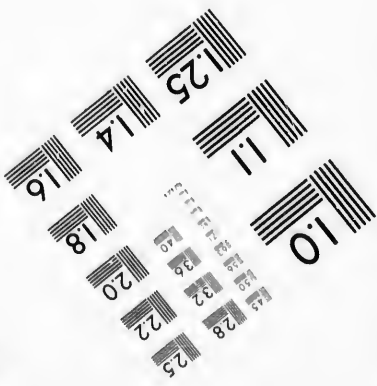
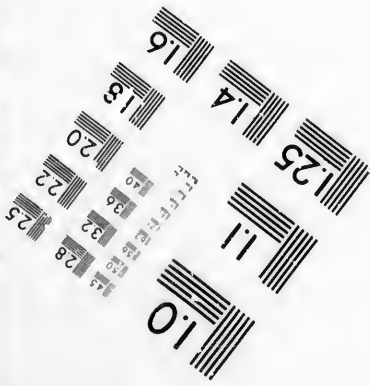
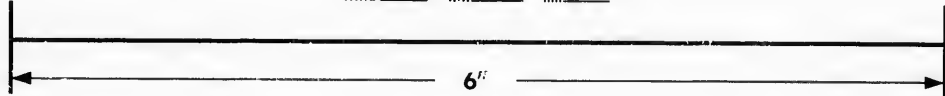
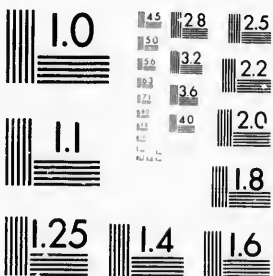


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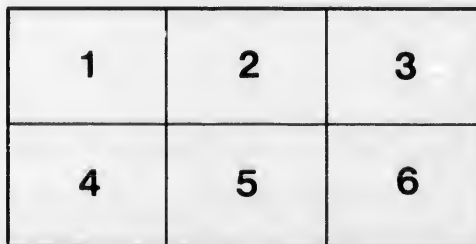
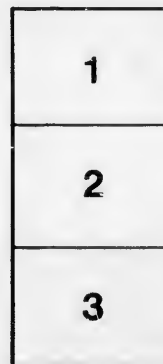
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ORNAMENTAL

— AND —

TIMBER TREES,

NOT NATIVES OF THE PROVINCE OF QUEBEC.

BY CHARLES GIBB, ABBOTTSFORD.

*A Paper from the Report for 1882 of the Montreal Horticultural
and Fruit Growers' Association.*

The Montreal Horticultural and Fruit Growers' Association

MONTREAL :
"WITNESS" PRINTING HOUSE, BONAVENTURE STREET.

1882.

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ORNAMENTAL AND TIMBER TREES.

(NOT NATIVES OF THE PROVINCE OF QUEBEC.)

BY CHARLES GIBB, ABBOTSFORD.

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 on 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 Neiges, 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 seemed 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 Finland, 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. RICCI—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. Warde 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.

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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. Hunneywell'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.

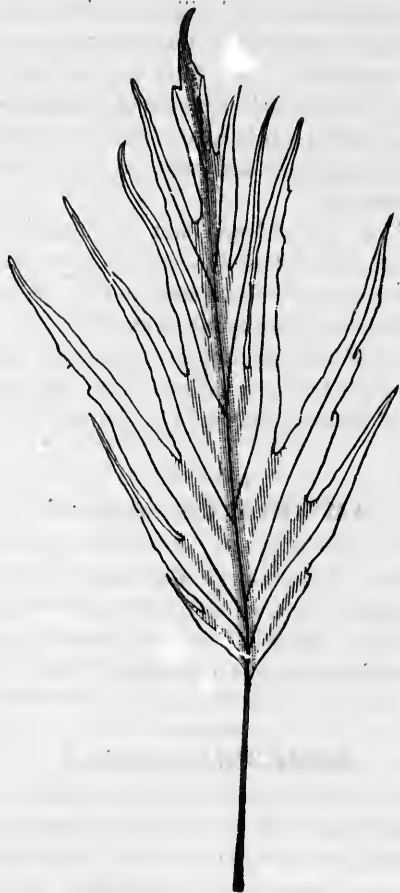
VAR. LACINIATA IMPERIALIS. *Imperial cut leaved alder*.—"Oh! what an aerial tree" exclaimed a friend as I showed him a specimen of this tree. It is dull in color, but of delicate graceful growth, quite unlike an alder or anything else, a rare though a frail, delicate looking beauty, indeed. I think this 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 perfect'y 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 fastigiata 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 birch.*—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. BHOJPUTTRA. *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 hardiness 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 Minnetonka, 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.

CEROIS.—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. 58, 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.

CORYLUS.—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. It 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.

FRAVINUS—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 hardness.

VAR. CONCAVÆFOLIA VARIEGATA. *Variegated 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 "inerm's," 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 light 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 fringing than a common Larch, and of a peculiar, almost tropical appearance. What is usually propagated as the *Kœmpferi* 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 *Leptolepsis* 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

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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-treing 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. CANESCENS 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 "Laree" with them should plant this tree.

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

the Archipelago, is, in leaf, like our common treabbling 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. Maackii*, 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. Simonii* 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 boundaries 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

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"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.

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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 driest 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-leaf 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 is of 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. DASYSTYLA 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

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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 hardness.

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. DOUGLASHI: 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 $69\frac{1}{2}$. 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. Schübler'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 other conifers that would resist their cold winters.

The winter temperature of St. Petersburg is at 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. PICTA. *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. CEMBEA. *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 Englemann'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. *Lofty 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 a large 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 dry 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 Société Imperial Zoologique d'Acclimatation 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. JEFFREYI*), 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 *Sun-ray 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 Vita*; 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 retinospora 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 Vita*.—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 Vita*, 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.

