however, will be needed to settle this question. One of the Spruces of northern Japan, *Picea jezoensis*, and its southern form (var. *hondoensis*) have grown miserably in Massachusetts up to the present time and give little promise of ever being valuable in this climate. The rare Tiger-tail Spruce (*Picea polita*) grows rapidly and is a perfectly hardy tree, but often begins to lose its lower branches before it is thirty feet tall. The northern *Picea Glehnii*, introduced by the Arboretum from seeds obtained by Professor Sargent in Hokkaido in 1892, now promises to be a handsome tree in this climate. The handsomest of the Japanese Spruces, judged by the few trees cultivated in Massachusetts, is *Picea bicolor*, or as it is more commonly called, *P. Alcockiana*. This tree, which is rare in Japan, was discovered in 1862 during the first ascent of Fuji-san by Europeans. Seeds were collected at this time and sent to Europe and it is probable that the few large trees of this Spruce cultivated in the United States and Europe were raised from these seeds. The trees cultivated in Europe under this name are usually *Picea jezoensis* var. *hondoensis*, and the Arboretum knows only five of these trees in the United States, two in the Hunnewell Pinetum, one also planted by Mr. Hunnewell in the grounds of the Town Hall at Wellesley, and two on the Phillips Estate in North Beverly, Massachusetts. In the Arboretum there are only small unsatisfactory grafted plants, and for years the Arboretum has tried without success to obtain a supply of seeds from Japan, for, judging by our present knowledge of the behavior of Spruces in this climate, *Picea bicolor* promises to be the handsomest which can be grown in this part of the country.

Abies. Fir-trees, like the Spruces, are widely distributed with many species through northern and elevated regions of the Northern Hemisphere, growing rather further south than the Spruces, as one Fir-tree grows in Mexico, one in Spain, one in northern Africa and several in southeastern Europe and Asia Minor. Many of the Firs are large and handsome trees, but the genus has not contributed much to the beauty of our northern plantations. Many of the handsomest and most interesting species are not hardy here, and several of the others are not presentable for more than a few years. Judging from the results which have now been obtained with these trees there are only two Firs which can be depended on to retain their beauty here for more than fifty years. These are the western American White Fir (*Abies concolor*), especially the form which grows on the mountains of southern Colorado, and the Japanese *Abies homolepis* or *brachyphylla*, a splendid tree with dark green leaves white on one surface and large purple cones. The variety of this tree with green cones (var. *umbellata*) has grown more rapidly in the Arboretum than the purple-coned tree, but it is a tree of more open habit and with lighter green leaves, and is less valuable as an ornamental tree. *Abies cilicica* from Asia Minor and *A. cephalonica* from southeastern Europe have grown well in Massachusetts for many years; although they have now nearly recovered, these two trees suffered severely in the cold winter of 1917-18.

Thuja, the name of the Arbor Vitaes, is a small genus confined to eastern and western North America, Japan, Korea and north China.

All the species with many varieties are in the Arboretum, and all do well here with the exception of the north China *T. orientalis* which probably needs a drier climate, for it is the only conifer which really grows well on the plains of western Kansas. The Red Cedar of the northwest coast (*Thuya plicata* or *gigantea*) is one of the great trees of the world, and in the Arboretum has grown to be one of the handsomest conifers in the collection.

Chamaecyparis, which differs from *Cupressus* chiefly in the fruit which matures at the end of the first season, is the name of the White Cedar. The genus is confined to the coast regions of eastern and western North America, to Japan and Formosa. The two Japanese species often called *Retinosporas*, with many abnormal forms, are common in gardens and old inhabitants of the Arboretum. The eastern American species, *Chamaecyparis thyoides*, although a common inhabitant of Massachusetts swamps, has grown slowly in the Arboretum and has occasionally been partly killed in severe winters. The handsomest and the largest of the genus, and one of the noblest of North American trees, *Chamaecyparis Lawsoniana*, the Lawson Cypress as it is often called, can only drag out a miserable existence here, and the beautiful Alaska Cedar, *Chamaecyparis nootkatensis*, is not hardy here.

Tsuga, the name of the Hemlock, is another small genus with species in eastern and western North America, Japan, western China and the Himalayas. The western American species exist here, but will probably never become large trees. The mountain Hemlock of Japan (*T. diversifolia*) is hardy and healthy, but it grows slowly and is not as handsome as our native species. The handsome but less hardy *T. Sieboldii*, a more southern tree, lives in sheltered positions but does not seem suited for general planting in Massachusetts. The Chinese species (*Tsuga chinensis*) has lived for several years in the Arboretum, although it was a good deal injured in the winter of 1917-18. The handsomest of the Hemlocks which can be grown in Massachusetts and now one of the most beautiful trees in the Arboretum is a native of the southern Appalachian Mountains, *Tsuga caroliniana*.

Pseudotsuga. Of the three species of this genus only the Rocky Mountain form of *Pseudotsuga taxifolia* is hardy here. It has been growing in Massachusetts since 1863, and up to this time has proved one of the hardest, handsomest and most rapid growing conifers which has been brought into this part of the country.

Juniperus. This is one of the largest and most widely distributed genera of conifers, for Junipers are found in all temperate and elevated parts of the Northern Hemisphere; they flourish in arid semi-desert regions in the interior of continents, and extend into the tropics. Some species are large and valuable trees and others are prostrate shrubs, the same species being sometimes a tree and sometimes a shrub. Massachusetts is too cold and wet for most Junipers, and only a small number of species with a number of varieties have been successfully grown in the Arboretum. The mild winter and the wet summer and autumn have helped this collection and the Arboretum Junipers have not before been in as good condition as they are now.

These Bulletins will now be discontinued until the spring of next year.

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