61/5/12
4/4/73
Jamaica Plain
Compared with those of recent years it is a "late spring" in the Arboretum after a winter remarkable in the large amount of snow which has fallen and which has covered the ground continuously from the middle of December to the middle of March. The deep cover of snow has successfully protected low growing plants; it has protected, too, field mice which have injured some valuable shrubs by stripping the bark from their stems and branches. The cold was not unusually severe. Covered by the deep snow the ground was free or nearly so of frost during the winter, and in March there was promise of an exceptionally early spring, but on the morning of March 29th the thermometer registered two degrees below zero and the prospect of an early spring was ended. Fortunately this extreme cold at the end of March had not been preceded by days of high temperature, and comparatively little damage to plants in the Arboretum was caused by it. Rhododendrons with persistent leaves have suffered here more than any other plants by the low temperature at the end of March. There are dead branches on many plants of the Catawbiense Hybrids which have grown uninjured here for years; and some of the large plants of the native Rhododendron maximum have suffered even more than the Catawbiense Hybrids. The hybrid Rhododendron myrtifolium (R. hirsutum x minus) which has been growing in the Arboretum since 1885 and has never before lost a leaf or a flower-bud, is now badly injured. It is interesting that a related hybrid, R. arbutifolium, the R. Wilsonii of many gardens (R. ferrugineum x minus) is uninjured, as is R. minus itself. Uninjured, too, are R. catawbiense, the Caucasian R. Smirnozii, the Japanese R. Metternichii, and R. Wateri, the hybrid of one of his
Catawbiense hybrids with *R. Metternichii* raised several years ago by the late Anthony Waterer. The varieties and hybrids, too, of *Rhododendron caucascum* are uninjured in leaf and bud. Of other broad-leaved evergreens *Paeris* or *Andromeda floribunda* from the southern Appalachian mountain region is as usual uninjured and covered with flower-buds soon to open. This is certainly the handsomest and one of the hardest broad-leaved evergreen plants which has yet been thoroughly tested in the northeastern states. The more common *Leucothoe Catesbyi* of the same region often loses all its leaves during severe winters when the plants are fully exposed to the sun, and last spring the native Inkberry (*Ilex glabra*) lost its leaves which now are as bright as they were in October. Even such a hardy broad-leaved evergreen as *Evonymus radicans vegeta* loses many of its leaves in severe winters which, however, never appear to injure the leaf-buds. This fact is important for this Evonymus is the only substitute for the Ivy which can be successfully grown in eastern Massachusetts. The leaves of the Ivy which has been growing here on the Administration Building for a number of years has suffered more this winter than it ever has before but probably will recover. This is one of the plants obtained from Riga on the Baltic which is probably as cold or colder than any other region where the Ivy grows naturally. It was hoped that plants which had grown in such a cold country would prove hardy here, but it now appears that there is little hope that an Ivy can be found which will prove really hardy east of Cape Cod. The Arboretum collection of conifers is in unusually good condition this year and there are no losses to report. The leaves of the southern Short-leaved Pine (*Pinus echinata*) are as usual badly burned, and although this valuable timber tree grows naturally on Staten and Long Island it is now evident that although it can exist in the Arboretum it will never make a fine tree here. The Chinese Pines (*Pinus sinensis* and its varieties) which lost nearly all their leaves a year ago are now in good condition; and the leaves of the Japanese Black Pine (*Pinus Thunbergii*) have been less injured by the winter than they have been for several years. It is still possible to say that the most beautiful conifer in the Arboretum is the Carolina Hemlock (*Tsuga caroliniana*).

**Winter Flowering Witch Hazels.** These plants have behaved in an unusual manner during the past winter. The species from southern Missouri and Oklahoma (*Hamamelis vernalis*) which usually blooms here at the end of December or early in January did not open its flowers until the middle of March. The flower-buds of this species, of the Chinese *H. mollis* and of *H. japonica* on the plants growing in low ground near the pond at the junction of the Meadow and the Valley Roads were killed. The plants of *Hamamelis japonica* have been growing in this position for the last twenty-five or thirty years and have never before failed to cover themselves in late January and in February with flowers. On high ground and in better drained soil *H. mollis* this year did not bloom until March 23, or at least two months after its normal time for flowering, and the flowers of the Japanese species were equally late. On the 21st of April the new red-flowered Japanese *H. incarnata* was still in full flower in the temperature of a hot July day. The flowers of this plant are small with dull red-brown
petals of little beauty, and it is only as a curiosity that it is worth a place in the garden.

The middle of April the season appeared to be ten or twelve days earlier than last year but on April 20th and 21st the temperature in the neighborhood of Boston rose in the afternoon to 87° and the buds of many plants began to open, and now a week later there is not more than a week's difference in the opening of flowers between this year and last. The Soft Maple (Acer saccharinum) which has been known to flower here in February was in full bloom this year on March 24th, nine days later than last year; and a tree of the Red Maple (Acer rubrum) was in flower this year on April 20th or ten days later than last year. In spite of the lateness of the season there are interesting flowers to be seen in the Arboretum, although it is still not too late for a destructive frost like that of April 21, 1922, which did so much damage to flowers here.

**Early Magnolias.** Three Japanese species are conspicuous in early spring; all of them, however, bloom at least ten days too early for their delicate white petals rarely escape injury by cold nights. The handsomest and the best known of these plants, Magnolia stellata, is a large round-topped shrub with star-like flowers which appear before the dark green leaves. Although a native of southern Japan, this Magnolia is entirely hardy in Massachusetts, and if it flowered later would be one of the most desirable plants which could be grown in northern gardens. The other early-flowering Japanese species are Magnolia salicifolia and M. kobus var. borealis. The former is a small slender tree with narrow pointed leaves and smaller flowers than those of M. stellata. It is a native of the mountain slopes of northern Hondo. It is hardy but has never grown as well in the Arboretum as it has in Highland Park, Rochester, New York. The third of these plants, the northern large-flowered form of M. kobus (var. borealis) is the most northern in its range of the Magnolias which flower before the leaves appear, and grows naturally only in Asia. This northern tree was introduced into gardens by the Arboretum as long ago as 1878, but in cultivation has never been a particularly successful plant. The small white flowers are pendent and are not often produced freely until the tree is thirty or forty years old. Growing in the open the trees are apt to produce heavy lower branches which interfere with the growth of the stem which is stunted and often killed by them. This Magnolia grows naturally in dense forests in which it becomes a tall tree with a long straight trunk, and it is probable that it will do better than it has in the Arboretum if it could be planted with other trees in woods. The old trees have all disappeared from the Arboretum, but one of the original seedlings growing in a garden in Brookline, is now more covered with flowers than it has ever been before.

