tree, so common in the cemeteries of southern Europe and the east, will scarcely stand in Philadelphia; and yet I am told by Col. Granville, that it is growing in Cyprus at an elevation of 6,000 feet—neither will the Funereal Cypress (*C. Funeris*) which I have not seen, but which is said to be a very beautiful weeping variety from China. It, too, proved tender with

Mr. Brown; both of these are classed, even by Mr. Hoopes, as tender. Lawson's Cypress, a rare beauty from California, is somewhat tender at Rochester. The Nootka Sound Cypress, (*C. Nutkaensis* or *Chamaecyparis Nutkaensis*), is decidedly ornamental, and grows to large size near the coast in British Columbia. One might not expect it to prove hardy here. However, Mr. Sargent has found it at an elevation of 4000 feet, and small ones at even 5,500 feet on Silver Mountain near Yale, B. C. Here, then, lies our hope of being able to grow this beautiful tree, when we are enterprising enough to obtain the seed from this high elevation. The *C. Thyoides* or "white cedar" is much like our native, so called, white cedar, but is much finer and more delicate. It is common in Virginia and Carolina, but is found here and there northward, even as far as Lanark, Ontario, latitude 42. This tree was identified by Vilmorin, of France, to whom Mr. Brown had been sending seed collected in the county of Lanark.

JUNIPERUS—Juniper.

We must not over-look the ornamental value of this race of plants.

J. COMMUNIS. *Common Juniper*.—Is a native of Europe and Asia, and of this continent. It usually grows from three to ten feet in height, sometimes much higher, and assumes all sorts of shapes. Mr. Brown had bushes four or five feet high, imported from Scotland, and grew hundreds of little plants from them. They seemed to be pretty hardy, perhaps quite so, but were well covered with snow, and far more hardy than the Irish.

VAR. HIBERNICA. *Irish Juniper*.—Is highly ornamental, feathery in leaf, and in form resembles a green column. It is highly ornamental, but needs protection in our climate.

VAR. SUECICA. *Swedish Juniper*.—In Prof. Schübeler's map, this is noted as growing wild in Norway, as high as Lat 71. It proved perfectly hardy with Mr. Brown, and more satisfactory than the English or common kind. He had plants thirty years old, most of these were very recumbent on account of the habit of growth impressed upon them, while young, by the heavy snows.

One of these plants was six feet in diameter. It seeded freely, and thousands of young plants were raised from it. It is not considered perfectly hardy at Waukegan, Ills., and at London, Ontario, I have seen it a good deal injured. Its hardiness, without heavy snow covering, we must not assume too positively.

J. SABINA. *Common English Savin Juniper*.—Is another of the trailing Junipers, which proved perfectly hardy with Mr. Brown. The foliage is not feathery like the Swedish, but is more yew-like, and more dense and glossy. From what I have seen of it I fancy this much more hardy than the Swedish.

J. SIENSIS.—This was shown to me at London, Ontario, by Mr. Saunders. It is a good deal like the Red Cedar. It had not received the slightest winter injury.

J. VIRGINIANA. *Red Cedar*.—Though we are north of the usual range of the Red Cedar, as a timber-tree, yet, as a shrub, Mr. Drummond says it extends high northward. On the Lac du Chene, above Alymer on the Ottawa, there is an Island where it has grown to good size. Mr. R. W. Shepherd tells me that the stanchions of the steamer Ottawa, built at Lachine in 1833, were made of this wood. In the West it is found of large size farther north than in the East. Prof. Porter tells me that it is growing in Minnesota, at the head waters of the Rum River and on the Mississippi, at least one foot in diameter. Mr. Sargent says it extends southward to Florida, and from the Atlantic to the Pacific, and is the most widely distributed of American trees. It extends to the West India Islands, too. In Bermuda, it is their natural wind-break tree. Without its shelter, they could not grow their cocoanut and cabbage palms, their bananas and loquats, and other tropical luxuries.

Its foliage is decidedly ornamental, feathery, and unlike any other tree here. I have seen it in Minnesota of a rich glaucous tint, singularly beautiful. Leaving New York by rail and entering the Hudson, the traveller is often struck by the many dark cypress-looking trees growing on the hill sides. This is a local fastigiate form of this tree ; usually it is more spreading.

PICEA.—Balsam or Fir.

Those who have only seen our native Balsams have no idea of the beauty of some of the foreign Piceas.

P. AMABILIS. *Lovely Silver Fir.*—This is perhaps the most lovely of all the Piceas. It has long, soft, softly tinted foliage of surpassing beauty. In Northern California, it grows to a height of 250 feet, and is found at elevations of 4,000 feet, and has also been found by Mr. Sargent on Silver Mountain, near Yale, B. C. The specimens I have seen about Boston and on the Centennial Grounds at Philadelphia, stood last winter well. Like all the Balsams it is suited to most soils. Its great beauty should induce some one to try it.

P. APOLLINIS. *Apollo Silver Fir.*—Struck me as a great beauty and one that was not injured upon the Centennial Grounds. It is a native of Greece, Mr. Hoopes says, found at elevations of 1,500 to 4,000 feet, and growing to a height of sixty or seventy feet.

P. ENGELMANNI.—Formerly known as **ABIES ENGELMANNI**, is a native of the Rocky Mountains from the sub-alpine to the alpine districts, says Dr. Engelman, as quoted by Mr. Hoopes. In Colorado it occupies a belt between 8,000 to 12,000 feet of elevation. In British Columbia, Dr. George Dawson finds it in the interior plateau, at an elevation of 2,500 and 3,500 feet, but north-east beyond the Peace River, specimens sent by Dr. Dawson to Dr. Engelman seem indistinguishable from **P. Alba**. It is one of those whose appearance takes away all doubts as to its hardiness. It has been said to be one of the only three conifers that will endure the winters of St. Petersburg. But, while I can readily expect it to do well there, yet there are many other conifers that would resist their cold winters equally well.

The winter temperature of St. Petersburg is but 2° lower than that of Montreal, and more moist on account of its nearness to the Gulf of Finland. In appearance this is a spruce, not a balsam, and some of the grafted varieties are of remarkable beauty. A little plant I have is somewhat the color of frosted silver, not green. This tint is *especially* worthy of trial.

P. FIRMA.—From Japan. Two specimens in the Centennial

grounds, killed back three or four feet in 1880-81. No other evergreen suffered so severely.

P. FRASERI. *Fraser's Balsam Fir*.—A native of the eastern Middle States. No improvement upon our other species.

P. GRANDIS. *Great Silver Fir*.—One of the coast flora of British Columbia, says Dr. George Dawson, adapted to moist localities. No assurance of its hardiness.

P. HUDSONICA. *Hudson's Bay Silver Fir*.—Is a dark velvety green shrub, as dense as a clipped hedge. It may grow two or three, or even four feet high, and is decidedly ornamental.

P. LASIOCARPA.—I regret that so much confusion surrounds this name. On the Centennial grounds there is a beautiful tree, just like *Amabilis*, which stood the severe winter of 1880-81 without injury, but queries arise as to whether this tree was properly named. Mr. George Dawson, who is very careful in regard to nomenclature, notes the habitat of a tree which appears to him to be the *A. Subalpina* of Engelmann, the *A. Lasiocarpa* of Hooker. He finds it growing in the rainy, yet severe districts of British Columbia, in its interior plateau, at elevations of 4000 feet. It also occurs on the Rocky Mountains in the Peace River district, and grows in cold damp situations between Lesser Slave Lake and Athabaska River, when at times it must be subject to a temperature of 50° below zero. It is, however, a tree suited to moist soils, and to cool, moist summers, not the hot dry summers we have here. At least it is so in British Columbia.

P. MENZIESII or P. PUNGENS P. SITCHENSIS. *Menzies' Spruce*.—"The blue spruce of the Rocky Mountains," says Dr. Engelmann, "is entirely sub-alpine, occurring between the limits of 7000 and 9000 feet in low or marshy soils, especially along the borders of streams. The plants grown from the first seed brought from California proved quite tender at Waukegan, Illinois, where they were grown by Mr. Robert Douglas, who has spent more valuable time and labor than anyone else in collecting and propagating these western coniferæ. These Californian seedlings made a growth of from six to nine inches the first season, and were killed by the succeeding winter. Seed was then procured from rather high elevation

in Colorado; the seedlings did not make more than one third as much growth as those from California, yet proved hardy. In Iowa, I am told, there are many trees of this species, bought long ago from the team drivers as they crossed from the Rocky Mountains. Dr. George Dawson finds it in many parts of British Columbia, but, so far, not in the very severe climates. It delights in partial shade and moisture.

Ten years ago I saw a tree of this species in the grounds of Mr. A. R. Whitney, who has an orchard of 20,000 trees at Franklin Grove, Illinois. It was, like my little Englemanni, the color of frosted silver, and I am told is now twenty feet high. This species is well worthy of trial here.

P. NOBILIS.—Mr. Hoopes quotes this as growing in California to the height of 200 feet, at elevations of from 6000 to 8000 feet. Its foliage too is said to be very beautiful. At the Centennial, the Hon. J. G. Joly, when acting as Judge, and noting the annual rings of the different woods exhibited, found this the fastest grower from the Pacific coast.

P. NORDMANNIANA. *Nordman's Silver Fir*.—This has been found, says Mr. Hoopes, on the Adshar Mountains at an elevation of 6000 feet, and growing to a height of 80 to 100 feet in some places, in high alpine regions intermingled with *Abies Orientalis*. It is abundant on the hills of the Crimea. This latter place, however, though upon our own latitude, is the land of the peach, apricot, and almond. Even the orange is grown there with partial protection. I have seen a good many specimens of this really lovely tree in many places, and have watched the effects of the winter of 1880-81 upon them, and I doubt if it would stand our severe climate. We may expect that hardier specimens will be introduced.

P. PECTINATA. *European Silver Fir*.—Is the common balsam of central and northern Europe. It proved hardy with Mr. Brown, and it should be so, for it is a native of high cold latitudes. Yet it is not always reliable in the Middle States, and apt to be short-lived.

P. PICCA. *Siberian Silver Fir*.—Would seem to be a fir that

we might try with safety, as it is found at high elevations in that cold country. On the Altai mountains, says Loudon, it forms large forests at an elevation of 4000 feet, and is even found as high as 5272 feet. Some specimens that I have seen even rival *Amabilis*, perhaps the loveliest of the Pacific piceas, while others that I have seen are not equal in beauty to our own balsam. Bearing this in mind I would urge the trial of this tree.

PINUS—Pine.

P. AUSTRIACA. *Austrian Pine*.—Is one of those trees that has worked its way into public favor, so that it is now extensively planted. It is unusually dark in color, and coarse and stiff in leaf. It is not as fast a grower as the white or the Scotch pines. Mr. Hoopes says it will thrive in wetter soils. It is perfectly hardy in Montreal, hardy with me, hardy in Minnesota.

P. BALFOURIANA.—Mr. Sargent, in his pamphlet on the "Forests of Central Nevada," noted this tree on Prospect Mountain, at an elevation of 7500 and 8000 feet. On account of its tufted foliage it is known to the lumbermen as the Fox-tailed Pine, and in its native mountains is strikingly ornamental. Trees from this dry region are worthy of our notice. It is also a native of California.

P. BANKSIANA. *Banksian or Grey Pine*.—This pine extends far to the northern limits of our white and red pines, and thence westward near to the mouth of the Mackenzie, almost to the Arctic sea. About Boston, I find it makes several growths during the year. Elliott says that when he procured specimens from the barren sands of the Islands of Lake Michigan, 25 years ago, he thought them of little use. Now they are 40 feet in height and extremely beautiful. Loudon fell greatly in love with it. Scott says, "odd and picturesque, but not handsome." It seems to vary very much in size and in habit of growth, and usually forms a bush with numerous ascending shoots.

P. CEMBRA. *Swiss Stone Pine*.—This is found in the Alps at elevations of 4000 and even 6000 feet, forming trees 50 feet in height. It is a tree of slow, erect growth. Its foliage con-

sists of innumerable dense little tufts of leaves, which are different from other pines, and quite ornamental. Mr. Brown planted this tree, and it, of course, proved hardy. On the Alps it is found at higher elevations than the Norway spruce or the Scotch pine. It is, in fact, the tree of highest elevation, for in the Alps, as in the Pyrenees and the mountains of Mexico, tree life ends with the pines; whereas in Scandinavia, in the Himalayas, the Caucasus, and many other ranges, there is a zone of birches above them.

These trees of high elevation and cold habitat like the Engelmann's Spruce, and Siberian Silver Fir, however much they may enjoy our cold winters sometimes, suffer somewhat from the hot parching winds on the western prairies. They are less likely to suffer here, yet while we are looking to cold climates for hardy species we must not forget the severity of our summer heat.

VAR. SIBERICA.—This is found in the severe climate of eastern Siberia, even at elevations of 3000 feet, and from what I have read of the cold climates where this pine grows, I fancy that it is often exposed to even lower temperatures than our own Banksian pine. It is even of still slower growth than that found in Switzerland.

VAR. MANTCHURICA.—The beautiful light color of this tree struck me very much at the Parson's Nursery, Flushing, Long Island. It would make a beautiful contrast with either of the two named above.

P. CONTORTA. *Western Scrub Pine*.—Also known as the Bull or Black Pine. Dr. George Dawson speaks of this tree as covering large areas in the higher elevations of British Columbia, on the hills that rise above 3500 feet, and where the rainfall is too great for the healthy growth of *P. Ponderosa*, and states on the authority of Dall, that it is found as far north as Fort Selkirk in Alaska, in latitude 63. I have not seen it, but it is said that, as an ornamental tree, its straggling and crooked branches are objectionable.

P. EXCELSA. *Lofly Bhotan Pine*.—This is the noble pine of the Himalayas, found at elevations of from 6000 to 8000 feet and

even occasionally, says Hoopes, up to 11,500 feet. It is much like our own white pine, when young, but is longer in leaf, and is when older said to be more spreading and drooping. It has stood the winters in the States to the south of us, and yet has often failed there, some think owing to the richness of the soil in which it has been planted. The rarity of the air of its native elevations may be the cause of its tendency to throw its sap so much into the leading shoot,—a sort of vegetable apoplexy, if we may so speak. I would specially draw attention to the argument upon this tree in Scott's "Suburban Homes."

