American Hawthorns. Some of these plants are now in bloom and the flowers of others will be conspicuous in this Arboretum during the next six weeks, and from the middle of August until midwinter Hawthorns will be brilliant here with fruit. No other group of plants is represented in the Arboretum by so many species; and no other group of small trees and shrubs with deciduous leaves can add so much beauty during such long periods of the year to our parks and gardens. The discovery, determination and cultivation of the large majority of these plants has been accomplished during the last twenty-three years. For until the end of the last century no one had formed any conception of the number, variety and distribution of these plants in North America. To the botanists of forty years ago fifteen or sixteen species with two or three varieties were known, and American gardeners were able to plant only two or three of these. There are now some five hundred species or forms established in the Arboretum, and an increasing number of these trees are flowering and producing their fruits here every year. Hawthorns are distributed in North America from Newfoundland and northern Quebec to northern Florida and northern Mexico, and from the Atlantic to the Pacific. They are much more abundant in species east of the eastern borders of the great plains than in the Rocky Mountain and Pacific regions, where they range northward into British Columbia and southward only into northern California. So far as is now known they are most abundant in species in the valleys of the streams which flow from north and south into Lake Erie, and in the region which extends from southern Missouri to the valley of the Red River in Arkansas. New York and Pennsylvania are rich in
species, and southward along the Appalachian Mountains and in the southeastern states species of Crataegus are not rare. The species have now been arranged in twenty-three groups distinguished by the shape and character of the leaves, the size of the flowers and the size and shape of the fruit, and it is interesting that while species of some of these groups are widely and generally distributed those of others are chiefly confined to particular sections of the country, as the Flavae to the southeastern states, the Douglassianae to the northwest, and the Tenuifoliae to the northeastern and middle states. The Macracanthae, which is one of the common northern groups, with many large trees, is extremely rare in the southern states and in Arkansas and eastern Texas is represented by only a few small shrubs. The Intricatae, composed mostly of small shrubs, has its greatest number of species in Pennsylvania and adjacent states, but is extremely rare in the Mississippi valley and unknown westward. The Molles Group, which contains the largest number of species which become trees of considerable size, is common in the northeast, almost unknown in the southeastern part of the country, and most abundant in Missouri, Arkansas and Texas to the valley of the San Antonio River and the Edwards Plateau. Descriptions and figures of twenty-five species of this Group are included in the new edition of Sargent's Manual of the Trees of North America, and there are already indications that the number can be enlarged. Trees of this Group are the earliest of the American Hawthorns to bloom in the Arboretum, and three of them are now covered with open flowers. These three species are Crataegus arnoldiana, C. arkansana and C. mollis. They are all large and handsome trees, and have some historical interest for students of American Hawthorns, for it was these plants which first attracted attention at the Arboretum to differences in their flowers in the number of stamens and in the color of anthers, which first led to the critical study of Crataegus which has been going on here ever since and which among other things has led to the sowing of 4269 different lots of Crataegus seeds.

Crataegus arnoldiana was found growing as a large rather misshapen shrub in the dense shade of large trees on the bank opposite the southern end of the Meadow Road. It has only been found outside of the Arboretum in the valley of the Mystic River at West Medford, Massachusetts, where a number of years ago there were several trees, and near Lyme, Connecticut. C. arnoldiana has taken kindly to cultivation and there are now a number of large and shapely specimens growing in the Arboretum. The largest of them are the two trees on the left hand side of the Valley Road close to the Centre Street entrance, and there are other good specimens on the left hand side of the Valley Road in front of the White Oak Collection and in the old Crataegus Collection between the Shrub Collection and the Arborway boundary. The flowers of C. arnoldiana are about three-quarters of an inch in diameter, and are arranged in broad, many-flowered clusters. Like those of most of the eastern species of this group, they have ten stamens and yellow anthers. The fruit is bright crimson, subglobose, slightly hairy at the ends and about three-quarters of an inch in length. It begins to ripen the middle of August and falls early in September. The early ripening fruit of no other Hawthorn is so conspicuous.
Crataegus arkansana, which is a native of the bottom lands of White River, near Newport, Arkansas, was first raised at the Arboretum in 1880. It is a tree some twenty feet high with a tall straight stem, a wide, rather irregular head and flowers an inch in diameter in broad clusters; like those of most of the western species they have twenty stamens and rose-colored anthers. The fruit is short-oblong to slightly obovoid, bright crimson, very lustrous, three-quarters of an inch in diameter and ripening late in October falls gradually during several weeks. This is perhaps the handsomest of the species with large, late-ripening fruit. There are plants in the Arboretum in the old Crataegus Group and on the left hand side of the South Street entrance to the Arboretum.