**Forsythias** are now covered with nearly fully expanded flowers and are the most conspicuous plants in the Arboretum. When planted in low ground they have lost some of their flower-buds from cold, especially those at the end of the branches, but even in low situations they are fuller of flowers than usual. A species which is flowering this spring for the first time in the United States is
**Forsythia ovata**, a native of the slopes of the Diamond Mountains of Korea, and in its range the most northern of the species of *Forsythia*. It is a large shrub with light yellow branches, broad, long-pointed, coarsely toothed leaves from 4-5 inches long, and from 3-4 inches wide, and clear primrose colored flowers rather smaller than those of *Forsythia Fortunei* or any of the forms of *F. intermedia*; they open about a week earlier than those of the other Forsythias. This Korean Forsythia promises to be a useful addition to early spring flowering shrubs and to be hardy in parts of this country where the other Forsythias cannot be successfully cultivated. The Arboretum plants were raised from seeds collected by Wilson in Korea in 1918.

Other plants also in bloom are many Poplars and Willows. *Erica carnea*, the only species of the true Heaths which is entirely hardy in this climate has been covered during the last two weeks with its bright rose-red flowers. The bright yellow flowers of the Leatherwood (*Dierea palustris*) and the Spicebush (*Benzoin aestivale*) make these two widely distributed native shrubs attractive features of the Arboretum at the end of April. They are plants still too little known to gardeners.

**April Flowering Rhododendrons.** The earliest of these, the Siberian *R. dahuricum*, which can be seen on Azalea Path is now well covered with its small rose purple flowers. Last year they were fully open on April 12 and were ruined by frost on the 21st. They may be ruined again this year for it is not too late for killing frosts. The flowers of the north China *Rhododendron mucronulatum* which open usually two or three days later than those of the Siberian plant are less delicate and are rarely injured by frost. On the lower side of Azalea Path there is a mass of this beautiful plant which is well worth a place in the spring garden. The plants of the hybrid Rhododendron (*R. citatum x dahuricum*) known in gardens as *R. praecox* "Early Gem" in the general Rhododendron collection are covered with expanding flower-buds. This is an interesting and handsome plant but the flowers are very delicate and five years out of six are ruined by frost.

Mr. J. G. Jack of the Arboretum staff will conduct a Field Class on Saturdays during the spring and early summer, to assist those who wish to gain a more intimate knowledge of the native and foreign trees and shrubs which grow in New England. Instruction will be given in informal outdoor talks and in the examination of the plants. Different botanical groups will be visited at each meeting, although any trees or shrubs found may form subjects for study. No technical knowledge or special preparation is required in order to join the class as the instruction is intended to be simple in character, affording opportunities for questions and answers relating to the specimens under observation. Unless otherwise notified the class will meet promptly at ten o'clock in the morning, on Saturdays, in the Arboretum at the Forest Hills entrance, beginning April 28th. The class will close on the 23rd of June. The fee for the course is $5.00, payable in advance.
Prunus. In the Arboretum are now placed in this genus the Peaches, Apricots, Almonds, Cherries and Plums. As now constituted this genus contains some of the important fruit trees of temperate regions, a few valuable timber trees, and a large number of plants cultivated for the beauty of their flowers or fruits, or for the evergreen leaves of some of the species. To few genera do northern gardens owe so great and varied beauty and in this Arboretum many of its species are established. The earliest of them to bloom in the Arboretum is a Peach, *Prunus Davidiana*, which opened its flowers on the 19th of April and shed its petals ten days later. This is the wild Peach-tree of northern China and a narrow tree with a tall slender stem and upright branches. The flowers are pink, and there is also in the Arboretum a white-flowered form. The small hard, green fruit is not seen here every year as the flowers are usually destroyed by spring frosts. This tree has little to recommend it as a garden plant, especially in regions where spring frosts are common, but for students of the geography of plants it is of much interest. It has been used with much success by pomologists as stock for varieties of the garden Peach.

Apricots began to flower this year as early as the 25th of April and are still covered with white flowers. The earliest this year is a form of *Prunus Armenaica* which for several years has been growing in the Arboretum where it has been called "The Mikado." Judging by the name it is possible that this plant came originally from Japan, where the Apricot, originally a native of northern China, has long been cultivated in a number of varieties. "The Mikado" is a strong growing,
hardy tree with a comparatively narrow head of erect branches. Near it in the Plum collection is also blooming the Apricot from eastern Siberia and Manchuria, Prunus sibirica, another hardy and handsome tree which appears to be little known in this country. Another species, Prunus mandshurica, has fewer flowers this spring. In its native country this is a low tree with a trunk sometimes three feet in diameter and wide-spreading branches. As it grows in the Arboretum this is the handsomest of the Apricots in habit and foliage. Another of these trees, Prunus dasycarpa, the so-called "Black Apricot" from the dark color of its slightly downy fruit blooms a little later and is now only opening its flowers. This tree, which has been cultivated for a long time in European gardens, is now believed to be a hybrid between the Apricot and the European Garden Plum. Little known in the United States, when in good flower it is one of the most beautiful objects in the Arboretum. The small hard fruit has been rarely seen here.