P. MONTICOLA. *White Pine*.—This tree is much like our own white pine, and is abundant, says Dr. George Dawson, in the southern portion of the coast ranges in British Columbia, where it attains a height of sixty to eighty feet, in some places, in rather severe climates. It clings to the regions of heavy rainfalls. We want the trees from the severe and dry climates. It also extends southward into California, where it is found, says Mr. Hoopes, at an elevation of 7000 feet.

P. MUGHO. *Mugho Pine*.—Is a pine bush or shrub, a native of the mountains of central Europe, growing sometimes to a height of twenty feet, but more often a mere bush. It has been used largely as a foreground to larger evergreens, in Prospect Park, Brooklyn, and with very good effect. It is likely to prove hardy, but has not yet been tried here.

P. PINASTER. *Cluster Pine*.—Is a native of both shores of the Mediterranean, the west of Asia, and the Himalayas. In France, says Loudon, it cannot be cultivated with a view to profit north of Paris, and even in that latitude is often destroyed by severe winters. In France its special use has been to cover tracts of drifting sand. This beautiful species, says Mr. Hoopes, is exceedingly unsatisfactory, and cannot be depended upon in the Northern and the Middle States. Mr. Brown had some young trees which proved hardy, but in this matter we must act with caution.

PINEA. *Stone Pine*.—A lofty tree with spreading umbrella-like head, as may be seen in photographs of different parts of Italy. It is a native of the south of Europe, and of the north of Africa. It

is quite tender for some distance to the south of us. I only mention it, that it may not be confounded with the Swiss Stone pine,

P. PONDEROSA. *Heavy-wooded Pine*.—Is found in the dry interior regions of the Pacific coast. It has dark-colored, long, coarse foliage, which is strikingly ornamental. "It abounds," says Mr. Sargent, "in all the Rocky Mountain region, and extends through New Mexico and Arizona to the Sierra Nevada, where, on the eastern slope it constitutes, in some of its forms, fully three quarters of the forest. Dr. George Dawson finds it in the central dry regions of British Columbia between the coast ranges and the Selkirk and Gold ranges up to latitude $51^{\circ} 30'$. Also on the east side of the Rocky Mountains, on the 49th parallel. At the height of 3000 feet it is replaced by the Douglas fir and P. *Contorta*. It occurs also in western Montana in severe climates. This is a tree of wide habitat, suited to dry soils, and found in very severe climates, one that should be tried, not for its timber, but for ornamental purposes.

P. RESINOSA. *Red Pine*.—It is strange that our native red pine should have been so overlooked. It is scarcely to be found for sale in American catalogues, and is seldom planted here. In foliage it is much like the Austrian, but has the one defect of being more open and sparse of branches.

P. STROBUS.—Our native white pine may yet be peddled in some parts of our country as a rare exotic, so scarce has it already become. In England it is known as the Weymouth pine, so named from the fine trees at Longleat House, Wiltshire, the seat of the Marquis of Bath, grown from seed, says Loudon, introduced in 1705. The following varieties are worthy of notice.

VAR. COMPACTA.—Is a dwarf round headed little tree or shrub, like a continually pruned white pine. Scott says it makes a growth of two to five inches per annum, and grows to a height of ten or twelve feet at maturity. It is one of the best of the dwarf pines.

VAR. NIVEA.—I have only seen this when young, but was very much struck by its silvery white foliage.

P. SYLVESTRIS. *Scotch Pine*.—Though known as the Scotch

Pine, the *Sylvestris* is found from Spain to Kamtschatka, and from the Mediterranean to the extreme limit of coniferous growth in Lapland.

Mr. Budd tells me that, in the opinion of Karl Kock, of Berlin, who is perhaps Europe's greatest authority, the *Sylvestris* is not a native of Scotland. It is nearly as fast a grower as the White Pine, and has been planted in enormous quantities, especially in the Western and North-western States.

But why has it been planted in preference to our own White Pine, which is a faster grower and yields a better quality of lumber? Partly because it stands the dry parching winds of the prairies better than the White Pine, and partly because the seed has been more readily procurable, and the plants are more easily and cheaply bought. I am also told that the branches are not torn out by severe storms as easily as in the White Pine.

The perfect hardiness of this tree, in Minnesota, suggests it for trial in Manitoba.

VAR. *RIGENSIS*. *Riga or Russian Pine*.—This is the variety which has been grown to the south-east of Riga, and which, for a long time supplied the masts for the British and French navies. These masts were seventy to eighty feet in length, and eighteen to twenty-five inches in diameter. Those grown in Sweden were of smaller size, and were known as spars. A large portion of this Riga pine, says Loudon, was grown upon the banks of the Dnieper, and carried twenty-five miles to the Dwina, where it was rafted down to Riga, the chief point of the mast trade. As early as 1785, the French government sent a mast-maker to Riga for seed. This was sown in different places, and, according to some opinions at that time, did not seem to differ much from the ordinary *Sylvestris* Pine.

At the government Ecole Forestière at Barres, Department of Loiret, formerly a private estate of M. de Vilmorin, there are thirty groups of *Sylvestris* Pine, planted with a special view to showing the comparative value of the mast-pines of Riga, and other varieties. (See "The Schools of Forestry in Europe," by Dr. J. C. Brown, Edinburgh, 1877.)

In the United States Report on Forestry for 1878-79, by Dr.

F. B. Hough, in a paper by M. Chatin, read before the Societé Imperial Zoologique d'Aclimation of Paris, there is given the opinion of M. de Vilmorin, who states that the Riga Pine grows more rapidly and to larger size; and that the timber is more elastic and valuable when mature.

Seed procured by F. R. Elliott, and described in his "Popular Trees and Shrubs," proved in many ways unlike the ordinary *Sylvestris*.

Of the following pines I should like to say a few words. The *P. ALBICAULIS*, the white, or white-bark pine, of Oregon and of the coast ranges, up to latitude 53, has been found by Mr. Sargent on Silver Mountain, near Yale, B. C., at an elevation of 5,000 feet. The *P. AUSTRALIS*, the long-leaved pine of the Gulf States, is not hardy even in the Middle States. *P. AYACAHUITE*, the lovely long-leaved pine from Mexico, is certainly hardier than was expected. It did not suffer at Flushing in 1880-81. *Jeffrey's pine* (*P. JEFFREYII*,) is very much like Ponderosa, and grows to large size in the mountains of Northern California, but I do not know at what elevation, nor our chances of being able to grow it. I have seen a fine specimen of this tree, on the grounds of Ellwanger and Barry, and it seemed to show no tenderness there. *Lambert's pine* (*P. LAMBERTIANA*,) which grows to a height of 200 feet in California, is much like our own White Pine, and seems to be hardy, as far as tested, to the south of us. The *P. MASSONIANA*, is one of the most widely distributed conifers in Japan, and is found as a bush at high elevations. The variety known as the *Sunday Pine* has distinct golden radiations which are remarkably attractive. The little plants I have seen would lead one to suppose it a dwarf species. A few plants that I saw at Flushing on the Experimental Grounds of the Rural New Yorker, and in the Centennial Grounds at Philadelphia, were not injured by the winter of 1880-81. The *P. MONTICOLA* of the Pacific coast, is much like our own White Pine. In British Columbia, Dr. George Dawson finds it on the coast ranges, and also inland, in the region of abundant rainfall. The trees of the dry regions are more likely to be of use to us.

RETINESPORA.

This is a family of rare beauty from Japan. They are very varied in foliage, some resembling the Juniper, others the Arbor Vitæ, and others, the Cypress. Struck by their beauty I watched them carefully, noting how they stood the severe winter of 1880-81, in different places near Boston, at Flushing, in Central Park, in Philadelphia, and I find they differ in hardiness, and some seem promising even here. *FILIFERA* (*thread branched,*) seems allied to our Arbor Vitæ, but more delicate, and the ends of its branches have elongated drooping filaments, very graceful and pretty. It seems one of the hardiest. It was not hurt on the Centennial Grounds at Philadelphia, where, from some cause, the evergreens suffered more than in Central Park or about Boston. In the Cemetery at London, Ontario, this has stood well and seems to be one of the hardiest. *OBTUSA NANA* is more cypress-like in foliage, very distinct, soft and velvety, not as hardy as some others, but worthy of greenhouse care. *PISIFERA* (*pea-fruited,*) is much like our Arbor Vitæ, but more delicate. It stood well wherever I have seen it, and that in many places, but is less novel, and less worthy of trial. *PLUMOSA* is quite feathery and dense in habit of growth. It stood everywhere as well as *Filifera*. *PLUMOSA AUREA* I wish to draw especial attention to. Its outer branches are all tipped with a bright lively yellow which it maintains through the greater part of the year. It forms a striking contrast to other evergreens in winter when all else is leafless. In Central Park, *PLUMOSA* and *FILIFERA* lost their fresh green tint, as our white cedar so often does here, yet this golden variety did not fade in the least. In London, on the other hand, *Aurea* did not stand as well as *Plumosa*, and this is what one would perhaps expect. In the grounds of the Rural New Yorker, it tipped slightly in 1880-81. Four plants passed through last winter with me, they were well mulched, but without snow covering and in full exposure to the north-west winds. This variety is becoming a great favorite about Boston. *ARGENTEA* is tipped with white, but not equal to the above. *SQUARROSA* is feathery and of a beautiful tint, but not as hardy as others.

SCIADOPITYS.

S. VERTICILLATA, Umbrella Pine.—Is a native of Japan, found in parts of the Island of Nipon, among the mountains in latitude 36°. It is quite unlike any other tree I ever saw. In its native land it is said to grow to a height of 100 feet. It was introduced here but a few years ago, and is proving a very slow grower. The plants I have seen at Mr. Sargent's, near Boston, at Wellesley, Mass., at Flushing, Long-Island, showed that it stood this late severe winter without injury. It is well worthy of such protection as it may need in our climate.

SEQUOIA.

This is the mammoth tree of California. Fancy trees nearly 300 feet in height, and thirty-five feet in diameter of trunk. The tree cut down by Bayard Taylor showed by its annual rings an age of 3,100 years! It contained 250,000 feet of timber. Imagine being able to ride, on horseback, the distance of seventy-five feet in the hollow of a fallen tree and then emerging from a knot-hole in one side!

This tree is not quite hardy in the Middle States. The finest specimens in the East are those in the grounds of Ellwanger and Barry at Rochester, which must be, I should say, at least twenty-five feet in height. These trees suffered but comparatively little from the severity of last winter, and would appear to be rather hardier than the majority of those brought to the Eastern States. Mr. Hoopes states that it grows on the Sierra Nevada in latitude 36 or 37, at an elevation of 5,000 to 7,000 feet, so hardier specimens may yet be found.

TAXUS.—Yew.

The Yew is a tree of rich sombre tint, slow growth, and long life, which thrives best in partial shade, and in moist climates. The English Yew (*T. BACCATA*) has for some reason been planted largely in English church-yards, where there are trees 800 and even 1,000 years old. Scott says it does well at Newport, and in New York, but not inland in the same latitude. It was injured on the Centennial Grounds last winter. Mr. Brown found it much

hardier than the Irish, which could not live above the snow. Mr. Hoopes says the upright *Irish Yew* will not stand north of Philadelphia. The *Golden Yew* (VARIEGATA AUREA) I saw at Flushing, and was very much struck by its bright golden color. It was not at all hurt there by the severe cold of last winter, and Mr. Hoopes says of it that it is even hardier than the species. This tree should be tried by those who will give it special winter protection.

Our native Yew, often called the Ground Hemlock, when cut back into compact bushy form, is quite ornamental. There is a golden variety of it too, but it by no means equals that described above.

THUJA.—Arbor Vitæ.

Our native White Cedar (T. OCCIDENTALIS) is our most convenient, if not our best hedge plant. For a wind-break it cannot equal the Spruce, nor can it equal the Hemlock, for delicate beauty; but for a quick, cheap, good hedge it is the best plant we have. Young trees chopped out of our black muck swamps in spring, planted close, and evenly cut back, if the soil be not too dry, quickly grow into a handsome hedge. One word of caution—trees from dense thickets, if planted in exposed places, often become winter-killed.

I am glad to see cedar-hedging coming into vogue. In some parts of Missisquoi it is not uncommon. The finest in the Province, as far as I know, far surpassing anything in Montreal, is that on the grounds of Mr. W. P. Carter, at Cowansville.

T. GIGANTEA. *Gigantic Arbor Vitæ*.—This is the giant cedar (so called) of the Pacific coast. On the coast of British Columbia, Mr. George Dawson has found it measure fifteen feet in diameter of trunk, and 150 feet in height.

Mr. John Mathers of Ottawa, tells me that a tree of this variety was measured by Hon. Malcolm Cameron which was twenty-one feet in diameter; very few plants of this variety have been grown in the Eastern States and they not satisfactory. However, Mr. Dawson, who has made detailed notes of its distribution in British Columbia, finds it inland in severe climates, whence we should obtain seed for trial.

T. OCC. AUREA. *Peabody's Arbor Vitæ*; and the "Golden" of R. Douglas, of Waukegan, Ill., are golden tipped varieties of our common cedar, which are bright in color and highly ornamental, The probable tenderness of the golden yew and the golden retinopora should cause us to prize these all the more. There are also silver tipped varieties, but not equal to the golden, and dwarf dense little gems useful in ornamental gardening. The *little gem* produced by Mr. R. Douglas is a little beauty and apparently hardy at Waukegan; the *Golden Trailing Dwarf* is another curiosity of his. The *Globosa*, a dense little shrub showed every signs of hardiness at London.

T. SIBERICA. *Siberian Arbor Vitæ*.—Is fully as good a hedge plant as our native, more dense in foliage, and it would seem more hardy, that is, it does not so lose its freshness of color as does our own when exposed to dry cold without our usual covering of snow. On account of its keeping its color so well it is highly prized for putting around bouquets at Minneapolis. I am assured positively by Mr. Thomas Douglas, that this variety is not of Siberian origin, but only a seedling of our native *Arbor Vitæ*, yet it is a hardier plant, and very useful and ornamental.

