BULLETIN NO. 37.

The remarkable mildness of the winter of 1912-13 will long be remembered by the lovers of plants in eastern Massachusetts. In the Arboretum the Silver Maple (Acer saccharinum) was in full bloom on January 23d. The flowers of the Japanese Witch Hazel opened the following day; on January 23d Hamamelis vernalis was also in bloom, and on February 2d expanded flowers were found on the European Daphne mezereum.

The Japanese Witch Hazel is too little known here; it is a large, vigorous, and perfectly hardy shrub and there are two forms, one of them blooming a few days before the other. In ordinary seasons they blossom about the middle of February, and for weeks their slender branchlets are bright with the clear yellow of the petals of their numerous flowers. These are uninjured by the severest cold to which they have ever been subjected here, a temperature of several degrees below zero making no impression on them. The Japanese Witch Hazel would be an excellent subject to plant in city yards and with the protection and warmth the plants would obtain from city buildings they would probably flower in Boston in January every year. Although its flowers are smaller than those of the Japanese species, Hamamelis vernalis is an interesting plant with considerable decorative possibilities. It is a native of southern Missouri and, although the existence of a Witch Hazel in that part of the country has long been known, it has only recently been distinguished from the autumn flowering species of the northern states. This Missouri species flowered this winter in the Arboretum for the first time in cultivation and is still little known in gardens.

In spite of the warmth of the early winter, which was followed by a few days of hard frost, the general absence of snow and the three cold nights in the first part of this month, few plants have suffered in the Arboretum and less damage has been done to doubtfully hardy species than usual. Many of the new Chinese plants introduced by the Arboretum and planted in exposed positions have now come through two winters—one exceptionally cold and one abnormally warm—without injury and there is, therefore, good reason to hope that several hundred new species of trees and shrubs raised from seed collected by Wilson can be added permanently to New England plantations.

With the exception of some Willows and Alders the earliest exotic tree to bloom in the Arboretum this year is the Japanese Euptelea polyandra, a small tree with erect branches and pyramidal habit. The flowers open before the leaves and their beauty is found in the large, conspicuous, orange-red anthers hanging on long slender filaments. The flowers are unisexual but the pistils do not appear until some time after the anthers. Euptelea is a small genus confined to Japan and western China. A second species, Euptelea Franchetti, raised from Wilson's seeds also promises to succeed in the Arboretum. The plants now in flower of the Japanese species are on the right-hand side of Azalea Path and should be examined by persons interested in rare and curious plants.
Cercidiphyllum japonicum, another Japanese tree, is just coming into flower. Unlike Euptelea, the male and female flowers are borne on different individuals and, like those of that genus, the flowers are without sepals and petals. The anthers of the staminate trees are red and rather showy, but the female flowers are inconspicuous. The beauty of the tree is in its foliage. The leaves are rounded and, although smaller, are in shape a good deal like those of the Redbud or Cercis. For this reason the name Cercidiphyllum has been given to the tree. When the leaves unfold they are bronze red, during the summer they are light green and turn in the autumn to clear yellow. This is the largest deciduous-leaved tree of Japan where it grows in the northern part of the empire scattered through forests of Oaks and other northern trees. Cercidiphyllum is a tree of pyramidal habit with a number of stems springing from the ground, and in Japan it often grows to the height of more than one hundred feet. It was introduced into the United States through the Arboretum many years ago and has now become common in collections here. There is a group of these trees on the two sides of the Meadow Road a short distance beyond the Administration Building entering from the Jamaica Plain gate. In western China Wilson found a Cercidiphyllum growing on open hill-sides with a tall straight trunk, and therefore quite unlike the Japanese tree in habit. This form, which has been named var. sinense, is growing well in the Arboretum, the young plants showing the single stem habit.

The first flowers of the earliest flowering Cherry in the Arboretum, Prunus tomentosa, are already open. This is a native of northern China and in cultivation is a broad, vigorous and perfectly hardy shrub of excellent habit which covers itself every year with large white flowers more or less tinged with red toward the base of the petals. The flowers are followed in early summer by bright red slightly hairy fruits of good flavor. Introduced by the Arboretum from Peking nearly thirty years ago, this has proved one of the most valuable of spring-flowering shrubs. There is a group of small plants of this Cherry on the right-hand side of the road just below the Forest Hills gate, and very large plants can be seen along the Boston Parkway between Perkins Street in Jamaica Plain and Forest Hills.

In the Cherry Group, on the Forest Hills Road, the Japanese and Chinese Prunus subhirtella and the Japanese Prunus pendula will be in full bloom early next week. The flowers of the former are among the most beautiful of the Asiatic Cherries, and the trees have never been more thickly covered with flower-buds.

The flowers of some of the Forsythias have appeared rather earlier than usual this year, especially those of the var. Fortunei of F. suspensa which is the form most generally cultivated in the neighborhood of Boston. This genus has given to our northern gardens some of the most beautiful and most satisfactory of all hardy shrubs. The species are all Chinese with the exception of F. europaea which was discovered in Albania a few years ago and is of much less value as a garden plant than the Chinese species. F. viridissima, the first species cultivated in Europe and America and the latest of all species to flower, is of comparatively little ornamental value. It is, however, one of the parents
of a race of hybrids, *F. Fortunei* being the other parent, known as *F. intermedia*, among which are some exceedingly valuable garden plants. One of these hybrids recently described as *F. intermedia var. primulina* originated in the Arboretum a few years ago. It has pale primrose-colored flowers which are produced in crowded clusters. This form is not yet much known in cultivation but it promises to be of exceptional value.

The Buffalo Berry (*Shepherdia argentea*) is in flower in the Oleaster Group on the left-hand side of Bussey Hill Road just above the Lilacs. The Buffalo Berry is a shrub or small tree, with handsome silvery leaves, minute clustered axillary flowers and small crimson or yellow subacid fruits which ripen early in the autumn. It is a common inhabitant of the borders of streams from Saskatchewan to the Rocky Mountains as far south as New Mexico. It is a valuable ornamental plant for the dry interior parts of the continent, and in the west much attention has, in recent years, been paid to it as a fruit plant.

The Spice Bush (*Benzoin aestivale*) is in full bloom on the right-hand side of the Bussey Hill Road opposite the end of the Lilac Group where there are large masses of this shrub. It is a native of the eastern United States and an inhabitant of the borders of swamps where it sometimes grows to the height of ten or fifteen feet. The flowers are small, bright yellow, and the male and female flowers are produced on different individuals, so that only some of the plants bear the small bright scarlet shining fruits which are so attractive late in the season in contrast with the bright yellow autumnal foliage. The leaves are fragrant like those of its relative the Sassafras, and are uninjured by insects. This is one of the common shrubs which should be better known by gardeners. Next to the Spice Bush Group the Leatherwood (*Dirca palustris*) is covered with its bright yellow flowers which appear before the leaves. This beautiful and interesting plant owes its common name to the toughness of the bark of the branches. Rarely cultivated, it deserves a conspicuous position in all collections of hardy shrubs.

On the right-hand side of Azalea Path the Japanese Box (*Buxus japonica*) is already in flower. This is a shrub of rather open habit with small yellow-green leaves, and the only really hardy Box which has been tried in the Arboretum. It is therefore of special interest to persons in search of broad-leaved evergreens suitable for New England gardens. It is remarkable, therefore, that this plant, which was raised here from seed brought from Japan by Professor Sargent twenty years ago, has remained practically unknown in this country beyond the borders of the Arboretum.

The most conspicuous flowers in the Shrub Collection now are those of a little European Heath, *Erica carnea*, which is already covered with its rosy red flowers. This is one of the few perfectly hardy Heaths which can be grown successfully in this climate, and an excellent plant for the early spring rock garden.

The Arboretum will be grateful for any publicity given these Bulletins.
ARNOLD ARBORETUM
HARVARD UNIVERSITY

BULLETIN
OF
POPULAR INFORMATION

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Next week the Arboretum should be visited by lovers of the flowers of early spring for it will then be gay with the white blossoms of the Shad Bushes (Amelanchier) which have been largely planted in the shrubberies and mixed plantations, making the last days of April here one of the most delightful weeks of the early spring. Amelanchier is largely North American, although there is one small shrubby species on the mountains of central Europe and another species is widely distributed in eastern Asia. In the United States the genus is found with many species in both the eastern and western parts of the country. Two species grow naturally in the Arboretum, *A. laevis* and *A. oblongifolia*. The former, which has been erroneously called *A. canadensis*, is a small tree easily distinguished in spring by the red color of the unfolding leaves which make a handsome contrast with the white flowers. This tree grows on uplands and there are several good-sized specimens at the base of the wooded slope on the south side of the Forest Hills Road in the rear of the lower end of the Apple Group. *A. oblongifolia* grows naturally on the borders of swamps and, although it often grows to a large size, is always shrubby in habit. There is a large wild plant of this species on the border of the north meadow, and it is this species which has been most generally planted in the Arboretum. The other tree Amelanchier, the true *A. canadensis*, is a larger plant than *A. laevis*, and it can easily be distinguished by the coat of fine down which covers the lower surface of the leaves which are silvery white, becoming green but never red when they first unfold. This tree is rare in New England, but it is common in western New York where it grows to a very large size, and in the southern states where it is the common species except on the Appalachian Mountains where at high elevations *A. laevis* occurs. There are a number of small shrubby species in the eastern states which are all beautiful and desirable garden plants, but who ever plants them and in what nursery can they be found? Unfortunately, their decorative value as garden plants, like that of so many other native shrubs, has not spread very far beyond the limits of the Arboretum. A complete collection of the species of eastern North America has now been arranged in the border along the grass path which, starting from a point opposite the Administration Building, turns to the right and follows the direction of the Meadow Road.

The Japanese *Prunus Sargentii* is in flower again. As was stated last year in Bulletin No. 20, this hardy tree is considered by many persons the most beautiful of all flowering Cherries. It is a large and perfectly hardy tree; the pink or rose-colored flowers are large and produced in great abundance, the ample dark green leaves turn orange and red in the autumn and the bark is smooth, red-brown and very lustrous. The trees in the Arboretum produce fruit every year in June and seeds will be distributed in the order of application to persons who wish to experiment with this valuable tree. The seeds should be sown as soon as received. There are six specimens of *Prunus Sargentii* on the Forest Hills Road near its junction with the Meadow Road.
Prunus triloba is in flower just below the entrance to the Shrub Collection at the Forest Hills Gate. This is a shrub with bright clear pink flowers about an inch in diameter which appear before the leaves. The double-flowered form of this shrub (var. multiplex) is a favorite in China, whence forty or fifty years ago it was introduced into Europe and the United States where it is often cultivated. The much more beautiful single-flowered form grows on the mountains near Peking and appears to have been cultivated for the first time in the Arboretum, to which seeds were sent from China in 1882. Although perfectly hardy, P. triloba is not a particularly vigorous plant. It well deserves a place, however, in every garden for the charming color of the flowers.

The Plum trees in the group next to the Cherries and at the principal entrance to the Shrub Collection from the Meadow Road are beginning to open their flower-buds. This year the Chinese Prunus triloba is the first to flower. It is a common fruit tree in China and Japan, and from it or from some of its varieties the so-called Japanese Plums, now so popular in the United States, have been derived. The flowers of this Asiatic tree will soon be followed by those of the Canada Plum (Prunus nigra) which is the most northern of the American Plum trees, being distributed from Newfoundland to the shores of the Strait of Mackinaw and southward along the northern borders of the United States. It is a small tree with dark, rough bark, and flowers slightly tinged with pink and becoming rose-color in fading. This, perhaps, is not one of the handsomest of the American Plum trees, but it is valuable on account of its hardiness, the early appearance of the flowers, and the early ripening of the fruit. The Plum Collection is near the principal entrance to the Shrub Collection from the Meadow Road and next to the Cherries.

The Arboretum collection of Willows is planted on both sides of the path which, starting from a point opposite the Administration Building, leads to the Shrub Collection and to the Forest Hills Gate. The collection, which contains a large number of species and hybrids, suffers for want of sufficient space for the proper development of individuals, especially of the species which become large trees, and on the whole is less satisfactory than some of the other groups in the Arboretum. Some of the dwarf shrubby species are now in flower and should be examined by persons in search of beautiful hardy shrubs suited for many decorative purposes. One of the most beautiful of these little Willows is Salix tristis, a spreading shrub not more than two feet high with slender stems and small gray-green leaves. The anthers of the male plant are bright red when they first appear and much more showy than the gray inflorescence of the female plant. This little willow grows naturally on dry barren soil from New England to Minnesota and southward. It takes kindly to cultivation and grows equally well on dry ground and in moist peaty soil, and soon spreads into large masses. It is an excellent plant for covering dry barren slopes. Salix humilis is another native shrub with gray-green leaves but yellow anthers. This species sometimes grows to the height of from six to nine feet, and the slender red stems make a handsome contrast with the silvery gray flower-clusters. This is also a plant of the northern United States and is as easily cultivated as S. tristis in all sorts of soil. In the same group are also flowering two dwarf exotic species, Salix repens var.
argentea from northern Europe and Siberia, and S. gracilistyla, a shrub three to four feet high from Japan. These plants can be seen on the left hand side of the walk not far from its entrance to the Meadow Road.

One of the first plants in the Arboretum to unfold its leaves in the spring is a shrub of the Rose Family, *Prinsepia sinensis*. The small but numerous, clear yellow, axillary flowers appear soon after the leaves and can now be seen on a well established plant on the upper side of Hickory Path near the Centre Street wall. This north China shrub is still rare in cultivation, but is well worth a place in any collection for its beauty and for its botanical interest.

The Arboretum is often asked about the best shrubs for ground cover, that is to cover the ground under trees or among larger shrubs. The two deciduous-leaved shrubs which have proved the most successful in the Arboretum for this purpose are both natives of the United States. They are the Fragrant Sumach (*Rhus canadensis* or *aromatica*) and the Yellow Root (*Zanthorrhiza apiifolia*). The former is rather a straggling plant with slender stems sometimes three or four feet high, although in one of its forms this plant grows much more compactly. The flowers are bright yellow, on short axillary branches appearing before the three-lobed leaves, and followed by red fruits which ripen in June. This has been found a useful plant in the Arboretum, although as a ground cover it has not proved as successful as the Yellow Root. This does not grow so tall, and, spreading rapidly by underground shoots, soon covers the ground with its erect stems. The small purple flowers are produced in terminal erect racemes and open before or with the leaves which are clear bright yellow in the autumn. Unfortunately this plant, which is a native of the Appalachian Mountain region, will not thrive in limestone soil. These two shrubs have been largely planted in the Arboretum and are now in flower.

Some of the forms of *Lonicera coerulea* are in flower in the Shrub Collection. This is a bush Honeysuckle which encircles the northern hemisphere and is attractive in habit with its creamy white flowers and bright blue fruits.

One of the broad-leaved evergreens, *Pieris (Andromeda) japonica*, is in bloom among the Rhododendrons at the base of Hemlock Hill. This is a hardy plant with handsome foliage and clusters of large white flowers which, however, are usually spoiled here by spring frosts. A better plant for this climate is *Pieris (Andromeda) floribunda*, a native of the southern Appalachian Mountains and one of the best broad-leaved shrubs which can be grown here. It forms in cultivation a broad, low, rounded head; the leaves, although small, are dark green, and the creamy white flowers are produced in profusion. The flower-buds are conspicuous through the winter and just now are beginning to open. There is a large specimen of this Andromeda in the bed on the north side of Hemlock Hill Road opposite the Laurels.

