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The climate of New England is usually considered unfavorable to the successful cultivation of conifers. As compared with New Zealand, northern Italy, Ireland, and the region adjacent to Puget Sound, New England is certainly a poor country for these trees. There are worse regions for conifers, however, like some of the middle western states and Texas, and two of the handsomest trees of this class in the world grow at their best in New England, the White Pine, *Pinus Strobus*, and the Hemlock, *Tsuga canadensis*. No region need be poor in conifers where these two trees flourish. The conifers of Europe do not find congenial conditions here, although those from the northern and central parts of the continent, like the Norway Spruce, and the Scotch, Austrian and Swiss Pines, are hardy although generally short-lived. The Himalayan species, with the exception of *Pinus excelsa* which is never satisfactory here, are not hardy. None of the conifers of Mexico or South America, Australia or Tasmania, can be grown in the northern states in which the species of southern China and Japan are not hardy. Unfortunately very few of the conifers of western North America succeed in the eastern states, as these are the noblest of the trees of this class. The exceptions are the western White Pine, *Pinus monticola*, a tree which bears a general resemblance to our eastern White Pine and which is distributed from the sea-level on Vancouver Island up to high altitudes on the California Sierra Nevada and the mountains of Idaho. The Sugar Pine of the California Sierras, *Pinus Lambertiana*, the greatest of all Pine trees, gives little promise here of ever becoming a large or valuable tree. This is also true of Jeffrey's Pine, *Pinus ponderosa* var. *Jeffreyi*, which can be seen in its greatest beauty on the eastern slopes of the Sierra Nevada. The western Mountain Hemlock, *Tsuga Mertensiana*, or as it is often called *Pattoniana*, *Abies amabilis*, the lovely Fir of the Cascade Range, the Incense Cedar of the Sierra Nevada, *Libocedrus decurrens*, and the Fir of the northwest coast, *Abies grandis*, and the Red Cedar, *Thuja plicata* or *gigantea*, are hardy in sheltered positions in the Arboretum but do not promise to be very long-lived here or to add much permanent beauty to our plantations. All the conifers of the northeastern part of this continent are, of course, hardy here but, with the exception of the White Pine, the Hemlock, the Red or Norway Pine, *Pinus resinosa*, the White Spruce, *Picea canadensis*, the Arbor Vitæ, *Thuja occidentalis*, the Red Cedar, *Juniperus virginiana*, and the Larch, *Larix americana*, none of these are of much ornamental value.

On the slopes of the Blue Ridge in South Carolina, about the headwaters of the Savannah River, there is a conifer which seems destined to play an important part in the decoration of our northern parks and gardens. This is the so-called Carolina Hemlock, *Tsuga caroliniana*, which although a smaller tree than our northern Hemlock is even more graceful in the droop of its slender branches. This is a tree from which much can

be expected. It is very hardy in the Arboretum where it has been growing for thirty years. The largest specimen in the collection will be found in the rear of the Laurels by the side of a walk along the northern base of Hemlock Hill. There are also a number of specimens in the mixed plantation of conifers near the corner of Centre and Walter Streets.

All the conifers of the Rocky Mountains are hardy in the Arboretum. The most promising of them are the Douglas Spruce, *Pseudotsuga mucronata*, and the Engelmann Spruce, *Picea Engelmannii*. The Douglas Spruce is one of the great trees of the world; it grows to an enormous size; it produces valuable timber, the Oregon Pine of commerce, and it is widely distributed from the shore of the Pacific Ocean over nearly all the mountain ranges of the west as far east as Colorado. A valuable lesson has been learned from this tree. For individuals raised from seeds gathered near the Pacific coast had not been hardy in New England, while plants from Colorado seed are perfectly hardy here, grow rapidly, and promise to become useful ornamental and timber trees. This experience with the Douglas Spruce shows in a striking manner the importance of a careful selection of the seeds of trees, and that in the case of widely distributed trees, like many conifers, the seeds should be gathered from regions most similar in climate to the region where the trees raised from the seeds are to grow. Such careful selection of seeds has been too generally neglected. When, however, its importance is understood it is possible that the area over which many trees can be successfully cultivated will be greatly extended.