TSUGA.—Hemlock.

Our native hemlock is one of the most graceful and beautiful of all coniferous trees. Imagine a hemlock fifty inches across the stump, grown in the open from infancy, branched to the very ground. There are specimens about Boston such as we have not, and cannot have for many years to come.

It is also our most beautiful hedge plant, though not as easily transplanted, nor does it become ornamental as soon as our white cedar. There is a beautiful hedge on the grounds of the late A. J. Downing, at Newburg, N.Y., one of those living, un-tombstone-like monuments which he so loved to leave behind him.

There are two dwarf varieties of it I must mention. The *Broad-leaved Hemlock* (T. *Canadensis Macrophylla*) is a compact, foreign-looking, bushy shrub of slow growth and dark foliage, very curious and unlike a hemlock. *Sargent's Weeping Hemlock* (T. *Can. Sargentii pendula*) found on Fiskhill Mountain

by H. W. Sargent. Its graceful pendulous beauty can hardly be surpassed. I saw specimens at Flushing and on the Grounds of the Rural New Yorker not injured by the winter of 1880-81.

Of other varieties, the *Indian Hemlock* (T. Brunoniana), though found in Bhotan at an elevation of 10,000 feet, has proved quite uncertain and tender in the Middle States. The *Douglas Spruce* (T. or Pseudo-Tsuga Douglasii) is a tree of which there are vast forests on the Pacific slope, where it grows to a height of 150 to 200 feet. Specimens have even been measured, it is said, which reach 3,000 feet.

"Too much cannot be said in praise of this magnificent and valuable tree," says Mr. Robert Douglas. The first seed procured by Mr. Douglas, was from California. The seedlings grew eight to twelve inches and perished the first winter. Seed was then procured from Colorado, which grew but two or three inches, and which, Mr. Douglas says, "have proved perfectly hardy." However, in the extreme North-West, I cannot hear of its having been tried, and its introduction here we must look upon as experimental.

The singular zigzags of its northern limits in British Columbia, have been carefully mapped out by Dr. George Dawson, who has found it in the interior, in latitude 55, at elevations of 3,000 feet and even higher, but then of small size; also upon the eastern slope of the Rocky Mountains, in climates of medium moisture and of very low winter temperature. Its foliage, I must say, is of medium beauty only. The *Western or California Hemlock* (T. MERTENSIANA), Dr. Geo. Dawson says, closely resembles our native species, but grows on the coast of British Columbia to a height of 200 feet, with a trunk six feet in diameter. It is found usually in the regions of abundant rainfall, and in some severe climates. The (T. PATTONIANA or WILLIAMSONII,) has been found by Mr. Sargent on Silver Mountain, British Columbia, at an elevation of 4,000 to 6,000 feet.

The above list of trees of course does not aim at being complete, nor even complete upon the points upon which it touches, but the writer has aimed at the strictest accuracy in what he does say. I hope it will serve as a useful guide, and also as a stepping stone to those who may follow up this much needed work.

TWO TROUBLES IN A YOUNG ORCHARD.

BY T. H. HOSKINS, M.D., NEWPORT, VT.

SPLITTING OF THE BARK.

We often find in the spring that young apple trees, in the nursery or orchard, have the bark split open near the ground, and raised from the wood partly, or entirely around the tree. We notice this in the spring, but close observation tells us that it is done in the fall, and is commonly produced by the first hard freeze, especially if it comes early, and the season is wet. Some varieties are very subject to this splitting, while others are almost, or entirely, exempt from it. It, as regards locality, extends from the northern limits of the apple to, at least, as far south as New Jersey; and as it takes place even in the north, as the result of early and not very severe freezes, there seems no reason why it should not happen nearly anywhere that apples are grown.

No one has ever, to my knowledge, suggested a means of prevention, and only one writer, (Prof. Joseph L. Budd, Horticulturist of the Iowa Agricultural College,) has investigated the cause. Prof. Budd tells us that the varieties subject to splitting have a more porous bark than others, and that the lower part of the trunk in those varieties which split will always be seen to be wet for some distance above the ground after wet weather, and to remain so for some time, when the unsplitting kinds will be dry. He believes the splitting to be due to this excess of water in the bark near the ground, in consequence of the excessive capillarity or porosity of the bark of such varieties. From the way Prof. Budd speaks of it, I infer that he regards this saturation of the bark as physical rather than vital, that is, that it is not a redundancy of sap, but a mere temporary water soaking.

As to prevention, no satisfactory one has ever been proposed for this evil. We may avoid it by choosing such sorts as are not subject to it; but this would exclude many of our best apples. Fortunately the bark is not often loosened entirely around the tree.

In many instances the separation extends only a little way on each side of the crack. Even when nothing is done, the injury scarcely, in such cases, checks the growth of the succeeding year, and is soon overgrown. But in a proportion, greater or less, of the cases, the separation of bark is considerable and sometimes total. If these are taken in the fall, soon after their occurrence, and carefully wound with waxed cloth, so as to draw the started bark closely together and bind it snugly to the wood, re-union may be expected, and the tree be saved. It is important to look over the trees after smart freezes in October and November, in order to discover these injuries immediately after their infliction. As the waxing has to be done in cold weather, it is necessary to carry a vessel of live coals about with you, in order to warm up the waxed cloth. For this kind of a job I use cloth that has had an extra application of wax upon one side. This extra waxing is wound next the tree. Though injury of this kind is most common in quite small trees, yet I have had it occur in bearing trees three inches in diameter, and very badly too.

DEATH OF THE BARK.

An evil very greatly complained of in northern Vermont, but of the extent of which in other localities I am not informed, is the death of the bark of apple trees upon the trunk, within two feet of the ground in most cases. This, like the splitting, does not occur to all varieties. Some (and these often are kinds that suffer the worst from splitting) are not affected at all by the death of the bark, or "bark-blight," as it is sometimes called. There are varieties of apples (notably the Duchess of Oldenburg), in which an abortive form of the disease is frequent, only the outer layer of bark being killed. This gives a scabby appearance, and seems to check the growth some, but is soon recovered from in good soil. For many years it has been held and taught that this disease is produced by bright and warm sunshine in winter, and protection by low branching, or by placing boards or bark on the south side of the trunk as a shelter has been advised. My own experience does not confirm this view, and I am obliged to con-

ness that I have no remedy whatever for this very serious trouble. In my own orchard, where all the trees in grass are protected from mice and rabbits by tying strips of lath or pieces of barrel staves around the trunks, this bark disease is just as common on trees thus sheltered from the sun as on those in tilled land which are not protected. And when the injury is partial, not entirely surrounding the tree, the killing seems to be indifferently on any side, and as frequently on the north-east as on the south-west side.

This disease, or another like it, sometimes attacks the bark in circumscribed spots, especially on trees of some size, causing the bark to die over an area an inch or so in diameter, and from that up the size of the hand, or larger. This form seems, like the other, to be limited to particular varieties, and I have seen it worse on the Peach of Montreal and the Canada Baldwin, which varieties, in my grounds at least, have not been attacked by the other form. These may be entirely distinct diseases, and I have sometimes suspected (though I have not been able to prove it), that this last mentioned form is the work of insects. The first named, and more injurious form, I have thought might possibly be due to a fungus, but this is rather negatived by the fact that the damage occurs in winter, is all done at once, and does not extend itself. If a strip of bark is left, extending from sound bark below to sound bark above (and this is not uncommon), the tree may be saved, and by removing the dead bark and waxing the wound the injury will heal over in time. But the tree so affected is much retarded in growth, and unless of considerable size I prefer to replace it with a sound one. Such an injury often causes the tree affected to produce fruit prematurely.

I am sorry that I am unable to do more than to give, so to speak, the natural history of these evils in the orchard, without being able to offer anything in the way of prevention. I have found them utterly unpreventable so far, but I still have hopes that prevention may be possible, and it is with the view of eliciting information that I offer this hastily written account of them, as I have found them to occur in my own orchard and nursery.

NEW AND RARE SHRUBBERY.

TREES AND SHRUBS FOR LAWNS AND YARDS.

BY PROF. J. L. BUDD.

From Report Iowa Horticultural Society.

The prairie home should have its shelter belts in the back grounds for protection from wind sweep, and, if of considerable extent, groups of neat growing trees may have a place in the side views for shade and rustic seats. Even partially in front isolated trees attaining considerable size may be sparingly introduced on grounds relatively large, if so placed as not to obstruct desirable views, but the Lawn proper should be planted with a view to ornament and beauty and not for shade. The shady walk to the front gate can hardly be tolerated as an evidence of good taste.

The larger growing trees first noted in the following list have no place in yards of small extent. In this list our well known trees and shrubs are not included, it being desirable to use the time in directing the attention to trees and shrubs that should be more widely planted in the State than they yet have been.

MEDIUM SIZED TREES.

Scotch Alder.—This has been supposed to be a wet land tree. On our dry prairies it assumes forms of beauty specially adapting it to side position on the lawn.

Cut-leaved Alder.—This is a medium sized, round topped tree in our climate with dark green serrulated leaves which attract general attention.

Weeping Poplar.—As grown in the nurseries top grafted on straight stock, ten feet in height, this makes a desirable side view tree, partially in the background. Its branches clothed with bright green foliage soon trail on the grass.

Cut-leaved Mulberry.—Though a new arrival from northern

Europe, this will soon be common on our larger lawns. It assumes a neat, spreading form, and its grayish white bark forms a pleasing contrast with its variable leaves.

Cut-leaved Birch.—In our rich soils this makes rapid growth, and should be accorded a side position. It would be more widely planted if its real value as an ornamental tree was better known to prairie planters.

European White Birch.—Grows with us very rapidly, and soon takes on a pendulous and decidedly beautiful form.

Oak-leaved Mountain Ash.—This very hardy and beautiful tree is as yet little known at the West. While classed with the smaller trees it forms a dense, round top, for which reason it should be placed where it will not obstruct views. We specially recommend it as a lawn tree of rare beauty that bids defiance to summer's heat and winter's colds. It is in reality a variation of the White Beam tree of Europe, and not a true Mountain Ash.

CARAGANA ARBORESCENS.—This unique lawn tree is a native of Siberia, and will prove hardy in all parts of the State. Its elegant pinnate foliage will never fail to attract the attention of visitors. Its yellow flowers are succeeded by small pods containing three or four seeds resembling peas. It has fruited already quite freely in the State. It grows from seed as readily as corn.

SHEPHERDIA ARGENTEA.—This is a very popular lawn tree in Europe on account of the beauty of its foliage and fruit. In Iowa where the tree is native and as hardy as a Willow it is rarely seen on lawns. In Cedar Rapids, on the grounds of S. Bowers, the well known florist, may be seen a group of these plants not exceeded in beauty, when clustered, with its really excellent fruit, by anything in the State in the line of trees. The tree is dioecious, so it should be planted in groups of three or four, or isolated trees may be made to fruit, if fertilized by putting in a staminate scion in the top.

CATALPA KAEMPFERI.—This is a Chinese species making a low bushy shrub of large size. In Summer it has decidedly a tropical expression. Its flowers are smaller than those of the *Speciosa*, and far more fragrant. The pods are about the same

length, but not larger than a goose quill. It flowers and produces fruit when only two or three years' old from seeds or cuttings. It seems perfectly hardy.

Blackhaw.—This native small tree has many things in its favor for lawn planting. Some of its varieties are worth growing for the fruit. As a lawn tree it is beautiful when in flower, fine in foliage, and even in Autumn its bronzy foliage is very attractive.

DWARF EVERGREENS.

PINUS PUMILIO.—This is usually grown in the nurseries as Dwarf Mountain Pine. It is a native of the mountain peaks of Central and Northern Europe. In our climate it never loses color by extremes of Summer heat or Winter cold. The few fine specimens we have in the State show its rare adaptability for lawn decoration. With us it does not attain a height greater than three or four feet in isolated positions, but soon covers an area of ten or more feet in diameter.

JUNIPERUS PROSTRATA.—Is sold under the name of *Savin*. It is perfectly hardy with us, yet rarely seen. It may be trained to hide foundations or walls, or as a dark green border to a flower garden along buildings or fence. Planted in isolated positions on the lawn, and given a proper form on the start, it makes with little care or trouble an object of special interest.

LAWN SHRUBS AND PLANTS.

PRUNUS TRILOBA.—In the Eastern States this large shrub has long been prized. Its flowers are half double, of a delicate pink color set thickly on long slender branches. With us they are an inch or more in diameter. It is a native of Northern China.

SPIRÆA TRILOBA.—This is a native of the Altai Mountains and as hardy with us as the Lilac. Its branches spread out laterally, with recurved tips, loaded in the following season with numerous compact corymbs of pure white flowers. Its glaucous lobed leaves are pretty through the season.

SPIRÆA OPPULIFOLIA.—In Europe this is known as the snow-ball leaved *Spiræa*. It is perfectly hardy and not excelled as a lawn shrub of large size. Its large corymbs of white flowers re-

tain their beauty for an unusual time. After the flowers are gone, the colored seed capsules are ornamental late in the season. The lobed and veined leaves assume all shades of red and yellow when touched with the first frost of Autumn.

NEW WHITE SPIRÆA.—This was received in Iowa as *Spiræa candida*, from Massachusetts. It is evidently a variety of *opulifolia*, and very hardy. It is very distinct in habit and a great bloomer.

SPIRÆA CALLOSA.—This is known in Europe as *Fortunei Spiræa*. It has large panicles of deep rose flowers, and blooms later and longer than the others named. It sometimes kills back in the tops, but as it flowers on the new shoots it is ever an object of beauty upon the Iowa lawn, if the injured shoots are shortened in Spring.

CORNUS ALBA SIBERICA.—The orange *red* shoots of the Siberian Dogwood make a fine appearance on the lawn in Winter. Its fine large leaves and shiny white flowers are attractions in Summer, and in Autumn it is loaded with its peculiar white fruit.

BETULA NANA.—This diminutive Birch is a native of very cold portions of Europe and America. Its peculiar round, sharply crenated leaves stand our Summer sun without injury. It is truly a charming miniature tree.