The Arboretum will be grateful for any publicity given these Bulletins.
Many of the Crabapples promise an exceptionally good bloom this year and several of them will be in full flower next week. There is a large collection of these plants in the Arboretum, including several hybrids, for there are few genera in which natural hybrids among cultivated plants are more often found.

The common Apple-tree of the orchard is usually believed to be a hybrid between the two European species, although the so-called Paradise Apple, which is largely used in this country as stock in the propagation of dwarf Apple-trees, is probably a form of *Malus pumila* from eastern Europe, central Asia and the Himalayas. Another important hybrid largely grown commercially and known, at least in this country, as the Siberian Crab is believed to have been obtained by a cross between the common Apple-tree and the small-fruited Siberian Crabapple, *M. baccata*. Plants of this hybrid are fast-growing, very hardy, usually pyramidal small trees. The flowers are handsome but the trees are most ornamental in the autumn when they are covered with their brilliant scarlet or orange, often translucent fruits which are usually from an inch to an inch and a half in diameter. These hybrids are hardy in northern regions too cold for the common Apple-tree, and they are often grown as fruit trees. Their fruit is subacid but valuable when cooked and for preserves. The most curious form, perhaps, of *Malus pumila* in the collection is *M. Niedzwetzkyana* from Turkestan. This small tree, which is one of the first Apples in the collection to bloom, has dark purplish red flowers and fruit, even the flesh of the fruit being purple, purple leaves at least early in the season, and dark bark and twigs. That this tree is only an abnormal variety is shown by the fact that the leaves of seedlings raised in the Arboretum are more often green than red.

One of the handsomest of all Crabapples, *M. floribunda*, is one of the earliest to flower. As it grows in this country it is a broad shrub with a trunk divided at the base into several large stems. The pink flowers, which are deep rose color in the bud, turn white before the petals fall and are produced in the greatest profusion. The dark green foliage is handsome, but the yellow or orange-colored fruits, which are not much larger than peas, make little show. The origin of this plant is uncertain. It was first sent to Europe from Japan, but it is not a native of that country and probably originally came from China, although it is not now known in China in a wild state. By some authors it is considered a hybrid between two of the species of northern China, although it bears but little resemblance to its supposed parents, and seedlings raised from this cultivated plant show comparatively little variation. The largest specimens of this Crabapple will be found in the neighborhood of the Administration Building.

A plant which is evidently a hybrid of *M. floribunda* with one of the hybrids of *M. baccata* appeared spontaneously in the Arboretum several years ago and has been named *M. Arnoldiana*. It has much larger pink flowers and larger fruit than *M. floribunda*, and in flower it is one of the most beautiful of all Crabapples. Another early-flowering form is known as *M. Scheideckeri*, a supposed hybrid of *M. floribunda*, the other parent being probably *M. spectabilis* or *M. prunifolia*. This
plant appeared in Germany a few years ago and is one of the most ornamental of Crabapples. The branches are erect and slightly spreading, forming a narrow pyramidal head. The pink and white flowers are produced in profusion, and the comparatively large yellow fruit is from three-quarters to an inch in diameter. Another pyramidal Crabapple much better known is *M. spectabilis*, a native of northern China and an old inhabitant of gardens. The large pink flowers of this tree as it is known in gardens are more or less double; there are several forms, of which the best, perhaps, is Rivers' Crab (*M. spectabilis Riversiana*), so named for the English nurseryman by whom it was raised or distributed nearly a century ago. The Crabapple of eastern Siberia, *M. baccata*, is a tall, narrow tree with white flowers on long, drooping stems, and yellow fruits not much larger than peas. This is a hardy and handsome tree, but it is less beautiful than several hybrids which were raised in the Arboretum many years ago from seeds sent from St. Petersburg. The parentage of these plants is uncertain, although *M. baccata* is no doubt one of the parents. They are wide-branching, vigorous trees with large pure white flowers and fruits two or three times larger than those of *M. baccata*.

By some persons the Parkman Crab (*M. Halliana*) is considered, when it is in flower, the most beautiful of the group. It is a small and not very vigorous tree, with dark bark, leaves tinged with purple when they first unfold, and bright, clear pink, semidouble flowers drooping on long stalks, and minute fruits. This is probably a Chinese plant which has long been cultivated in Japanese gardens but is not now known in a wild state. It reached America sixty years ago and was first cultivated in this country by the historian Francis Parkman in his garden on the shores of Jamaica Pond. Seedlings of this plant show great variation.

Japanese species which deserve the attention of lovers of hardy plants are *M. zumi* from Japan, with pink and white flowers, and *M. Sargentii*, a native of the borders of salt marshes in the northern island, and the only shrub Apple which is now known. In the Arboretum it has proved a valuable late-flowering plant; and it appears particularly well suited for northern gardens for on the coast of Maine it grows even better than it does here. The last of the eastern Asiatic species to flower is *M. toeringo*, from northern China and Japan. This is a small tree with spreading branches, numerous, very small flowers, and minute, red or yellow fruits. A low, shrubby seedling form of this species has appeared in the Arboretum.

The American Crabapples bloom later than the Asiatic and European species. There is one species (*M. fusca*) on the northwest coast and several in the Atlantic states from New York, Michigan and Iowa southward. In the group on the Forest Hills Road and nearly opposite the end of the Meadow Road *M. fusca* is well established. With it there is an interesting hybrid of this and the common Apple-tree named *M. Dawsoniana*. This is a vigorous tree with the peculiar oblong yellow fruit of its American parent. The fruits, however, are much larger and the leaves resemble those of the common Apple. *M. coronaria* from the eastern states and *M. ioensis* from the central west are in this group, and there are plants of *M. angustifolia* from the extreme southeastern states now well established on Hickory Path near Centre Street. Of *M. ioensis* there are two plants opposite the end of the
Meadow Road, of the form known as the Bechtel Crab. This tree has double pale pink flowers which look like small clustered Roses. This is the last Crabapple in the collection to bloom, and one of the most popular plants in the Arboretum, judging by the fact that when the trees are in flower the ground about them is trodden hard by visitors who want to examine them at close range.

There are two groups of Apple-trees in the Arboretum. The first is on the left-hand side of the Forest Hills Road entering from the Forest Hills Gate and opposite the end of the Meadow Road. This collection contains the largest plants in the Arboretum. The second and supplementary collection is arranged at the eastern base of Peter's Hill. The plants are smaller, but this collection contains a larger number of species and hybrids than the other. For the lovers of spring flowers the blooming of the Crabapples is one of the three or four most interesting periods in the Arboretum year.

The earliest of the Viburnums to flower this year is *V. Carlesii*, from Korea, whence it was sent to Europe a few years ago. It is very hardy and blooms freely when not more than a foot high. It is particularly interesting from the fact that the flower-buds are bright orange-red. The inner surface of the corolla, however, is white and as the flowers open the color of the outer surface gradually fades to pink and then to white. As the buds do not always expand at the same time there are therefore in the cluster pink buds among the white flowers. This plant is still comparatively little known, but it seems destined to become a valuable and popular garden plant.

The Mahonia from the northwest coast, *Berberis or Mahonia Aquifolium*, with its shining Holly-like leaves, yellow flowers and blue fruits, is well known to garden lovers except perhaps in the extreme northern states where this plant is not very hardy and in severe winters is often badly injured. The much dwarfer and perfectly hardy Mahonia from the southern Rocky Mountains (*B. repens*) is, however, much less known as a garden plant. This plant grows only a few inches high and the leaves lack the lustre of those of the Oregon plant; it spreads rapidly, however, in good soil and soon forms a broad mat. This promises to be one of the best broad-leaved evergreens for ground cover in this climate. It is now in flower in the Shrub Collection.

The earliest true Barberry to flower in the Arboretum is *Berberis dictyophylla* which, although it comes from the southern part of China, is perfectly hardy here. The flowers are solitary or occasionally in pairs in the axils of the leaves, about half an inch in diameter, and pale primrose yellow. The great beauty of the plant, however, is in the leaves which, although not large, are silvery white on the lower surface and in the autumn turn brilliant scarlet on the upper surface while the lower surface retains its spring and summer color. This shrub can be seen with the other Barberries in the Shrub Collection and in the supplementary collection of Barberries on Hickory Path near Centre Street.

Several Honeysuckles (*Lonicera*) and some of the early-flowering Currants and Gooseberries (*Ribes*) are now in flower in the Shrub Collection and deserve the attention of visitors.

The Arboretum will be grateful for any publicity given these Bulletins.
The earliest Lilac in the collection was in flower at the end of the last week in April and it will be the first of July before the flowers of the latest have faded. The Lilacs are all Old World plants and the genus is confined to eastern Europe, southwestern Asia, the Himalayas, and to eastern Asia, from eastern Siberia to western China and to Japan, the largest number of species having been found in China. Although a great improvement has been made in the flowers of the common Lilac of gardens (S. vulgaris) by skillful cultivators of this plant in France and Germany, comparatively few important results have yet been obtained by crossing the different species, although one of the most valuable of all Lilacs as a garden plant is a hybrid between S. vulgaris and S. persica. This hybrid appeared in the Botanic Garden at Rouen nearly a century ago and through an error as to its origin it was unfortunately called S. chinensis. In gardens it is also sometimes known as S. rothomagensis. Another interesting hybrid Lilac is known as S. hyacinthiflora. This was raised in France and is the result of crossing the common Lilac with the Chinese S. oblata. The extremely fragrant flowers are small and double and are borne in small clusters. This plant, however, is chiefly valuable on account of its earliness for, like its Chinese parent, it is one of the first Lilacs to flower. Some of the recently discovered Chinese species will probably be less desirable garden plants than several of the better known species, but it is not impossible that they may prove valuable in the production of new hybrid races. That a great and unexpected prize may be obtained by the breeder of Lilacs is shown in the new race known generally as Syringa Henryi. This hybrid was obtained in Paris a few years ago by crossing the Hungarian S. Josikaea with the Chinese S. villosa. One of the plants obtained from this cross, called Lutèce, is one of the most beautiful of all garden Lilacs, although its Hungarian parent is perhaps the least beautiful of the whole genus, and the last species most breeders would have selected for one of the parents of a new race of garden plants. What therefore may be the result of crossing the small-flowered species collected by Wilson in western China with some of the large-flowered species no one can now predict.

From the wild Lilac (S. vulgaris) of the mountains of Bulgaria, with its narrow clusters of small lilac-purple flowers, many varieties have been obtained in the three centuries since this plant reached western Europe. The flowers of these varieties vary from dark purplish red through all the shades of lilac, and to pale pink, white and blue. The flower-clusters vary in length and breadth, and there are single-flowered, semi-double and double-flowered forms. The flowers of some forms are more fragrant than those of others and there is a difference of a week or more in their time of flowering. The double-flowered forms usually bloom later than the single-flowered form, and the double flowers last longer. The wild Bulgarian plant is in the collection and will flower this year. It is on the left-hand side of the path going up the hill through the Lilac Group, and the plant is labelled “Syringa vulgaris. Bulgaria.” It is interesting to compare the flowers of these wild plants with those of the forms which have been improved by cultivation. There are now one hundred and sixty of these
forms in the collection. Several others are in cultivation, but the Arboretum collection shows the variation which cultivators have produced in the Lilac and contains all the most desirable and valuable kinds. New varieties are produced every year but these show no real improvement over many of the forms produced many years ago, and the appearance of new varieties more valuable than those already in cultivation can hardly be expected.

The Arboretum is often asked for a list of the best garden Lilacs. No two persons, however, will agree on what are the best Lilacs for this is a matter of individual taste. Some persons prefer the white flowers and others the very dark flowers. Some lovers of Lilacs think that none of the new varieties compare in beauty with the purple-flowered Lilac of old gardens. One of the most satisfactory of the lilac-flowered forms is Charles X. Among the single-flowered white varieties no plant produces larger flowers in greater abundance than Marie Legrave; for those persons who admire double-flowered Lilacs none is better than the late-blooming, white-flowered Madame Lemoine. Philémon, Ludwig Späth and Congo are as good as any of the very dark-flowered varieties, and among the pink-flowered varieties Macrostachya is a first-rate garden plant. All the forms are equally hardy and equally vigorous; they all grow with nearly equal rapidity. Many of these forms, however, are so nearly alike that it is not easy to distinguish them, and in a collection of ten or twelve can be obtained all that are best worth growing.

In addition to S. vulgaris there are now established in the collection twenty species of Syringa and some of them are beautiful and desirable garden plants. The first of the species to flower is S. affinis from northern China; this is one of the most generally cultivated of all shrubs in the gardens of Peking. The pure white flowers are borne in loose, rather narrow, open clusters, and are extremely fragrant. There is a mauve-flowered variety of this species, var. Giraldii, which was discovered a few years ago in western China by a French missionary and which appears to be unknown in Chinese gardens. The two forms are very hardy, grow rapidly, and are blooming well this year. The habit of these plants, however, is loose and not attractive, but they deserve a place in every collection on account of their very early and fragrant flowers. Another Chinese Lilac, S. oblata, flowers nearly as early. This plant has the handsomest leaves produced by any Lilac; they are broad, thick and shining, and in the autumn, unlike those of any other Lilac, they turn a deep dark wine color before falling. This plant grows into a large, broad symmetrical shrub. The flowers are pale lilac color and very fragrant, but unfortunately the flower-buds are often injured by late frosts and the brittle branches are frequently broken by ice. When this Lilac is in good condition it is one of the handsomest of the collection, but it cannot be depended on. This year the flower-buds have been killed.

Another north China species, S. pubescens, is one of the best of the genus as a garden plant. It is a tall shrub with erect stems, small leaves and large clusters of pale lilac-colored flowers remarkable for the long tube of the corolla and for their delicate fragrance; indeed the flowers of S. pubescens are more fragrant than those of any other Lilac, and for this fragrance alone this plant should find a conspicuous place in every northern garden.
Syringa villosa, another north China species, is valuable for it is the last of the true Lilacs to flower. It is a large, vigorous shrub, of excellent habit, with large leaves. The flowers are produced in clusters which vary in size on different individuals; they vary, too, in color from rose to flesh color and occasionally nearly to white. This plant is therefore best propagated by cuttings taken from the best varieties rather than by seeds. The flowers have a disagreeable odor. Only two of the new Chinese species will flower this year, S. Meyeri and S. Julianae. The former has dark purple flowers, with corolla tubes even longer than those of S. pubescens, and is interesting because it begins to flower freely when not more than a foot or two high; its history, too, is interesting. The plants in the Arboretum were raised from seeds gathered in China by F. N. Meyer, a collector of the United States Department of Agriculture. Meyer made no herbarium specimens and has no recollection of the place where he found the plant. No other plants but those in the Arboretum were raised, and the only knowledge of the species has been obtained from the small plants cultivated here. S. Julianae, discovered in western China by Wilson, is of the same general character as S. pubescens, and is a conspicuous plant in flower as the outside of the corolla is dark purple and the inner surface of the corolla lobes white. The flowers are fragrant but not so fragrant as those of S. pubescens. The plant is very hardy but it is too new in cultivation to make it possible to judge of its real value as a garden plant.