Cherries are placed by many authors in the genera Cerasus, Lauracerasus and Padus, here considered sections of the genus Prunus. This is the most numerous in species and the most widely distributed of all the groups of the genus Prunus, and among the Cherries are some of the most beautiful when in flower of the trees and shrubs which can be grown in northern gardens. The earliest to bloom this year has been

Prunus tomentosa, an early introduction by the Arboretum from northern China, has proved to be one of the handsomest of the early spring flowering shrubs in the neighborhood of Boston. It is a vigorous plant five or six feet high and when well grown often broader than tall. The flowers open from pink buds as the leaves unfold and their bright red stalk and calyx make a handsome contrast with the white petals often marked with rose. The small lustrous scarlet juicy fruit which ripens in June has an excellent flavor and is attracting the attention of pomologists living in regions of extreme winter cold like the Dakotas and Manitoba where this inhabitant of the mountain slopes in the neighborhood of Peking has proven perfectly hardy. A variety (var. endotricha) brought from western China by Wilson flowers a few days later. This variety is chiefly distinguished from the north China plant by the absence of the hairs on the fruit.

Prunus subhirtella. This, the Spring Cherry of the Japanese, is the most delightful, travellers say, of the Japanese Cherries and as usual has been covered with flowers which opened on the 28th of April before the leaves began to unfold. Pink when they open the petals become nearly white before they fall. Prunus subhirtella is not known as a wild plant, and not uncommon in the gardens of western Japan is not often seen in those of Tokio. This is perhaps the reason why it has been less often sent to this country. The fact, too, that it does not reproduce itself from seeds is another reason why the "Spring Cherry" is still so rarely seen in the United States and Europe. The two large plants on the right hand side of the Forest Hills Road have been growing in the Arboretum for twenty-nine years, and when they are in flower no other plant in the collection, Cherry, Plum, Crabapple, Lilac,
Azalea or Rhododendron, equals them in beauty. The flowers, too, last longer in good condition than those of the other Japanese Cherry-trees. Three varieties of *Prunus subhirtella* are cultivated in the Arboretum where they begin to flower a few days later than the type. One of these, the var. *ascendens*, is a tall tree not uncommon in the woods of central Japan. It is this tree which is usually produced from the seeds of *Prunus subhirtella*, and the seedlings furnish the best stock on which to graft that plant. Still extremely rare in gardens, this variety *ascendens* shows little promise of becoming a valuable garden plant. Much better known is the variety *pendula*. This is the Japanese Weeping Cherry which has been cultivated for fifty years in this country and is now common in the neighborhood of Boston and New York. The trees are very beautiful when they are covered with their small pure pink flowers, but these last only for two or three days. Seeds of the tree with pendulous branches occasionally produce seedlings of similar habit, but most of these seedlings are the var. *ascendens* which is the best stock for the var. *pendula*. Another variety of *Prunus subhirtella* (var. *autumnalis*) has been growing in the Arboretum for only a few years but is a plant of considerable promise especially as it flowers in both spring and autumn. This is a shrub or in Japan occasionally a small tree, with semi-double pink and white flowers which open in spring a day or two later than those of the variety *pendula*. The autumn flowers are rather smaller and less abundant than those of the spring crop, but opening in October never fail to create interest and curiosity.

*Prunus incisa* is again covered with flowers which open at the same time as that of *Prunus subhirtella*. The pure white petals only last for a few days but the calyx which gradually turns red remains on the fruit for two or three weeks and is distinctly conspicuous. The name *incisa* of this Cherry is descriptive of the deep lobes of the large handsome leaves. Although a common plant in Japan on the Hakone Mountains and the slopes of Fuji-san this Cherry still remains extremely rare in American and European gardens. The oldest plant in the Arboretum now established near *Prunus subhirtella* on the right hand side of the Forest Hills Road was obtained in 1912 from a German nursery.

The Sargent Cherry, as the northern form of *Prunus serrulata* (var. *sachalinensis*) is often called, is the handsomest of all Cherry-trees of large size, as *Prunus subhirtella* is the handsomest of the species which are shrubs rather than trees. The rose colored or pink flowers which began to open this year on the 27th of April are short lived but their abundance, the hardiness of the tree which has not yet been attacked here by disease, the beauty of the large dark green leaves, brilliantly colored in the autumn, and the lustrous bark make this the handsomest of all Cherry-trees of large size. In northern Japan it was once a common inhabitant of the forest growing sometimes to a height of eighty feet with a tall massive trunk. Such trees are sought for the valuable lumber they produce and are fast disappearing. It was first raised in the Arboretum in 1891 from seeds presented by Dr. William Sturgis Bigelow, of Boston, and this tree, the largest
specimen standing in the United States, is growing on the right of the Forest Hills Road below the plants of *Prunus subhirtella*. A taller and narrower plant, raised from seeds collected by Professor Sargent in Japan in 1892, is standing by the Forest Hills Road, near its junction with the Meadow Road. Some of the handsomest and hardest of the double-flowered Cherry-trees cultivated by the Japanese like *albo-rosea*, and *fugenzo*, better known in nurseries as "James H. Veitch," are forms of the Sargent Cherry which supplies the best stock on which the double-flowered forms can be worked.

*Prunus yedoensis* is the Cherry-tree which has been planted in great numbers in Tokio where it makes a city holiday when it is in flower. It is a wide-branched tree sometimes fifty feet high with pure white flowers. It is hardy in the Arboretum but the flower-buds are often killed by cold and it has usually flowered more abundantly in the Peter's Hill nursery than near the Forest Hills gate where the oldest specimens in the collection has been growing for many years.

**Chinese Cherry-trees.** Some of the species discovered by Wilson in western China and raised from seeds collected by him have been in flower during the past week. Of interest chiefly to botanists none of these trees are of much promise for the decoration of parks and gardens. The most interesting perhaps is the variety *meda* of *Prunus pilosiuscula* which is distinct in the drooping habit of the small white or pink long-stamened flowers.

**Plums.** In the United States are found more species of the Plum group of the genus *Prunus* than in all the rest of the world. They grow as trees and as small and large shrubs, and are found from Canada to Texas and from the Atlantic to the Pacific, but are most abundant in species and individually in the Arkansas, Oklahoma and Texas region. In all eastern Asia there is but one species and in Europe two or three. The earliest species to bloom and now in full flower, *Prunus nigra*, the so-called Canada Plum, is a native of the northern border of the United States from New Brunswick westward to North Dakota. From *Prunus americana* with which it is sometimes compared it is well distinguished by the short incurved, not straight, pointed teeth, by the glands on the leaf stalks, and the larger flowers with petals which turn rose color in fading. The Chinese *Prunus salicifolia* is also in flower. It is from this tree that the so-called Japanese Plums now largely grown in this country have been developed.

