The Lindens. On the whole the group of Lindens on the right hand side of the Meadow Road is the best arranged and most satisfactory group of trees in the Arboretum, and so far as flowers are concerned these are the most interesting trees in this climate in July. Linden trees are found in eastern North America, eastern Asia, the Caucasus and in Europe, and the species are usually widely distributed and common forest trees. They are all quite similar in the character of their flowers and fruit, and chiefly differ in the shape of their leaves, in the presence or absence of the hairs on the leaves and branchlets, and in the nature of this hairy covering when it exists. A curious fact about Linden trees is that in the flowers of the American species there are five petal-like scales opposite the petals and connected with the clusters of stamens, and that in the flowers of the Old World Linden trees these petal-like scales do not occur. Another interesting fact which has been learned here about Linden trees is that in the Arboretum the European species and their hybrids are more vigorous and handsomer trees than the Asiatic species, although with few other exceptions eastern Asiatic trees give more satisfaction in eastern North America than the trees of western Europe. The European Lindens, too, grow more rapidly than the American species which have never been very generally planted in this part of the country with the exception perhaps of the northern Tilia glabra which often suffers here in dry summers from the attacks of the red spider which disfigures and often causes the leaves to fall in August, especially when planted as a street tree. This tree usually appears in books under the incorrect name of Tilia americana. It is a splendid tree in the forests of northern New Eng-
land and eastern Canada, where it is found from northern New Brunswick to the shores of Lake Winnipeg, but is less common and smaller southward. The leaves are destitute of hairs with the exception of the large conspicuous tufts in the axils of the veins on their lower surface which is light green and lustrous. Three other American species are established in the Arboretum, *Tilia neglecta*, *T. heterophylla* var. *Michauxii* and *T. monticola*. The first of these differs from *T. glabra* in the short, gray, finely attached pubescence which covers the lower surface of the leaves during the season and in the small inconspicuous tufts of axillary hairs. This is also a common northern tree which often grows with *T. glabra* and has been confused with it in books on American trees. It has a wide range from the valley of the St. Lawrence River in the Province of Quebec through the northern states, and ranges southward along the Appalachian Mountains to North Carolina, and westward to southwestern Missouri. This tree, which has not been many years in the Arboretum, has so far escaped the attacks of the red spider, has grown rapidly and proved to be a good tree. *T. heterophylla* var. *Michauxii* is a northern variety of a species widely distributed in the southeastern states. It differs from *T. glabra* and *T. neglecta* in the thick white down which covers the lower surface of the leaves early in the season and on the leaves of upper branches is often brown. It is a handsome tree with slender, reddish or yellowish branchlets and small, slightly flattened winter-buds. It occurs in western New York and is widely distributed southward from the valley of the Susquehanna and lower Ohio rivers, in the southern states being usually confined to the slopes of the Appalachian Mountains and their foothills. It is hardy in the Arboretum but has grown more slowly than *T. neglecta* and *T. monticola*. This last is the most conspicuous of the American Lindens which has been satisfactorily grown in the Arboretum. It is the tree which has been incorrectly called *Tilia heterophylla* in many books in which American trees have been discussed. It is found only on the slopes of the southern Appalachian Mountains from Virginia to North Carolina and eastern Tennessee, growing with *T. heterophylla* var. *Michauxii*. From that tree it differs in its much stouter branchlets, much larger compressed winter-buds, larger leaves very oblique at the base, often seven or eight inches long, thickly covered below with white tomentum and hanging on long slender stalks. The flowers are larger than those of any of the American Lindens. This Linden has grown more rapidly in the Arboretum than *T. heterophylla* var. *Michauxii* and promises to be a valuable tree in northern parks.

There are three Linden trees in western Europe, *Tilia platyphyllos*, *T. cordata* and *T. vulgaris*. The first has yellowish green leaves covered on the lower surface with short hairs found also on the young branchlets. This is the first of the European species to bloom in the Arboretum where it is growing with several of its abnormal forms, including one with deeply divided leaves (var. *asplenifolia*) one with slightly lobed leaves (var. *vitifolia*) and one of pyramidal habit (var. *pyramidalis*). These varieties are curious rather than beautiful and have little to recommend them as ornamental trees. *T. platyphyllos* appears to be the common Linden sold by American nurseriesmen as "European Linden." It is perfectly hardy but as an ornamental plant
is less desirable than the other European species. Much handsomer is the small-leaved \textit{T. cordata} which is the last of the Lindens in the collection to open its flower-buds. The leaves are often broader than long, with a heart-shaped base, very dark green above and pale below, and rarely more than two and a half inches in length. This tree has grown slowly here and is still a broad, densely branched pyramid. Not common in American plantations, the Arboretum has not heard of large specimens in the United States. In central and northern Europe trees one hundred feet tall are not uncommon. The third of the Lindens of western Europe, \textit{T. vulgaris}, is believed to be a natural hybrid between \textit{T. platyphyllos} and \textit{T. cordata}. It is a large tree with leaves dull green on the upper surface, lighter on the lower surface, and destitute of hairs except in the axils of the veins below. There are fine old specimens of this tree in the neighborhood of Boston, and it is the best Linden in this climate to shade city streets. It is this tree which has been so successfully used in Boston on Louis Pasteur Avenue which connects the Harvard Medical School with Audubon Road.

The Two Silver Lindens of eastern Europe, \textit{T. tomentosa}, sometimes called \textit{T. argentea}, and \textit{T. petiolaris}, are handsome trees of unusual appearance which may often be seen in American parks. \textit{Tilia tomentosa}, which is a common tree in the forests of Hungary, is a large tree with erect branches which in this country form a broad, compact, round-topped head and large leaves dark green above and snow-white below. This tree has been a good deal planted in the parks of New York City where large and handsome specimens can now be seen. It appears to be less well known in New England. \textit{T. petiolaris} is a handsome tree and one of the most beautiful of the exotic trees which can be grown in this climate, as can be seen in Newport, Rhode Island, where there are many noble specimens. It is a tall tree with drooping branches which form a narrow head, and leaves which are silvery white on the lower surface, and drooping on long slender stalks flutter gracefully in the slightest breeze. This tree is not known in a wild state and its origin is uncertain. \textit{T. spectabilis}, which is believed to be a hybrid of \textit{T. petiolaris} or \textit{T. tomentosa} with \textit{T. glabra}, is a handsome fast growing tree with the large leaves of the American species and silvery white below. This is one of the handsomest Lindens in the Arboretum collection. The var. \textit{Moltkei} of this hybrid is a tree of denser habit and greener leaves, and in this climate a handsomer and more desirable tree than \textit{T. glabra}. It originated many years ago in the Spaeth Nursery near Berlin. The Crimean Linden (\textit{T. euchlora}, sometimes called \textit{T. dasystyla}), is distinct in its dark green lustrous leaves, and is believed to be a hybrid between \textit{T. caucasica} and \textit{T. cordata}. This beautiful tree is hardy in the Arboretum, but does not grow as well here as the European species, certainly not as well as it does in some of the countries of western Europe where it has been used and is recommended as a street tree. \textit{T. caucasica}, one of its supposed parents, is not in the Arboretum collection.

Asiatic Lindens have not yet given much promise of growing here into large or handsome trees. Nearly every species from eastern Asia which has been described has been planted in the Arboretum more