Of old-fashioned shrubs now too seldom seen in gardens none are more beautiful than the Persian Lilac (S. persica) and its white-flowered variety. The Persian Lilac is a native of southwestern Europe where it is found from the Caucasus to Afghanistan and was cultivated in England as early as the middle of the seventeenth century. In gardens it forms a wide and shapely bush which, after the common Lilac has finished its bloom, covers itself with long clusters of small, fragrant flowers which weigh down the slender branches. This is one of the parents of the hybrid S. chinensis already mentioned. This hybrid is a shrub as large or larger than the common Lilac, with slender branches, leaves intermediate in shape between those of its two parents, and large, elongated clusters of purple-red flowers intermediate also in size between those of its parents. There is a variety of this hybrid with nearly white flowers.

There are three tree-like Lilacs with large unsymmetrical clusters of small white flowers which belong to a section of the genus distinguished by the very short tube of the corolla. The first of these to flower, S. amurensis, comes from eastern Siberia; this is followed by S. pekinensis from northern China, and later by S. japonica, the last and most tree-like of the Lilacs.

The Arboretum Lilacs have never given promise of a more abundant crop of flowers, and it is probable that the largest number of plants will be in the best condition during the week beginning on the 14th of May.

The Arboretum will be grateful for any publicity given these Bulletins.
The Horsechestnut (Aesculus Hippocastanum) growing naturally in a restricted area has the power of flourishing and reproducing itself in regions with climates as unlike as those of eastern New England and western Scotland. The home of this tree among the mountains of northern Greece is of such limited extent that, although the Horsechestnut has been cultivated in Europe for more than three centuries, it is only in comparatively recent years that the wild tree has been discovered. The Grecian Horsechestnut is one of the noblest of the exotic trees cultivated in the United States, but for the development of its greatest beauty it requires deep, rich, moist soil and abundant space for the spread of its branches. Few other trees suffer more from smoke, dust, and the other unnatural conditions of city life. There are a number of forms in cultivation but none of them equal the typical tree in beauty. One of the best known of these abnormal forms is the variety with double flowers (var. Baumannii, or flore pleno). This form flowers later than the single-flowered tree and the flowers last a long time in good condition. There are varieties with erect branches (var. pyramidalis) and with erect and spreading branches forming a round-topped tree (var. umbraculifera); and there are varieties with variously incised leaflets (var. incisa and var. laciniata), and with leaves blotched with yellow (var. variegata), but these are all horticultural curiosities and of no interest to the general planter.

The so-called red-flowered Horsechestnut, which appeared in Europe many years ago, although its origin is not entirely clear, is probably a hybrid of the common Horsechestnut with the red-flowered A. Pavia of the southeastern United States. The right name of this tree is A. carnea, although it is often found in nurseries under the name of A. rubicunda. It has the general habit and appearance of the common Horsechestnut, but it is a smaller tree and blooms later, and the flowers on different individuals vary from red to pale rose color. The handsomest form (var. Briotii) has deep red flowers and is one of the most ornamental of the arborescent Horsechestnuts. The Japanese Horsechestnut (A. turbinata) is rather closely related to the Grecian tree and resembles it in general appearance, although the flowers are less showy. In its native country this is a large and handsome tree, and it promises to be a valuable ornamental tree here. The largest specimen in the United States is in Rochester, New York, where the Japanese Horsechestnut has flowered and produced large crops of seeds for several years. The Himalayan Horsechestnut, the species from central China discovered by Wilson, and the California species are not hardy here, and the north China Horsechestnut is not yet established in the Arboretum.

Southeastern North America is the real home of the Horsechestnuts, judging by the multiplication of species in that part of the world where a number of interesting and valuable new forms have recently been discovered. The earliest of the American species to flower is the so-called Ohio Buckeye, A. glabra, which has now been in bloom for ten days. This is a small tree with pale yellow flowers, fruit like that of the Grecian tree covered with prickles and dark bark exfoliating in thin flakes. There is a tree of the Ohio Buckeye in the Horsechestnut Group on the Meadow Road, but the largest specimen in the Arboretum is on the left-hand side of the South Street entrance. A form of this tree with usually seven instead of five leaflets (var. Buckleyi) is
not otherwise different from the common form and flowers with it in the rear of the Horsechestnut Group. Near this is another form of this tree (var. leucoderms) from southern Missouri and Arkansas, with pale bark which blooms about two weeks later than the type and is just coming into flower.

The other yellow-flowered arborescent Horsechestnut of the eastern states (A. octandra) differs from the Ohio Buckeye in the absence of prickles from the fruit. It is a larger tree, growing sometimes on the slopes of the southern Appalachian Mountains to the height of eighty feet, and blooms a week or ten days later. This is a valuable ornamental tree which is now rarely found in collections. The other arborescent species of the southern states, the red-flowered A. Pavia, is not yet established in the Arboretum, although some garden forms of this tree (var. atrosanguinea and var. Whittleyi), flower here freely.

From a race of hybrids between A. octandra and A. Pavia some valuable garden plants have been obtained. This hybrid appeared in Paris at the beginning of the last century and the correct name for it is A. hybrida, although in recent European publications it is sometimes called A. versicolor. The flowers are of different shades of red, and individuals differ in foliage, in the size and color of the flowers, and in their time of opening. There are two large bushy specimens of this hybrid quite different from each other in appearance in front of the Horsechestnut Group and next to A. glabra on the Meadow Road, and other forms can be found in the rear of this group. Of recently described species from the southeastern states only A. georgiana from central Georgia will flower this year. This is a broad, round-topped shrub, growing sometimes to the height of five or six feet, with large red and yellow flowers in long compact clusters, and a plant of much promise as a garden ornament. A large bed of this shrub will be found on the path in the rear of the Horsechestnut Group and opposite the mass of A. parviflora. This well known shrub is the last of the Horsechestnuts to flower and its tall narrow spikes of white flowers will not open before midsummer. Near this bed are beds of young plants of the yellow-flowered A. arguta, a small shrub from eastern Texas, and of the beautiful red-flowered shrub or small tree from the southern and southwestern states usually called A. austrina. Much attention has been paid to the formation of the Arboretum collection of Horsechestnuts and it will well repay the attention of persons interested in a beautiful genus of now too little known trees and shrubs well suited for the decoration of northern parks and gardens.

Among the American Magnolias in the group on the right-hand side of the Jamaica Plain entrance M. Fraserti is already opening its large cream-colored flowers which are conspicuous on the ends of the branches. This small tree is a native of the southern Appalachian Mountains and is perfectly hardy in the Arboretum. The small, bright canary yellow flowers of M. cordata open almost at the same time. This Magnolia was sent from the United States to France more than a hundred years ago and is now only known in the descendants of the trees cultivated in France, all attempts to find the wild trees in recent years having proved unsuccessful. This is a shapely, desirable and perfectly hardy ornamental tree. The leaves are dark rich green; the abundant flowers are of an unusual color for those of a Magnolia, and the second crop of flowers which these trees usually produce in summer adds to its value. The cultivated trees produce no seeds, and as
it can only be propagated by grafting *Magnolia cordata* is rare in collections.

Some of the most beautiful and interesting shrubs now in flower will be found among the Bush Honeysuckles. The decorative value of some of these can best be seen in the grass border by the Bussey Hill Road, opposite the Lilac Group, where several of these shrubs have been so planted that they have abundant space for full development and can show all their beauty of foliage, flowers and fruit. In the Shrub Collection there are a large number of these plants, and others can be found in the supplementary collection in the border on Linden Path in the rear of the group of Linden trees. In the Shrub Collection several interesting species are in flower or will soon be in flower. Attention is called to *Lonicera syringantha* and its variety *Wolffi* from western China, with purple fragrant flowers, and to *L. tibetica*. Two charming plants in this collection are *L. amoena* and *L. amoena Arnoldiana*, the latter a product of the Arboretum. They are garden hybrids, with slender pink flowers, of the Tartarian Honeysuckle, with *L. Korolkowii*, a species of central Asia. Other Honeysuckles now in bloom which should be examined are *L. bella*, a large and vigorous hybrid of *L. Morrowii* with the Tartarian Honeysuckle, *L. minutiflora*, remarkable in the beauty of its brilliantly colored fruits, *L. notha*, a hybrid of the Tartarian Honeysuckle with *L. Ruprechtiiana* of eastern Siberia, *L. minutiflora* from central Asia, and the slender and graceful *L. coeruloca graciliflora* with its beautiful drooping flowers. Of the shrubs introduced by the Arboretum into New England gardens none is now more generally cultivated or has proved more valuable than *L. Morrowii* from northern Japan. This in cultivation here is a broad high bush with wide-spreading branches clinging close to the ground. The pale blue-green leaves are pleasant in tone, and the yellow flowers are produced in the greatest profusion. This remarkable shrub, which has been largely planted in several of the Boston parks, appears to grow here more vigorously than it does in its native country.

On Azalea path the red-flowered *Rhododendron (Azalea) Kaempferi* is in flower. There are masses of this plant on both sides of the lower end of this path and between the Hemlocks and the Laurels at the northern base of Hemlock Hill. The shade and coolness of this position suit this inhabitant of the high mountains of Japan, and it flowers later here than on Azalea Path and the flowers remain longer in good condition. These flowers, in front of the dark background of Hemlocks, make one of the most brilliant shows of the Arboretum season.

The earliest of the American Rhododendrons to flower, *R. carolinianum*, is opening its flowers in the collection at the base of Hemlock Hill. This is a southern plant with handsome, very dark green leaves and small clusters of bright pink flowers. It grows at a considerable elevation on the Appalachian Mountains and although it was known in England and recognized as a distinct variety as early as 1810, it was afterwards confused with another southern species, *R. punctatum* and entirely lost sight of; and it is only recently that a comparison of the two plants in cultivation has shown the differences between them. It is perfectly hardy and a valuable garden plant. *R. punctatum* is a plant of lower altitudes with smaller leaves and flowers; it blooms several weeks later and is a less valuable plant.

The Arboretum will be grateful for any publicity given these Bulletins.
Hawthorns have been largely planted in the Arboretum and many of these interesting trees and shrubs are now in flower. The principal collections are between the boundary wall of the Arboretum and the Shrub Collection near the Forest Hills Gate, and on the eastern slope of Peter’s Hill. The multiplication of the species of Hawthorn (Crataegus) in eastern North America is remarkable, and nowhere else beyond the tropics is there a genus of woody plants represented by so many distinct forms. Much attention has been given at the Arboretum in the last fourteen years to the collection, study and cultivation of these plants, and some three thousand lots of seeds of wild plants from different parts of the country have been planted. Among the seedlings raised are, of course, many duplicates, but between six and seven hundred species raised in the Arboretum are now established on Peter’s Hill where plants of between fourteen and fifteen hundred of the seedling numbers have been planted in small square beds. Many of these plants are already flowering, and this collection promises to be in a few years one of the important features of the Arboretum both from an educational and an ornamental point of view. It will now repay examination.

The American species of Crataegus fall into some twenty natural groups, and on Peter’s Hill the species of the different groups are arranged together. In eastern North America Hawthorns are distributed from Nova Scotia and the valley of the St. Lawrence River to central Florida and western Texas. The number of species is greatest, perhaps, in the territory adjacent to Lake Ontario and the streams flowing into it. They are very numerous in the St. Lawrence Valley, in the lower peninsula of Michigan, in southern Missouri and Arkansas, and in the foothill region of the southern Appalachian Mountains. The genus is poorly represented in the Rocky Mountain region and reaches the northwest coast with a single species. Some species are found over thousands of square miles; others are very local. The American Hawthorns vary greatly in size; some species are trees which on the fertile bottom-lands of streams flowing into the lower Mississippi River are sometimes wide-branched and fifty or sixty feet tall, and others are shrubs often not more than two or three feet high. In the Arboretum some species begin to flower at the end of April or early in May and it is the middle of June before the flowers on some species open. No plants hardy in New England produce such abundant crops of beautiful fruits. The fruit of some species ripens in August and from August until November there is a succession of ripening fruits on some of the plants; and on some species the fruit remains in good condition during the entire winter. The species which flower the earliest belong to what is called the Mollis Group from one of its species. These are shapely and often large trees; they all have large flowers, large leaves and large, brilliantly colored and often edible, usually scarlet fruits.

Examples of this group are Crataegus Arnoldiana, first found growing wild in the Arboretum, and C. arkansana from northern Arkansas; both of these trees can be seen in the group near the Forest Hills Gate, and C. Arnoldiana has been largely planted in different parts of the Arboretum. Of C. arkansana there is a large specimen on the
left-hand side of the South Street entrance. The fruit of the first ripens in August, that of the latter in October.

One of the most interesting of the natural groups for the decoration of gardens and shrubbery borders is the Intricatae. The plants of this group are nearly all small, late-flowering shrubs, although the group contains a few small trees from the southern Appalachian region. These little shrubs produce very large flowers usually in few-flowered clusters; their fruit is often showy and their leaves turn brilliantly in the autumn. The largest number of the species of the Intricatae have been found in Pennsylvania and Michigan; they occur also in western New England, in New York and Ontario, but are extremely rare in all the region west of the Mississippi River. The plants of this group are arranged together on the lower side of the road at the eastern base of Peter's Hill and will soon be in bloom.

In the old collection, near the Forest Hills Gate, several other groups are well represented by flowering and fruiting plants; the Crus-galli by *C. fecunda*, a large wide-spreading tree from the neighborhood of St. Louis; the Dilatatae by *C. coccinoides* from the same region, well distinguished by its very compact clusters of large flowers; the Virides by *C. nitida* from the bottom-lands of the Missouri River in Illinois, opposite St. Louis, a handsome, flat-topped tree with wide-spreading branches; the Prunosae by the type of the group, *C. pruinosa*, a widely distributed eastern tree and one of the most beautiful of the genus both in its flowers and fruits; the Flavae, a group confined to the southeastern states, by *C. aprica* from the neighborhood of Ashville, North Carolina; and the Tomentosae by several forms of *C. tomentosa*, by the beautiful *C. succulenta* with its drooping clusters of brilliant fruits, and by *C. prunifolia*, a plant which, although it has been cultivated in England for more than a century, has not yet been found growing wild.

On the south slope of the Overlook on Bussey Hill there is a group of several plants of *C. punctata*. This is a large, wide-branched, flat-topped tree and one of the commonest and most widely distributed of American Thorns, growing from the St. Lawrence Valley to North Carolina and to Illinois. This species is interesting because some individuals bear red and others bright yellow fruit.

Species of *Crataegus* are few in western Europe and in all of Asia, but there are a number of handsome species in southeastern Europe, Asia Minor and the Caucasus. Nearly all the Old World species and many of their varieties are now growing more or less well in the Arboretum and can be seen both in the old collection and on Peter's Hill. Among the exotic species none is more beautiful here than *Crataegus pinnatifida* from northern China and Manchuria. This is a plant with large and very deeply divided lustrous leaves. Growing wild it is a medium-sized shrub with comparatively small fruits, but it has been long cultivated in orchards in northern China as a fruit tree, and by cultivation it has been developed into a tree with large and edible fruits.