**Almonds.** It has been possible to grow in the Arboretum only the species from north China, *Prunus triloba*. It is a tall shrub of open, irregular habit and its only beauty is in its flowers which in color are of the purest pink; no other plant in the Arboretum produces flowers more delicately beautiful in color. This plant has been growing here since 1888 when it was raised from seeds sent by Dr. Bretschneider from Peking. The double-flowered form (var. *plena*) which was found by Fortune in a Chinese garden many years ago is a better known and often a popular garden plant.
Pear-trees. The Arboretum contains one of the largest collections in the world of the wild types of Pear-trees, especially those from northern and western China. As ornamental trees none of the species from southeastern Europe compare in size or in beauty of foliage and flowers with several of the Chinese species, among which are some of the handsomest of the hardy trees of recent introduction. The earliest of the Pear-trees in the collection, *Pyrus ussuriensis*, opened its first flowers this year on April 30th. This tree, which is common in northern China, Korea and Manchuria and the only species which has a foothold in Japan where it has recently been discovered, inhabits more northern and colder regions than any other Pear-tree. If any Pear-tree proves hardy therefore in the northern interior part of this continent it should be this species; and if it proves resistant to blight it should yield the hardiest of all Pear-stocks. No other species attains such a large size as is shown by the photograph made in 1919 by Wilson in Korea of a tree which was sixty feet high, with a tall trunk fourteen feet round and a head of spreading branches seventy-five feet across. The flowers are not as large as those of some of the other species, but as a flowering tree *P. ussuriensis* is one of the most beautiful of all Pear-trees for the flower-buds and the opening flowers are deeply tinged with rose-color. The fruit is subglobose, green, hard, and from one-half to three-quarters of an inch in diameter and, like that of most wild Pear-trees, is of no comestible value. Among other Pear-trees this northern species, as a young tree at least can be easily recognized by its smooth pale bark.
A tree of northern China now considered a variety of Pyrus ussuriensis (var. ovidea) is an older inhabitant of the Arboretum. It blooms two weeks later than the more northern tree; the flowers are larger and pure white; the fruit, too, is larger with a yellow skin and succulent flesh and unlike that of other Pear-trees is broad at base and narrow at apex. The leaves turn brilliant scarlet; and in the autumn the large tree standing on the left hand side of the Forest Hills Road, near the Arboretum entrance, is a conspicuous object.

Pyrus Calleryana, a handsome and shapely tree raised from seeds collected by Wilson in western China has grown rapidly in the Arboretum where it has flowered and produced fruits for several years. This tree promises to be one of the most valuable plants introduced by the Arboretum into the United States for the inoculation of its seedlings has shown, as far as such tests prove anything, that they are immune to attacks of the blight which has been the destruction in the United States of many varieties of garden Pear-trees. Pomologists, therefore, now believe that they have found in this tree the stock which will make the cultivation of pears in this country a more certain and profitable industry than it has been since the Pear-tree blight became prevalent. Many thousand seedlings of Pyrus Calleryana have been raised by the Department of Agriculture of the United States and by different experimental stations from the seeds produced by the Arboretum trees, and if these seedlings prove as valuable as American pomologists now believe them to be they will show the country the value of museums like the Arnold Arboretum, and more than justify the labor and money it has expended in its explorations in eastern Asia. Unfortunately the only specimens of this tree outside of China which produce large crops of fruit are in this Arboretum, and the supply of seeds will for some time longer be insufficient to meet the demands for it. The large white flowers and ample, dark green leaves make Pyrus Calleryana a valuable garden plant; the small glabrous fruit is hardly more than a third of an inch in diameter.

Pyrus serotina, another of Wilson's introductions from western China, is of special interest to the students of cultivated fruits as it is the wild type from which have been derived the hard, round, gritty pears which have been cultivated for centuries by the Chinese and Japanese. These cultivated oriental pears are often handsome trees with beautiful flowers and greenish yellow fruits which are often extremely ornamental, but western palates and digestions cannot cope with the hard fruits with cells filled with grit. These Japanese Sand Pear-trees crossed with European Garden Pear-trees several years ago produced in the United States the Keiffer and Lecomte Pears. These, although rather hard, are handsome and suited to long shipment. Much was expected of them especially in the southern states where large orchards of these trees were planted. The trees proved so susceptible to blight that their cultivation has been practically abandoned. Pyrus serotina has grown with remarkable rapidity in the Arboretum and in spring is covered with large flowers more or less deeply tinged with rose and unfolding deep bronze-colored leaves.

Pyrus Bretschneideri is the only Chinese Pear-tree which some day
may be developed into a valuable fruit tree for the northern United States. It is one of the three species of Pear-trees raised at the Arboretum in 1883 from seeds sent here from Peking by the late Dr. Bretschneider. This tree has not been attacked by blight here and produces globose yellow juicy fruits of good flavor, and up to an inch and a half in diameter. Nothing is known to us here of this species as a wild tree but from it have evidently been developed in China the tree which produces the large round or pyriform juicy fruits of excellent flavor conspicuous in the Peking markets in September and October. The other North China Pear-trees raised from Dr. Bretschneider's seeds are *Pyrus betulaefolia* and *P. phaeocarpa*. The former is a large tree with small flowers and leaves and small globose brown fruit. It has grown rapidly, and is very hardy and at one time it was thought that it would prove a good stock on which to work orchard Pear-trees. Later it has often suffered from blight and so can now only be considered valuable as a garden ornament. Dr. Bretschneider's third species proved, when it flowered and fruited a few years ago, to be an undescribed species and it has been named *Pyrus phaeocarpa*. The small russet-brown fruit is globose on some trees and pyriform on others. The European Pears, which are of smaller size, flower later than the Chinese species. The original Pear collection is on the left hand side of Forest Hills Road and a larger and more complete collection has recently been planted in the hollow at the eastern base of Peter's Hill. The best specimens of the species introduced by Wilson from western China will be found on the southern slope of Bussey Hill.