PHILADELPHUS.—The old sweet-scented mock orange is rarely seen in our city or country yards. We have now several improved varieties, about all of which are worthy of trial.

ROSE ACACIA.—This beautiful shrub is by no means new, but it is not as common as it should be, and where found is not rightly managed. The suckers should be kept down, and the plant grown in form of miniature trees. It then becomes an object of beauty not surpassed by any hardy shrub in our list.

BERBERRIS PURPUREA.—The purple leaved Barberry, if properly managed, is a desirable ornamental shrub attaining, if the sprouts are kept down, a height of from four to six feet. Its violet purple foliage, and dense loads of highly colored fruit will attract attention through the season.

HYPERICUM KALMIANUM.—This is a very hardy, neat-appearing

shrub, producing a great number of bright, yellow flowers in August. It holds its foliage unaffected by frosts later in Autumn than any hardy shrub I know of. The colored seed capsules also remain perfect and in apparent growing condition long after the first severe cold weather.

LONICERA TARTARICA in variety:—Many seminal varieties of the tree Honeysuckle have been produced of late, some of which are superior to the parent in foliage, habit of growth, and in size, beauty and perfume of the flowers. True to their northern origin, they are all, as far as tried, hardy on the prairies. Of those obtainable in our nurseries, *grandiflora* and *grandiflora alba* are best.

LONICERA SEMPERVIRENS.—I do not know of many well kept plants of this rarely beautiful shrub in the State. When most shrubs are destitute of bloom, and sun-burned in leaf, this one—as its name implies—is always luxuriantly green, and covered with its rich scarlet flowers on every terminal branchlet. Its thick leaves seem to adapt it to such dry, hot summers as ours.

RHUS OSBECKI.—This species of the sumac is attracting much attention in the Eastern States. It comes from Northern China, and we need not be surprised that it endures perfectly our hot summers and cold winters. It is unique in all its parts, and when better known will be a great favorite.

HYDRANGEA PANICULATA.—Rather unexpectedly to many, this beautiful flowering shrub proves hardy in nearly all parts of the State. It should be given a position where it would be screened from the noon-day sun. In very hot, dry weather in August, its leaves are somewhat inclined to burn.

CLEMATIS JACKMANII.—With slight protection to roots, in winter, this queen of the climbers, is hardy with us. Its foliage endures our summers perfectly. During late summer and autumn it flowers in continuous masses on shoots of the season's growth. Its great, rich, blue flowers are often more than four inches in diameter.

HIBISCUS.—The grand double flowering varieties are tender with us in winter, but stand our summers perfectly. It pays to take them up, wintering them in a corner of the cellar, with sand

over the roots. The trouble is not much, and they are treasures on the lawn in autumn.

ROSA RUGOSA.—I am glad to report this beautiful plaited leaved rose, from Northern China, as hardy as our wild Dog rose. It is an oddity in all respects. To be appreciated it must be grown for two or three years.

PERENNIAL PLANTS.

I will close by urging the claims of two beautiful hardy perennial plants, appropriate for the lawn, which should be better known.

BOCCONIA CORDATA.—A small circular bed of this oriental plant on the lawn will every time give pleasure. It grows to a height of five to six feet, with large sub-tropical foliage. Its immense spikes of white flowers in July and August, are not its least attractions. With slight covering the roots are safe in our worst winters.

DICTAMNUS.—This is usually known as "Gas plant," but is rarely seen at the West. A well kept circular bed of it on the lawn is neat and attractive through the season. It grows about two feet in height, and bears spikes of curious red and white flowers which are very fragrant. Roots live over winter with slight protection.

Where can these plants be procured? None of them are new, rare or high priced. Some of them may be found in our local nurseries, and all of them in the larger eastern collections. The list is the outgrowth of much trial and experiment with everything attainable in the eastern nurseries.

If followed by those who wish to step outside the prescribed lists of this Society, it will save the great expense and loss of faith usually attending random experiments.

Agricultural College, Ames, Iowa.

APPLE CULTURE.

BY N. C. FISK.

As I have derived great pleasure, as well as instruction from reading the different reports on Fruit Culture, published by the Montreal Horticultural Society, it would be uncourteous on my part if I should neglect to contribute an article on the apple, as I have been requested to do by the Society.

In so doing I, perhaps, cannot furnish anything of more interest on the culture of the apple than by giving my experience and the result of my orchard from a commercial point of view.

In the year of 1857 I was very anxious to plant an orchard of apple trees of good varieties. We had then no horticultural reports or the experience of any orchardist, published in the Province of Quebec, for guidance. The leading varieties of the New England States and Ontario, I knew, would not answer our climate. I wished to obtain native grown trees of such varieties as had proved hardy in this Province. I visited Montreal, Belœil and Stanstead, but I could find no nurseryman who had a catalogue of the trees grown by him; it seemed to be quite a question whether we could grow any of the good commercial varieties of apples.

One nurseryman at Stanstead contended that the Province of Quebec could only grow crabs with any prospect of success, but growing the crab-apple, he thought, would be highly remunerative to farmers for culinary use and for making champagne cider; he accordingly, later on, grew great numbers of crab-apple trees and sold them throughout the Eastern Townships.

As it still seems to be a question with many whether we really can grow apples in a commercial way with a prospect of getting a fair remuneration for the money invested, I propose giving as near as I can from memory and memorandums kept, the result of my orchard.

The orchard occupies nine arpents on the western slope of the

Yamaska Mountain; it was previously an old pasture, with from two to three feet of soil before coming to the hard-pan and so stony that it was impossible to plough it. When I commenced planting in 1858 there was one-fifth of the orchard planted in seedlings, among them were five Fameuse trees and five trees of other grafted fruit, which at that time was considered a large proportion. My first planting was 150 trees which I got at Belœil. The next trees were set in the spring of 1859; unfortunately they were more or less winter-killed, and there were only twelve trees out of the 250 that retained their original tops. This was very discouraging and, as I could not get native trees of such varieties as I wanted to plant, I commenced growing them and finally finished planting the plot of ground in the spring of 1865.

As I was unable to give the trees any cultivation except an occasional top-dressing of the land, from the nature of the soil their growth was necessarily slow and when the trees came into bearing, a great many varieties gave little or no profit. The memoranda that I have of the different years are as follows:—

1864—	122	bushels,	sold for	\$ 70.00
1865—	160	“	“	127.00
1866—	85	“	“	79.00
1869—	400	“	“	300.00
1870—	200	“	“	175.00
1871—	700	“	“	450.00
1878—	1050	“	“	522.00
1880—	1300	“	“	600.00
1881—	2000	“	“	1005.00

Of the missing years I have no memoranda, but as far as memory serves me, there has been a fair crop every year, except the years of 1875 and '76, the years that the caterpillars were so numerous; even then the crop was not an entire failure.

No doubt that twenty years hence, orchardists will consider this a very poor remuneration for the number of acres; but it must be taken into consideration that when this orchard was planted there were no reports of experienced orchardists yet published. The amateur now has many advantages to commence orcharding and the chances are he will meet with better success.

The orchard has thirty varieties of grafted fruit in it, twenty-

five varieties too many for real profit, for the greatest amount of money has been obtained from the Fameuse. The five most profitable varieties in the orchard are, Fameuse, Winter Calville, St. Lawrence, Autumn Strawberry and Summer Calville. The five varieties which I think will prove the most profitable for future setting, placed in order of their respective value as commercial apples are, Fameuse, Wealthy, Duchess, Alexander and Winter St. Lawrence.

I would suggest that any one planting trees in soil which he does not intend to cultivate, should be careful to keep a space of two or three feet around each tree free from grass and pulverized for at least four years after planting; thousands of trees that have been planted in the Eastern Townships have died from letting the grass grow round the trees, thus absorbing the moisture and causing the tree to become stunted and bark bound.

I have had many inquiries as to what will prevent the Fameuse apple from spotting. I do not think there is any sure remedy, but it can be prevented in a great measure, by thorough underdrainage, close pruning, and a greater fertility of soil. The spot forms on the apple usually in the month of June, during cold heavy rains; if the foliage is very heavy and dense the apple does not fully dry and fungus forms on it; if the tree is lacking in vigor and has a great number of branches, the consequence will be numerous small scabby apples.

There was shipped, this autumn, from Abbotsford to a Boston firm, 1120 barrels of apples, principally Fameuse, besides many barrels to different parts of the Province. Twenty years ago I do not think ten barrels of Fameuse could have been purchased in this place.

NAMES OF APPLES.

	J. G. Field, Stanstead.	Geo. K. Davis, Stanbridge.	R. Jack Chateaugay Basin.	Jos. Roach, Abbotsford.	J. M. Fisk, Abbotsford.	N. S. Whitney, Frelighsburg.	David Westover, Frelighsburg.	Revd. F. J. Paradis, St. Raphael.	J. McCabe, St. Marthe.	R. W. Shepard, Jr., Comco.	Hugh McCall, St. Joseph du Lac.	Mrs. S. K. Foster, Knowlton.	Dr. T. H. Hoskins, Newport.
	STANFELD Co.	MISSISSQUI Co.	CHATEAUGAY Co.	ROUVILLE, Co.		MISSISSQUI Co.		BELLECHASE Co.	VAUDREUIL Co.		TWO MOUNTAINS Co.	BROME Co.	VERMONT, U S.
Fameuse.....	2	1	1	1	1	2	2	1	1	1	2	1	3
Red Astrachan.....		4	5				1						
Peach of Montreal.....	4					5		5	5		1	4	
Duchess of Oldenburg...	1	5	2	4	2	3	5	3		2		3	4
St. Lawrence.....		3		2	4	4					3		
Alexander.....			4				4	4	4		5		
White Astrachan.....													
Jonathan.....													
Northern Spy.....													
Canada Baldwin.....		2		5	5			2					
Wealthy.....										3			1
Gravenstein.....													
Westfield Seek no Further. (Beaumont (crab).....													
Belvedere (crab).....													
Beauty of the West (so called)	3												
Tetofsky ..	5												
Golden Ball.....			3										
Foundling (erroneously call- ed Late Strawberry....				3	3								5
Golden Russet.....						1	3						
Winter St. Lawrence.....									3	5	4		
Strawberry of Montreal...									2				
Hardy Apple (?).....												2	
Scott's Winter.....													2
Yellow Transpare't,Russian													5

In the above list, therefore, the apples stand in the following order as to votes for position.

- | | |
|--------------------------|----------------------|
| 1. Fameuse. | 10. Golden Russet. |
| 2. Duchess of Oldenburg. | 11. White Astrachan. |
| 3. Peach of M. | 12. Northern Spy. |
| 4. { Red Astrachan and | 13. { Hardy. |
| { St. Lawrence. | { Scott's Winter. |
| 5. Alexander. | { Strawberry of M. |
| 6. Canada Baldwin. | { Jonathan. |
| 7. Wealthy. | 14. { Gravenstein. |
| 8. Foundling. | { Beauty of West. |
| 9. Winter St. Lawrence. | { Golden Ball. |

Our last list of the five best varieties was made in 1876.

A comparison of the first five of 1876 and 1881 will be interesting:—

1876.	1881.
1. Fameuse.	1. Fameuse.
2. St. Lawrence.	2. Duchess.
3. Red Astrachan.	3. Peach.
4. Alexander.	4. { Red Astrachan. } equal.
5. Peach.	4. { St. Lawrence. }
	5. Alexander.

Fameuse still holds its own; in fact, has no rival yet for first place:

St. Lawrence, which held second place in 1876, is now fourth; and *Duchess of Oldenburg* which did not find a place among the first five in 1876, now ranks as the second most profitable apple. The *Duchess* seems to give general satisfaction wherever planted; the tree is so very hardy, such an early and heavy bearer, and its fruit always even in size and of such fine appearance that it sells readily in the market. But among city growers (*i.e.* Hochelaga county growers), *St. Lawrence* takes a higher place than "*Duchess of Oldenburg*"; on the Upper Lachine Road especially, it is much esteemed and considered second only to *Fameuse*.

Peach of Montreal, now has *third* place, instead of fifth; this is accounted for by the fact that, of late years, it has been largely planted out by the country growers, and like *Duchess*, being hardy and a good annual bearer, has become a favorite apple for home markets.

Our great want seems to be an apple for export. *Fameuse* can hardly be called an exportable apple. Dealers call it a "*dangerous fruit*" to export, because it seldom reaches Liverpool in good condition. Of the five first apples on our list this year, *Fameuse* only is a winter fruit—and *early* winter at that.

The list shows us that only in the counties to the south of Montreal, is any attempt made at growing late keeping exportable apples, and only one grower gives an apple of this class (*Golden Russet*), first place; the others place the late keepers low down on their lists, thus proving that even in the most favorable dis-

tricts of the Province, we have not yet discovered the right kind of late keeper to grow for the export trade.

Red Astrachan is still considered a profitable apple to cultivate, (ranking a little lower, however, than in 1876,) notwithstanding reports of its tenderness and poor bearing in some localities. But owing to the earliness of the fruit and its beautiful appearance—perhaps the most beautiful of all our August apples—it sells readily and at high prices.

REMARKS by some of the growers, on varieties, are interesting, and I shall give a few extracts from their letters.

Mr. R. Brodie of Coteau St Pierre says—"growers should be careful to plant out only the most highly colored variety of Fameuse, for it takes the market better." He calls Red the *Montreal Fameuse*," and says:—"I have a few trees planted that I got from St. Hilaire, which are decidedly not the same as our Fameuse: the Montreal Fameuse is *nearly all red and is a better keeper*, while the other is striped, and green on one side, and does not keep so well." Montreal Fameuse averages one year with another, \$2.50 per barrel.

I think Mr. Brodie's opinion, that there are two distinct varieties of Fameuse, in fact, *so distinct* that the varieties are of different season, will not be generally endorsed. I could show him both the red and striped kinds growing in my orchard *on the same tree*.

Mr. David Westover, of Frelighsburg says, "I would place Fameuse first, but its fruit spots so, that two thirds of its crop is unmarketable. It is becoming a serious question what we can do to overcome this difficulty."

