I was always fond of gardening. I probably inherited this love of plants, for among my mother's people there was usually at least one in each family who was fond of growing things. One of my ancestors planted a garden over two hundred years ago that is still one of the show places of Scotland.

Some of the happiest days of my early childhood were spent in an old garden near Aberdeen, Scotland. It was there I really learned to know many plants that are still my favourites. Among the shrubs were rhododendrons, lilacs and mock-oranges; there were fragrant herbs such as myrrh, rosemary and southernwood, and the path that led down to a bed of old-fashioned moss and cabbage roses was bordered with double white and pink varieties of *Dianthus plumarius*. The window of my bedroom looked out into an old Yew tree, covered in the fall with red berries, and the birds that sheltered there would wake me up in the morning with their song. Along the edge of the driveway *Narcissus poeticus* and daffodils were naturalized under the maples that formed the avenue. A small stream, or "burn" as we call it in Scotland, ran through the property and *Mimulus luteus* grew in the grass along its banks, apparently wild. Down by the wall under which the burn flowed there was a copper beech, a few of whose branchlets trailed in the water as if loath to see it go. It was here, also, that I first knew the monkey puzzle tree, a tree that can be grown in Boston, only under glass.

I am the youngest of a large family which came to Canada fifty years ago and settled near where I now live in northern Manitoba. At that time this was the northern outpost of agriculture in Manitoba. We were thirty miles from the nearest town which had only one train a week. There were no telephones or motor cars in those days and the journey to town and back took two days with horses. The early settlers made their living principally by stock-raising and little gardening was done other than the growing of enough of the more common vegetables for home consumption. At that time there were no varieties of either corn or
tomatoes that could be ripened out-of-doors in northern Manitoba. A few zinnias, petunias and portulacas were sometimes grown, but I was told that it was scarcely worth while bothering with them as they would only be coming nicely into bloom when the early autumn frosts would destroy them. In spite of this, the first dollar I had was saved for the purchase of flower seeds and I was able to show those early settlers that other flowers besides petunias, portulacas and zinnias could be grown in this district.

There was no horticultural page in any of the Manitoba papers those days, and the only horticultural information within my reach was contained in the annual reports of the Dominion Government Experimental Farms which were established in 1886. In these reports I found a mine of information including articles on plant breeding by the late Dr. William Saunders, the founder and first director of the Dominion Experimental Farms. As I grew to manhood I started growing trees and shrubs from seed secured from trade sources and also from the horticultural division of the Experimental Farm. Later on, when I secured a farm of my own, I bought nursery stock from many available sources, only to find that very few of my old favourites could be cultivated here. None of the old roses were fully hardy, neither the mockoranges nor Spiraea Van Houttei could be expected to flower unless protected, and even the common lilacs were sometimes injured by our severe winters. At that time it was thought that trees also, especially conifers, could not be grown on the Canadian prairies. The reports on Dr. Saunders' work in plant breeding led me to think that possibly I, too, could obtain or produce new strains that would be hardy here.

The quest for material to carry on this work led me into correspondence with many men and institutions well known to the horticultural world, including the late Professor C. S. Sargent; Mr. W. T. Macoun, Dominion Horticulturist; and the Edinburgh, Kew, and Upsala Botanic Gardens. To all these men and institutions with which I came in contact, either personally or by correspondence, I owe much. My horticultural work at this time was merely a hobby, as in conjunction with a brother I was carrying on a fairly large grain and stock farm and I was in charge of the live stock end of the business. Being much in the saddle I had a good opportunity to get acquainted with our native plants and to study their habits.

As my collection of plants grew, I found that there was quite a difference in the hardiness of geographical forms of the same species. For instance, the Scotch pine, usually grown from commercial seed collected in Germany, was hardy in ordinary winters, but every so often we would have test winters that would kill many of them outright and badly injure many more. The same species when grown from seed of the north-Russian, Finnish, or north-Swedish forms is equally as hardy as our native Jack pine and a very much finer and faster growing tree. With the Norway spruce, the Finnish form is also much hardier than that grown from ordinary commercial seed, and can stand our worst winters without injury.
PLATE V

_Tilia cordata_
An interesting example of this variation of hardiness within the species is provided by *Acer glabrum*. I have collected this maple from four different sources, viz. near Boulder, Colorado; west of Cheyenne, Wyoming; at Waterton Park in southwest Alberta; and just west of Fernie in southeastern British Columbia. Our Canadian forms usually kill to near the snow line; some of those from Wyoming have suffered in very severe winters, but the lone specimen from Colorado has never been injured by winter.