**Shad Bushes**, as the American species of *Amelanchier* are often called, are beautiful and interesting trees or shrubs which bloom in early spring and several of them are now conspicuous in the Arboretum. *Amelanchier* like *Crataegus* and *Prunophora*, the name of the Plum group in *Prunus*, is a genus almost entirely confined to North America. One small, shrubby species grows on the mountains of central Europe and another shrubby species in China and Japan. The other species are American and grow from the shores of the Atlantic to those of the Pacific and from Canada to the shores of the Gulf of Mexico. The first of the Shad bushes to flower here, *Amelanchier canadensis*, opened its flower-buds on the 30th of April. This is a tree occasionally 70 feet high with a trunk 18 inches in diameter. Rare and of comparatively small size in Canada and New England, it grows to almost its largest size in western New York, and in the Gulf States, where it is found as far west as western Louisiana, it is the only species. Long confused with the common tree species of the northern states, *A. laevis*, it is still rarely cultivated and a comparatively new introduction into the Arboretum. Here it is perfectly hardy and promises to become a large tree. As it flowers at the same time as the early flowered Japanese Cherry-trees it should prove a good subject to plant with them. A dwarf northern Shad Bush *Amelanchier Bartramiana*, flowered this year as early as *A. canadensis*. This is an inhabitant of cold, northern swamps, but is now well established in the Arboretum. It is a slender shrub with small flowers arranged, not in racemes, like those of the other species, but in one or two-flowered clusters. In early spring it is distinct in the yellow bronze color of the unfolding leaves.
Amelanchier laevis and A. oblongifolia form part of the native flora of the Arboretum and flower a few days later than A. canadensis. The former is a tree which grows naturally on dry upland wooded slopes and under favorable conditions becomes 40 feet high and forms a trunk from 12 to 18 inches in diameter. This tree is easily recognized, when it is in flower by the dark red-brown color of the leaves. There are native trees of this Amelanchier on the wooded slope on the left hand side of Forest Hills Road back of the Crabapple collection. Amelanchier oblongifolia is a large shrub, rather than a tree, and is an inhabitant of the borders of swamps where it grows usually in moist, only partly drained soil. This plant is conspicuous as the leaves unfold as they are thickly covered with silvery white hairs. The many large specimens of this shrub which can be seen from the drives make the early days of May an attractive time to visit the Arboretum.

Prunsepia sinensis is again covered with clusters of bright yellow flowers which spring from the axils of the half-grown leaves. This Prunsepia is a tall broad shrub with long spreading and arching branches and stems armed with many spines. It is perfectly hardy and the handsomest shrub Manchuria has yet contributed to western gardens. There are only two specimens in the Arboretum and these came here from Petrograd in 1903 and 1906, and it has been found difficult to propagate them by cuttings. Fortunately last year one of the plants produced for the first time a few seeds and these have germinated, so there is reason to hope if the Arboretum plants become more fruitful that this species will be a common ornament in northern gardens. It has much to recommend it as a hedge plant. The species from northern China, P. uniflora, is a spiny shrub with small white flowers, and although it has little beauty, its value for forming impenetrable hedges may prove considerable.

Some Japanese Cherries. In the last issue of this Bulletin a few of the Japanese Cherry-trees growing in the Arboretum including Prunus serrulata var. sachalinensis were described. Two varieties of this tree which blossom later are now in flower — the vars. spontanea and pubescens. The former is a widely distributed tree in central and southern Japan, Korea and western China. The flowers are rather smaller and of a paler pink in color than those of the var. sachalinensis; the var. pubescens differs from it in the pale under surface of the leaves which are more or less thickly covered with hairs. Although the flowers are smaller than those of var. sachalinensis these trees are valuable because they prolong the season of bloom of the pink flowered tree Cherries. They can be seen on the southern slope of Bussey Hill and in the Peter's Hill Nursery.

For the next few weeks a guide will meet visitors to the Arboretum on Sunday afternoons at three o'clock, starting from the Forest Hills gate.
Asiatic Crabapples. Some of the early flowering species and varieties of these trees are perhaps the most conspicuous objects in the Arboretum this week. For many years much attention has been devoted here to these trees and the collection, which is as nearly complete as it has been possible to make it, is certainly one of the best in the world. The species are all represented here and it is not probable that there are more to discover although there is always a possibility that an undescribed species is still hidden in some unvisited valley in southern Kansu or in some of the other remote provinces of western China. New hybrids are much more probable. Indeed, there is danger that there may be too many of them, for these plants are so susceptible to pollen from their neighbors that it is useless to plant the seeds of any of the Arboretum trees with the expectation of obtaining seedlings similar to the parent; and as nurserymen and amateurs are now everywhere planting Crabapple-seeds, there will in a few years be as many hybrids of unknown origin as there are now new Irises and other garden plants. This will mean troublesome and usually unsatisfactory work for the conscientious dendrologist anxious to throw light on the origin of cultivated trees.

The flowering of the Crabapples makes one of the chief spectacular displays of the year here and of these displays only that of the Lilacs attracts a larger number of visitors. Many of the plants are well covered with buds; a few will flower sparingly or not at all this year but the general display will be an average one, although not as good certainly as last year when all the trees were covered with flowers. The collection is arranged on the left hand side of the Forest Hills Road and at
the eastern base of Peter's Hill, a short distance from the entrance at the corner of South and Bussey Streets. The oldest and largest plants are by the Forests Hills Road but there is a larger number of species and varieties on Peter's Hill which should be visited by everyone interested in these plants. There is in one of these Bulletins only space to call attention to a few of the most interesting of these plants. The earliest of them to flower,

**Malus baccata mandshurica**, is a native of Manchuria, Korea and northern Japan, and the eastern form of the better known **Malus baccata**, the Siberian Crabapple, which reached Europe more than a century ago and for a long time was one of the two Asiatic Crabapples known in western gardens. The Manchurian form as it grows in the Arboretum is a tree fifteen or eighteen feet tall and broad; the flowers, which are produced in profusion, are pure white, rather more than an inch across, and more fragrant than those of any other Asiatic Crabapple. The fruit is round, yellow or red, and not larger than a large pea. The Manchurian Crabapple, which is still rare in this country, should for the fragrance of the flowers alone find a place in all collections.