"Mrs Foster of Knowlton, who also complains of the spotting—says the Fameuse is a good bearer, tolerably hardy and the fruit always in demand at a high price, if well grown—but with me, for the last few years it has *not* been as fair and smooth as formerly, being more inclined to spot."

We are glad to learn that no complaints of Fameuse spotting to any serious extent are reported by growers north of the St. Lawrence river. Mrs. Foster highly recommends the "Hardy apple," and says, "I find on my sandy soil that the best bearers and longest lived trees are the *Hardy*; they never fail to bear and some

"seasons, *enormously*." The "Hardy came from Vermont, I believe; the fruit is of good size and keeps well till May in a cool, dry place, and though rather acid it is so good and firm, and cooks so evenly, that from January to May, which may be considered its season, it brings a very fair price, say from \$2 to 2.50 a barrel, which, considering its productiveness, pays me."

Mr. J. G. Field, of *Stanstead*, speaks highly of an apple called the "*Beauty of the West*," which, however, is unknown to us. He says, "'Beauty of the West' is an apple that has been only in our family in this vicinity. It was sent by your society to the Centennial Exhibition without its name, which we have only lately learned. The fruit is larger than *Fameuse*, and to my taste is more highly flavored; with decent treatment it is a full bearer, though not so early a bearer as some. It is a very fine looking fruit. I would very strongly recommend it to the notice of your society."

Mr. Morris, of *Sherbrooke*, thus speaks of two crabs which he has placed in the list of profitable apples:

"The *Beaumont Crab*, a new variety, is a large very beautiful-shaped apple, covered with a bright bloom. The fruit is a very dark-red all over, flavor like and equal to *Fameuse*. I do not know where it came from."

The *Belvedere Crab* came from *Belvedere*, the residence of the *Felton* family. The late *W. L. Felton*, some twenty years ago, procured in *Montreal* a grafted tree, which died; the shoot which sprang from the root has produced a large, long, yellow crab, slightly russetted, very sweet.

Foundling (*hitherto known as Late Strawberry*), is mentioned by *Mrs. Foster*, of *Knowlton*, *J. M. Fisk* and *Jos. Roach*, of *Abbotsford*, as a profitable apple, but both *Mrs. Foster* and *Mr. Fisk* report that the tree does not live long, although the former says she has one tree that has borne a fair crop every year, for twenty years. *This apple is known in Brome county, under the name of Lawrence.*

Wealthy is very highly praised by those who have fruited it. *J. M. Fisk* says, "I have a feeling that *Wealthy* will, in a few years, rank next to *Fameuse* for profit in our Province;" and *Doctor*

Hoskins, of Newport, Vermont, writes on 18th January, 1882,
"I think I am still safe in my position, that the 'Wealthy,' grown
"and consumed here, will keep as well as imported 'Baldwins,' i.e.
"the injury consequent on packing and transportation of 'Baldwins'
"reduces its keeping about to a level of the 'Wealthy' not subject
"to those causes of decay."

R. W. SHEPHERD, JR.,
Secy. Report Committee.



ON THE WORK OF THE STATE AGRICULTURAL
COLLEGE AT AMES, IOWA, UNDER
PROF. J. L. BUDD.

Notes taken by C. Gibb, Abbotsford, Que.

The attention of Northern fruit growers has of late been drawn to the series of experiments and importations at Ames, Iowa. In the reports of their State Horticultural Society, we have read Mr. Budd's sketches of the history of the different species of fruits and how that, during the middle ages, the large sized early apples of Northern China became distributed along the old caravan route westward, and gaining a foothold about Astrachan, became crossed with the Russian apple of the Tetofsky type, and the long keeping apple growing upon the Southern side of the Caucasus, and finally became blended into the species or family described by Loudon as the *Pyrus Malus Astrachanica*. Those of this family that have stood their trial as to hardiness upon the Steppes of Russia, as far north as Simbrisk and Moscow, promise to be of great value to the colder parts of this Continent. The first importation from Russia, received three years ago, consisted of a collection from St. Petersburg, of about 230 varieties of apples and twenty of pears. From such a climate as St. Petersburg, so high in latitude and so near the cold waters of the Gulf of Finland, one could hardly expect winter fruits. This importation, however, contained collections from the neighborhoods of Simbrisk and Kalonga, dry interior regions above latitude 54. The pears seemed to partake largely of the Swedish type, allied to the St. Ghislain, one of the hardiest of the pears grown in Montreal by the late Jas. H. Springle. This was a special collection undertaken for the Iowa Agricultural College, by Dr. Regel, Director of the Imperial Gardens; a collection evidently made with great care by Dr. Regel, and fortunately it arrived in perfect condition. Whether a collection of cherries and plums was received at this time I cannot say.

Previous to this, in 1870, the Department of Agriculture at Washington had imported an immense collection of Russian apples; the catalogue contains the names of 252 varieties, and in looking over the list one may note the names of many now known to be valuable. However, in the climate of Washington, these Northern fruits deteriorated in quality, and all ripened by about 20th August; yet, scions of these when they fruited in Vermont and Wisconsin, proved late winter fruits, and Mr. Budd's Russian correspondence shows that thirty of these were winter apples when grown at the North. This collection, too, contained a large number of apples, not Russian, but German and French, a large number of autumn apples of little value; the collection, in fact, showed signs of hasty selection. Knowing this, I expected the collections at Ames, also, to have been selected hastily. In this I was entirely mistaken, for I find both Dr. Regel and Dr. Arnold, in the selections sent to Ames, have taken the greatest possible care in selection, great care in accuracy of description.

The second importation at Ames was from Dr. Arnold, President of the Agriculture College at Petrovsk, near Moscow, and consisted of 200 varieties of apple, fifteen of pear, six of plum, and nine of cherry. Previous to this, the Russian Government had appointed a commission to visit the different fruit districts and gather the best late keeping apples for a trial on the college farm at Petrovsk; forty-two kinds were selected; these are stated to be large handsome apples of good quality and good keepers, and duplicates of those kindly sent by Dr. Arnold as part of this collection.

The pears deserve special notice. Some of them are soft-wooded pears, and graft readily upon the apple. They seem to be the descendants of the Strawberry pear of Northern China, which found their way westward along the old caravan route to Astrachan, where in time they became crossed with the cultivated forms of *Pirus Persica*. Also varieties of the Sand pear of Southern China and their crosses. Dr. Arnold, Dr. Regel and Dr. Lucas speak of these Russian pears as being of large size and fine appearance, and excellent for culinary use; some few of them are pretty good as dessert fruits, but not equal to the best Belgian varieties. They

are, however, of undoubted hardiness as they succeed at Moscow, where the winter temperature is nearly two degrees colder than in the city of Quebec, five degrees colder than in Montreal. The plums and cherries in this collection, owing to delays in transit, were lost.

A third importation consisted of a number of small trees of different varieties of pear, plum, cherry; also, a collection of Swedish fruits, received through Dr. Lucas, President of the Pomological Institute at Rentlingen, Wurtemberg, who is one of Europe's first pomologists. It seems singular that of the six varieties of the cherry recommended by him for culture in our cold climates, not one of them should be propagated in this country, so little are many of the fruits of Central Germany known here. On the grounds of the College Farm at Ames, there is a block of 1,600 trees, top-grafted with apples and pears received from Russia, and from the cold latitudes of this continent, in all about 400 varieties.

In the nurseries may be seen a great variety of promising fruits. There is the Russian Mulberry, introduced by the Mennonites into Minnesota and Nebraska, and evidently a favorite plant with them for fruit, hedging, timber and the feeding of silkworms; the Siberian Apricot, also brought out by the Mennonites, grown to some extent in Southern Siberia, and pretty good in quality. There is the German Apricot, grown upon the Hartz Mountains, sixty miles South East of Hanover, a good fruit showing no signs of winter injury. Hill's Chili peach, considered in Michigan to be hardiest of the peaches, is badly injured; alongside of it are nine kinds from Pekin all right! Mr. Budd has also two peach trees from pits grown 350 miles North West of Pekin. From this point he received a box which probably contained some real treasures, scions, plants and fruits; however, owing to delays in transit and custom house vandalism, the contents were dried, worthless; only two peach trees were grown from pits; the express charges were forty dollars. This gives some idea of the difficulties and expenses connected with importation from such countries. The *Prunus Simonii* from China seems perfectly hardy at Ames. Fruit of it was sent by Ellwanger & Barry last year; it is a good little fruit, but seems to be neither a plum nor nectarine. The June berries, too,

Mr. Budd has been making a collection of. He has varieties from Germany, China, and the Rocky Mountains, some as large as medium sized cherries and of good quality ; alongside of the nursery, the men were sowing the seeds of the *Shepherdia Argentea*, or Buffalo berry, a highly ornamental fruit-bearing tree which should be grown here. Mr. Budd also has a Northern Medlar and a hardy variety of the Filbert, also two varieties of Sweet Barberries and I know not what else.

The collection of apples and pears from Central Russia seems complete ; that is, they seem about as complete as the Russian Agricultural College and the Russian Pomologists have been able to make them. Among the Russian cherries and plums there has been greater loss, as the scions are more liable to injury from delays in transit.

From Germany, there has been received a collection of such fruits as Dr. Lucas thought likely to prove most valuable in severe climates. Swedish fruits were also received from Dr. Lucas but what variety or to extent I cannot say.

From Northern China, from Mantchuria, and the dry regions to the West of it, we may expect valuable additions to our list of fruits, but importations from there must be attended with much delay and uncertainty.

The collection of fruits at Ames, is the most extensive and valuable for severe climates that has ever been gathered in this country, or in Europe, if we except Russia.

Mr. Budd has fought out the question of *thick leaved* Russian Fruits until he has brought it out of what perhaps seemed the cloud land of scientific theory into the *terra-firma* of clear facts. The use to Iowa of these collections one would estimate according as he values the blessings of fruit, but not to Iowa only. Some day the shores of Lake St. John in the North-East, and the slopes of Turtle and Pembina Mountains in Manitoba will profit by them. If there is joy in conscious use, the movers in work like this must have their full fair share of it.

I append the descriptions of a few new apples as given by Prof. Budd in the report for 1880 of the Iowa Horticultural Society.
Yellow Transparent.—This was imported from St. Petersburg

in 1870. It has been fruited in Iowa at several northern points. In nursery and orchard it is a fine, erect growing tree, as hardy as a crab. It comes into bearing very young, and bids fair to be an abundant bearer. So far as known to the writer, it matures earlier in the season than Early Harvest, which it very much resembles in appearance and quality. In uniformity and size, the specimens we have grown are superior to Early Harvest. It bids fair to become the leading very early apple for the North, and perhaps all parts of the State.

Constantine.—This variety was introduced into Germany and England as early as was the Oldenburg, and has become a great favorite. The fruit is very large, and even more beautiful than is common with the Russian fruits. Dr. Hogg says: "Flesh white, tender, juicy, sweet, slightly sub-acid, and with the fine balsamic aroma which is met with in the flesh of the Cellina." When picked when nicely commencing to color, it will keep into December and ripen up like a pear. We do not know any limit to the hardiness of the tree. In the nurseries it has the name of Grand Duke Constantine, Wolf River. This is claimed to be a seedling originated in Waupacca County, Wisconsin. If so, it is probably a seedling of the Constantine or Alexander. The fruit is of the largest size and very highly colored. In quality it is not equal to Constantine, but superior to Alexander. The tree has not been known to be injured by the most severe winters of our northern counties. Indeed, it has stood rough usage better than the Oldenburg or Wealthy. If picked early the fruit keeps later than Fameuse. This tree should be extensively planted at the North.

Scott's Winter.—This is a medium sized fruit of good quality, keeping late into the spring. In appearance and color it is much like well-grown Winesap. The tree is hardy in portions of Vermont and Canada, where only the varieties we call iron-clad can survive. In nursery it is a moderate grower, and appears as hardy as crab. It is one of our most promising late keepers.

Belle de Boskoff.—Our first specimens of scions and fruit, were received from Charles Downing, who seems to believe it to be of Russian origin. It proves a rapid grower, and seems to ripen up its wood better than does the Gros Pomier. We expect it to prove

about as hardy as Walbridge. The fruit might be classed with the Yellow Russets, but it colors up finely on the sunny side. In size it is fully up to the Perry Russet, and in quality it equals English Golden. It is likely to become a great favorite as far north as it proves an iron-clad.

Borsdorf (402.)—This was imported from Russia by the Department of Agriculture in 1870. I believe it will do far better on the prairies than where it has been fruited in the East. The specimens I have seen and tasted would pass muster in competition with the best shipping Michigan varieties. Last season we kept specimens in good condition until late in April. In nursery and orchard it is a slow grower and seems as hardy as a crab.

Red Queen (316.)—This was also imported from Russia in 1870. The tree is a good grower, perfectly hardy, and has the merit of blossoming very late in spring, the fruit is of good size, and better in quality than Willow; picked in proper season it keeps through winter. Will be popular at the north.

Kepka Malenka (401.)—Imported in 1870, tree a fair grower and early bearer. Beyond all doubt it will prove hardy and in all parts of the State. In size the fruit is about like Ben Davis, and in our air it colors up fully as well. Vermont specimens of fruit have kept until June. This is the most promising very late keeper known to the writer for our northern prairies.

Charlamoff (262.)—This is a nice grower top-worked on Gros Pomier, and a fair erect grower in nursery. Its fruit is as large as Dominie, and as beautiful as Duchess, as reported by A. G. Tuttle, of Wisconsin. If picked early it keeps through winter; in quality it is said to equal Dominie.

Hibernal (378.)—This is a fine erect grower, Mr. Tuttle reports it to bear early, and that it is an acid apple as large as Rhode Island Greening. If picked early it keeps through the winter. To prevent misapprehension, I wish to repeat that directing attention to new varieties is one thing, and recommending them for extended culture quite another. The varieties noted are very hardy and their fruit compares favorably with our best market sorts. They are merely offered as very promising for trial and propagation by our nurserymen to a limited extent while watching their farther behavior in our climate.

HORTICULTURAL AND FRUIT GROWERS'
ASSOCIATION OF MISSISQUOI, 1881.