*Ulmus pumila* has given us a very vivid illustration of the difference in hardiness of geographical strains. In 1940 a nursery row 100 yards long had three quarters of its length planted to this elm grown from seed secured from Harbin, Manchuria, and the balance of the row was planted to a strain that had been hardy for a number of years in southern Manitoba and was bearing seed there. In September 1942, the temperature went down to zero, and during the following winter we had temperatures of $-50$ and $-55^\circ$ F. In the spring of 1943 the *Ulmus pumila* from Harbin was alive to the tips of the branches, while the other strain was killed out, root and branch.

With many other trees and shrubs I have found that the forms in commerce are not suited to our conditions, and were hardy only when special strains were collected or secured from correspondents. Besides the examples already noted, the following are hardy at Dropmore only when special strains are secured:

- *Acer saccharinum*
- *Deutzia parviflora*
- *Juniperus communis*
- *Juniperus scopulorum*
- *Juniperus virginiana*
- *Larix decidua*
- *Larix leptolepis*
- *Larix occidentalis*
- *Pinus contorta*
- *Pinus flexilis*
- *Pinus strobus*
- *Prunus triflora koreana*
- *Pyrus ussuriensis*
- *Tilia americana*
- *Tilia cordata*
- *Thuja occidentalis*
- *Ulmus japonica*
- *Ulmus scabra*
- *Weigela florida*

The hardy strain of *Ulmus scabra* came to me as seeds from the Uppsala Botanic Gardens, and *Ulmus japonica* is the Manchurian form sent to me by the Bureau of Plant Industry at Washington. *Prunus triflora koreana* is even hardier than the wild *Prunus nigra* that I collected twenty miles east of Dropmore. The fruits of some of its varieties are excellent eating, raw or cooked, and come nearer to the domestic varieties in quality than any other plum that is hardy here. I have crossed this plum with our sand cherries, sand cherry hybrids, and with a green gage plum of my own raising. The latter cross gave weak plants that do not look promising at the present time.

In October 1918, after four strenuous war years, I took a three weeks' holiday
and paid my first visit to the Central Experimental Farm at Ottawa, and the Arnold Arboretum. After having seen a little of the great wealth of material to be found at the Arboretum, I decided to report to Professor Sargent. A kindly-looking elderly gentleman, accompanied by a younger man, was pointing out some trees as I approached and enquired the way to the Administration Building. They were Professor Sargent and his companion, the Superintendent, while the trees they were examining were Chinese pear species. I noticed that one tree had already shed its leaves, and remarked to Professor Sargent that if any tree was to prove hardy with us I felt sure that would be the one. It proved to be *Pyrus ussuriensis* and from the scion that I brought back with me I grew what is now the oldest hardy pear tree on the prairies of western Canada.

Among the other treasures I brought back with me, were some one-year-old seedlings of two lilacs grown from seed collected on the Diamond mountains of Korea by E. H. Wilson in 1917. These lilacs (*Syringa velutina* and *S. oblata dilatata*) have proved absolutely hardy at Dropmore; and, therefore, in 1921 I crossed some of the "French" lilacs, which sometimes are quite severely injured by our winters, with *S. oblata dilatata*. A new race of "American" lilacs resulted which seems better suited to our continental climate than the European varieties of the common lilac. These new lilacs have several interesting features. Many of them have bronze leaves in spring, and turn a deep purple in autumn. They do not sucker to the same extent as the older lilacs (in fact a hedge of the first hybrids raised in 1922 has not suckered yet) and they are extremely free-flowering and fragrant. In some of my later crosses of these lilacs the blooms compare well with Lemoine's varieties and are much hardier here in northern Manitoba.

Professor Sargent sent me seeds of several varieties of trees and shrubs collected by Dr. J. F. Rock in western Kansu, but very little of this material has proved sufficiently hardy for our cold, dry climate. At the present time, those that are still alive and promising are *Betula albo-sinensis*, *Picea purpurea*, *Daphne Giralldii*, *D. tangutica*, *Potentilla fruticosa* and *Caragana brevifolia*. I corresponded with Professor Sargent until the time of his death—indeed, his last letter was written to me just a few days before he died and it fell to me to write a Canadian appreciation of his work.