**Malus robusta.** This is another of the early flowering Crabapples and is believed to be a hybrid between *M. baccata* and *M. prunifolia*. Planted in good soil and allowed sufficient room for development it will grow into a large shapely tree with a broad, round-topped, irregular head of spreading often drooping branches. The flowers are fragrant and larger than those of the other Asiatic Crabapples with pure white or occasionally greenish petals; and the fruit, which varies in size on different plants, is globose and dull red.

**Malus Halliana**, with its form *Parkmanii* which has double flowers, is perhaps the most distinct of all Crabapples in the color of its rose-red flowers. It is a shapely small tree, with erect and spreading stems forming a narrow vase-like head, and dark green leaves. The globose reddish fruit is not larger than a small pea. The Parkman Crab was among the first Japanese trees to reach this country direct, having been sent by Dr. George R. Hall in 1861 to Boston where it was first planted in Mr. Francis Parkman's garden on the shores of Jamaica Pond. This Crabapple is a favorite in Japanese gardens where it is known as "Kaido," but has not been found in a wild state. Whatever its origin the Parkman Crab is one of the most distinct and beautiful of the small trees which flower here during the early days of May.

**Malus theifera**, from central and western China, is closely related to Hall's Crab. It is one of Wilson's introductions through seeds sent to Veitch in 1900 and in 1907 to the Arboretum where it is now from twelve to fourteen feet high. It has upright, spreading, rather zigzag branches which are densely studded with short spurs which bear numerous clusters of flowers rose-red in the bud, becoming pale and almost white when fully expanded. In central China the peasants collect the leaves and from them prepare a palatable beverage which they call red tea. From this fact the specific name is derived.
Malus floribunda, by many persons considered the most beautiful of Crabapples, was introduced into Holland by Von Siebold in 1853 from Nagasaki, Japan. The place where it grows wild still remains unknown, although possibly it is one of the high mountains of Kyushu. Japanese botanists and nurserymen confuse it with the Parkman Crab, and Wilson has not seen it in Japanese gardens. It is a broad, round-topped, treelike shrub sometimes twenty-five feet tall with stout branches and slender arching and pendent branchlets. The clustered flowers are white when fully expanded, rose-red in the bud, and as they open in succession the two colors make a beautiful contrast. The fruit is about the size of a pea, yellowish or yellowish brown; from some plants it falls in the early autumn, on others it remains on the branches during the winter or until devoured by birds who are particularly fond of it. Several plants with persistent fruit are growing close to the Administration Building in the Arboretum, and during the winter are filled with numerous species of birds, including pheasants who are fond of these Crabapples. A hybrid between M. floribunda and perhaps M. robusta appeared in the Arboretum in 1883 among a lot of seedlings of M. floribunda and has been named M. Arnoldiana. It has the habit and abundant flowers of M. floribunda, but the flowers and fruit are nearly twice as large. It is a handsomer plant than M. floribunda and one of the most beautiful of the Crabapples in the Arboretum.

Malus Sieboldii is another of the species introduced in 1853 from the gardens of Japan into Europe by Von Siebold. It is a low, dense shrub of spreading habit with the leaves on vigorous branchlets three-lobed, small flowers white tinged with rose in color, and small yellow fruits. Von Siebold's Crab is really a dwarf form of a species common on the Korean Island of Quelpaert, and on the mountains of central Japan and Hokkaido, to which the name var. arborescens has been given. This is a tree often thirty feet or more tall, with ascending, wide-spreading branches, twiggy branchlets and minute fruit yellow on some and red on other individuals. Although the flowers are small, they are produced in immense quantities, and this species has the advantage of flowering later than the other Asiatic Crabapples.

Malus Sargentii from salt marshes in the neighborhood of Muroran in northern Japan, where it was discovered by Professor Sargent in 1892, has qualities which give it a field of usefulness peculiarly its own. This species is a dwarf with rigid and spreading branches, the lower branches flat on the ground; it is well suited for covering slopes and banks. The flowers are in umbel-like clusters, saucer-shaped, round and of the purest white, and are followed by masses of wine-colored fruit which is covered by a slight bloom and unless eaten by birds remains on the plants well into the spring.

Malus prunifolia var. rinki is the wild parent discovered by Wilson in western China of the race of apples long cultivated in the Orient, and since it fruits freely in the hot moist valleys of central China as well as in the cold regions of northern Korea it may prove of value to pomologists in breeding new races of hardy Apple-trees.
Other species and hybrids well worth the attention of plant lovers who find pleasure in surrounding themselves with hardy trees and shrubs are the Japanese *Malus micromalus*, the Chinese *M. torimoides* and *M. transitoria*, and *Malus sublobata*, a hybrid of uncertain origin, which is now the tallest of the Crabapples in the collection, and promises to become a large tree. This hybrid is particularly attractive in the autumn when it is covered with bright yellow fruits.