Engelmann's Spruce in Colorado forms pure forests up to altitudes of 11,000 or 12,000 feet and ranges north into Alberta. It is a narrow pyramidal tree with gray-green foliage and cinnamon-red bark. It is too soon to speak of the value of this tree as a permanent addition to our plantations for it is only fifty years since it was discovered. The trees in the Pinetum of the Arboretum, which are believed to be the best in cultivation, are thirty-two years old. The Colorado White Fir, *Abies concolor*, is a fast-growing and hardy tree which of all the silver Firs appears to best suited to New England. There are a number of specimens in the Pinetum about thirty years old but, like other silver Firs, they will probably grow less attractive as they grow older. The California form of *Abies concolor*, the *Abies Lowiana* of some collections, is hardy here but is a less desirable tree in this climate than the Colorado form. The best known of the Colorado conifers is the so-called Blue Spruce, the *Picea pungens* of most collections. This has been largely propagated in European and American nurseries and very generally planted. As this tree grows in Colorado, where it is not common, it becomes long before it attains its full size thin, ragged and unsightly. In cultivation the young plants are handsome and symmetrical, but as the cultivated plants grow older they lose their lower branches and much of their beauty, and it is probable that this tree will not much longer retain its popularity. The Rocky Mountain form of the western Yellow Pine, *Pinus ponderosa* var. *scopulorum*, and the Rocky Mountain White Pine, *Pinus flexilis*, can be

seen in the Pinetum but these are trees which grow slowly and probably will never be large or important trees in this climate.

The conifers of central and northern Japan usually do well in New England although only time can tell whether they will ever reach old age here. One of the Silver Firs, *Abies brachyphylla*, grows particularly well in the Arboretum and, next to *Abies concolor*, is one of the most promising of the Silver Firs which have been planted in New England. The other Japanese Firs are hardy here but none of them seem likely to attain any great size or age. Several of the Japanese Spruces grow well, and of *Picea Alcockiana*, *Picea bicolor*, and *Picea Glenhii*, better specimens can be seen in New England than in Europe.

The Japanese Arbor Vitae, *Thuja Standishii*, is not a large tree but it is perfectly at home in the Arboretum, as is the curious Umbrella Pine, *Sciadopitys verticillata*, and the Mountain Hemlock, *Tsuga diversifolia*. The true Pines of Japan, *Pinus Thunbergii*, *Pinus densiflora*, the eastern Asiatic representative of the so-called Scotch Pine of Europe and Siberia, *Pinus parviflora* and *Pinus pentaphylla*, are all well established in the Arboretum and produce cones here every year. The different forms of *Retinospora*, or *Chamaecyparis*, can also be seen in the Arboretum where there is a large collection of these plants; they sometimes suffer from our dry summers.

Of the continental conifers of eastern Asia the most interesting in the Arboretum are the Korean and Manchurian White Pine, *Pinus koraiensis*, one of the most valuable timber trees of eastern Asia, and the curious Lacebark Pine of China, *Pinus Bungeana*. This is a tree often shrubby in habit with thin foliage and chiefly remarkable for the snow-white color of the trunk and branches of old trees, a condition which none of the specimens in this country are yet old enough to show.

Two conifers from the Balkan Mountains are hardy in the Arboretum and produce their cones annually. These are a Spruce, *Picea omorika*, and a White Pine, *Pinus peuke*. *Picea omorika*, although it forms great forests on the mountains of southeastern Europe, has been known for a few years only to botanists and some of the oldest plants in cultivation are in the Arboretum where they form narrow, rather compact pyramids and, growing rapidly, promise to be valuable ornamental trees. Its nearest relative is the Spruce of the northwest coast, *Picea sitchensis*, which is not hardy here.

Of the Firs of southeastern Europe and Asia Minor *Abies cilicica* and *Abies cephalonica* are perhaps of the most promise in this climate where they are perfectly hardy. The former is a native of the Cilician Taurus where it grows at a high elevation above the sea-level with the Cedar of Lebanon, here in its most northern and coldest station. A few years ago the Arboretum was fortunate in securing the seeds of the Cedar from this region and the trees raised from these seeds are now well established and promise to be successful here, while plants of this tree derived from Palestine have proved unable to bear the New England climate.