In 1924, the Great Plains Horticultural Section of the American Association for the Advancement of Science, met in Manitoba and about twenty of the members spent a day at my place. Among this company were Professor Alderman of the Division of Horticulture at the University of Minnesota and Mr. M. B. Davis of Ottawa (now the Dominion Horticulturist). They were quite surprised at the variety of material I had succeeded in collecting and growing and also at the amount of plant breeding I had already done. These men strongly advised me to keep on with the work, even if it meant commercializing it. By 1924 rural western Canada was already suffering from the post-war depression. I decided to take the advice of Professor Alderman and Mr. Davis, and a few years later the Mani-
toba Hardy Plant Nursery was established and now has patrons from the Yukon to Europe, and as far south as New Zealand.

Next to growing the plants themselves, I enjoy reading books on plants and their distribution. As we are so far from any large town, I have no opportunity to consult the horticultural or botanical shelves of a good library, so have had to build up a small library of my own. In one of my books, "Flore des Serres et des Jardines de l'Europe," Vol. XIX, I saw photographs of Caragana jubata and Malus baccata "flora roseo pleno" and decided that both probably would be hardy if I could secure them. After several years I obtained the Caragana and now have a well-grown bush of it about four feet high. The young branches of Caragana jubata are very wooly and the leaf stalks and stipules become hard and thorny, making it a difficult shrub to graft. Under conditions in this hemisphere it is also difficult to raise from seed, and is therefore likely to remain scarce in American gardens. I consider this a pity, as it is rather striking looking when in bloom. The double-flowered Malus baccata has so far eluded me and apparently is no longer grown in western Europe.

Another of my own books, Bean's "Trees and Shrubs Hardy in the British Isles," indicates that a number of hardy trees and shrubs from cold dry sections of the northern hemisphere do not flourish in Britain. Bean speaks of one of these as follows: "Populus tristis (Fischer) is a balsam poplar allied to the above, with similar downy shoots and leaf stalks . . . Brandis, alluding to it as P. balsamifera, says it occurs in arid valleys of the inner north-western Himalayas. Probably our climate is too moist and dull for it. Although introduced in 1896 from Spaeth's Nursery at Berlin, it has never succeeded; and although it makes vigorous growths during the summer, they are frequently cut back in winter, and it has never got beyond a few feet high." Ten years ago I obtained cuttings of this poplar from Kew and now have several trees over thirty feet high. Besides being a fast grower, and very easily propagated from cuttings, it is highly resistant to the leaf rust that frequently disfigures all our native poplars. So far I have hybrids between it and our aspen and balsam poplar, and have seeds ripening on cottonwood that were fertilized with its pollen. I hope to get a disease resistant tree with soft white wood that will grow easily from cuttings.

The way that some plants appear in gardens often makes a most interesting story. Ribes diacanthum unexpectedly grew in my garden from some unknown source years before I secured seed of it from a correspondent in Manchuria. This, by the way, is a much more attractive shrub in northern Manitoba than R. alpinum. It grows up to four feet high and besides fruiting freely its foliage colours up brilliantly in autumn. Larix Gmelini japonica came to me from the Yokohama Nursery Company under the name of Larix leptolepis. Knowing that it was not named correctly, I sent a sample of the seed to the late E. H. Wilson, who found out from the manager of the Japanese firm that the seed had been collected in the Kurile Islands. This larch is better suited to our climate than L. leptolepis and
PLATE VI

_Picea Engelmanni_ as it grows in the Arnold Arboretum.
my plants look as if they will develop into beautiful specimens. In the midst of a block of Siberian spruce, some of which have now started to bear cones, there is one answering the description of *Picea bicolor reflexa*. This seed was secured from Johannes Rafn & Son of Copenhagen, Denmark, and it is just possible that a few of the seeds of the Japanese spruce may have become mixed with the Siberian species. Seeds of juniper from Japan yielded one plant that was quite obviously different from the rest. Now over fifteen years old, this has quite an ancient tree look about it, though only twelve inches high and about sixteen inches across. So far it has proved quite hardy with us. A rooted cutting is now in the nursery of the Arnold Arboretum under the provisional name of *Chamaecyparis* "Dropmore variety." It has not as yet borne fruit.

