ARNOLD ARBORETUM
HARVARD UNIVERSITY BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JULY 14, 1922

Linden Trees. At midsummer the Lindens scent the air with their fragrant flowers from which bees gather their richest harvest. *Tilia*, the name of the Linden, is one of the widely and generally distributed genera of the trees of the northern hemisphere; it is absent, however, from western North America, and no Linden has yet been found in the forests which cover the Himalayas. Eastern North America with fifteen species is richer in Lindens than all the rest of the world, and in eastern North America Lindens are found from New Brunswick westward to Lake Winnipeg and southward to northern Florida and northeastern Mexico. To the two species which grow in Canada another is added in New York and Pennsylvania; southward in the forests which cover the high slopes of the Appalachian Mountains and in those of the coast region of the Carolinas and Georgia the number increases. Lindens are common in all the Gulf states, and abound in eastern and southern Texas where five species and several varieties occur and where Lindens grow by the scanty streams, and under the bluffs of the Edwards Plateau, a region in which Lindens could hardly be expected to flourish.

The ability of the southern species to grow in New England has still to be demonstrated in the Arboretum, and only three northern and one southern Appalachian species are established here. These are *Tilia glabra*, more often called *Tilia americana*, *T. neglecta*, *T. heterophylla* var. *Michauxii*, and *T. monticola*. Of these *Tilia glabra*, which was once abundant in northern woods where it grew to a great size, is the only American species which has been often planted as a shade tree in

New England. Generally, however, it has not proved a good tree beyond the limits of the cool damp woods which are its home, for in less favorable situations the leaves are disfigured by the red spider which often kills them. The other American species are still little known in parks and gardens.

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 or 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 less 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 also in Europe grows to a large size, but is not very often seen in this country. A better tree here than either *T. platyphyllos* or *T. cordata*, *T. vulgaris* is now generally believed to be a natural hybrid of these species. The leaves are dull green on the upper surface, paler on the lower surface, and without hairs with the exception of those in the tufts in the axils of the veins below. This tree, which has been often planted in the northern and middle states, is one of the best trees to shade the streets of northern cities. The largest and handsomest Linden-trees in the neighborhood of Boston are of this hybrid.

The two Lindens of eastern Europe, *T. tomentosa* and *T. petiolaris*, are distinct and handsome trees with leaves silvery 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 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 occasionally seen in the neighborhood of Boston, but it is more common southward, especially in Newport, Rhode Island, where there are a number of noble specimens.

It is too soon to speak with authority on the value of the Asiatic species. 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 a natural hybrid between *T. caucasica* and *T. caudata*. One of the handsomest of the 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 like those of its other parent. A variety of this hybrid called "Moltkei" 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. The Arboretum collection of Lindens has been arranged in the meadow on the right hand side of the Meadow Road. It now contains forty-five species, hybrids and varieties, and offers a good opportunity for the study of these trees, although they are of course too young to show their habit at maturity. Many of them, however, have produced flowers and ripened fruit for several years, and every year information of their permanent value in this region is accumulating.

The Sorrel Tree, *Oxydendrum arboreum*, is already covered with flowers which will open before the end of the month. This tree is a native of the southern Appalachian forests. It has deciduous bright green, shining leaves which have a pleasant acidulous flavor and in the autumn turn bright scarlet, Andromeda-like flowers erect on the branches of spreading or slightly drooping terminal clusters, and pale capsular fruits which in the autumn are conspicuous among the brilliant leaves. In its native forests the Sorrel-tree sometimes grows to a height of sixty feet, but as it grows slowly and begins to flower at the north when only a few feet high it will probably never attain a great size here. It is one of the handsomest, nevertheless, of summer-flowering trees which can be grown in New England. There is a group of these plants among the Laurels at the northern base of Hemlock Hill.

The summer-flowering Buckeye, *Aesculus parviflora*, is already covered with its tall narrow spikes of small, slender, white flowers with long exserted stamens, and is perhaps the most conspicuous of the summer-flowering shrubs, with the exception of Hydrangeas, which are hardy in the Arboretum. It is a native of the southeastern states from South Carolina to Florida and Alabama, and nowhere abundant it appears to be most common in northern Alabama. It has long, however, been a favorite in gardens in which it produces stems seven or eight feet high and in good soil and with sufficient room spreads into great thickets often twenty or thirty feet across.

Cornus amomum, the Silky Cornel, is the last of the American Dogwoods to bloom and flowers can still be found on many of the plants in the Arboretum where they have been largely used. In cultivation it is not a satisfactory plant unless it can be given sufficient room for its wide-spreading branches to extend freely over the ground. When crowded by other plants the branches become erect and it loses its real beauty and value. To be seen at its best this Cornel should have a clear space with a diameter of not less than twenty feet in which to spread. It is well suited for the front of groups of trees and shrubs,

1922. "Linden Trees." *Bulletin of popular information - Arnold Arboretum, Harvard University* 8(15), 57–59. <https://doi.org/10.5962/p.321274>.

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