Many of the North American Hawthorns grow naturally in limestone soil, but in cultivation they thrive in all soils, grow rapidly, and many of the species begin to flower when very small. They suffer, like many other plants of the Rose Family, from the attacks of the San Jose scale, and the leaves are often disfigured or killed by the larvae of a
leaf-mining insect which causes them to turn brown in early summer. These, however, are pests which can be controlled, and the American Hawthorns, the existence of many of which was not even suspected a dozen years ago, seem destined to play an important part in the decoration of American and European parks and gardens.

Another North American genus of the Rose Family, Aronia, sometimes considered a section of the genus Pyrus, also contains plants valuable for the garden and the shrubbery. There are three species, all widely distributed in the eastern part of the country, *A. melanocarpa*, *A. atropurpurea* and *A. arbutifolia*; they all have small white flowers in erect compound clusters, showy fruits and handsome foliage. The typical *A. melanocarpa* is a shrub 12 or 18 inches high with stems spreading into a broad mat. There is a form of this species (var. *elata*), however, which is much more common and grows into a tall, broad shrub from 6 to 10 ft. tall, and another form (var. *grandifolia*) with broader leaves, also a tall shrub. The fruit of these species is black and lustrous, and drooping on long stems remains on the plant until the beginning of winter. *Aronia atropurpurea* is also a tall erect shrub, in general habit and foliage like the var. *elata* of the first species. The fruit, however, is dark vinous red and ripens and falls earlier. The leaves of these two species turn orange and red in the autumn before falling. *Aronia arbutifolia* is a tall, slender and more irregular growing plant with later flowers, smaller leaves and erect clusters of smaller bright scarlet fruits which remain on the plants without change of color well into the winter. The brilliant fruit and the bright scarlet of the autumn leaves make this late in the season one of the most beautiful of the native shrubs. All the forms of Aronia take kindly to cultivation and are now in flower in the Shrub Collection. They have also been largely planted in the shrubberies along the Arboretum roads.

The Highbush Blueberry, *Vaccinium corymbosum*, has never flowered more abundantly in the Arboretum than this year, and it is desirable to call attention again to this wonderful plant which is beautiful in its flowers, its abundant edible blue fruits, and in the splendid scarlet of its autumn leaves. The Highbush Blueberry, which grows naturally along the moist borders of swamps and other low places where it occasionally reaches the height of twelve or fifteen feet, is easily cultivated and grows freely in good garden soil. On the plants in the Arboretum, where they have been largely planted, the flowers differ considerably in size and in the time of opening. They vary, too, in the size and quality of the fruit, but all the forms are equally valuable as garden ornaments. For its fruit, which is the best of all Blueberry fruits, for the beauty of its flowers and its autumn leaves, this shrub cannot be too often planted. There are several plants on each side of Azalea Path near its entrance from the Bussey Hill Road, and the Highbush Blueberry can be seen now in full flower in many of the roadside plantations.

The Arboretum will be grateful for any publicity given these Bulletins.
For the decoration of northern gardens there are no more beautiful or desirable shrubs than the Azaleas of eastern North America. There are seven species of these plants and they are now all called Rhododendrons by botanists, and in the Arboretum all Azaleas are labeled Rhododendrons. The first species to bloom, R. Vaseyi, begins to flower the beginning of May and the flowers of the last, R. viscosum, can be found here as late as the middle of July, so that the Azalea season is a long one. R. Vaseyi is a tall shrub, with slender stems and an open irregular habit. In its home in the sheltered valleys of the Blue Ridge in South Carolina it sometimes grows to the height of from fifteen to eighteen feet. The flowers are produced before the leaves appear in small compact clusters and are pure pink in color, but occasionally plants are found with nearly white flowers. Although this plant was not discovered until comparatively a few years ago, it has been much planted in gardens near Boston and it is fast becoming here one of the most popular of the early-flowering spring shrubs. With R. Vaseyi the Rhodora (R. canadense) flowers. This well known dwarf shrub often covers, especially in the north, large areas of moist or swampy land with a sheet of bloom. The small flowers, however, are of a rather unattractive rose-purple color, and the fame of the Rhodora is perhaps due more to Emerson’s poem than to its intrinsic beauty. Naturally the Rhodora grows from Newfoundland to Pennsylvania and New Jersey.

The next to bloom are the two pink-flowered species, R. canescens and R. nudiflorum; the former is a northern and the latter a more southern plant and is especially common in the Gulf States from Florida to eastern Texas. The flowers of these plants open before or with the unfolding of the leaves and in early spring fill the woods with beauty and fragrance. Both species can now be seen in flower on Azalea Path, and there is a large mass of Azalea canescens on the right-hand side of the Meadow Road in front of the Linden Group. The Flame-colored Azalea, R. calendulaceum, is the next species to flower and is already beginning to open its orange, yellow, or reddish flowers which are not fragrant. This shrub is an inhabitant of the Appalachian Mountain region from southern New York to Georgia, and is extremely abundant on the lower slopes of the high mountains of North Carolina and Tennessee. In flower it is the most showy of our Azaleas and one of the most beautiful of all flowering shrubs. A large mass of this Azalea has been planted on the slope below Azalea Path and occasional large specimens can be seen in the border plantations along some of the roads.

The next species to flower, R. arborescens, is also a native of the Appalachian Mountains on which it grows from Pennsylvania to Georgia and where in sheltered valleys it sometimes attains the height of fifteen feet or more. The flowers, which appear after the leaves are nearly fully grown, are white or faintly tinged with rose color and are made conspicuous by the long bright red filaments of the stamens. The flowers are very fragrant and the young leaves have the odor of new mown grass. Less showy in flower than the Flame-colored Azalea it is one of the most beautiful of all hardy Azaleas.
The last species to flower, the Clammy Azalea or Swamp Honeysuckle, is a common inhabitant of the swamps of the eastern states, especially of those in the neighborhood of the coast. The rather small flowers are pure white and covered with clammy hairs, and the leaves are often of a pale bluish color, especially on their lower surface. This plant is valuable for the lateness of its flowers which do not open until the flowers of most hardy shrubs have passed, and for their fragrance.

These shrubs are all perfectly hardy in eastern Massachusetts and flourish in all exposures and in good garden soil, although like all Rhododendrons they cannot be made to live in soil strongly impregnated with lime. They are not often cultivated because it is not easy to find these plants in nurseries, for few nurserymen, especially in the United States, care to take the trouble to raise such plants from seeds, the only satisfactory way in which they can be propagated. In beauty, constitution and hardiness they are superior to the so-called Ghent Azaleas which are hybrids between the species from the Caucasus, which is not hardy here, and some of the American species. The Ghent Azaleas are favorites with European nurserymen who propagate them by grafting and they are imported in large numbers into this country. Here they grow slowly; many of the varieties are not at all hardy and others are liable to lose large branches in severe winters. The American species are better garden plants here, too, than the yellow-flowered Asiatic species, *R. japonicum*, usually called *Azalea mollis* in gardens, a common Japanese and Korean plant, and the Chinese *R. sinense* or the hybrids of these two species. *Azalea mollis* is hardy and free-flowering but the plants are short-lived in this country. The little known *R. sinense* with its beautiful yellow flowers is hardy but the flower-buds have usually been killed in each of the two or three winters this plant has been exposed here in the open ground. The Japanese and Chinese *Viburnum tomentosum* is now in flower. This is a large shrub with wide-spreading horizontal branches along the upper side of which the flat flower-clusters are thickly placed and are surrounded by a ring of pure white sterile or ray flowers which make the conspicuous part of the inflorescence. The flowers are followed in the late autumn by brilliant fruits which, scarlet at first, become black when fully ripe. The leaves turn orange and scarlet in the autumn. There is an interesting narrow-leaved form of this plant (var. *lanceolatum*), discovered in Japan by Professor Sargent, now flowering in the Arboretum. There are also two "Snowball" forms of this plant developed in Japanese gardens and much cultivated here and in Europe under the name of *Viburnum plicatum*. The correct name of the more common of these two plants is *V. tomentosum*, var. *dilatatum*. This is the Japanese Snowball usually cultivated in this country and it will not be in its best condition for another week or ten days. The other form (V. tomentosum, var. *dilatatum*, f. *rotundifolium*), which appears to be a dwarfer plant, has been in flower for the last ten days. These forms of Viburnum can be seen growing together in the large collection of Viburnums recently arranged on Bussey Hill Road just before it turns into the Valley Road near the Centre Street Gate. *Viburnum tomentosum* and the Corean *V. Carlesii* are ornamental plants of great beauty and value but, with the exception of these two plants, none of the eastern Asiatic species compare in value as decora-
tive plants with the Viburnums of North America. To these much of the late spring and early summer beauty of the Arboretum shrubberies is due, and the successful cultivation here of these plants is at last making their value known and appreciated. Thirty years ago it was practically impossible to buy an American Viburnum in any nursery, but now several of the species are largely propagated in many North American nurseries and have been used in considerable quantities in many American parks.

About a dozen of the American Viburnums are thoroughly established in the Arboretum, the different species flowering through period of two months. The earliest to flower and the most difficult to establish here satisfactorily, V. alnifolium, often called V. lantanoides, the Hobble Bush or Moosewood of northern woods, has been out of flower for several weeks and now the only species in flower is the Black Haw, V. prunifolium. This is a small shapely tree of the Middle States where it is often extremely common. The flowers are in convex clusters and are followed by sweet blue-black fruits. These and the leaves, which late in the season turn deep wine color, make this a particularly attractive plant in the autumn. Several other species will be in flower in a few days and will be mentioned in later issues of these bulletins.

Three species of Enkianthus, an Asiatic genus of the Heath Family, are unusually full of flowers and flower-buds this year. The largest of the Japanese species, E. campanulatus, is now in flower and the flowers of the other species will open in a few days. E. campanulatus is a tall shrub with bell-shaped flowers hanging gracefully in long clusters which are partly hidden by the leaves. There are two forms in the collection, one with pale yellow flowers striped with red, and the other with rather smaller red flowers. The leaves of all these plants turn brilliant scarlet in the autumn and for its autumn colors E. campanulatus is much cultivated in Japanese gardens. The three species are in the Shrub Collection, and there is a large group of them on the lower side of Azalea Path where E. campanulatus can now be seen in its greatest spring beauty.

Of Chinese plants flowering here for the first time attention is called to Lonicera Koehneana, a large hardy and vigorous shrub with dark red-purple branchlets, thick yellow-green leaves with conspicuous veins and pale yellow flowers slightly tinged with red on the outer surface of the corolla, and to Neillia sinensis, an interesting plant related to the Spiraeas. The former is in the bed of Chinese shrubs on the southern slope of Bussey Hill, in which a number of the new Cotoneasters are also in flower, and the Neillia is on Hickory Path near Centre Street.

The Arboretum will be grateful for any publicity given these Bulletins.
ARNOLD ARBORETUM
HARVARD UNIVERSITY

BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.
JUNE 5, 1913
BULLETIN NO. 44.

At no other time in the year is the Arboretum more interesting and attractive than in the early days of June. The leaves of many trees have now grown to their full size; those of others are still in their vernal stages. The conifers are now covered with the tender green of their new shoots and are more beautiful than at any other time of the year. The Rhododendrons are fast opening their flowers and these will soon be followed by those of the Laurel (Kalmia); many Azaleas are blooming, and the flowers of Viburnums, Cornels, and other native shrubs add to the beauty of the plantations.

One of these native shrubs or small trees, *Viburnum Lentago*, sometimes known as the Nannyberry, is now very conspicuous in many parts of the Arboretum. Few more beautiful shrubs than this common inhabitant of the roadside and the wood-border of New England can be found in any part of the world. It is a shrub or small tree sometimes twenty feet high with a broad round head. The leaves are large, thick and lustrous, and in the autumn assume delicate shades of red and orange; the flowers are creamy white and are borne in large and abundant convex clusters, and the large blue-black fruits hang on drooping stems and do not disappear from the branches until the beginning of winter. In the first week of June the Arboretum owes much to this plant. Another arborescent Viburnum, *V. rufidulum*, from the southern states is a plant of much beauty; it is the largest of the American species and sometimes grows in Louisiana and Arkansas into a shapely tree thirty or forty feet high with a tall stem and spreading branches. The flower-clusters are usually smaller than those of *V. Lentago*, but the leaves are larger and much more lustrous, and no other Viburnum has such handsome foliage. It is distinguished by the rusty red felt which covers the winter-buds and the edges of the leaf-stalks, and is found on the lower surface of the leaves. The plants of this Viburnum in the Arboretum are still small; the best one is on Hickory Path near Centre Street and is now in flower.

One of the handsomest American Viburnums, *V. pubescens*, is also in flower. This is a tall shrub with small pointed leaves and small nearly flat clusters of white flowers, which are produced in such abundance that they almost entirely cover the plant. This Viburnum grows naturally on limestone soil although limestone is not essential to it and is therefore valuable in a large part of the country where limestone prevents the cultivation of many plants like Rhododendrons, Azaleas, and other members of the Heath Family. There is a large mass of *V. pubescens* on the right-hand side of Bussey Hill Road opposite the upper end of the Lilac Group. Just above these there is a group of *Viburnum acerifolium*, another northern shrub sometimes called Arrow-wood, a common inhabitant of the eastern part of the continent. It is a small shrub with leaves which resemble those of some Maples, small clusters of white flowers raised on long stems, and black fruits. This plant is valuable as an undershrub for it grows well in comparatively dense shade.
A plant of *Viburnum bracteatum*, on Hickory Path near Centre Street, will soon be in flower. This is the rarest of American Viburnums, being known to grow naturally only on the cliffs of the Coosa River near Rome, Georgia, where it is a tall shrub with numerous slender stems. With it on Hemlock Path is a plant of the form of *Viburnum pubescens* from southern Missouri and Arkansas which has sometimes been called *V. affine*. Another exceedingly rare species, *V. molle*, from southern Kentucky and southern Missouri, with large, nearly round thick leaves on long stems, will also soon be in flower. It is in the general Viburnum Group on the Bussey Hill Road near its junction with the Valley Road and near the Centre Street entrance.

*Viburnum americanum* is one of the species with palmately lobed leaves, flat flower-clusters surrounded by a ring of showy white ray flowers, and red fruits; it is a tall broad shrub common in northern woods and particularly ornamental late in the autumn when the leaves turn yellow and orange color and the brilliant translucent fruits, which sometimes remain on the plants through the winter, are very conspicuous. There are two other species of this particular group now in flower, *V. Opulus* and *V. Sargentii*. The former is a native of northern Europe and Siberia; the flower-clusters are smaller than those of the American species but it is a larger and handsomer shrub with thicker and darker green leaves which fall later in the autumn, and rather larger, darker colored fruit. There is a variety of this plant with yellow fruit (var. *xanthocarpum*); another variety is a low, dense little bush (var. *nanum*) which very seldom flowers. The old-fashioned Snowball or Guelder Rose is a variety of *V. Opulus* with all the flowers sterile. *V. Sargentii* is a common shrub in northeastern Asia and when it is in flower it is the handsomest of these three species, for the ray flowers are larger than those of the American or the European plant. The dark green leaves with the long, narrow terminal lobes are interesting, but the fruit of this plant is comparatively small, dull-colored, and much less attractive than that of the other species.