Two shrub families that are interesting garden subjects and have quite a few members that are hardy in northern Manitoba are the daphnes and the brooms. Besides the two daphnes already mentioned we have *Daphne Mezereum*, *B. Cneorum* and its lovely and very dwarf white form, and a six-inch plant of *D. collina* which came safely through last winter without protection and has flower buds now showing colour. Among the brooms, *Cytisus decumbens* becomes a mat of yellow, two inches high and one to two feet across in June. *Cytisus nigricans*, *C. austriacus*, *C. elongatus*, *C. hirsutus*, *C. leucanthus* var. *Schipkaensis*, and *C. purpureus* all have forms sufficiently hardy to be worth cultivating. In genistas, the spiny four-to-six-inch bushlets of *Genista sylvestris* flower freely. *Genista tinctoria* and the double-flowered form are very showy and reliable. *Genista sagittalis*, though it at times suffers a little from our winters, is as a rule a mass of gold in summer. Another member of the pea family that is quite hardy here is *Maackia amurensis* with its upright spikes of yellow-eyed white flowers. In some seasons this seed ripens freely with us.

Before the great drought of the nineteen thirties completely wiped out my collection of rhododendrons, I had some measure of success with a number of the hardiest species. Both *Rhododendron hirsutum* and *R. ferrugineum* had flowered for several years. Even *R. caucasicum* had lived through a winter and flowered. Seedlings of its close relative, *R. chrysanthum*, proved winter-hardy and I had hoped to raise hybrids between these two. Unfortunately, before *R. chrysanthum* flowered, the drought period had reached us and in July it died. Our only water supply at that time came from a well 285 feet deep and it contained far too much lime and iron to be of any value to rhododendrons. *Rhododendron mucronatum*, *R. canadense*, and *Erica carnea* have all lived long enough to flower when planted in especially prepared soil, but curiously enough I have had little success with *R. dauricum*. Where suitable soil and moisture conditions can be provided, and snow covering in winter can be relied upon, there is no doubt that a number of rhododendrons would prove hardy and fairly easy to cultivate. In such a location there is a wide open field for the plant breeder who cares to work with this type of shrub.
**Some of the More Unusual Trees at Dropmore**

*Acer saccharinum*, 35 feet high, bole circumference 22 inches.

*Larix decidua*, up to 50 feet high with bole circumference up to 2 feet 4 inches at 30 years of age.

*Larix Gmelini japonica*, 25 feet high, with a bole circumference of 13 inches. This is a most variable tree in leaf colour and habit, and some forms are highly ornamental.

*Larix laricina*, up to 50 feet in height with bole circumference of 2 feet 4 inches. Though usually found growing in swamps in nature, this tree has stood the drought years much better than any of the poplars.

*Larix sibirica*, thirty years old, up to 45 feet high with bole circumferences running from 2 feet 4 inches to 3 feet at 3 feet above ground level. A belt of seedlings eleven years old are now up to 25 feet in height, some of them with a bole circumference of 23 inches at 3 feet above ground. The parent trees were growing near the European and American larches and many of the young trees show signs of hybrid origin in both the bark and cones.

*Picea abies*, a beautiful specimen in a sheltered spot, 45 feet high with branch spread of 28 feet, bole circumference 3 feet.

*Picea pungens glauca*, 35 feet high, bole circumference 2 feet 10 inches.

*Pinus Cembra*, 20 feet high, bole circumference 17 inches at 3 feet.

*Pinus Cembra sibirica*, 24 feet high, bole circumference 17 inches.

*Pinus flexilis*, 17 feet high, bole circumference 11 inches.

*Pinus sylvestris*, 30 years old, now up to 50 feet high with bole circumference running from 2 feet 6 inches to 3 feet.

*Populus tristis*, ten years old, over 30 feet high with a bole in circumference of 2 feet 8 inches and a branch spread of 22 feet.

*Pyrus ussuriensis*, twenty-six years old, circumference at three feet, 2 feet 10 inches, height 25 feet, spread of branches 25 feet.

*Sorbus amurensis* forms a clump reaching a height of 24 feet, the main stem having a circumference of 25 inches, three feet from the ground.

*Sorbus aucuparia* grown from seed collected near the headwaters of the River Tay in Perthshire, Scotland; now 20 feet high and with three main stems from 12 to 15 inches in circumference.

*Thuja occidentalis*, 25 feet high, bole circumference 29 inches at 2 feet.

*Tilia americana*, 30 feet high, 25 feet spread of branches and bole circumference of 2 feet 8 inches at three feet.

*Tilia cordata*, a clump 22 feet high with a spread of 20 feet, the main stem having a bole circumference of 23 inches.