**Rhododendron Schlippenbachii** opened its first flowers this year on Azalea Path May 5th and earlier than those of any other Azalea in the collection. It is one of the commonest shrubs of Korea and is often the dominant undergrowth in open woods. From Korea it crosses into northeastern Manchuria where it grows on the shores of Possiet Bay; it occurs, too, in two localities in northern Japan. Wilson found it extremely abundant in Korea on the lower slopes of Chirisan and on the Diamond Mountains, which were when he visited this region early in July "a wonderful sight with literally miles and miles of the purest pink from the millions of flowers of this Azalea." In Korea this Azalea on the wind-swept, grass-covered cliffs of the coast grows less than a foot high and is covered with flowers. In the forests of the interior it often grows to a height of fifteen feet and forms a tall and slender or a broad and shapely shrub. The leaves are large for those of an Azalea, being from three and a half inches to four inches long and sometimes nearly three inches wide, and are arranged in whorls of five at the end of the branches. This plant grows further north than any other Azalea with the exception of the North American Rhodora. The thermometer in the region of Diamond Mountains usually registers every winter a temperature of 35° to 40° below zero Fahrenheit. There is therefore no reason why this Azalea should not flourish in the coldest parts of New England. It has flowered now for several years in the Arboretum, and planted in an exposed sunny position has never suffered. Its hardiness and the beauty of its flowers make it one of the most valuable shrubs if not the most valuable, which northeastern North America has obtained from northeastern Asia. The flowers are perhaps more beautiful than those of any other Azalea. The plant and the flower-buds are hardy but young plants grown in frames start to grow so early that if they are transferred to the open ground in the spring the young growth is often killed by frost. It is therefore wise to move them from the nursery to the open ground in the autumn; slightly protected the young plants come safely through the winter and do not start to grow in the open ground until the danger of frost has passed. Even better results are obtained by potting young plants in the autumn, keeping them in a deep frame or pit during the winter and allowing them to finish their year's growth in the pots before they are planted out. The young plants make only one growth during the season and are certainly more difficult to manage than most Azaleas, but this Korean plant is worth a great deal more trouble than it takes to get it started.

**Viburnum Carlesii** is already in bloom in the collection on the Bussey Hill Road. This hardy Korean shrub with white, delightfully fragrant flowers in small, compact clusters, opening from rose-pink buds, always attracts attention and is fast becoming known in American gardens. With the exception of the American Hobble Bush, it is the earliest of the Viburnums to flower.
Lilacs. The word Lilac as most persons understand it means the plant with purple or with white flowers of old-fashioned gardens, and this Lilac, the *Syringa vulgaris* of botanists, and its numerous varieties are the most popular shrubs which can be grown in northern gardens, and the flowers of no other plant bring so many visitors to the Arboretum. This Lilac reached western Europe at the end of the sixteenth century by way of Constantinople and Vienna; and until a few years ago Persia was believed to be its native country, now, however, it is known to be a native of the mountain valleys of Bulgaria. It is not known when this plant first reached America, for there is no authentic record of it in this country before 1785 when Washington planted it at Mt. Vernon. It probably came much earlier for the colonists often brought favorite plants with them from their English homes. The wild form of *Syringa vulgaris* was raised from seeds sent to the Arboretum from Bulgaria in 1896. The flowers are purple and resemble those of the purple Lilac of old gardens but the flower-clusters are narrower with less crowded flowers. There is no record of the date of the first appearance of the white-flowered form which was first described in 1623. In the Arboretum can be seen good examples of the Lilacs of old New England gardens on the eastern slope and near the summit of Bussey Hill where two long rows of them were planted more than a century ago on each side of one of Mr. Benjamin Bussey’s garden walks.

The improvement of the garden Lilac dates only from 1843 when a nurseryman at Liege in Belgium raised a plant with small double flowers. Nothing is now known of the origin of this plant but as it was called *Syringa vulgaris azurea plena* it was probably a seedling of the
common Lilac and not a hybrid. By fertilizing the flowers of *Syringa vulgaris azurea plena* with the pollen of varieties of the common Lilac, Lemoine produced the first important double-flowered Lilac, *S. Lemoinei* and others, and by again crossing these with forms of the common Lilac the double-flowered Lilacs of recent years have been made. By the crossing of varieties and by careful selection the flowers of the common Lilac have been gradually changed in size and in color in the last thirty years, but unfortunately the flowers of many modern Lilacs have lost a good deal of the fragrance of the old-fashioned Lilac, which, once enjoyed, is never forgotten. There are too many varieties of the common Lilac now cultivated. Some of them with different names given to seedlings in different nurseries and often in different countries are identical, and others are so much alike that they can only be distinguished by close comparison. It is important to cultivate them all in the Arboretum for study and comparison, but in a private garden everything that is best in the forms of *Syringa vulgaris* can be found in not over a dozen of the single-flowered and a dozen of the double-flowered forms. The Arboretum does not undertake to name the twenty-four best varieties. The selection must be left to the person who is going to plant them for no two persons agree about Lilac-flowers. There are already between one hundred and sixty and one hundred and seventy named varieties of this Lilac in the Arboretum collection. The flowers are fast opening, and the best way for persons living in the neighborhood of Boston to make their selection is to study the Arboretum collection, and make notes on the color and size of the flowers and the size and shape of the flower-clusters.

In planting Lilacs it must be remembered that plants on their own roots are superior to those which have been grafted on other varieties of the common Lilac, for Lilacs produce many root-suckers. These often grow vigorously, so that a person who buys a fine named variety may in a few years find that the suckers from the root on which it was grafted have overpowered and killed his named variety, or that he has a bush producing on different branches flowers of his original purchase and of the stock. Nurserymen also use the Privet as a stock on which to graft Lilacs. This is a better stock than the Lilac for if it produces suckers they are easily recognized and can be removed, and if the grafted plants are set deep Lilac roots are soon produced. Privet-stock is strongly advocated by many good growers of Lilacs but others still believe that the best plants are raised from cuttings which can be made in winter from hard wood, but best from the soft wood taken in late June or early July. No one should ever buy a Lilac plant grafted on the root of another Lilac.

The Persian Lilac, the *Syringa persica* of botanists, was known in England as early as 1658. This is a beautiful, hardy plant with slender, drooping, wide-spreading branches, narrower leaves than those of the common Lilac, and small fragrant, lavender-colored flowers in short compact clusters. There is a variety with white flowers and another with lacinately lobed leaves. For many years it was universally believed that because Linnaeus had named it *Syringa persica* this plant was a native of Persia or of some country adjacent to Persia. Meyer, collecting in China for the Department of Agriculture of the United
States, found in 1915 quantities of a Lilac covering hillsides in Kansu. Plants raised from seeds of this Lilac have flowered and proved identical with the lobed leaf form of *Syringa persica* and as the plants have grown stronger they produce branches with the entire leaves of the type of the species. Since 1915 the Arboretum has also received dried specimens of this Lilac collected in Kansu. As a specimen of a wild plant from Persia is not to be found in the large European herbaria, there is every reason to believe that the Persian Lilac is a Chinese plant, brought from China to western Asia and Europe just as the Peach and other Chinese plants found their way westward.