HON. THOS. WOOD,	-	-	-	-	<i>President.</i>
DAVID WESTOVER,	-	-	-	-	<i>Sec.-Treas.</i>
WM. PATTISON,	-	-	-	-	<i>Vice-Pres.</i>

It is gratifying to be able to report that this work of the Society for the year has been quite successful, the list of members being the largest of any since its formation, which, of itself, is proof that a lively interest is awakening in the advance of fruit growing. Although not able to say that regular meetings for testing fruits have been held yet, I may say that considerable discussions on the merits of different varieties of apples have taken place, the great diversity of opinions leads to the conclusions that location, soil, and market, all have an important bearing as to the profitability and success in fruit growing. By far the largest part of the apple crop in this country is yet of "native" varieties and the next are early, and that which we most need, viz., winter keepers are the smallest part. In planting for market it is generally conceded that one should plant only the very early and winter varieties, leaving the time between to be supplied by natives and those sent in from abroad.

The total number of plates of apples exhibited at our exhibition was 460—Pears, nine; Plums, eighteen; Grapes, forty-five, and Crab apples, forty-five. The two first prizes on apples were taken by the Messrs. McCallum of St. Thomas, in the Western part of the County, and Mr. Pattison, of Clarenceville, took first in grapes, whose collection had already taken first prizes in Montreal and Abbotsford. Grape vines are being planted by farmers pretty generally through the Townships and any hints on their care will be a real good. Pears and Plums were in small numbers, the season not seeming to have been propitious.

The Floral and vegetable departments were filled to repletion, and were duly admired by the numbers of spectators present.

GRAPE CULTURE.

CLARENCEVILLE, DEC., 7th, 1881.

TO R. W. SHEPHERD, JR., *Report Committee Montreal Horticultural Society and Fruit Growers' Association of Quebec.*

DEAR SIR,—I have long intended to give you those promised "notes" of last season's experience with the new grapes fruited by me. The most prominent in my mind as possessing special merit for earliness, productiveness, and fine fruit, is the *Worden*, a seedling of Concord brought out by Mr. Worden, of Minetta, New York. I have fruited it for two years, and find it better in many respects than its parent, and much earlier, promising to be as productive and hardy and larger and better in flavor. Planted alongside of Moore's Early I can see but little difference in its time of ripening. *Telegraph*, though not a very new variety, claims, I think, more attention than has been given to it. It is as large in berry as the preceding, ripens early, and has a very compact and handsome cluster. *Black-Eagle*, one of the late Dr. Underhill's productions, gives much promise for favorable localities in this Province, ripens about with Concord, a little later perhaps, and is a grape of superior flavor. *Burnett*, No. 19 of P. C. Dempsey's Hybrids, ripens earlier than the latter, and when fully ripe, or a little past, has a fine flavor, and the berry is very large. I consider it a Canadian triumph. *Whitehall* was sent me, in request for early new grapes, by Mr. Campbell, of Ohio, who is pronounced the best western authority on this fruit. It is a medium-sized berry, ripening very early, and it may on further acquaintance be found very desirable, as the flavor is good. *Belvidere* from same quarter is a little later, very productive, in some respects resembling *Creveling*, no better. As the *Talman* was said to be "confused" with the *Champion*, I, from curiosity, obtained it from its original state, Ohio, and if not true to name, Mr. Campbell is responsible. Alongside of *Champion*, and the so called *Beaconsfield*, I found it several days later and better in quality, keeping in eatable condition long after these varieties were worthless. The *Champion*, bought of J. S. Stone, of Charlotte, N.Y., the proprietor and intro-

ducer of it, and the Beaconsfield, bought of Menzies and Gallagher, of Point Claire, prove identical in ever respect.

Mr. Arnold's black grapes, crosses of Clinton with Black St. Peter and Black Hamburg, *Brant*, *Canada* and *Othello* were allowed to overbear; those I had on exhibition were small and not matured; their flavor is not developed till after frost. *Brant*, the earliest, may be worthy of culture with us, as it is excellent for table or wine. To conclude, the black grapes of Mr. Burr's new Kansas grape, "*Early Visitor*," deserve notice. Prof. Husmann, of Missouri, advised me to try it, and the vines showed great vigor. It has been placed in the market this fall and has the endorsement of prominent authorities as the earliest grape known, and the best of its class, the *Labrusca*.

As to red grapes the *Brighton* is early, hardy, vigorous, and good. *Lindley*, No. 9 of Roger's Hybrids, is a favorite with me, a rampant grower, splendid bunch and berry, has to be restricted in bearing. *Agawam*, another favorite, for its aromatic flavor, has but one fault—imperfect bunches. *Salem* is very desirable and, particularly, as a long keeper.

Northern Muscadine is the earliest red grape I have, and does not drop from the bunch as in some localities.

In grapes, *Lady*, the earliest, bore for the first time, though planted three years, and was satisfactory except a slight tendency to crack. *Eva*, one of Miller's successes, promises well, is vigorous, and superior in quality to *Martha*, its parent, and I believe will succeed generally in the Province; it ripens with Delaware. *Elvira* is a strong grower, healthy foliage; *Martha*, though springing from Concord, when young makes a slow growth; of the two latter I will defer an opinion until after another year's trial. *Autuchon*, Arnold's No. 5 Clinton, crossed with Golden Chasselas, small berry, but a long tapering bunch, fine quality, the foliage of this and all Mr. Arnold's Hybrids the Thrip shows a preference for. *Allen's Hybrid*, so fine with me last year, was reduced in size beyond recognition by the ravages of this destructive insect. Mr. Caywood's *Duchess*, and Mr. Rickett's *Lady Washington*, both made a strong growth and the foliage was very healthy. These and the *Prentiss* may appear in my exhibit next year.

Professor Husmann's last work on grape-growing should be in the hands of every grape raiser, but I must caution them about his opinion, from a Southern point of view, in reference, on page 53, to many varieties which he condemns, that we cannot at present afford to drop from our fruit list. Agawam, Allen's Hybrid, Diana, Croton, Diana Hamburg, Northern Muscadine, Rebecca, and Hartford, he pronounces "worthless"; and they perhaps have been superseded in the South by many better varieties we cannot grow North.

Though I find by experience it is best to be somewhat conservative as to systems of training the vine, and try new systems cautiously, I am giving trial to the Kniffin system now being introduced on the Hudson, and in New Jersey. The trellis is of two wires, the lowest three and a half feet from the ground, the upper six feet. The vine has but one stalk tied perpendicularly to both wires, arms are allowed to grow along each wire, right and left, and all other shoots on main stalk are brushed off as they appear. In fall, these arms are cut back to five or six buds for fruiting next year, and the following year the new shoots that will start from the buds at the base of the present fruiting arms, laterals are allowed to grow to end of trellis, only clipping off ends of laterals that may grow too rampant, after fruiting and at fall, pruning the present season's wood that bore is to be cut clean away to stalk: at the same time cut back present year's growth of arms to five to six buds as before. The system is claimed to require very little attention and was highly recommended to me by Mr. Williams, secretary of the New Jersey Horticultural Society at the last session of the American Pomological Society in Boston. The only doubt I have is, that in time the stalk will become too rigid to lay down for winter protection; if so, will not remove vine from trellis but bind over the arms and tie matting around the whole.

W. MEAD PATTISON.

THE RASPBERRY.

BY ANNIE L. JACK.

“What Raspberries do you recommend for the Province of Quebec?” This was one of the questions recently asked by the Editor of the *Rural New Yorker*, and my answer was “Brinkle's Orange, Clarke, and Cuthbert.”

I know the first named is supposed to be tender, but with a little protection, and the usual winter of snow, has proved as hardy as any other in our garden, where it has fruited for twenty-three years, always luscious, always salable, and satisfactory, in growth and fruit. The Clarke with the same treatment produces strong canes, and a long season of its fruit often giving us the first dish July 1st, and the last after the grapes are ripe. This lateness of fruiting is a regular occurrence, and cannot be set down to the mildness or wetness of a season; cannot be simply a “sport.”

The Cuthbert, has fruited with us for the last two seasons. It is large—firm and a good market berry, but of a sweetness that fades away into insipidity. The first time the fruit was tested among us, we exclaimed, “Oh what a firm, sweet berry,” but after going back to the Clarkes in the next rows, the verdict was unanimous that our old favorite was still “best” for quality, though the Cuthbert hardy and productive and a decided acquisition. Our Raspberries were planted in rows eight feet apart, and for several years could be cultivated. But the canes grew and spread rapidly, and for the past two years we have contented ourselves with mulching the ground with swamp hay and buckwheat straw. But this is an untidy proceeding and will end in the demoralizing of the plot altogether, I have no doubt.

After the Raspberry has done fruiting, the old canes are cut out, and before the leaves fall, a boy with an old sickle goes along the rows, shortening the canes to allow the wood to ripen. After

trying wire as a trellis we have found it to "*sag*" badly and now tie with rough bark to cedar posts at convenient distances.

The market for Raspberries is better than for Strawberries in a season when the latter are a full crop, and they can be grown with less expense of labor.

And although enormous quantities of wild fruit are brought into the city, it does not interfere with the sale of cultivated varieties, which are more sought after than ever as the public taste becomes better acquainted with their excellence.



THE CULTIVATION OF HOLLAND BULBS.

BY ANNIE L. JACK.

The first flowers of Spring seem too little known in the gardens of this country, unless it may be in some of the city gardens out of reach of general observation. In England, every small plot must have its Snowdrops, its Crocuses and Tulips, with the Daffodil and other hardy Bulbs, and how they linger in the memory of those whose eyes first saw the light where such flowers bloom in rich perfection !

As I have noticed so often the want of these flowers, and been asked frequently regarding their culture, I will just answer the questions here. The best time to plant is in late September; these will blossom first, then in October put in a few more Hyacinths that will be as much later in flowering. Tulips require to be planted about three inches deep, Hyacinths four, Snowdrops and Crocuses two inches, and larger Bulbs in proportion. The custom of planting in masses for the smaller Bulbs, and in lines for the larger, giving strict attention to harmony of color, cannot fail to please the eye. During the winter Holland Bulbs give satisfaction where many other flowers fail, and especially in city houses where gas and coal do so much to injure delicate plants; while they sometimes succeed grown in water, it is safe to plant in earth, and I know from experience that a box of these Bulbs can become a "thing of beauty" from December until March. A few Roman Hyacinths will bloom for the holidays, and the rest in succession. After planting in the box or pot in autumn, they must be placed in a cool dark cellar and sparingly watered to retard growth until the roots have developed. In about six weeks they may be brought to the light and allowed to grow gradually at first.

The Bulbs can now be procured at such reasonable rates, that it is a pity all flower lovers do not enjoy their exceptional beauty. All except the Hyacinth continue for years to bloom where planted, but *its* best bloom is seen in the first season.

REPORT OF THE JUDGES ON GREEN-HOUSES,
WINDOW GARDENS, &c.

Notwithstanding the reluctance shown by most persons to learn their own faults, or have them known, every one is willing to discover the failings of his friends, and this is exactly the case with Floriculturists. It, therefore, becomes a difficult task to be a judge and to please every one.

With these few opening remarks, I would respectfully suggest a few changes for next year's competition, which, I hope, will make the work of the judges more satisfactory.

The two first points of excellence—cleanliness and evidence of attention—being synonymous, would it not be well to substitute variety? The points would then be evidence of attention (which would embrace cleanliness), variety and bloom.

It is to be regretted that only three entries were made in this class, as private green-houses are now numerous in this city, and as only one visit is made, it surely would not inconvenience the exhibitor.

With reference to the judges, would it not be advisable to divide or have two sets on visiting days? The tour of inspection would be made much quicker and cost no more, while the judges would be able to more fully retain in their minds the merits of each place visited.

GREEN-HOUSES.

1st Prize.—The green-house of Mr. Mackenzie is deserving of all praise for all three points. The only want to be seen being a deficiency of plants suitable for cut and bloom.

Was awarded.

2nd Prize.—Dr. Barnes' shows great evidence of attention, but comes short in bloom.

Was awarded.

3rd Prize.—Mr. T. Comte's plants are without doubt the best grown, but show a lack of attention.

Was awarded.

WINDOW GARDENS.

1st Prize.—In this class Miss McCord carries off the palm and deserves great credit; the show of Hyacinths, Crocuses and Tulips could not be better if grown in a green-house. The one deficiency being variety of plants in bloom.

Was awarded.

2nd Prize.—Mrs. J. W. Maxwell takes second place, and would have taken first had she followed Miss McCord's footsteps in growing bulbous plants; her Geraniums and Fuchsias and other plants were well grown, but deficient in bloom.

Was awarded.

3rd Prize.—Mr. J. Stephenson.

Was awarded.

4th Prize.—Mr. Campbell.

Was awarded.

WARDIAN CASES.

The collection of Ferns contained in the Wardian Cases visited, and all fall short of what they should be for competition. Their cultivation and also their generic and specific distinctions have not received the attention necessary for success. I would recommend the competitors in this class to visit Mr. J. Brown's collection, who, I am sure, would and could give them all necessary information on the subject.

The introduction of Hyacinths, Tulips, Crocuses and plants of other species into the Wardian Cases is to be discouraged. It may look very attractive, but could not be considered as a point of excellence.

Mrs. Rathwell,	-	-	-	-	13 pts.
F. McNab,	-	-	-	-	12 "
J. B. Goode,	-	-	-	-	11 "
W. Young,	-	-	-	-	0 "

H. M. GAULT'S, ESQ., PRIZE.

It is to be regretted that Mr. Gault's liberal offer only secured three entries. There must have been some misunderstanding on

the part of the mechanics as we expected at least a dozen competitors.

		Class.	Evid. atten.	Bloom.
17 pts.	J. W. Johnson,	6	6	5
12 "	J. Hanna,	5	6	1
14 "	P. Rodden,	6	6	2

A. F. DUNLOP,
Architect.

Feb. 28th, 1882.



JOINT REPORT OF THE FRUIT GROWER'S ASSOCIATIONS OF ABBOTTSFORD AND COUNTY OF SHEFFORD.