A little later *Viburnum cassinoïdes* will be in flower. To many persons this tall shrub of northern swamps and swamp borders is considered the handsomest of the American Viburnums. In cultivation it is a rather low, broad plant. The leaves, which vary greatly in shape and size on different individuals, are thick and dark green; the flowers are creamy white and are arranged in large or small convex clusters and are followed by drooping fruits which, when fully grown, at first green, gradually turn flesh color or pink and finally dark blue, and are covered with a glaucous bloom, the fruit of the different colors sometimes appearing together in the same cluster. This plant takes kindly to cultivation and has been largely planted in the roadside shrubberies. Among the individuals in the large group of this species in the general Viburnum Group on Bussey Hill Road can be seen its leaf variations. The southern relative of *V. cassinoïdes*, *V. nudum*, has never become established in the Arboretum, although as it grows at high altitudes on the Appalachian Mountains it should prove hardy in New England.
Three blue-fruited American Viburnums, *V. dentatum*, *V. venosum* and *V. Canbyi*, will not be in bloom for some time, the latest of them, *V. Canbyi*, carrying the flowering of these plants to midsummer, so that the flowers of American Viburnums can be seen in the Arboretum from the middle of May to the middle of July.

One of the latest of the Bush Honeysuckles, *Lonicera Maackii*, is in flower in the Shrub Collection. This is a tall, narrow plant with dark green leaves. The flowers are white and larger than those of any of the Bush Honeysuckles, and are very handsome. The small bright red fruit remains on the branches until the beginning of winter and long after the leaves have fallen. This shrub, which comes from the region of the Amoor river, in eastern Siberia, is perfectly hardy and an exceedingly valuable decorative plant which well deserves a place in all collections of hardy shrubs. The variety of this species, (var. *podocarpa*) from western China flowers a few days later than the northern plant; the flowers are smaller and less beautiful, but the fruits are larger, and, ripening before the leaves lose their summer green, make the plant attractive in the late autumn.

Some species of Mock Orange (Philadelphus) are already flowering. The earliest to bloom in the collection is *P. Schrenkii* var. *Jackii*, a plant discovered by Mr. Jack in Korea a few years ago. It is a hardy shrub with erect stems and rather small flowers. *P. hirsutus* from the southern Appalachian region and *P. tenuiflorus* from eastern Siberia are also in bloom. There is a large collection of species, varieties and hybrids of Philadelphus in the Arboretum. They are planted in the Shrub Collection and in a supplementary collection forming a large group on the Bussey Hill Road opposite the Lilac Group. Many useful hardy shrubs with beautiful flowers are found among these plants which will be in bloom now for several weeks and will repay careful study by persons interested in such plants.

In great beauty now are *Aesculus carnea* Briotii and *A. georgiana* in the Horsechestnut Group; *Lonicera Korolkovii* and its hybrids and varieties in the Shrub Collection; the lovely blue and white flowered *Sophora viciifolia* on Hickory Path near Centre Street; the two new Chinese Cotoneasters in the Chinese Shrub Collection on the south side of Bussey Hill, *C. hupehensis*, *C. divaricata* and *Syringa villosa*, *S. Julianae*, and the hybrid *S. Lutèce* in the Lilac Group.

An illustrated guide to the Arboretum containing a map showing the position of the different groups of plants has recently been published. It will be found useful to persons unfamiliar with the position of the different groups of plants. Copies of this guide can be obtained at the Administration Building in the Arboretum, from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from The Houghton, Mifflin Company, 4 Park Street, Boston, at the Old Corner Bookstore, Bromfield Street, Boston, and at the office of the Harvard Alumni Bulletin, 50 State Street, Boston. Price, 30 cents.

The Arboretum will be grateful for any publicity given these Bulletins.
ARNOLD ARBORETUM
HARVARD UNIVERSITY

BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.
JUNE 12, 1913
The evergreen Rhododendrons in the Arboretum have never bloomed more fully than they have this year and the clusters of flowers and the individual flowers have never been larger. The flowers of some of the early flowering species and varieties have already passed, but those of many of the most important plants are still in good condition and others are still to open.

The hardiest in this climate of all the large-flowered Rhododendrons is R. catawbiense, an inhabitant of the upper slopes of the highest of the Appalachian peaks on which it grows in great quantities at altitudes between five and six thousand feet. It is a wide, low, round-topped, compact shrub with broad, dark green leaves and rose-purple flowers of a rather disagreeable color. There are a number of plants of this Rhododendron brought from North Carolina now in flower in the collection. This species is one parent of the race of hybrid Rhododendrons which are usually cultivated in northern gardens and practically the only evergreen Rhododendrons found in those of the northeastern United States, with the exception of another species of the eastern states, R. maximum. This race of hybrids has been made by crossing R. catawbiense with some of the species from the Himalayas, chiefly probably with R. arboreum, with R. maximum, and in the early days of Rhododendron cultivation in England with the Caucasian R. ponticum. These catawbiense hybrids, as they are called, are hardy and valuable in this country in proportion to the influence on them of R. catawbiense.

Rhododendron maximum, which grows naturally as far north as New England, is of course perfectly hardy; it has long and very handsome leaves, and the pale pink or pink and white flowers are beautiful in color, but they open so late that the flower-clusters are much hidden by the young branches which have grown from buds below the flower-bud before the flowers open, while in R. catawbiense and its hybrids these branches do not begin to grow until after the flowers have faded. Several hybrids between R. maximum and R. catawbiense are in cultivation. One of these, known as R. delicatissimum, is one of the hardiest and most beautiful of all Rhododendrons which can be successfully cultivated in this climate. As a rule hybrids of hardy plants are as hardy as their parents, but this is not always true of R. catawbiense-maximum hybrids, for some of these, like R. wellesleyanum and several raised in the neighborhood of Boston, are not very hardy, a fact due no doubt to some tender strain in the Catawbiense parent, itself a hybrid.

Two other species of the southern Appalachian region are also hardy here, R. carolinianum and R. minus, or, as it has been more generally called, R. punctatum. These are small shrubs with small dotted leaves and small clusters of pink flowers. The differences between these two plants have only recently been understood. R. carolinianum is an inhabitant of high altitudes, with handsome dark green leaves, and flowers which open and fade before the young branches begin to grow, and therefore are not hidden by them. This is perhaps the handsomest of all the dwarf Rhododendrons which can be successfully grown here; it has been out of bloom for several weeks. R. minus is a plant of lower altitudes, with smaller leaves and flowers and more open habit, and the small flower-clusters are much hidden, like those of R. maximum, by the young branches which rise high above them.
A few other species are hardy in this climate. The most distinct and the handsomest of these is *R. Smirnovii* from the Caucasus. This is a large plant with dark green leaves covered below with a thick mat of nearly white felt, and large clusters of large bright pink flowers. This plant is perfectly hardy but it grows best in partial shade as our hot sun causes the leaves to curl in summer. If the right position can be found for it, however, this is one of the most beautiful of the evergreen Rhododendrons which can be grown successfully in eastern Massachusetts. Hybrids of this plant with some of the Catawbiense hybrids are hardy and interesting plants. *R. micranthum* is another species which proves to be hardy here. It is a plant widely distributed from northern to western China and in its native country sometimes grows from six to eight feet high. The small leaves and small compact clusters of small white flowers look like those of a Ledum. There are a number of plants of this Rhododendron in flower at the base of Hemlock Hill and there are others on Azalea Path. The two dwarf Rhododendrons from the mountains of central Europe, *R. ferrugineum* and *R. hirsutum*, are in the collection and the latter is now in flower. These plants, however, are not very satisfactory in this climate, and unless exceptionally good positions can be found for them they are not long-lived here. Two hybrids, however, in which these European Rhododendrons have played their part are valuable garden plants in this climate. The first of these, *R. myrtifolium*, is a hybrid between *R. hirsutum* and *R. minus*, and is a very compact, round-topped shrub, sometimes growing to the height of four feet, with small flowers of a good shade of pink. The great value of this plant is in its compact habit and handsome foliage. The second of these hybrids, *R. arbutifolium*, is the result of a cross between *R. ferrugineum* and *R. minus*. This is a plant with a more open habit than *R. myrtifolium* and soon spreads into a wide low mass of handsome foliage; the flowers are small and of an unattractive rose color, and the value of the plant is found in its ability to cover either sunny or shady banks and for this it is admirably adapted. This plant is usually found in nurseries under the name of *R. Wilsonii*, a name, however, which properly belongs to another hybrid between two Himalayan species.

Persons who study the Arboretum Rhododendrons with a view of establishing collections of these plants must remember that the position of the Arboretum collection on the northern and northeastern sides of a thick wood of conifers is an exceptionally favorable one for these plants, and that many of the Catawbiense hybrids now flowering in the Arboretum cannot be depended on in less favorable positions. The number of these hybrids which are really hardy in all situations in Massachusetts is not large. Some of them which have grown in eastern Massachusetts for many years and have proved perfectly hardy here, even in exposed positions, are among the red-flowered varieties, Atrosanguineum (very early), Charles Dickens and H. W. Sargent (late); among the pink-flowered varieties, Mrs C. S. Sargent and Henrietta Sargent, similar in general appearance but the latter with smaller and more compact flower-clusters and flowers of a less perfect pink; among the rose-colored varieties, Roseum elegans and Lady Armstrong; among the dark purple-flowered varieties, Purpureum grandiflorum, Purpureum elegans, and King of the Purples; among the light purples, Everesteinum, one of the hardiest of these hybrids; among the whites, Catawbiense album (early), Album elegans and Album grandiflorum (both
slightly tinged with blush); and among the whites tinged with pink Delicatissimum (very late).

The Chinese Chionanthus retusa, although by no means a new plant, is flowering now for the first time in the Arboretum. It is related to the eastern American Fringe-tree or Old Man's Beard (C. virginica), when in flower one of the most beautiful of the small trees or shrubs of eastern North America where it grows from New Jersey and Missouri to Florida and Texas. This plant with its long drooping clusters of flowers with their long narrow white petals is a familiar object in most old gardens in this country, where it is always an object of interest. As an ornamental plant the Chinese species is much less attractive than its American relative; the leaves, although darker green, are smaller, and the flowers, which are produced in short, nearly erect clusters, are much smaller with shorter petals. Except as another instance of the close relationship between the floras of eastern North America and eastern Asia the Chinese Chionanthus is of comparatively little interest. The two species are growing on the Bussey Hill Road just above the Lilac Group and there are plants of them both on Azalea Path.

Two Andromeda-like plants are now in good condition, Leucothoe Catesbaei and Lyonia mariana. The former is an evergreen with long spreading and arching stems clothed with handsome long-pointed leaves, and small clusters of axillary white flowers; it is a native of the southern Appalachian region and one of the hardiest and most desirable of the broad-leaved evergreen shrubs which can be grown in this climate. For the development of its greatest beauty, however, it needs rather moist soil and a shady position. It has been planted in large numbers along the brook and in the small ravine at the base of Hemlock Hill and is now flowering freely. Lyonia mariana is a smaller shrub with deciduous leaves and larger, white, racemose flowers borne on leafless shoots. This plant is common in the eastern states from Rhode Island southward, and in cultivation is not particular about soil or situation. There is a large mass of it now in full flower on the right-hand side of the Meadow Road in front of the Horsechestnut Group; and these two species are in the Shrub Collection.

In the Philadelphus Groups many plants are beginning to flower every week. P. coronaria, the Mock Orange of old-fashioned gardens, with its small, creamy white fragrant flowers, is already in bloom and near it in the Shrub Collection P. Falconeri is covered with its delicate white blossoms. The origin and the native country of this graceful shrub are still unknown. Of all the gifts which science has made to gardens few are more beautiful and valuable than the race of hybrid Philadelphus known generally as P. Lemotinet. There are a large number of these hybrids in the collection and they will bloom in succession during several weeks. The earliest this year are called Boule d'Argent and Manteau d'Hermine. The value of these wonderful little plants is now recognized in many nurseries, and there is no longer any reason why they should not find their way into every northern garden.

The Laurels (Kalmia latifolia) are beginning to expand their flower-buds and in a few days will be in their best condition. With the fading of these flowers will pass the last of the great floral displays of the Arboretum year.

The Arboretum will be grateful for any publicity given these Bulletins.
ARNOLD ARBORETUM
HARVARD UNIVERSITY

BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.
JUNE 20, 1913
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No other North American tree is so familiar to the people of so many different parts of the world as the False Acacia or Yellow Locust of the Appalachian Mountain forests, *Robinia pseudacacia*, and it is now naturalized in many regions far removed from its native home. No other exotic tree has been so generally planted in northern and central Europe since its introduction into the garden of the Paris Museum in 1636 by the King's gardener Robin, whose labors it commemorates; and no other American tree has given rise to such a voluminous literature. The cheerful light green foliage and hanging clusters of fragrant white flowers are known to everyone who has ever looked at trees. The value of the timber which it produces, the rapidity of its growth, its power to adapt itself to different soils and to reproduce itself rapidly by seeds which germinate readily and by stump and root shoots, would make it a most valuable subject for forest and coppice planting in this country if it could be protected from insects, but the value of the Locust is practically destroyed in nearly all parts of the United States beyond the mountain forests which are its home by the borers which riddle the trunk and branches. Owing to the difficulty of keeping the Locust in a presentable condition here no serious effort has ever been made to bring together the interesting varieties or "sports" of this tree which have appeared from time to time in European gardens and are largely planted in European collections of trees. At least thirty of these varieties are now known; the one most often seen in Germany, especially in suburban gardens, is the so-called Parasol Acacia (var. *umbraculifera*). The short branches of this plant form a compact spherical head which is usually grafted on a tall stem of the common Robinis, as in this country a dwarf form of the Catalpa is made into a "standard" by grafting it on a tall stem of the tree form. The only abnormal form of the Robinia thoroughly established in the Arboretum is one of the most remarkable of them all; var. *monophylla*, in which the leaves are reduced to a single broad leaflet.

The two pink-flowered arborescent Robinias, *R. viscosa* and *R. neo-mexicana*, are also subject to attacks by the borer. *R. viscosa*, the Clammy Locust, is not yet in flower but its near relative, the Rocky Mountain species, *R. neo-mexicana*, is now covered with its short clusters of pale rose-colored flowers. More beautiful perhaps than either of these trees is a hybrid of the Rocky Mountain species with *R. pseudacacia*, *R. Holdtii*, named for the Colorado nurseryman in whose establishment it appeared a few years ago. This tree is very hardy; it appears to suffer less than its parents from borers, it grows rapidly and plants only a few feet high cover themselves with pale pink flowers. This tree, which is not yet often seen in eastern collections, is an interesting and valuable addition to the rather short list of trees which flower here in early summer. The Robinias are planted with the other trees of the Pea Family on the right-hand side of the Meadow Road beyond the piece of natural woods.