*Ulmus japonica* from seed collected in Manchuria for the United States Department of Agriculture. This tree has three main stems near the ground, each of which is from 24 to 25 inches in circumference. Though only 20 feet high, this tree has a spread of branches of 24 feet.
PLATE VII

*Pyrus ussuriensis*
Conifers at Dropmore

| Abies balsamea       | Picea abies       |
| Abies holophylla    | Picea bicolor reflexa |
| Abies nephrolepis   | Picea Engelmanni   |
| Abies sibirica      | Picea glauca      |
| Chamaecyparis (?) Dropmore variety | Picea jezoensis |
| Juniperus communis  | Picea mariana     |
| Juniperus horizontalis | Picea obovata   |
| Juniperus Sabina    | Picea purpurea    |
| Juniperus scopulorum | Pinus Banksiana  |
| Juniperus virginiana | Pinus Cembra    |
| Larix decidua       | Pinus Cembra sibirica |
| Larix Gmelini       | Pinus contorta    |
| Larix Gmelini japonica | Pinus flexilis |
| Larix Gmelini japonica x sibirica | Pinus Mugo |
| Larix Gmelini olgensis | Pinus ponderosa  |
| Larix laricina      | Pinus resinosa    |
| Larix leptolepis    | Pinus Strobus     |
| Larix occidentalis  | Pinus sylvestris  |
| Pseudotsuga Douglasi |

Though much progress has been made in gardening during the past fifty years, there is still much to do. Many of the trees and shrubs of northeastern Asia with northern limits in Kamchatka, eastern Siberia, Saghaliien and northern Korea, have been introduced to cultivation from their southern or insular limits and may prove much hardier when secured from colder and drier districts. *Syringa japonica*, introduced to cultivation from Sapor in the north island of Japan by Professor Sargent, is the only broad-leaved tree or shrub from Japan that has proved fully hardy here. Possibly others from the same neighbourhood would repay a thorough trial. While we have a small company of very enthusiastic plant workers in western Canada who are doing much to improve our fruits, vegetables and flowers by plant breeding, there is still much more to do than they can hope to accomplish. Personally, I would like to see some of the following plants introduced: a hardy weeping willow, a pyramidal poplar, a double-flowered *Malus baccata*, large-flowered dogwoods, buckeyes with bright-coloured flowers (the Ohio buckeye is quite hardy), and truly hardy viburnums with the fragrance and beauty of *Viburnum Carlesii*.

A complete list of hardy bulbs and herbaceous perennials that are grown at Dropmore would be wearisome, so I will mention only a few of the more outstanding that are finding their way into our northern gardens by way of Dropmore. In early spring we have *Callianthemum angustifolium* with its pure white buttercups, and *Viola altaica* that becomes a mat of cream or yellow pansies.
(rarely blue) in early May. These are hybridizing with the garden violas to give what I hope will be a race of quite hardy pansies. Towards the end of June or early July, Iris Kaempferi from Manchuria and Iris acutifolia, which came to me from Leyden Botanic Gardens, are among the most striking flowers in the garden. There is Ligularia speciosa with enormous elephant-ear leaves and fifteen to eighteen-inch spikes of orange yellow flowers. Chrysanthemum Zasdzinskii from Austria, though rather a disappointing daisy that is scarcely worth growing on its own account, has given me some hybrids that are both hardy and beautiful. (It is interesting to note here that the inspiration I got from a visit to Alex Cumming of Bristol, Connecticut, started me breeding chrysanthemums.) Muscari polyanthum is also quite at home and towards the end of May, Tulipa Ostrowskiana (scarlet) and T. Kolpakowskiana (yellow) make brilliant patches of colour. In early June the white narcissus of the Swiss Alps comes into bloom. This was collected for me by Henry Correvon, high above Montreux, about twenty-five years ago, and is the only narcissus that really does well here. Then as the German iris starts to flower, we have Allium sebrlanense (pure white) and the blue Ixiolirion montanum. These two make a lovely picture when grown together. Lilies of course are grown by the acre at Dropmore, and our collection of these is being augmented yearly. That, however, is a story in itself.

While my work with plants has been done entirely with a view to securing forms suited for this region, it is interesting to note that some of my hybrids are beginning to find a place in widely separated gardens of the world. It is a great satisfaction to know that some of the new hybrids raised here have been sufficiently outstanding to warrant their being planted elsewhere, even in gardens where an extremely low temperature is not the all important factor in the selection of varieties.

F. L. Skinner
Dropmore, Manitoba, Canada

Mr. Skinner owns and operates one of the most northern nurseries for ornamental plant materials in North America. His experiences and observations in growing ornamental woody plants where winter temperatures may go to $-50^\circ$ F. or even lower may prove of interest to Arnoldia readers.