N. COTTON FISK	- -	President, F. G. A. Abbotsford.
CHARLES GIBB,	- -	Sec.-Treas. " " " " "
WILLIAM NIXON,	- -	Vice-President " Co. Shefford
DAVID GREEN, M. D		Sec.-Treas. " " " "

The year 1881 witnessed the first organization of a Fruit Growers' Association in the County of Shefford. Seven years ago Abbotsford, acting the part of a pioneer, formed the first Fruit Growers' Association in the Province of Quebec. Missisquoi, Brome, L'Islet and St. Francis, each in the order named, imitated the example so wisely and well set them by the fruit-growers' of Abbotsford. Shefford, though a little late in the field, fired with a spirit of emulation, and not wishing to be left behind in this age of progress, has at length made a move to develop her horticultural resources. The numerous roll of membership, and the magnificent display at her first exhibition last autumn, gave proof that she is not to be the least in the arena of honorable competition. It may not be generally known, yet the fact remains that Shefford is the parent of Abbotsford in the matter of fruit-raising. Seventy years ago the late Col. O'Dwyer visited the old Spaulding Orchard on Shefford Mountain, owned some few years since by the late Mr. Joseph Gibbon, and procured therefrom three grafted trees, "a Late Strawberry (now known to be the 'Foundling,') a Blue Pearmain, and a Flat Graft, the last named being probably a local name for a fruit which once proved very profitable." These grafted trees Col. O'Dwyer planted at Abbotsford, and formed the nucleus or starting-point of the extensive nurseries and orchards, which at the present day beautify and utilize the slopes of the lovely Yamaska Mountain.

There being a sort of blood-relationship between Abbotsford and Shefford, it was but natural that it should manifest itself in

some telling manner, and accordingly the Directors of both the Associations resolved to hold a joint Exhibition, having first obtained the assent of the Council of Agriculture. Parent and child—the parent in the feebleness of her infancy, the child in the vigor of a well developed womanhood, (somewhat of an anomaly we admit,) held in the Town hall, Granby, 27th and 28th September last, one of the most extensive and creditable displays of horticultural products, that had ever been brought together in the Province outside the cities. We must bear in mind the Scripture admonition—“ Let another man praise thee, not thine own mouth ; a stranger, and not thine own lips,” and remember that boastfulness and brag are likely to become, in the eyes of some, conceit and offence.

However, Dr. Hurlburt, one of the founders, if not the founder, of the Fruit Growers' Association of Ontario, an enthusiastic pomologist, and one who has had opportunity of visiting the principal fruit exhibitions in this country, in the United States, Great Britain, and on the continent of Europe, was pleased to say that the apples exhibited in Granby were amongst the best if not *the best* he had ever seen. But to particularize, we had 577 plates of apples on the tables, of which eighty-two were crabs and hybrids. There were nine sections devoted to “ single plates,” embracing, Fameuse, Late Strawberry, Golden Russet, Blue Pearmain, Canada Baldwin, St. Lawrence, Alexander, Duchess and Red Astrachan. In these sections the competition was very active ; in Fameuse alone there were twenty-six competitors, and taking the nine sections collectively the entries averaged sixteen in each. In collections—grafted and seeding,—there were twenty-two entries ; some of the exhibitors in the former class displaying upon these plates from thirty-five to forty named varieties.

In grapes we had seventy-two varieties of out-door and two of vinery grapes. The out-door class was made up of twenty-five varieties of white, nineteen of red, and twenty-eight of black grapes, which displayed their luscious clusters upon 140 plates. At a Fruit meeting held in Granby, on the evening of the 30th September, all these varieties were tasted and tested.

Our vegetable exhibit was very creditable, comprising 188

entries, and the interest manifested by our farmers in this department was wide-spread and praiseworthy.

The first prize, for the best collection of Potatoes, was awarded to Mr. E. Longley, of Waterloo, who showed fourteen named varieties of the newest and most choice tubers.

In the department of Pot Plants and Flowers, the number of entries was not so large as either in Fruits or Vegetables, not owing to a lack of a taste for Floriculture (Flora has her devotion here as well as Pomona), but the late date at which our exhibition was held, so as to prevent clashing with the Provincial Show in Montreal, and the Agricultural shows in the adjoining counties, together with the advent of rains and early frosts, excluded a goodly number from entering the field of competition. Notwithstanding these drawbacks, we had seventy-five entries, and we have no doubt but that the competition, in this department, at the next fall exhibition, will be more keen and extended.

Associations, such as ours, deserve to have the fostering hand of a paternal government extended to them—*not empty*. We stand in need of help mainly, during the first years of our organization; a few exhibitions of horticultural products will awaken the attention and interest of the farmer, will enlist not merely his sympathies, but his most substantial aid in furtherance of the cause of fruit culture, and compelling the "Earth to yield her increase, for his profit as well as pleasure, his aspirations will be directed to the Giver of it all—the First Gardener."

Annual Reports evince a growing interest on the subject of Horticulture, they give a wider knowledge of what sister associations are doing, they are calculated to correct errors and remedy imperfections, and by interchange of thought and generous criticism mark out the road to greater excellence.

GRAPE MEETING.

Notes by C. Gibb, Abbotsford

Two days after the Joint Exhibition of the Shefford and Abbotsford Association, a meeting was held in the council room at Granby, to test and taste the varieties of grapes so temptingly displayed during the Exhibition. Seventy-two varieties of out-door and two varieties of vinery grapes were submitted. The out-door sorts were made up of twenty-five white, nineteen red and twenty-eight black. These different varieties were classified as follows:—

1st.—Those of Northern Fox Grapes, species of which Champion, Hartford, Concord, Moore's Early, Martha, Eva, Niagara, Pocklington and many others were shown as samples. Grapes whose skin is thick and season short; if not fully ripe, acid and very pulpy; if over ripe, foxy and apt to drop from the bunch; a hardy species, thick-leaved and adapted to the north.

Such are the general characteristics of the species, but with a good deal of variation; for instance, that wild foxy flavor so strong in the Champion, Perkins and Northern Muscadine becomes subdued into a more refined muskiness in Worden and Niagara. Though the Hartford and N. Muscadine drop badly from the bunch, especially on the least approach of frost, others hold on pretty well and even stand carriage to distant markets; the thickness of skin, which reaches its maximum in Champion, reaches, perhaps, its minimum in the Pocklington, and yet it is thick-skinned compared with others in other classes. In the Champion we have that extreme earliness which makes it valuable for unfavorable localities, while the Concord is too late, except for the most favorable. Yet, let us not close our eyes to the uses the Concord has been to us indirectly. It is the grape that started the great grape industry in the States to the south of us, that caused what little grape fever we have here, and must be held in grateful memory for its offspring, Martha, Eva, Pocklington, Lady Washington, Cottage, Worden, Duchess, Niagara, Brighton, Jefferson. "Had

it not been, neither would they have been." To Mr. E. W. Bull, of Concord, Mass., are we indebted for those years of patient labor which resulted in the Concord, and in a certain degree are we indebted to him for those of its progeny, which shall be the favorite grapes of the near and distant future. It is said that, after Mr. Bull produced the Concord, he raised 2,000 seedlings before he found one holding points of superiority. Mr. E. S. Rogers, of Salem, Mass., then launched out into an almost unexplored field, when attempting to hybridize the Native Fox with the European Grape, and we all know with what results; and it must be gratifying to him to see that that work is so ably carried on. Mr. Jas. H. Ricketts, of Newburg, N.Y., sends us nine of his hybrids as a sample of the results of *his* labors. Mr. A. J. Caywood, of Marlborough, N.Y., Duchess and Red Poughkeepsie, and we know not what else is forthcoming. J. B. Moore, of Concord, Mass., who has produced the Moore's Early, a hardy early grape of great promise here, has also spent many years of patient labor; neither should we forget our Ontario Hybridists, P. C. Dempsey, of Albury, and Chas. Arnold, of Paris, whose hybrids were also upon the tables; and yet none of these men make money, or rather they do, if filling other men's pockets is *making* it, but they do not draw it out of other pockets into theirs. It is better work than that usually paid for in this world, and probably more refreshing than work for self.

2nd.—What appears to be a southern species of the same fox (Labrusca) grape, of which Catawba, Adirondac, Iona, Isabella, &c., are examples, bearing berries of thinner skin, with little or imperceptible pulp, richer flavor, and without strong foxiness, adhering well to the bunch and often producing good keeping and shipping grapes.

In this class we have even greater variety than among the Northern Labrusca group. *Whitehall* we have placed in this class, merely on account of its Adirondac character. Its quality is really good, and it is said to be very early. *Rochester* and *Monroe*, two seedlings of Ellwanger and Barry, we were very much pleased with. The former is the richer in flavor, and it ripens, Messrs E. and B. tell us, quite as early as Delaware, and it would

appear so. Monroe is not so rich in flavor, yet its entire freedom from pulp and its extreme earliness make it valuable. Both of these grapes, however, seem of rather short season. *Red Poughkeepsie*, a seedling of Mr. Caywood's, from Iona and Delaware, is a luscious early little grape of Delaware type, which we fell in love with last year. We wish that plants of it were procurable. *Prentiss* is a really good white grape, but, as it ripens with Concord, its area of cultivation here is limited. It was kindly given to us at Boston, by Mr. T. S. Hubbard, of Fredonia, N. Y. There is a query in regard to its origin that should be thoroughly ventilated, for there seems strong evidence of it being a seedling of Rebecca, produced by Mr. Caywood, but never yet sold by him. *Vergennes* and *Vermont* are grapes very much alike. Those on our tables were picked for the Exhibition at Montreal, in September, and were not ripe enough to judge their flavor. I fear *Vergennes* does not ripen as early as it is said, viz, with Hartford. *Jefferson* is one of Mr. Rickett's, from Concord and Iona, a cross between the Northern and Southern Labrusca, a red grape much like Iona, and ripens with Concord. The samples upon exhibition were not fully ripe. Mr. Downing holds a very high opinion of this grape.

3rd.—The Frost grape family, allied to our own wild vines, which sweeten after frosts, seedlings of Clinton, and Taylor of which Bacchus and Elvira were shown. The *Bacchus* is one of Mr. Rickett's. It is enormously productive and a rampant grower, and valuable for wine and table, if our season is long enough for it. Elvira is later than Concord, too late.

4th.—Hybrids between the Fox grapes and European, including Roger's Hybrids, Downing, Corton, and Dempsey's seedlings, the Burnet and others, together with the offspring of these Hybrids as Lady Washington and Brighton. Here we find still greater improvement in the quality and size of the fruit, but greater valuable-ness in the hardness of the vine.

Allen's Hybrid, the first true Hybrid produced in this country, has the delicate constitution and thin leaf of the European vine. Its union with Concord produces the Lady Washington, whose leaf is about as thick as an average Labrusca.

Roger's Hybrids are well known. Of the red, *Massasoit*

Lindley and *Agawam* are highly prized, they are rich, luscious grapes, which with fair care, and in moderately good situation, yield good crops. Of the black, *Wilder* is the best known, but we expect *Herbert* and *Essex* to be equal favorites before long. *Barry*, *Regua* and *Merrimac* seem a little later, and, therefore, less valuable here. These numerous Hybrids we know well from the former exhibits made by Mr. J. W. Bailey, of Plattsburg, N.Y.

Mr. Dempsey's seedlings are from the Hartford, fertilized by Black Hamburg, and many of them, strange to say, are white. That marked No. 25 was sweet and rich, and ripe. I fear there is some mistake here, as this grape is quite a late one. It is of No. 60 that the Ontario Fruit Committee has said, "of sweet foreign flavor, and earlier than Delaware."

Burnet is a large, very peculiar, yet rich luscious grape, I fear a little variable in quality, and yet it seems variable in time of ripening. Dempsey No. 4, also black, has a flavor much like *Burnet*. *Downing*, produced by Mr. Ricketts, from *Israella* and *Muscat*, Hamburg, is a remarkable grape. It has an unusually long bunch, and large oblong berries which hold on well to the bunch. It is thin in skin, juicy, free from foxiness, and without pulp. We doubt if Mr. Ricketts would have given it its present name if he had not valued it highly. It probably ripens about with *Concord*.

Next we come to crosses between these Hybrids and *Labrusca* grape. *Brighton*, (from *Concord*, by *Diana*, Hamburg, this last from *Diana*, by *Black*, Hamburg,) is a rich, high quality grape which ripens as early as *Delaware*, and well worthy of trial. Its leafage in the States is sometimes subject to mildew, but our uplands are comparatively free from this trouble.

Duchess, originated by Mr. Caywood, is from a white seedling of *Concord*, fertilized by *Delaware* or *Walter*; the white *Concord* seedling, from *Concord* and *Montgomery*, the later a native grape of European parentage. It is rather small, but it is a thin-skinned, sweet luscious grape of the finest quality. It ripens with *Concord*, a little late, yet it has this valuable quality that, if picked a week before ripe, it still becomes sweet and good. Full detailed

description of these white and red grapes are given in the report of the Abbottsford Fruit Growers' Association for 1880.

Lady Washington is a magnificent grape. The bunch is very large and the berry shows the fine breeding of its Allen's Hybrid parentage. The bunches given to us by Mr. Ricketts, were picked for the meeting of the American Pomological Society, on 13th September and were not quite ripe, yet we could easily discern its high quality. It ripens with Concord, but is well worthy of a warm corner.

5th.—Hybrids between the Frost grape and the European, including many of Mr. Ricketts' productions—*Naomi*, *Empire State*, and *Waverley*; also, *Arnold's Brant*, *Autuchon*, *Canada*, and *Othello*.

Empire State is a seedling of Hartford, fertilized by Clinton. The bunches must have been nearly ten inches long, very narrow and with a long narrow shoulder; the berry is largish, greenish white; skin medium in thickness, sweet and rich, with some muskiness and very little pulp. Mr. Ricketts says it fruited for the first time in 1879, and bore thirty-eight bunches; and in 1880, forty-bunches, of which eight ripened with Hartford Prolific. It certainly is a very early grape and well worthy of trial.