The latest of the American Magnolias are now in flower, *M. macrophylla* and *M. glauca*. The former is a medium-sized tree with wide-spreading branches and is distinguished by the fact that of all trees which grow beyond the tropics it has the largest leaves and the largest flowers. The leaves of this remarkable tree are silvery white on the lower surface, from twenty to thirty inches long and from eight to
nine inches wide, and the cup-shaped creamy white fragrant flowers are sometimes a foot in diameter. Although an inhabitant of the south, *M. macrophylla* is perfectly hardy in New England, but unless it is planted in sheltered positions the trees often become disfigured by the wind which tears the large delicate leaves. Less showy *M. glauca* is a more valuable plant for general cultivation. Often a large tree in the extreme south, at the north *M. glauca* is never more than a small tree, or more often a large shrub. The leaves are dark green and very lustrous on the upper surface and silvery white on the lower surface; the small, cup-shaped flowers are creamy white and delightfully fragrant, and they continue to open in succession from the middle of June until August. In all North America there is not a more delightful shrub to plant in the garden, or one that will give larger returns in beauty and fragrance; and yet it is difficult to find it in American nurseries, and it is unknown to most American planters of this generation. A hybrid, *M. Thompsoniana*, between *M. glauca* and *M. tripetala*, another American species, is a handsome plant with the general appearance of *M. glauca* but with larger leaves and larger, equally fragrant flowers. This plant is with the American Magnolias on the right-hand side of the Jamaica Plain Gate and is now in flower. Unfortunately it is much less hardy than either of its parents.

On Hickory Path near Centre Street there is a group of large plants of *Styrax japonica* now covered with their pure white cup-shaped flowers hanging gracefully down from the branches on long slender stems; this is one of the handsome flowering shrubs of Japan, but unless a sheltered position can be provided for it, it is not perfectly hardy in the neighborhood of Boston. That it is perfectly at home, where it is now planted in the Arboretum, is shown by the great crops of seedlings which spring up every year under the old plants.

Near this group of *Styrax japonica* are two species of *Indigofera*, *I. Kirilowii* and *I. amblyantha*, now in flower. The former is a native of Korea and is a low leafy plant which spreads into a broad mass and continues to produce its racemes of large pure pink flowers during several weeks. It was introduced a few years ago into the Arboretum by Mr. Jack, and is an exceedingly valuable garden plant. There is a specimen also of this species in the Shrub Collection. *I. amblyantha* is of entirely different habit, with slender erect stems, small leaves, and erect axillary clusters of small rose-colored flowers which continue to appear during two or three months. An inhabitant of river cliffs in Hupeh at altitudes up to six thousand feet, it sometimes grows there to the height of six feet. This plant flowered in the Arboretum last year for the first time. It appears to be perfectly hardy, and it is one of the most beautiful of the small shrubs introduced by Wilson from western China. Two other species of this genus are established on Azalea Path near its entrance from the Bussey Hill Road, *I. Gerardiana*, a native of the Himalayas, and *I. decora* from southern China. These two plants, although they are killed back to the ground every winter, send up new stems and flower profusely every year. *I. decora* with its large white flowers is a beautiful little plant well worth knowing; it is just coming into bloom.

In the Shrub Collection one of the Roses discovered by Wilson on the mountains of Hupeh, *Rosa setipoda*, is now in flower; it is a large vigorous shrub with broad, many-flowered clusters of long-stalked, dark pink flowers. This Rose proves to be very hardy and promises to be a decorative plant of much value.
Attention is called to another Chinese plant, *Spiraea Henryi*, now flowering in the Shrub Collection and perhaps the handsomest of recent additions to the large number of Spiraeas now cultivated in gardens. *S. Henryi* is a tall, hardy, vigorous shrub with wide-spreading arching branches which on the upper side are covered with large flat clusters of white flowers. Among the Chinese shrubs in the collection of these plants on the south side of Bussey Hill *Hydrangea xanthoneura* and its varieties are in flower; these with *H. Bretschneideri* from northern China are the earliest to flower of all the Hydrangeas which are hardy in this climate.

In the Shrub Collection two of the latest of the Bush Honeysuckles are in flower and are beautiful now and later in the season when the fruit is ripe. These plants are *Lonicera Ledebourii* from the Pacific coast region and *L. involucrata*, var. *serotina* from the mountains of the interior of the continent. The long slender flowers of these two plants are bright yellow more or less tinged with red, and they are surrounded by large, leaf-like dark red cups which remain under the large, black, lustrous fruit. This particular group of Honeysuckles contains some of the hardiest and most beautiful garden shrubs which have been brought into the Arboretum from western North America, a region which has produced few plants which are hardy in this climate.

One of the decorative objects in the Shrub Collection is the large plant of *Halimodendron argenteum*, called Salt-tree because it inhabits the saline steppes near the river Irtish in Siberia. The pale rose-colored, pea-shaped, fragrant flowers, which are produced in great abundance, are borne in short clusters, and their delicate beauty is heightened by the color of the leaves which are covered with a pale silky down. The plant remains in flower during several weeks.

Among vines of recent introduction *Periploca sepium*, a native of Korea, is worth consideration. This is a plant with slender stems, small pointed dark green and very lustrous leaves, and axillary clusters of long-stalked flowers in which the strongly reflexed, dark brown sepals are the conspicuous feature. It can now be seen, covered with flowers, on the eastern side of the Shrub Collection.

The Himalayan Lilac, *Syringa Emodi*, or as it is sometimes considered a variety of the Chinese *S. villosa*, is now covered with flowers. This is not an occurrence of every year for this species is not perfectly hardy and the ends of the branches and the flower-buds are often killed in severe winters. It is a large, broad shrub with large leaves light yellow green above and silvery gray and covered with soft white hairs below, and long narrow clusters of small white fragrant flowers. It is the last of the true Lilacs to bloom and from all other Lilacs it differs in its light yellow foliage.

Conspicuous plants now in flower in the roadside plantations are the North American *Viburnum dentatum* and *V. cassinoides* and the Japanese *V. dilatatum*, a species with very large, slightly convex clusters of creamy white flowers which are followed in the autumn by small bright red fruits. Other conspicuous plants are the North American *Cornus rugosa* and *C. racemosa*, the European *C. alba*, and two native Roses *Rosa lucida* and *R. humilis*. The flame-colored *Rhododendron* (Azalea) *calendulaceum* now makes a brilliant show, and the Laurels (*Kalmia*) are in full bloom. The Laurels can most easily be reached from the South Street or from the Walter Street entrances, and should be visited within a few days.
It is generally believed that the disease which is now destroying the American Chestnut-tree and the European Chestnuts planted in this country will not attack the Asiatic species. If these trees are really immune they will probably be of much economic importance in the United States. The Japanese Chestnut-tree (Castanea crenata) is a common inhabitant of the mountain forests of the central and northern parts of the empire. The Japanese have paid much attention to improving it as a fruit tree and very large chestnuts are sold in the markets of Kobe and Osaka, and are sometimes imported into San Francisco; and nearly as large nuts are raised in great quantities in the neighborhood of the northern city of Awomori. Several of these improved forms of the Japanese Chestnut have long been cultivated in the United States; the tree is hardy in the Arboretum but it does not grow particularly well in eastern Massachusetts, and the climate of the middle states appears better to agree with it. Unless the ravages of the chestnut disease can be checked, it is to China that we must turn for a tree to replace the native Chestnut in New England. Fortunately the common Chestnut of northern and central China (C. mollissima) is a tree of good promise here. Raised in the Arboretum from nuts found in Peking by Professor Sargent in 1903 the plants have grown without any check or injury and are now forming tall straight stems and narrow heads. They flowered and produced a few fruits last year and they are now coming into bloom again and look as if they would soon become productive. The other Chinese Chestnut (C. Villoreiniana) is a larger tree and an inhabitant of the mountain forests of western Hupeh where it grows at altitudes between two and four thousand feet above the sea-level. Like the American Chinquapin it has only one nut in a burr. Plants of this noble tree have been raised at the Arboretum from seed collected by Wilson and are growing well, but it is too soon to speak of its hardiness and value in this climate. The Chinquapin (Castanea pumila) in the shrubby form common in the South Atlantic states, and in the tree form of the region west of the Mississippi River, from southern Missouri to Texas, is in flower. Although the species is not immune, the plants in the Arboretum have not yet been attacked by the disease. The Chinquapin blooms earlier than the common Chestnut-tree (C. dentata) on which the flowers are usually open during the first week of July. The Chestnut collection is on the right-hand side of the Valley Road just beyond the Hickories, going from the Centre Street entrance.

Several Grapevines are in flower and their perfume fills the air. Much time and labor has been expended in forming this collection which is on the trellis at the east side of the Shrub Collection and is one of the most interesting and valuable in the Arboretum. These plants have great decorative value, but their value is still little known to gardeners and it is difficult to obtain many of the species. The value of Grapevines for covering walls can be seen near the Jamaica Plain entrance and on the wall between the Jamaica Plain and Forest Hills entrances, and their value for covering the ground can be seen at the junction of the Meadow and Hemlock Hill Roads, where there are grapevines which are cut back to the ground every spring. All the North American species which are hardy are growing in the Shrub Collection. Among little known species best worth attention are per-
haps *Vitis Doaniana* and *V. cinerea*; the first is a native of the Texas Panhandle and is a fast-growing plant, apparently perfectly at home in New England. The leaves are large and thick, and of a rather pale bluish green color. The fruit grows in small clusters and is covered with a pale bloom. *V. cinerea* grows on river banks in the Mississippi Valley from Illinois to Kansas and Texas. This plant bears very large leaves which are dark green and dull on the upper surface and ashy gray on the lower surface, which, like the young shoots, is clothed when the leaves unfold with a thick, felt-like, gray covering. Some of the other species in the collection which are worth studying from the point of view of the planter of handsome vines are *V. vulpina*, the Frost Grape, the species which grows the farthest north; *V. rotundifolia*, the Muscadine or southern Fox Grape; *V. monticola*, the Sweet Mountain Grape of the limestone hills of southwestern Texas; *V. rubra*, a graceful plant found from Illinois to Missouri, Louisiana and Texas; *V. arizonica*, with small, pale gray-green leaves; *V. aestivalis*, the Summer Grape of the middle states, with large, dark green leaves covered below with rusty brown hairs; *V. bicolor*, of the northern and middle states, a vigorous growing plant with large, deeply-lobed leaves dark green on the upper surface and pale blue-green on the lower surface; *V. labrusca*, the common Fox Grape of New England, with leaves which are covered below with tawny white, tan-colored or red-brown felt, and large berries which vary in color from dark purple to reddish brown or amber color; and *V. cordifolia*, the Frost Grape, an inhabitant of the middle states, with thin leaves light green on both surfaces, and with large clusters of small blue fruits which become edible after frost; this is one of the largest and most vigorous of the American Grapevines, often growing into the tops of the tallest trees and forming stems from one to two feet in diameter.

Among Old World Grapevines the most valuable as ornamental plants here are *V. Coignetiae* and *V. amurensis*. The first is an inhabitant of northern Japan, and is a large plant with enormous, thick, prominently veined leaves pale on the lower surface, which in the autumn turn bright scarlet. This for northern countries is one of the most valuable of all Grapevines. *V. amurensis* is a native of eastern Siberia and, although less vigorous than *V. Coignetiae*, it is a hardy and valuable plant for covering walls and trellises. The Chinese *V. Davidii* is interesting because, unlike other Grapevines, the stems are thickly covered with spines. The leaves of this plant turn bright red in the autumn. Unfortunately in severe winters the stems are killed back to the ground, and it rarely produces fruit in this climate. Equally interesting, perhaps, is another Chinese Grapevine, *V. Pagnuccii*, with leaves which are sometimes shaped like those of an ordinary Grapevine and sometimes are deeply and variously lobed much like those on the Virginia Creeper. There are in the Arboretum a large number of Chinese Grapevines raised from seeds collected by Wilson in western China, but it is still too soon to speak of their value here as ornamental plants.

The earliest Hawthorns (*Crataegus*) are in flower in the Arboretum before the end of April, and the latest of them, the so-called Washington Thorn (*C. cordata*), is now in flower, so that these plants have a blooming period here of at least two months. Their fruits are beautiful during even a longer period, for the earliest Hawthorn fruit is ripe in August and on some species it remains on the branches and retains its shape and color until spring. The Washington Thorn is a native of the
southern Appalachian foothill region and westward to Missouri, and has occasionally become naturalized in the middle Atlantic states from West Chester County, New York, to Delaware. It is a tree sometimes thirty feet high, with erect branches, small, nearly triangular, shining leaves which turn bright scarlet in the autumn, small, dull white flowers in small compact clusters, and small scarlet fruit which remains on the branches until late spring. The late flowers, the brilliancy of the autumn foliage, and the abundance and brightness of the fruit during the winter months, make this one of the most desirable of the American Hawthorns as a garden plant. Several large plants of the Washington Thorn can be seen on the slopes of the overlook near the top of Bussey Hill.

The Silky Cornel, *Cornus Amomum*, is now opening its small white flowers. This has been much used in the Arhoretum borders, but in cultivation it is not a satisfactory plant unless it can be given sufficient room for its wide-spreading branches to extend freely and spread 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 it 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 larger plants; and there is no better shrub to plant by the margins of streams and ponds where its long branches can hang gracefully over the water. Its purple stems are attractive in winter, and the bright blue fruits which ripen in the autumn add to the attractions of this native shrub. In the Cornel Group, at the junction of the Meadow and Bussey Hill Roads, there is a good specimen of this plant and near it are two southern species which will not be in flower for a few days, *C. asperifolia* and *C. stricta*.

Attention is called to one of the new Honeysuckles from western China, *Lonicera Henryi*. This is a plant with long slender stems which, on its native mountains spreads over low bushes and rocks; it has large, dark green pointed leaves, and axillary clusters of flowers which when they first open are rose color but soon turn orange red; they have no perfume. There is a mass of this plant in full flower in the bed of Chinese plants on the southern slopes of Bussey Hill. The white-flowered Chinese and Japanese tree Lilacs (*Syringa pekinensis* and *S. japonica*), many species and varieties of Philadelphus, the native Roses, the fragrant *Rhododendron arborescens*, and the yellow-flowered Woad-wax (*Genista tinctoria*) are now conspicuous in the Arboretum. The last is the plant which covers many hills in Essex County, Massachusetts, where, an escape from cultivation, it has proved a dangerous weed and destroyed much of the value of thousands of acres of land.

The Arboretum will be grateful for any publicity given these Bulletins.
Several of the Oaks of eastern Asia are established in the Arboretum, including all the species of northern Japan, eastern Siberia, northern Korea and northern China. In addition to these there is a large collection of young plants raised from Wilson's seeds collected in western China. These are growing rapidly and appear to be perfectly hardy, but their relationship and names have not yet been determined. There are many evergreen Oaks in southern Japan and southern China, but none of these are hardy in our northern states where only the species with deciduous leaves can be grown. These all belong to the White Oak Group, that is they are species which mature their acorns in one season, all the Black Oaks, which require two seasons for the development of their fruit, being found only in America. There are six Japanese Oaks in the Arboretum; the largest and most valuable of these are Quercus grosseserrata and Q. crispula. These two trees under favorable conditions sometimes grow in Japan to the height of one hundred feet and produce trunks from three to four feet in diameter. In central Hokkaido these trees form a considerable part of the forest growth and their abundance and the value of the timber which they produce has already attracted the attention of American lumbermen, and it is probable that Japanese white oak timber will become a considerable article of import into the United States. The next species, Quercus glandulifera, is perhaps the most widely distributed Oak of Japan and the common species of the high mountains of the central island at elevations over three thousand feet. This is a small tree rarely more than thirty or forty feet tall which sometimes begins to bear acorns when not more than a foot high. The small leaves somewhat resemble those of one of the American Chestnut Oaks. Two Japanese Oaks with narrow leaves, in general outline like those of the Chestnut tree, both hardy here, are interesting on account of their peculiar foliage; the larger of these two trees, Q. variabilis, sometimes reaches in Japan the height of eighty feet with a trunk three or four feet in diameter. The under surface of the leaves is silvery white and the bark is thick and corky. This tree is rare in Japan and possibly has been introduced there from China; it is common in Korea and in northern and central China. The bark is sometimes used as cork and the large, thick cups of the fruit are used in the preparation of a black dye and are sold in Chinese markets in large quantities. Quercus serrata is a smaller tree with darker bark and the leaves are bright green on the two surfaces. The fifth Japanese Oak in the collection, Q. dentata, is remarkable for the great size of the leaves which are often a foot long and eight inches broad, obovate in outline and deeply lobed, and for the long, narrow, chestnut brown scales of the cup which nearly encloses the small acorn. This is a common tree on the mountains of central Japan and ranges far northward and to northern and central China, and, although it grows sometimes to a large size, it is rarely a handsome or picturesque tree. The dark thick bark is used in tanning leather. There is a variety (pinnatifida) in the collection with deeply divided leaves.

