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Conifers. The value of institutions like the Arboretum appears in the fact that several cone-bearing plants which were first cultivated in this country at this Arboretum are now generally recognized as the best plants in their different classes which can be grown in the north-eastern United States. The most important of the conifers introduced by the Arboretum are *Tsuga caroliniana*, *Picea Engelmannii*, *Picea Omorika*, *Picea Glehnii*, the Colorado form of *Abies concolor*, the interior form of *Thuja plicata*, *Juniperus chinensis* var. *Sargentii* and *Picea glauca* var. *albertiana conica*.

Tsuga caroliniana, the Carolina Hemlock, as it grows in the Arboretum is generally considered the most graceful and beautiful cone-bearing tree in the collection. It is a native of the Blue Ridge, the eastern range of the Appalachian Mountains on which it grows from southwestern Virginia to northern Georgia usually in scattered groves on the rocky banks of streams usually at elevations between two thousand five hundred and three thousand feet. It escaped the attention of the numerous botanists who explored the southern Appalachian Mountains during the last half of the eighteenth and the first half of the nineteenth century, and its distinct character was first noticed in 1850 by Dr. L. B. Gibbes of Charleston, S. C., although it was not until thirty-one years later that it was described by Dr. Engelman. This Hemlock was first raised at the Arboretum in 1880 and the tallest tree here is now nearly forty feet high. On the Blue Ridge the Carolina Hemlock is usually not more than forty or fifty feet high, although occasionally trees up to seventy feet in height occur, and the trunk

has rarely a greater diameter than two feet. It is a much smaller tree therefore than the northern Hemlock. The branches are more pendulous and the leaves are darker green and more lustrous than those of this tree. The leaves, too, are usually notched at the apex and slightly toothed, while those of the northern tree are usually rounded at the apex and are not toothed. The two trees are, however, best distinguished by their cones; those of the southern tree are not stalked and their scales are much longer than broad with obtusely pointed bracts; and those of the northern trees are stalked and the scales are about as long as wide with bracts broad and truncate at the apex. Many persons see and admire the Carolina Hemlock in the Arboretum every year, but it is still rare in cultivation, and probably ten thousand Colorado Blue Spruces (*Picea pungens*) are planted in this country every year for one Carolina Hemlock. It is not found in many American nurseries, and the price at which it is offered is excessive.

Picea Engelmannii, which is the common and most widely distributed Spruce of the Rocky Mountains, was discovered in Colorado in 1862 by D. C. C. Parry. Seeds are said to have been sent by him in that year to the Harvard Botanic Garden, but there is no record that plants were raised there; and it is believed that this tree was first cultivated in 1879 when seeds were planted in this Arboretum. The Engelmann Spruce grows to its largest size on the mountains of Colorado where trees one hundred and fifty feet high with trunks up to five feet in diameter have been seen; further north and south the trees are smaller. As it grew in great forests which fifty years ago covered the slopes of the Colorado mountains up to altitudes of ten thousand feet it was with its light cinnamon red bark and narrow pyramidal crown of soft light gray-green leaves one of the handsomest, perhaps the handsomest of all Spruce-trees. The Engelmann Spruce has grown well in the Arboretum, and the tallest trees here are nearly forty feet high. For many years the stems were clothed with branches to the ground, but four or five years ago the lower branches began to die and the trunks of the largest trees are now naked for a distance of seven or eight feet from the ground. The narrow crowns are still perfectly healthy and the trees are growing rapidly. Engelmann's Spruce is a good ornamental tree to plant in New England, and its hardiness, the rapidity of its growth, and the value of the timber it produces may make it a valuable tree for forest planting in the northeastern states. In western Europe, where Engelmann's Spruce suffers from spring frosts, it is little known, which is perhaps the reason that it has been so little planted in the eastern states for Americans have been often too much governed in the selection of trees by what is known of them in England. From all points of view *Picea Engelmannii* is now the best Spruce which has been planted in the Arboretum.

Picea Omorika, the Servian Spruce which was not distinguished until 1875, was first raised at the Arboretum in 1880 from seeds presented to it by the late Dr. Bolle of Berlin. The Arboretum trees are now from thirty to forty feet high, with trunks clothed to the ground with short branches which form a narrow pyramid clothed with leaves dark green and lustrous on the ventral surface and pale on the other. This Spruce has proved perfectly hardy here and is one of the handsomest

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