The important conifers of the Caucasus, *Abies Nordmanniana* and *Picea orientalis*, are hardy here and the latter is a valuable ornamental tree not unlike in general appearance the Red Spruce, *Picea rubra*, of northeastern North America which grows very slowly and does not take kindly to cultivation. The Spruce, *Picea Schrenkiana*, which covers with a stunted forest the dry slopes of the mountains of central Asia, is hardy and healthy in the Arboretum, but it will probably never become an important ornamental tree. A more desirable tree here is the Spruce of central Siberia, *Picea obovata*, which is well established in the Arboretum where it already produces its cones.

All the Larches now known, with the exception of the Himalayan species, are growing in the Arboretum, including an interesting hybrid between the European and the Japanese species lately produced in Scotland. As an ornamental tree the eastern North American *Larix americana* is the most picturesque of all the Larches. The Japanese *Larix Kaempferi* or *leptolepis* grows the most rapidly. The largest of the genus is the western American *Larix occidentalis*, and the least known are *Larix chinensis* and *Larix Potanini*. *Larix siberica* from eastern Siberia and the Altai and *Larix dahurica* from eastern Siberia are still little known in this country. The Larches are at the western end of the Pinetum just above the Walter Street entrance. Near them is a group of Larch-like trees, *Pseudolarix Kaempferi*, a Chinese tree with the deciduous leaves of a true Larch and erect cones which fall apart when ripe like those of the Cedars. This interesting, beautiful and hardy tree which for many years was only known in temple gardens, has now been found growing abundantly on the mountains near Ningpo in southern China.

It is impossible in the space of one of these bulletins to do more than briefly mention the most important conifers in the Arboretum, where there are now growing all the species with their numerous varieties which it is possible to keep alive here. The world has been pretty thoroughly explored for coniferous plants and the only place left where new trees of this class are likely to occur is western China. On the high mountains which form the Chinese-Tibetan boundary in addition to Firs, Hemlocks and Larches there appear to be more species of Spruce than in all the rest of the world. Seeds of all, or nearly all, of these trees have been obtained by the Arboretum, and the seedlings raised from them are now growing here and, through the agency of the Arboretum, in several American and European gardens.

The Taxus Family, Taxaceae, is now usually separated from the Coniferae although the Yews and their allies are generally spoken of as conifers. The most important of this group is, of course, *Ginkgo biloba*, the last survivor of an ancient race once widespread over the northern hemisphere and now known only from the plants cultivated in Chinese and Japanese gardens and their descendants. This tree is very hardy; it grows rapidly; it lives to a great age; and at maturity it becomes very

picturesque with its wide-spreading and drooping branches. It should be planted in this country more generally than it has been for it readily adapts itself to the severe climate of New England.

One of the most interesting genera in this Family is *Torreya*, or as it is sometimes called Tumion, named in honor of a Nestor of North American botanists, and it is fortunate that its Japanese representative, *Torreya nucifera*, one of the handsomest evergreen trees in Japan, is hardy in this climate. A group of these plants is growing among the Laurels at the base of Hemlock Hill. The type of this genus, *Torreya taxifolia*, is a native of western Florida and one of the rarest of North American trees. There is a plant of this species near the top of Hemlock Hill where in a very sheltered position it has been growing for a number of years with several other conifers of doubtful hardiness.

The European Yew, *Taxus baccata*, is generally not hardy in New England, although there are a few varieties of this tree growing in the Arboretum. It is fortunate, therefore, that the Japanese and Chinese Yew, *Taxus cuspidata*, is entirely hardy here. The foliage of this tree is rather lighter in color than that of the European Yew; it grows more rapidly, and there appears no reason why it should not reach a large size and attain a great age in this country. There is a semiprostrate form with darker-colored leaves and long and semierect branches which spread into large masses. This is the variety *brevifolia* of American gardens. Of all the contributions, and they are many and important, which Japan has made to the gardens of New England these Yews are probably the most valuable.

These bulletins will now be discontinued until the spring.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has recently been published. It will be found useful to persons unfamiliar with the position of the different groups of plants. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, and at the Old Corner Bookstore, Bromfield Street, Boston.

The Arboretum will be grateful for any publicity given these Bulletins.



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