The plants of Quercus glandulifera, Q. crispula and Q. grosseserrata, although only twenty years old, now produce crops of acorns in the Arboretum. This is important for it is extremely difficult to import acorns from foreign countries in good condition, for they soon lose their vitality unless carefully packed in soil or in sphagnum moss. For this reason the Oaks of eastern Asia are very rare in American
and European collections. *Q. dentata* and *Q. variabilis* have not yet produced fruit in the Arboretum. *Q. serrata* and *Q. aliena* from Korea, and *Q. mongolica* from eastern Siberia and Mongolia are still too young to be productive.

The general collection of eastern Asiatic Oaks is planted on the southern slope of Bussey Hill to the left of the southern end of Azalea Path. Here are plants of the Japanese form of *Q. variabilis*. On the lower side of Azalea Path there is a good specimen of *Q. glandulifera* and a specimen of *Q. grosseserrata*. Near the southern end of Oak Path there is the largest specimen of *Q. variabilis* in the collection. This tree was raised from seed sent from Peking in 1882. Near this tree are young plants of *Q. serrata* and two plants of *Q. dentata*. Several specimens of *Q. glandulifera*, *Q. crispula* and *Q. grosseserrata* can be seen in the mixed plantation along the road at the top of Peter's Hill, and there is a group of these three species on the steep slope rising from the Parkway directly opposite the Forest Hills entrance to the Arboretum.

The Oaks of Europe do not often flourish in New England. None of the species of the Mediterranean region are hardy here; and although the two common Oaks of western Europe, *Q. pedunculata* and *Q. sessiliflora* are hardy and grow rapidly in this country for a few years, they are short-lived here and not to be depended on. It is possible, however, that the Hungarian Oak, *Q. conferta*, or as it is often called, *Q. pannonica*, may prove an exception to this general rule in regard to European Oaks as the climate of eastern Europe with its cold winters and hot dry summers is not as unlike that of eastern North America as the climate of western Europe. *Q. conferta* is a large and valuable timber tree with large, dark green, deeply lobed and lustrous leaves; it grows rapidly and is very hardy here, but it is too soon to speak of its permanent value or to say more than that it is a tree which deserves a more general trial in this country than it has yet received. The largest specimen in the neighborhood of Boston can be seen in the Arboretum on Oak Path near the Japanese *Q. dentata*.

The black-fruited *Sambucus canadensis* and its varieties are in bloom in the Shrub Collection and the common form is conspicuous along the Bussey Brook; and, although these Elders are now in full bloom, the brilliant red or orange fruits of the early-flowering species, *S. pubens* of North America and the Old World *S. racemosa* are nearly ripe. As a foliage plant the most beautiful of these red-fruiting Elders is probably the Japanese *S. racemosa*, var. *Sieboldii*, which is well established with the other Elders in the Shrub Collection.

The brilliant fruits of some other plants are already conspicuous in the Arboretum, notably of some of the Bush Honeysuckles. These plants produce fruit in great quantities and it remains in good condition for several weeks, and as the different species ripen their fruit from early summer to the beginning of October their second period of beauty is a long one. On different species or hybrids the fruit is blue, black, orange, or scarlet, and these beautiful and abundant fruits following beautiful flowers make them desirable garden plants, especially in the northern United States where they are very hardy and where they appear to bloom more freely than in other parts of the world. No group of shrubs in the Arboretum is more worthy of the careful attention of persons who desire to plant hardy, fast-growing shrubs beautiful when covered in spring with innumerable flowers or in early summer when their showy fruits are ripe.
Some other plants in the Shrub Collection are now in their greatest beauty. Among these two yellow-flowered plants of the Pea Family, *Cytisus capitatus* and *C. nigricans*, are well worth attention, especially the latter which is a small, slender shrub with erect racemes of large flowers, and perhaps the most beautiful of the genus which can be successfully grown here. *Colutea arborescens* from southern Europe, and *C. cilicica* from Asia Minor, also of the Pea Family, are just now in great beauty, for they are still covered with their bright yellow flowers; and these are mixed with the large inflated pods developed from earlier flowers and now more or less deeply tinged with rose color.

The first of the Hypericums to flower in the collection and one of the gems of the genus, *H. Buckleyi*, is now opening its flowers. It is a dwarf plant growing here only a few inches high but spreading into a broad mat which becomes covered with yellow flowers and as these remain in good condition for a long time, it is well suited for a sunny position in the rock garden.

Attention is called again this year to the hybrid *Lonicera Heckrottii* which is now in bloom. The flowers, although not fragrant, are very beautiful, the outer surface of the corolla being deep rose color and the inner surface pale yellow, both buds and open flowers occurring together in the same cluster. This is the only plant in the Arboretum which is really a continuous bloomer. Last year the first flowers opened at the end of June and flowers continued to open until November.

The Yucca of the high plains at the eastern base of the southern Rocky Mountains, *Y. glauca*, is in bloom for the first time in the Arboretum. The Heather (*Calluna vulgaris*) with its numerous varieties is already opening its purple and white flowers and promises abundant bloom in the Shrub Collection and among the Rhododendrons at the base of Hemlock Hill. The latest of the Viburnums to flower and one of the most conspicuous plants now in bloom in the Arboretum is *V. Canbyi*. This is a magnificent plant in cultivation if sufficient space is given to it for free development when it will grow rapidly into a round-topped shrub ten or twelve feet high and broad. The last of the Rhododendrons (*R. maximum*) is now in flower, and the latest of the Azaleas (*R. viscosum*), the so-called Swamp Honeysuckle of our eastern coast region, is opening its fragrant white flowers. The Spice Bush, *Clethra alnifolia*, which has been largely planted in the roadside shrubberies, is still to flower. Only the earliest of the Linden trees have opened their fragrant flowers, and during several weeks the other species and hybrids of these handsome trees will be in flower. Other interesting trees will flower still later and will well repay weekly visits to the Arboretum. Of these late-blooming trees may be mentioned the North American Sorrel-tree, *Oxydendrum arboreum*, and the North American Hercules' Club (*Aralia spinosa*). These two trees are among the Laurels at the base of Hemlock Hill. The arborescent Aralia of eastern Asia (*A. chinensis*) and *Acanthopanax ricinifolius* of the same Family, with its large tropical looking leaves and great clusters of small white flowers are in the Aralia Group near the junction of the Meadow and the Bussey Hill Roads. Another tree still to flower is the Chinese *Koelreuteria paniculata* with its large erect clusters of bright yellow flowers and to be seen on the Meadow Road. Other Asiatic trees to flower are *Sophora japonica* and *Maackia amurensis* which are established with the other trees of the Pea Family on the right-hand side and near the Bussey Hill Road.

These bulletins will now be discontinued until the autumn.
Persons interested in the plants best suited for the decoration of parks and gardens of eastern North America can find much to learn in the Arboretum from this time until the end of the year, for it is in the autumn that conifers are seen to the best advantage and that the mature leaves of the few broad-leaved evergreens which flourish in this climate best show the beauty and value of these plants for the late autumn and winter garden. Perhaps nowhere else in the world are so many different plants with brilliant autumn foliage and handsome and abundant autumn fruits assembled as in the Arboretum; and in no other garden can such plants be so easily and conveniently studied. Such plants give a character and beauty to the autumn garden which can be found only in eastern North America and perhaps in Japan where the leaves of many of the native trees and shrubs assume brilliant colors before they fall. In the Arboretum the autumn foliage of many Japanese plants is as brilliant as it is in their native country, but it is still to be shown if that of American plants cultivated in Japan is as beautiful there as it is in our eastern states.

The earliest of the American trees to change the color of its leaves this year is the Red or Scarlet Maple, *Acer rubrum*. On trees growing in swamps the leaves are now often bright scarlet, while on trees growing on higher and drier ground the leaves are still bright green or only slightly tinged with red. The so-called Water Willow, *Decodon verticillatus*, perhaps better known as *Nesaea*, is a native of all the region from Maine to Florida and Louisiana, and is a shrub with arching stems from two to three feet long growing only in the wet often submerged borders of streams and ponds where it often spreads into broad thickets. The flowers and fruits are not conspicuous, but the stems hanging over the water make an interesting and attractive margin to a shallow pond or sluggish stream, and in early autumn the leaves turn bright scarlet, so that for a few weeks the plants are conspicuous among the green sedges and swamp grasses with which they are usually associated. It is not probable that the Water Willow is often cultivated, but it is now well established in the Arboretum along the margins of two of the little ponds near the junction of the Meadow and Bussey Hill Roads.

The leaves of some of the forms of the so-called Virginia Creeper of eastern North America are already bright scarlet. The earliest to adopt its autumn dress and now in brilliant color is *Parthenocissus vitacea*. This plant rarely has adhesive discs at the ends of the tendrils, so that it cannot attach itself to the trunks of trees or to brick and stone walls like *Parthenocissus quinquefolia*, which is often sold in nurseries as *Ampelopsis Engelmannii*. Of this plant there are several varieties recognized by botanists. On the variety *hirsuta* the young branches, tendrils and leaves are covered with soft down, and a form of this variety which grows in the neighborhood of Ontario in Canada appears to be the best of all the Virginia Creepers for covering brick walls. Fine plants of this form can be seen on some of the buildings at the Central Experimental Farm of the Dominion of Canada at Ottawa. The variety *San Paulii*, which is the common form in Illinois and Missouri, also attaches itself to walls and grows rapidly to a great
height. Nearly all the forms of the Virginia Creeper can now be seen on the trellis at the eastern side of the Shrub Collection and near the entrance from the Forest Hills Gate.

One of the handomest shrubs in early autumn is the Japanese Evonymus alatus, for the leaves of this plant turn a delicate rose color unlike those of any other plant in the Arboretum. This Evonymus, with abundant room, spreads into a compact round-headed shrub from four to six feet tall and ten or twelve feet in diameter. The fruit is small and less conspicuous than that of many species of Evonymus. The broad or sometimes narrow corky wings of the branches make it conspicuous in winter. There is a good specimen in the Evonymus Group on the Meadow Road, and a large isolated specimen in the grass border of the Bussey Hill Road above the Lilac Group.

The earliest of the Opulus Group of Viburnums to change the color of its leaves is the eastern Asiatic Viburnum Sargentii, and on some individuals of this species the leaves are already dark red. Of the three species of this group this is the handsomest in flower, for the sterile flowers which surround the clusters of perfect flowers are larger than those of the eastern American or of the European species, but the fruit is small, dull in color and of little value.

Another plant from northeastern Asia, Acer ginnala, is beautiful in the autumn when the brilliant scarlet of the fading leaves of this small tree is hardly surpassed by that of any American tree or shrub. Among Maples Acer ginnala is interesting on account of the fragrance of the flowers, fragrant Maple flowers being unusual. It is a native of eastern Siberia, and has proved very hardy in the northern states, and in Quebec and Ontario.

Bright scarlet now are the leaves of Rosa nitida. This little Rose, which grows naturally on the margins of swamps from Newfoundland to New England, is perhaps the most beautiful of our native Roses and very distinct in the bright red prickles which thickly cover the stems and branches; it is too rarely cultivated.

A few of the fruits which ripen in early autumn are already conspicuous. There is perhaps no shrub more beautiful in the Arboretum at this time than one of the American Cornels, Cornus rugosa, or, as it is sometimes called, C. circinata. This is a tall, broad, round-headed shrub with greenish branches and round-oval, dark green leaves. The flowers are not more showy than those of other Cornels, but the clusters of light blue fruits on red stalks which now cover the plants make them objects of much interest and beauty. There are several plants of this species in the Cornel Group at the junction of the Meadow and Bussey Hill Roads, and there are large masses of it among the Hickories on the Valley Road. The finest individual plants, however, are on the slope where the Celtis collection is planted, on the right-hand side of the path which follows the north side of the Bussey Hill Road. The red Osier Cornel or Dogwood, Cornus racemosa, often called C. stolonifera or C. candidissima, is also beautiful at this season, for the leaves are beginning to turn dark red and the plants are covered with abundant clusters of white fruits on bright red stalks. There is a large mass of this plant in the Cornel Group and it has been largely planted in the mixed plantations along the drives. Spreading rapidly into large dense clusters, with good foliage, abundant flowers and beautiful fruits, few shrubs are more desirable for park or roadside plantations.
The two eastern American species of Mountain Ash, *Sorbus americana* and its variety *decora*, are covered with large clusters of scarlet fruit which remain on the branches in brilliant condition until after the leaves have fallen and until late in the season when they are eaten by the robins. These plants are on the border at the eastern end of the Shrub Collection and near the entrance from the Forest Hills Gate. In the same border several species of American Hawthorns are now bearing large crops of scarlet fruits, notably *Crataegus succulenta*, *C. prunifolia*, and *C. rotundifolia*. On some of the American Hawthorns the fruit ripens soon after the middle of August and has already disappeared; on other species it will continue to ripen during the next two months, and the fruit of a few species will retain its beauty until spring. Many of the young plants in the general collection of Hawthorns on Peter's Hill, are fruiting this year, and among them one of the Colorado species (*C. colorado*) is conspicuous from the abundance of its bright red fruits which ripen early in September. The decorative value of the American Hawthorns is hardly realized yet, although few small trees or shrubs produce more beautiful flowers or handsomer or more abundant fruits.

The collections of Grapevines on the trellises at the eastern side of the Shrub Collection is now in excellent condition and is one of the most complete and successful groups in the Arboretum. Persons interested in hardy vines or desirous of seeing the decorative value of our native Grapevines should lose no time in visiting this collection for the first severe frost kills the leaves of these plants. All the species of eastern North America, except two or three from the extreme south, are represented in the collection and they all have value as ornamental plants. Of the species which are not often seen in cultivation attention is called to *Vitis Doaniana* from the Texas Panhandle, *V. bicolor* from eastern New York and southward, and *V. arizonica* with its small pale gray-green leaves. The Japanese *Vitis Coignetiae* is perhaps a more vigorous plant than any of the American species, although probably *V. cinerea* and *V. aestivalis* growing on the rich bottom-lands of the Mississippi valley reach a greater height than this Japanese vine, but in the size of its thick dark green leaves which are sometimes a foot in diameter, in its vigor, rapid growth and massive appearance it has no equal among the Grapevines which have been grown in the Arboretum. In northern Japan the leaves turn bright scarlet before falling, but the earlier frosts of the American autumn, which is a month earlier than the autumn of Japan, generally destroy the leaves while they are still green.

