and has little to recommend it either as an ornamental or a timber tree. The Fir-tree, in its native swamps in the northeastern part of the country, is with its narrow pyramidal head of dark green leaves silvery white below a beautiful object, but like many other Fir-trees it does not take kindly to cultivation and in the Arboretum has never lived more than a few years. The White Cedar, too, is a hard tree to establish, and although a common native tree in the swamps of eastern Massachusetts it has not always proved hardy in the Arboretum where it has grown best on dry gravelly slopes. Few trees have shown so great seminal variation as the eastern *Arborvitae*, and the collection of the forms of this useful tree is one of the most interesting in the Arboretum only excelled in variety by that of the forms of the Red Cedar. No other low-growing Juniper clings so close to the ground as *Juniperus horizontalis*, and few plants make a denser mat or a better ground cover.

European Conifers in New England. Seventy-five years ago three European conifers were much planted in the northeastern United States because native trees at that time were not often found in American nurseries, and because the idea prevailed and still prevails that exotic plants were more valuable than native ones. These three conifers were the Norway Spruce so-called (*Picea Abies* or *excelsa*), the Scotch Pine (*Pinus sylvestris*) and the Austrian Pine (*P. nigra*). These are hardy, fast-growing, and for several years here handsome trees. The introduction of the Norway Spruce must be considered a misfortune, however, for New England where it was planted and is still planted as an ornamental tree in great numbers. It grows rapidly while young and often remains in good condition until it is from thirty-five to forty years old; then it begins to fail, the leading shoot dying or failing to make a satisfactory growth and all the upper part of the tree gradually becoming thin and unsightly, with the result that there is now hardly a park or a country place in New England where the sad spectacle of such half dead trees cannot be seen. Further south the Norway Spruce often promises to become a longer-lived tree; and the best specimens known to the Arboretum are in the military cemetery at Gettysburg, Pennsylvania. The Scotch Pine, which in Europe is a magnificent tree and one of the most picturesque of all Pines, is hardy and grows rapidly here, often reproducing itself from self-sown seed. When about thirty years old it has the unfortunate habit of dying suddenly without obvious cause, and it is doubtful if many Scotch Pines more than fifty years old can be found in this country. Although inferior as an ornamental tree and probably as a timber producing tree to the native Red Pine, the Austrian Pine is hardy and grows rapidly here, but like the Scotch Pine often dies suddenly when only thirty or forty years old. These three conifers are easily raised and the seed is readily obtained. The young plants grow rapidly and they are therefore profitable plants for nurserymen to handle, and the public, in spite of the American experience with them continues to buy them. In some of the states they are raised by state agencies and given away or sold at a nominal price, or planted by the states in reforestation operations. Two conifers from southeastern Europe, although still insufficiently tested in this climate, promise to be valuable here. These are a White Pine, *Pinus peuke*, and a Spruce, *Picea omorika*. The former has been growing in the Arboretum since 1883; it is quite hardy, but as an ornamental

tree it has no advantage over the native White Pine or the western *Pinus monticola*. *Picea omorika* was first raised from seed at the Arboretum in 1881; it has proved hardy and has grown rapidly, but suffers somewhat from the weevil which does so much damage to the leader of the native White Pine. *Picea omorika* is the only Spruce-tree with flat leaves which is really hardy in this climate; and at the end of forty-two years it is by far the handsomest and most satisfactory Spruce-tree in the Arboretum.

Conifers from Eastern Asia. China, especially the western part of the empire, is the home of a large number of conifers. It has given us from the south the Golden Larch (*Pseudolarix amabilis*), the handsomest of all the conifers with deciduous leaves and one of the most beautiful trees which can be grown in eastern North America, and from the north the interesting Lace-bark Pine (*Pinus Bungeana*) with thin papery bark as white on the trunks of old trees as that of a Canoe Birch, various forms of the common and widely distributed hard Pine (*P. sinensis*), and *Juniperus chinensis* in numerous forms. Of the value of the numerous Firs and Spruces discovered by Wilson on the slopes of the mountains of western China and now growing in the Arboretum it is still too early to say anything beyond the fact that at this time *Picea Balfouriana* promises to be the most distinct and valuable. To Japan the Arboretum is indebted for several Spruces, Pines and Firs, including *Abies homolepis*, often sold in nurseries as *A. brachyphylla*, the best probably of all the Firs for this climate, one of the handsomest of Junipers (*J. rigida*), the Retinosporas (*Chamaecyparis*), the handsome *Thuja Standishii*, and the curious Umbrella Pine (*Sciadopitys*).

The Rocky Mountain Region of North America has done much for the New England lovers of conifers. Four trees which grow to their largest size in the forests of the Pacific states range inland to the continental divide and are hardy here. These trees in the north are *Abies grandis*, *Thuja plicata*, one of America's noblest trees, *Pinus monticola*, the western White Pine, and *Tsuga heterophylla*; the southern Rocky Mountain states have given us hardy forms of the Douglas Spruce (*Pseudotsuga*) and of the White Fir of California (*Abies concolor*), and the Engelmann Spruce (*Picea Engelmannii*), one of the world's handsomest Spruce-trees. This tree has been growing since 1873 in the Arboretum where it is perfectly hardy. It has grown rapidly and until four or five years ago formed a perfect pyramid with lower branches sweeping the ground. Then the lower branches began to die and the trunks are now bare of branches for a distance of four or five feet above the ground. The tops of the trees, however, are still in perfect health and are growing rapidly.

The want of space in these Bulletins forbids a detailed description of these and of many of the other conifers in the collection, but the following list of seven species which up to this time show here the greatest promise as ornamental trees may be useful. The Carolina Hemlock (*Tsuga caroliniana*) is placed first on the list as the most beautiful conifer now growing in the Arboretum; the others are the native White Pine (*P. Strobus*), the Japanese *Abies homolepis*, the Colorado *A. concolor*, the European *Picea omorika*, the Rocky Mountain *Thuja plicata*, and the Chinese Golden Larch (*Pseudolarix amabilis*).

These Bulletins will now be discontinued until the spring of 1924.

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