Crataegus mollis is the common and best known species of this Group and grows on the bottom-land of streams in the region from northern Ohio and southwestern Ontario to northern Missouri and eastern South Dakota, Nebraska and Kansas. It is a round-topped tree often forty feet high, with a tall well formed trunk and spreading branches. The flowers, which are arranged in broad many-flowered clusters, have twenty stamens and yellow anthers. The fruit is nearly globose, scarlet, often an inch in diameter, and ripens late in August or in September, and falls gradually. The largest plant in the Arboretum is by the right hand side of the South Street entrance. Further notes on American Hawthorns as they flower will appear in later issues of these Bulletins.

Rhododendron (Azalea) Schlippenbachii is in flower on the upper side of Azalea Path where two plants are now established. The pale pink fragrant flowers, which are about three inches in diameter and marked on one of the lobes of the corolla with red-brown spots, are perhaps more beautiful than those of any other Azalea, certainly of any Azalea which has proved hardy in the Arboretum. R. Schlippenbachii is one of the commonest shrubs of Korea and often forms the dominant undergrowth in open woods. From Korea it crosses into northeastern Manchuria where it grows on the shores of Possiet Bay; it occurs, too, in two localities in northern Japan. In Korea this Azalea on the wind-swept grass-covered cliffs of the coast grows less than a foot high but flowers abundantly. In the forests of the interior it often grows to a height of fifteen feet and forms a tall and slender or a broad and shapely shrub. The leaves are large for an Azalea, being from three and a half to four inches long and sometimes nearly three inches wide, and are arranged in whorls of five at the end of the branches. This plant grows further north than any other Azalea, with the exception of the North American Rhodora. The thermometer in the region of the Diamond Mountains usually registers every winter a temperature of 35° to 40° below zero Fahrenheit. There is therefore no reason why this Azalea should not flourish in the coldest parts of New England. Its hardiness and the beauty of its flowers make it one of the most valuable shrubs, if not the most valuable, which northeastern North America has obtained from northeastern Asia. This Azalea, however, is still rare in gardens. The seeds germinate freely, but the seedlings have proved difficult to manage, and many have been lost here in at-
tempts to transplant them. The seedlings, too, make only one growth in the season and so increase slowly. It is therefore doubtful if the spread of this plant will be as rapid in American gardens as was hoped a few years ago when it was first brought to this country.

Rhododendron (Azalea) yedoense var. poukhanense, which is the first Azalea in the Arboretum to open its flower-buds, has been in full bloom for several days on Azalea Path where there is a large mass of these plants. This is a very hardy shrub widely distributed in Korea from the neighborhood of Seoul southward, and grows generally in open Pine-woods and on grass-covered slopes where it forms dense mats rarely more than three feet high, although in more sheltered shaded positions it is occasionally as much as six feet tall. Here in the Arboretum in full exposure to the sun it forms dense mat-like bushes from two to two and a half feet tall and three feet or more in diameter. This Azalea is perfectly hardy in the Arboretum where it first flowered in 1914. The flowers are clustered, with a rose or rosy purple corolla, and are more fragrant than those of any other Azalea in the Arboretum collection. On Azalea Path these Korean Azaleas are growing close to plants of Fothergilla major and F. monticola which are now also in bloom, and the snow white flowers of the Fothergillas contrasting delightfully with the rose-colored flowers of the Azaleas suggest a good color scheme for the spring garden.

Early-flowering Viburnums. The first Viburnum to bloom in the Arboretum this year is Viburnum alnifolium, the Hobblebush or Moosewood of cold, wet northern woods. It is a large shrub spreading by shoots from the roots, with broad flat clusters of small flowers surrounded by a ring of large pure white neutral flowers, dark green leaves with prominent veins, which turn orange and scarlet in the autumn, and fruit in drooping clusters, bright red at first when fully grown and dark blue or nearly black at maturity. This is one of the handsomest of the American Viburnums but it has proved a difficult plant to establish here, although in other Massachusetts gardens it has grown better than it has in the Arboretum, where, however, it at last appears to have become accustomed to its surroundings. Another Viburnum is in flower in the group of these plants near the upper end of the Bussey Hill Road and on Hickory Path near Centre Street. This is the Korean Viburnum Carlesii and one of the hardiest and most beautiful shrubs which the gardens of America have obtained from eastern Asia. Its greatest value is found in the white waxy flowers which are arranged in small, very compact, nearly globose clusters and open from rose-colored buds. As the flowers do not all open at once the buds among the white flowers add to the beauty and interest of the flower-clusters in early spring. The flowers of no other Viburnum and of few other hardy plants are as fragrant as those of Viburnum Carlesii. It is a plant which should be in every northern garden. Unfortunately seeds are produced rarely in this country. It has suffered, too, from the fact that Japanese nurserymen have for several years sent to this country as this species a Japanese plant called Viburnum bitchuense which is in every way inferior as a garden plant. This Viburnum is also in flower near V. Carlesii in the Viburnum group.