Naomi, from Clinton by one of the Muscats, is a medium-sized green grape, which Mr. Downing thinks very favorably of. It was not ripe enough to fairly judge its flavor. Of Mr. Arnold's seedlings, *Brant* is perhaps the most promising. It seems earlier than *Canada* or *Othello*. *Autuchon* seems moderately early and is of fine quality.

Mr. Ricketts' *Dunlap* we must mention somewhere, though we do not know its parentage. It is a red, thin-skinned, sweet, rich flavored grape, which ripens early and is well worthy in trying.

6th and lastly.—Certain varieties of European grapes which have been doing well in certain localities, in spite of their small thin leaves and delicacy of constitution. We do not recommend them. The European grape in the Eastern and Middle States, ever since its first trial in 1630, has been little else than a failure for open vineyard culture. Amid thousands of recorded failures not one durable success. Still there are places here, where some

of these grapes have done so well, and for so many years, that they are worthy of notice.

St. Sulpice (so called) is a fair sized grape of good quality and one of the earliest. It has been grown for many years in the garden of the Seminary of St. Sulpice in Montreal. Another, red, sweet, medium-sized grape grown there is worth bearing in mind. *Bonne dame de Vignala*, imported by the College de Montreal from Italy, is also a good grape, and ripens, I should think, with Sweetwater, or soon after, probably a little earlier than the Chasselas de Fontainbleau. These grapes are all thin in skin, entirely free from pulp, and sweet, usually rich, but the foliage is apt to be destroyed by thrip; in unfavorable localities subject to mildew, and they would fall an easy prey to the phylloxera should it appear.

This meeting like that held in Montreal after the close of the Montreal Horticultural Society's Exhibition was most enjoyable and instructive, and while we express our thanks to Mr. Pattison and others for their collections of grapes, yet we must remember that this success is not owing to our little labor in planting or gathering, but is the result of the long patient labors of Messrs. Bull, Rogers, Rickets, Caywood, Moore, Arnold and Dempsey who have produced the grapes we so enjoy.



ANNUAL REPORT OF THE FRUIT GROWERS' ASSOCIATION,
BROME COUNTY, FOR THE YEAR 1881.

The officers of this Society now present to the general annual meeting, the second annual report prepared under the rules and regulations issued by the Council of Agriculture for the Province of Quebec.

At the last annual meeting held the 11th January, 1881, the officers for the past years were duly elected and instructed to prepare a prize list and make arrangements for the holding of the the annual exhibition and to exert themselves in other ways calculated to advance the interest of fruit culture in this county.

At a meeting of the officers held on the said 11th day of January, 1881, immediately after their election, the accompanying prize list for the annual exhibition was prepared, the noteworthy feature connected with these being the prizes offered for general competition, an inducement held out by which we hoped to obtain specimens of what our older sister societies in their several counties had accomplished.

We have also the pleasant duty of alluding to the receipt of a number of works on Horticulture and Fruit Raising sent us by the Secretary of the Montreal Horticultural Society.

These works have been kept in the secretary's hands, accessible to all members either for reference or, subject to reasonable restrictions, to be taken to their home for perusal. We trust that this nucleus of a Library may be added to and would suggest that any surplus funds might be applied to this object.

The annual exhibition was again held in connection with that of the Agricultural Society of this county, in the buildings of the Knowlton Park Association on the 14th and 15th September last. Notwithstanding that, in consequence of overcrowding of last year, we had greatly increased the accommodation, we were again in want of space, from which may be judged the great increase in the intent of the show.

There was however a marked change, inasmuch as while last

year there were but few apples and a fair display of vegetables, this year the show of vegetables was small and inferior with few exceptions, but the apples surprised every one by their number and excellence.

The show of flowers and plants was much more extensive and finer, especially the floral designs and general collections of plants in pots.

No doubt the inferiority of the vegetables was mainly owing to the bad season, it being a subject of universal remark that the gardens through the county were not looking well all last summer. The improvement in the show of apples is chiefly due to the larger number of members, exhibitors, and to the interest awakened in the subject by holding of the exhibitions, thus plainly illustrating the advantages derived from these exhibitions and societies.

It was, however, a subject of universal regret that none of the neighboring societies were induced to send collections from outside our county, which, no doubt, was due in great part to the press of other exhibitions, county and provincial, about the same date.

The officers, in conclusion, wish to call attention to other methods of encouraging fruit raising, such as meetings during the winter for reading and discussion, prizes for gardens and growing crops of fruits and tree planting, etc., and to urge some steps in that direction on the society; the annual exhibition being only one of the objects inculcated by the Council of Agriculture in its Rules and Regulations under which we have our being.

The whole respectfully submitted,

(Signed)

S. A. FISHER, President,

J. M. LEFEBVRE, Sec.-Treas.

Knowlton, January 10, 1882.

COUNTY OF L'ISLET HORTICULTURAL SOCIETY.

The annual meeting of the members of this Society was held at St. Jean, Port Joli, Tuesday the 17th January, 1882, Dr. S. Roy in the chair.

The Secretary, P. G. Verreault, Esq, read the transactions of the Society for the past year. His report was adopted.

The Directors elected were Rev. J. Lagneux, President; Dr. S. Roy, Esq., Vice-President; Thos. Pouliot, Esq., Eug. Casgrain, Esq., MM. Louis Lapointe, Arthur Talbot, L Proteau; P. G Ven-eault, Esq., Secretary-Treasurer; A. Dupuis, Corresponding Secretary.

The very interesting subject of "Fruit Culture, and the Best Means of Making it Profitable," was pertinently discussed, and the conclusion arrived at is: that the Society should encourage the propagation and dissemination of the apple trees (seedlings) which have resisted our severe climate for over a century, and which bear, still, good crops of apples. Dr. S. Roy said that he saw in Mr. Pelletier's orchard at St. Jean, Port Joli, a grand old apple tree (over 100 years of age) whose branches, covering a large area of ground, once bore forty bushels of apples yearly, and bearing last summer a few barrels. He advises the propagation of such hardy, productive trees. But till these promising seedlings are disseminated, the five most profitable apples in this county, according to the reports obtained by the Committee on Fruits are:—Fameuse, White W. Calville (of L'Islet), Duchess, St. Lawrence, Grise; in crabs, Transcendant. It is the opinion of some members that this choice shall be modified when the young orchards of King's, R. Russets, Baldwin, N. Spy, Ben. Davis, Ontario, Swaysie, Canada Red, &c., come into bearing

The meeting heard with interest the report of one of the directors, who was specially sent to the exhibition of fruits held last fall by the Montreal Horticultural Society. Having informed the meeting that in the vicinity of Montreal and in exposed situations in the Eastern Townships, some varieties of apples, not tried here,

have proved very profitable, by the hardiness of the trees and their great productiveness, it was unanimously resolved that: "Considering that the testing in this country of hardy varieties of apple trees, and especially those recommended by Charles Gibb, Esq., of Abbotsford, may prove beneficial to fruit growers; that the secretary is authorized to purchase 200 or 300 apple trees (4 to 5 feet) from the nurseryman who offered them to the Society at exceptionally low rates. Each member who shall pay \$1.50 into the hands of P. G. Verreault, secretary, before the 1st of March next, shall be entitled to twelve plants of apple trees, to be delivered May next."

The Society having still a balance of 200 apple trees (on the thousand offered to the Eastern Counties of the Province) it was proposed and unanimously adopted that these 200 apple trees should be given as prizes at the next exhibition for encouraging the grafting and planting of fruit trees.

The Directors see with pleasure that plums grown here commonly called damson and imperial, blue and yellow Orleans for over a century, are attracting the attention of nursery-men and fruit growers in different parts of Canada and the United States. The hardiness of the trees, and their productiveness, their facility of propagation by the suckers, and the delicious aroma of the fruits, contribute to put them at the head of the list of profitable trees for general culture, as they thrive on nearly all soils and expositions.

Letters received by the Secretary, from several prominent citizens of Canada and United States, asking for young plum trees were read; some of the members expressed their desire of exchanging plum trees for other plants, such as hardy apple trees, and invite correspondence on the subject.

The essay on "Forest Tree Planting," by Hon. H. G. Joly, was read by the members of the Society with much interest and the success of Mr. Joly's plantation of black walnuts has induced some of the members to plant a large quantity of seedlings of this most valuable and beautiful forest tree. The plants had a fine appearance last fall, and if they resist the extreme cold of this winter, the severest for many years, hopes may be entertained of

the possibility of acclimatizing the black walnut in this county to further east.

The Society's exhibitions of fruits, flowers and vegetables have accomplished much good already, bringing hundreds of people into personal contact with good fruit: they have given a sensible impulse to fruit-tree planting: they help the planter in the selection of the varieties most suitable to the soil and climate.

Orchards heretofore neglected, receive more careful attention from the hands of their owners. Thousands of plum seedlings which were left growing thickly under their parent trees, sucking their life, are now removed and planted to form new orchards. Good seeding apples are exhibited, their good points are noted, and if really valuable, inducements are given for their propagation.

A very good method was used at the last exhibition by one of the members, which ought to be followed in future. His large collection of apples, plums and grapes was well labelled, each variety had its name, quality of the fruit, time of ripening, origin, strength and hardiness of the tree, its productiveness and age of bearing. Such descriptions are interesting and instructive.

In flower culture a manifest improvement has taken place; the last flower show proves it; the flowers were choice and arranged with extremely good taste. In vegetables, new and valuable varieties have been introduced and exhibited. These are the good results obtained by the annual exhibition.

The distribution of suitable trees by the Society is also one of the best methods for the advancement of fruit culture. The Rev. R. Burnet, President of the Fruit Growers' Association of Ontario, writes:

"Of all the efforts for the dissemination of a taste for horticulture, we question if any can compare in beneficial effects to the distribution of suitable plants and trees throughout the length and breadth of Ontario. It was a happy thought that originated this method for the advancement of fruit culture. It has wrought wonders among our fruit growers. The increased vitality among our members was not the least benefit. The roll of membership suddenly rose from hundreds to thousands, and men who had been chary or indifferent in having anything to do with the Association,

felt it at once to be their duty to join its ranks. Varying success may have attended the advance of the Society since, but it never has altogether lost the impetus for good which it then received. It brought our Association into more prominent notice than it had heretofore received. The remotest counties and districts furnished names to the membership, and increased interest and benefit were the result. But this was not all. Increased interest in fruit-growing was a consequence. At first, the Society was, perhaps, singularly fortunate in their choice of trees for dissemination.

Provincially, our tree distribution has had a good result. It has constituted the length and breadth of our fair Province an experimented garden or farm. Instead of a limitation to the good in a small, and perhaps uncentral locality, in the trial of a plant's adaptation to our soil and climate, here is a provincial test—in every way worthy of the broad and enlightened views of our fruit growers. It is most remarkable that good reports reach us from every quarter of the most unvarying success of our plants. Thus—although the limits be most divergent—here we have reports from Elgin and Kent, as well as from Simcoe and Ottawa, each giving no uncertain sound, that where the plants grew from the first planting, there they have succeeded beyond all expectation. The future of this initial success it would be hard to portray, when every farmer throughout the land only cultivates the best and choicest fruits, when every orchard shall be a sample orchard, when only good fruits shall be sold in our markets, when a general taste for good fruit is diffused—who will be able to make a correct estimate of the benefits accruing from our dissemination of the best fruits?

“In speaking of the almost uniform success that has attended the distribution of trees by the Association, and the happy results to fruit-growers and others, it would be unpardonable not to notice the real source and strength of our efforts in this direction. It is the governmental aid that enables us to make such efforts as we are doing for the good of the fruit interests of our country. Surely it is a wise provision of our Legislative Assembly. It has often occurred to us, that seeing the wonderful amount of good being accomplished by the Fruit Growers' Association, of Ontario, that

the grant is not increased. Surely double the amount would not be considered too large a sum by the politicians at the helm of affairs for the advancement of such an important interest as that of the Association clearly is. What is the Society doing for an increase of the grant?

"It may be possible that our Society is languishing for the want of a vehicle to convey its doings and its efforts to an appreciative public. In these days of reading and publishing, the society that overlooks the assistance to be obtained from the use of the fourth estate, will soon fall in public favor however beneficent its aims may be.

"Let the members of the Association plead with their representatives in the Legislative Assembly to urge the claims of our Society, and as the great lever to accomplish their purpose, let them point to the profitable and truly admirable individual and provincial results that have accrued from the distribution of plants and trees by the Society. Success demands consideration. Means are wanted to render the Society a still greater and greater success. Economically administered, the funds are fairly spent for the advantage of the whole constituency of our province. Greater means, and thereby increasing responsibility, would meet with greater consideration and more marked success."

The County of L'Islet Horticultural Society, understanding the immense good done in Ontario by the Fruit Growers' Association, has followed the same method, and trees to the amount of \$225 were distributed in 1880 and 1881 by the Society, but instead of being done by Government aid, the trees were a gift of one of the members, whilst the Government grants to the Fruit Growers' Association of Ontario have been \$3,000 in a single year (1877).

It appears by Mr. Burnet's statement that this liberal grant is not sufficient. What would he say of ours?

Let us see what was the amount invested, in 1877, by the F. G. Association of Ontario in plants for distribution. The Secretary's account show \$692; thus our society has, in proportion, done more in the distribution of trees, considering the Government grants to each society.

It is a matter of regret that the small Government grant (\$50) for 1881 has not yet been paid to the Society by the Council of Agriculture.

The Council, we hope, is aware of the useful work done by the Society. Hon. M. Chapleau has congratulated the Society from his seat in the Legislative Assembly; and the kind words of the Premier were followed by something more substantial—"a special grant which was duly paid."

On motion of the President, thanks were voted in favor of the agricultural papers and newspapers of this Province, and to the Montreal Horticultural Society, who have kindly published the transactions of the Society, and who are solicited to do so in future, in order to increase the membership of the Society.

Rev. Mr. Lagneux expressed in very appropriate terms the great influence of the Press of the Province, acknowledging that in general it made great efforts in behalf of agriculture and horticulture; in fact a *single recipe* or direction in farm or orchard being often worth—to the farmer—more than a year's subscription to the paper publishing it.

AUGUSTE DUPUIS,

Corresponding Secretary.

Village des Aulnaies,

Co. L'Islet, January, 1882.