The season for flowers in the Arboretum is practically ended for the year, although one of the new Chinese shrubs, *Indigofera ambliantha* is still covered with its erect spikes of small rose-colored flowers. This is a small perfectly hardy shrub with erect stems, which, beginning to flower the middle of July, continues to produce its flower clusters until October. Among summer-flowering shrubs this is certainly one of the most beautiful of recent introduction.

The Arboretum will be grateful for any publicity given these Bulletins.
The exceptionally wet and cloudy weather of October has lessened the beauty of the fading leaves of many trees and shrubs in the Arboretum this autumn. From some American plants the leaves have fallen with little change of color, on others the colors are dull, and on many plants which are usually brilliant the first of November the leaves are still green and will probably be destroyed by the first serious frost before assuming their usual autumn colors. There are, of course, many exceptions to this general statement. The clear yellow tints of the leaves of the Japanese Cercidiphyllum have never been more beautiful than during the past few weeks. From some of the trees the leaves have already fallen or are falling rapidly, on others they are yellow, and on others still green or only slightly turned. As this tree is better known in this country its value is more appreciated. First introduced into the United States by the Arboretum in 1878, Cercidiphyllum has become thoroughly established in several collections in the neighborhood of Boston and has flowered and produced abundant crops of seeds here for several years. Cercidiphyllum is the largest tree of extratropical Asia, growing often to the height of one hundred feet or more and forming an enormous trunk composed of a number of secondary stems. The trees are fastigiate in habit with erect branches and slender branchlets, and the flowers and fruit are inconspicuous. The leaves somewhat resemble those of the Redbud or Cercis in shape, whence the name Cercidiphyllum. As they expand in very early spring, they are a dark bronze-red in color, and during the summer are rather dull blue-green. There are a number of these trees on both sides of the Meadow Road just beyond the Administration Building.

A plant of much beauty at this time owing to the dark wine color of its ripening leaves is the Japanese Stuartia pseudocamellia. This is a small slender tree common on the mountain slopes of central Japan, belonging to the family to which the Tea-plant and the Camellia belong. The white, cup-shaped flowers resemble those of a single-flowered Camellia; they are smaller, however, than those of the two American Stuartias, S. pentagyna of the Appalachian Mountains and S. virginica of the southeastern states. These are both shrubs, and the flowers of the latter are larger and more beautiful than the flowers of the other Stuartias, but this handsome plant is not hardy in New England and is now rarely found in European gardens, although it was introduced into England more than a century ago and appears to be perfectly hardy in the neighborhood of London. Stuartia pentagyna is perfectly hardy here and is one of the most desirable of the summer-flowering shrubs which can be grown in this climate. It is a large, free-flowering shrub and there is a form with bright purple stamens which make the flowers more conspicuous than those of the common form with yellow stamens. There is a good plant of the Japanese species on the upper side of Azalea Path, and there are plants of this and of Stuartia pentagyna in the Shrub Collection.

The three species of the eastern American genus Aronia, or Chokeberry, are beautiful plants in the autumn. Some of the forms of Aronia nigra are the largest in this group, sometimes growing to the height of eight or ten feet. The shining black fruit of these plants,
hanging in large and abundant clusters, contrasts well with the red and orange tints of the autumn leaves. Aronia intermedia, of the same general appearance, has earlier ripening, dark wine-colored fruit, while A. arbutifolia has erect clusters of smaller fruit and narrower leaves which are bright scarlet before falling. This plant late in the autumn is one of the showiest of all the shrubs of eastern North America. All the Aronias are easily cultivated and excellent garden plants; the flowers are abundant and handsome, and they have great value for the decoration of the autumn garden.

The leaves of no other shrub in the Arboretum are now so bright scarlet as those of the common Highbush Blueberry of New England swamps (Vaccinium corymbosum). This plant has much to recommend it for general cultivation; the habit is good, the flowers are beautiful, the large bright blue fruits which cover the branches in early summer are very handsome and of better quality than those of any other Blueberry, and the autumn foliage is unsurpassed in brilliancy. Young plants can be easily transplanted from the swamps and succeed in any good garden soil in which they grow rapidly and flower and produce fruit in abundance. The Highbush Blueberry has been largely planted in the Arboretum shrubberies and there is a group of these plants on both sides of Azalea Path at its entrance from the Bussey Hill Road at the base of the Overlook.

Some of the new Cotoneasters discovered by Wilson in western China are shrubs of much beauty at this season of the year, and among them are several of the handsomest and most desirable garden shrubs of recent introduction. Some of the species grow six or eight feet high and some form dense mats of prostrate stems: some have bright red and others shining black fruits, and nearly all of them have dark green and very lustrous leaves which retain this color until the late autumn. One of the handsomest plants of this group is Cotoneaster hupehensis with erect and spreading stems, larger and more conspicuous flowers than those of other species of Cotoneaster, and exceptionally large red fruits which have already fallen. Cotoneaster foveolata is a tall shrub with black fruit and leaves which turn late in the autumn to brilliant shades of orange and scarlet. For its autumn foliage this plant might well find a place in every garden. Although no longer a novelty, Cotoneaster horizontalis is one of the most useful and interesting of the Chinese species of Cotoneaster. It is a low plant with spreading and arching stems which in time form a broad mat not more than a foot high. The small leaves are dark green and very lustrous: the minute flowers are dark red and these are followed by innumerable small red fruits. This is a most desirable plant for the borders of small shrubberies, for the rock garden and for covering low walls. A collection of several species of the new Chinese Cotoneasters can be seen in the long bed of new Chinese plants on the southern slope of Bussey Hill, and there is a large specimen of C. horizontalis on the upper side of Hickory Path near Centre Street which is now covered with fruit and well shows the decorative value of this plant.

Unfortunately only a few species of the genus Callicarpa are hardy in this climate, and the beautiful C. americana, the so-called French Mulberry, which makes such a brilliant display in the southern woods at this season of the year with its large clusters of rose-purple fruit, cannot be grown here. The decorative value of plants of this genus
for the autumn garden can now be seen, however, at the entrance of Azalea Path from the Bussey Hill Road where there is a group of Callicarpa japonica covered with the small, shining, light purple fruit of this hardy little shrub. There are two forms of this plant in the group, the larger, with larger fruit having been raised from seed collected in Corea, and the smaller plants with smaller fruit raised from seeds gathered on the mountains of Japan.

Almost as conspicuous as the fruit of this Callicarpa is that of the Japanese Symplocos crataegoides, although it is still somewhat hidden by the ample foliage of the plant. This native of Japan is one of the few shrubs with bright blue fruit which can be grown in this climate. It is a large and perfectly hardy shrub which in late spring is covered with clusters of small white flowers and these are followed by small fruits which in the early autumn become bright blue and remain in good condition on the branches until after the leaves have fallen. Large plants of this Symplocos can be seen on the Bussey Hill Road above the Lilac Group, and it is in the Shrub Collection.

The fruit of most of the Bush Honeysuckles ripens and falls in summer, but a conspicuous exception to this general statement is found in Lonicera Maackii and its variety podocarpa. Lonicera Maackii, which is a native of the Amoor River region in northeastern Asia, is a large shrub with erect stems and white flowers which are larger and perhaps more beautiful than those of any other Bush Honeysuckle. The fruit of this plant is bright red, of medium size, and remains on the branches after the leaves have fallen, making it a valuable decorative plant in the late autumn. The flowers of the variety podocarpa which was discovered by Wilson in western China, are smaller, tinged with yellow or rose color, and less beautiful, but the fruit is larger and the leaves remain much later without change of color on the branches. At this time, therefore, the plant is covered with bright green leaves and bright red or orange fruit, making it one of the most attractive shrubs in the Arboretum at this season. There are large specimens of the Chinese and Siberian plants side by side in the Shrub Collection, and there are plants of the latter also covered with fruit in the Chinese collection on the southern slope of Bussey Hill.

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Three species, at least, of Hawthorns show their greatest beauty in early November. These species are *Crataegus cordata*, *C. nitida* and *C. persistens*. The first of these plants, the so-called Washington Thorn, is a narrow, rather slender tree which in favorable situations grows to the height of twenty or thirty feet. The leaves are nearly triangular in outline, of medium size and very lustrous. The flowers, which open about the middle of June, are small, creamy white, and are produced in small, compact but very numerous clusters; these are followed by small, scarlet, shining fruits which ripen late in October and remain on the trees without change of color until the spring. As the fruit assumes its bright color the leaves turn gradually to brilliant shades of orange and scarlet. This tree, therefore, which is much less beautiful when it is in flower than many other Hawthorns, is surpassed in the late autumn by few members of the genus. *Crataegus cordata* is a native of the southern Appalachian region from Virginia to Alabama, and is also abundant in southern Missouri. Formerly much cultivated as a hedge plant in the middle states, it is now sparingly naturalized in eastern Pennsylvania and in Delaware. The largest plants of this Hawthorn in the Arboretum are on the side of the Bussey Hill Overlook, and there is a good plant on Hickory Path near Centre Street. *Crataegus nitida* is a native of the bottom-lands of the Mississippi River in Illinois opposite the city of St. Louis, and is a larger tree of entirely different habit. The branches are wide-spreading and slightly pendulous, and form a large, rather open, round-topped head. The leaves are narrow, long-pointed and very lustrous, and, as is often the case with American Hawthorns, those at the ends of the branches are usually two or three times larger than the leaves on fertile branchlets. The flowers are pure white, of medium size, and produced in very numerous clusters which cover the upper side of the branches. The scarlet drooping fruit, which is also of medium size, ripens late just as the leaves turn orange and scarlet. In habit, in brilliancy of foliage, in its autumn colors, and in its abundant flowers and showy fruit *Crataegus nitida* is one of the handsomest of the American Hawthorns which has grown to a large size in the Arboretum. There are several good specimens of this tree on the bank on the east side of the Shrub Collection. *Crataegus persistens* retains its leaves which are now as green as they were at midsummer, after those of all the other Hawthorns have fallen, and the crimson fruit remains without change of color on the branches until late in the winter, making this tree the most conspicuous of all the winter-fruiting plants which have yet proved hardy in New England. This tree in habit and in the shape and general appearance of the leaves resembles some of the Cockspur Thorns of eastern North America. Raised at the Arboretum from seeds sent from the Paris Museum, its native country is still unknown. No plant at all like it has been found in the United States, although it is certainly a species of the New World. The fact that it retains its leaves so late in the autumn indicates a southern origin, and, if it is not a hybrid, it is possible that it may still be found in some of the elevated valleys of central Mexico. But whatever its origin, this is a tree of perfect hardiness and exceptional ornamental value. The
largest plant in the country and the type of the species can be seen among several large Hawthorns at the foot of the bank on the parkway near the Forest Hills entrance of the Arboretum, where it can be easily recognized as it is now the only plant in this collection with perfectly green leaves. Here, too, are several good plants of Crataegus nitida.

Unfortunately the European Holly, Ilex Aquifolium, and its numerous varieties which are splendid ornaments of parks and gardens in more temperate regions, is not hardy in New England. This is also true of the evergreen Hollies of China and of the broad-leaved evergreen species of southern Japan, and only three species of these plants can be grown here. These are the red-fruited Ilex opaca of the eastern United States, and the black-fruited I. glabra and I. crenata. Ilex opaca is interesting as it is the only broad-leaved evergreen tree which is hardy in New England. In general habit and in its fruit it resembles the European species, but on this American tree the leaves are dull and not lustrous like those of the European species. The bright red berries remain on the branches through the winter, however, and make it an ornamental tree here of the first class. There are several specimens in different parts of the Arboretum, and a large plant now covered with fruit among the Laurels at the northern base of Hemlock Hill. Ilex glabra is a round-topped shrub occasionally five or six feet high and is very common on sandy land in the neighborhood of the coast from New England to Texas. It is very hardy and is chiefly valuable for its small shining leaves which nearly completely hide the small black fruits which remain on the branches during the winter. This is certainly one of the most valuable of the evergreen shrubs which can be grown in this climate. A fine mass of it can be seen on the Bussey Hill Road opposite the Laurels at the northern base of Hemlock Hill. Ilex crenata is a taller growing and narrower plant than I. glabra, with darker green leaves and rather larger fruits. The leaves vary greatly in size on different individuals, and the plants with smaller leaves have proved hardier in the Arboretum than the broader-leaved forms. There are several plants of this Japanese Holly on Azalea Path which have grown to their present size from seeds planted here twenty years ago.

The number of broad-leaved evergreen shrubs which can be grown in this climate is small, but the leaves of a few deciduous-leaved species are not injured by early frosts and remain green so late in the season that they are valuable for the autumn garden. One of the most useful of these plants is the European Privet, Ligustrum vulgare, a plant formerly much cultivated in this country and now occasionally naturalized in the eastern states. The leaves are now as dark green as they were at midsummer, and their beauty is increased by the larger handsome clusters of shining black berries on the ends of the branches. This is a large, very hardy and fast-growing shrub which in recent years has been somewhat overlooked owing to the introduction of numerous Japanese and Chinese Privets which are all, however, far less valuable ornamental plants. There is a form of the European Privet with yellow fruits which is not particularly handsome, and forms varying from the normal plant in habit. They can all be seen in the Shrub Collection.
A Evonymus known as *E. Hamiltonianus*, var. *semipersistens*, a shrub of uncertain origin but probably Chinese, is valuable because the leaves are still as green as they were early in the season. The flowers of this plant, like those of all the species of Evonymus, are small, and the fruit is unusually small, inconspicuous and late ripening; and it is only for the green of its leaves in late autumn that this plant is valuable. A good specimen can be seen in the Evonymous Group on the right-hand side of the Meadow Road. All the forms of the common Lilac (*Syringa vulgaris*) are still as green as they were at midsummer, and the leaves of *Magnolia glauca* are still nearly as bright and shining as they were two months ago.

The mild winter and the abundant rains of the early spring, and of October have been favorable to conifers, and many of the trees in the Pinetum have never looked better than they do today. This, of course, is not a good climate for conifers and some of the most beautiful and interesting of these trees cannot be grown here at all, including nearly all the species from western North America and those from the southern United States and Mexico. The coniferous trees of the countries of the Mediterranean Basin, and of South America, Tasmania and New Zealand, too, are not hardy here. Those of northeastern North America and the Rocky Mountains are the species on which we can best depend, and among these the White Pine, the Red Pine, the Canadian and the Carolinia Hemlocks, the Red Cedar, the Arborvitae, the Colorado White Fir (*Abies concolor*), the Colorado Douglas Fir (*Pseudotsuga Douglasii*) can be counted among the most beautiful conifers in the world. All the species of central and northern Europe are hardy here but are often short-lived. So far as it is possible to judge by an experience only of from twenty to thirty years all the Siberian and north of China conifers are promising here, as are nearly all the Japanese species, although some of these are more valuable ornamental trees here than others. Of the great number of new conifers recently raised here from seed collected in western China, the most important probably of all the Arboretum introductions it is still too soon to speak, but, judging by the climate where these trees grow, it is not improbable that some of these Firs and Spruces may succeed in New England.

These bulletins will now be discontinued until the spring.

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