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Linden-trees. The earliest of these trees are already blooming, and now for several weeks their fragrant flowers, frequented by swarms of bees, will perfume the air. The studies of Linden-trees at the Arboretum have shown that the European species grow more rapidly and give every promise of being better trees in this climate than the American and Asiatic species. This is unusual, for of other European trees only the Beech and White Willow grow better here than their American relatives, and except Lindens all eastern Asiatic trees are more at home in eastern North America than the trees of Europe. The five European species, *Tilia platyphyllos*, *T. cordata*, *T. vulgaris*, *T. tomentosa*, and *T. petiolaris*, and several varieties of the first are growing here in a satisfactory manner. The first of these trees is easily distinguished by the hairs which cover the lower surface of the yellow-green leaves and the young branches. This tree is the first of the European species to flower. It has long been cultivated in the eastern states; indeed it appears to be the common European Linden sold by American nurserymen, although as an ornamental tree it is the least desirable of the European Lindens. *Tilia cordata*, distinguished by its small cordate leaves pale and glaucous on the lower surface, is the last of the Lindens to flower. It is a beautiful tree which in Europe grows to a large size, but is not very often seen in this country, and if there are large specimens here they have escaped the attention of the Arboretum. It is an interesting fact that the Linden-tree which has been growing in eastern Massachusetts long enough to show its value in this climate is generally believed to be a hybrid between *Tilia platyphyllos* and *T. cordata*, which is variously known as

T. vulgaris, *T. europaea* and *T. intermedia*. The leaves, which are intermediate in size between those of its supposed parents, are dull green on the upper surface, pale on the lower surface and destitute of hairs with the exception of those which form the clusters in the axils of the veins. The largest and handsomest Linden-trees in the neighborhood of Boston are this hybrid and larger and handsomer specimens can sometimes be seen in the Middle States. The shapely and healthy young trees which have been planted to shade the Louis Pasteur Avenue in Boston are good specimens of this tree and show what city street-trees should be.

The two Lindens of eastern Europe, *T. tomentosa* and *T. petiolaris*, are distinct and handsome trees with leaves silver white on the lower surface, which can be easily and successfully grown in southern New England. *T. tomentosa*, which is common in the forests of Hungary, in this country forms a broad, compact, round-topped head with erect branches and large leaves erect on short stalks. *T. petiolaris* is a more beautiful tree with pendulous branches which form a narrow head, and with leaves drooping on long slender stems. It has proved to be one of the handsomest exotic trees which can be planted in the eastern states.

It is too soon to speak with authority on the value of the Asiatic Lindens. Only *T. japonica* has been long enough in this country to give any real indication of its value. It is a graceful and handsome little tree which is the first of the Lindens in the Arboretum collection to flower, but as yet shows no indication of growing to the great size this tree attains in Japan. Some of the most valuable of the Lindens are hybrids. Attention has already been called in this Bulletin to *Tilia vulgaris*. The Crimean *Tilia euchlora* is believed to be the natural hybrid between *T. caucasica* and *T. cordata*. One of the handsomest Linden-trees in the Arboretum, *T. spectabilis*, is supposed to be a hybrid of *T. glabra* and *T. petiolaris*. It is a fast-growing tree with leaves as large or larger than those of *T. glabra* but silvery white below like those of its other parent. A variety of this hybrid called "Moltke" originated many years ago in a German nursery. It is a tree of denser habit and darker leaves than *T. spectabilis* and grows well in the Arboretum.

In North America fifteen species and a few varieties of Linden-trees are now recognized; that is more than in all the rest of the world. One of the northern species, *Tilia glabra* or *americana* as it is still often called, is the American species which has been most often cultivated; it is a splendid tree at the north and although usually much smaller reaches occasionally the height of 120 feet with a trunk from three to four feet in diameter. This tree is easily distinguished by the lustrous under surface of the leaves which are destitute of hairs with the exception of those which form on the lower surface the conspicuous rusty brown axillary tufts. This tree has been much planted in Canada and the northern states as a park and street tree; it is more satisfactory northward for in southern New England and the Middle States the leaves especially on street trees are often disfigured by red spiders which however can be kept in check by dry sulphur spray. The second northern species, *Tilia neglecta*, although it was described many years ago in Europe from cultivated trees was not recognized by American botanists and tree lovers until a comparatively short time ago. This

tree is readily distinguished from *Tilia glabra* by the short, firmly attached grey hairs which cover the under surface of the leaves during the season. This is a smaller tree than *Tilia glabra* rarely growing to the height of 75 feet. In Canada it has been found as yet only in the neighborhood of Montreal; it ranges to the coast of southern New England and New York, through the Middle States and along the Appalachian Mountains to those of North Carolina and Tennessee and from western New York to northern Wisconsin. This tree is now well established in the Arboretum where it has grown rapidly and is now well covered with flowers which open a week or ten days before those of *T. glabra*. The leaves of this tree have not been attacked here by red spiders. Two other American Lindens are established in the Arboretum, *Tilia heterophylla* var. *Michauxii* and *T. monticola*. The lower surface of the leaves of these trees is covered during the season with silvery white felt. The handsomer of these trees, *Tilia monticola*, grows naturally only on the Appalachian Mountains at altitudes between 2000 and 3000 feet and from southwestern Virginia to eastern Tennessee and western North Carolina. This Linden is always a conspicuous object for the leaves which are very oblique at the base droop on long slender stalks and are oblong and larger than those of the other American Lindens. This promises to be an excellent tree for more general cultivation in northern parks and gardens. The other hardy species, *T. heterophylla* var. *Michauxii*, has grown more slowly in the Arboretum than *T. monticola* and is less distinct and beautiful. These two species and *T. neglecta* are growing side by side and close to the grass path in the rear of the Linden collection and can be easily compared. The Linden collection now contains some thirty species and hybrids and forms one of the most satisfactory and interesting groups of trees in the Arboretum. It is arranged in the meadow on the right hand side of the Meadow Road.

The last Azaleas. As the yellow or flame colored flowers of *Rhododendron* (*Azalea*) *calendulaceum* wither those of another Appalachian species *R. (Azalea) arborescens* begin to open. The flowers are white with bright red stamens and style and deliciously fragrant and do not open until after the leaves have grown nearly to their full size. The home of this plant is on the Appalachian Mountains on which it is found from western Pennsylvania to northern Georgia, in the neighborhood of streams in the rich soil of sheltered valleys growing to the height of from fifteen to twenty feet; and on the Carolina Mountains is often not more than three or four feet tall forming at altitudes of about 5,000 feet above the sea, great thickets often many acres in extent. Recent studies of this plant show that its value as a garden plant is not generally understood and appreciated. The flowers vary to an unusual degree in size and in the length and diameter of the corolla-tube and although the corolla is usually pure white a form is now known in which the corolla is suffused with rose; in another it is more or less striped with rose; in another form the corolla is tinged more or less deeply with yellow, and in another it is marked by a yellow blotch. These forms are all worth places in a collection of Azaleas, and it is possible that if seedlings were raised from them other and perhaps more

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