Fifty years ago the species of Syringa known in this country were *Syringa vulgaris*, *S. persica*, the Hungarian *S. Josikaea*, the Himalayan *S. Emodii*, and the Chinese *S oblata* and *S. amurensis*, and two hybrids. Now there are twenty-seven species growing here with a few varieties and nearly all the known hybrids. In addition to these are a few species or perhaps forms which have been described by botanists but not yet introduced into cultivation. Of the twenty-seven species now in this country, twenty-two have been introduced by the Arboretum. Among these Arboretum introductions there are several beautiful and important garden plants. Among them for many persons the best is

**Syringa pubescens.** This is a tall shrub with erect stems, small leaves and broad clusters of small, pale mauve flowers with a long slender corolla-tube. For their fragrance which is more pungent and delightful than that of the flower of any other Lilac, *Syringa pubescens* should find a place in every northern garden. Plants in the United States have failed to produce seeds and as this species has proved unusually difficult to increase by cuttings, it has remained one of the rarest Lilacs in American gardens. It can, of course, be increased by grafting and sooner or later fertile seeds will be found on some of the large plants growing in the Arboretum. *Syringa pubescens* has been growing in the Arboretum since 1883 where it was raised from seeds sent here by Dr. Bretschneider from Peking.

**Syringa villosa** is another first rate garden plant for which the United States is also indebted to Dr. Bretschneider. It is a large, round-topped bush from ten to twelve feet tall and wide, with large, broad, elliptic to oblong leaves, bright green and dull on the upper surface and pale below, a broad or narrow cluster of flesh colored or nearly white flowers which have the rather disagreeable odor of those of the Privet. In spite of this drawback *S. villosa* is a good garden plant; the habit is excellent; it flowers freely every year and the flowers do not open until those of most other Lilacs have faded.

**Syringa Sweginzowii** is a native of northwestern China and came to the Arboretum by the way of St. Petersburg. It is a narrow shrub with slender erect branches, narrow leaves and long narrow clusters of slightly fragrant flowers, flesh-colored in the bud and becoming white after opening, with a long slender corolla tube. The relationship of this Lilac which flowers profusely every year, is with *S. pubescens* but it is a smaller plant blooming ten or twelve days later and the flowers are much less fragrant. As it grows in the Arboretum, *S. Sweginzowii* is one of the handsomest of the Lilacs of recent introduction.
Syringe Julianae, one of Wilson’s discoveries in western China, is another plant which deserves a permanent place in American gardens. It is also of the same group as S. pubescens with the same shaped flowers with the long corolla tube, but they are arranged in a short broad cluster and are much less fragrant. Their beauty is increased by the contrast between the violet-purple of the outer surface of the corolla and the white inner surface of its lobes.

Syringe tomentella, or as it has sometimes been called S. Wilsonii, another of Wilson’s Chinese discoveries, is a tall fast growing, hardy shrub with slender arching stems forming an open broad head. The leaves resemble those of S. villosa and the flowers which are produced in large open clusters are of the palest rose-color with a long slender corolla-tube.

Syringe microphylla, although by no means one of the handsomest of the new Lilacs, is interesting because it blooms every year in October as well as in June. It is a native of north-central China and is a narrow shrub with slender erect stems and small leaves and small pale rose-colored flowers in small narrow clusters.

Syringe reflexa which resembles S. villosa in habit and foliage differs from all other Lilacs in its narrow, cylindric, pendent clusters of dark rose-colored flowers. It is a native of western China where it was discovered by Wilson. It is a hardy, vigorous fast growing shrub which promises to grow here to a large size. As a garden plant it is chiefly valuable for the unusual shape of its drooping flower-clusters.

It is too soon to speak of the value of the recently introduced Korean species, S. velutina, S. dilitata and S. formosissima, which are perfectly hardy in the Arboretum and have already flowered sparingly in the Arboretum.

A Hybrid Lilac. The first hybrid Lilac appeared in the Botanic Garden at Rouen in 1810, and was the result of the crossing of Syringa vulgaris and S. persica. It is one of the most valuable of Lilacs. It grows quickly into a bush ten or twelve feet high and broad of rather open habit, and is very hardy and blooms freely every year. In shape the leaves resemble those of the Persian Lilac but are broader. The flowers, too, resemble those of the Persian Lilac, but are longer and produced in massive clusters sometimes two feet in length and so heavy that the slender branches can barely support them. The flowers are reddish purple and there are forms with darker red flowers and with nearly white flowers. This Lilac has often been called Syringa rothomagensis, but unfortunately through a misunderstanding of its origin the oldest and correct name for it is Syringa chinensis.

Early Azaleas. The pink flowered Rhododendron Vaseyi from the Carolina Blue Ridge is now blooming near the Meadow Road, and the Japanese R. Kaempheri now makes a blaze of color on the southern slope of Bussey Hill.
Hybrid Lilacs. In the last issue of these Bulletins an account was given of Syringa chinensis, the first hybrid Lilac of which there is a record. The next hybrid of which there is a history, Syringa hyacinthiflora, was made by Lemoine of Nancy in 1859 by crossing S. oblata with S. vulgaris coerulea plena the first of the double-flowering forms of the common Syringa vulgaris. S. oblata, the first of the Chinese Lilacs with the exception of Syringa persica to reach Europe from China was found probably in a Shanghai garden by Fortune and sent by him to England in 1852; from England it reached the United States as early as 1869 and perhaps earlier. It is a large, round-topped shrub, with broad, heart-shaped leaves which unlike those of other Lilacs are thick and coriaceous and in the autumn turn scarlet. It is one of the first Lilacs to bloom in the spring here and the large violet-colored flowers in comparatively small clusters are extremely fragrant. In severe winters the flower-buds are sometimes injured. It is interesting that this handsome plant has not yet been found growing wild; and there is no record here that it has been seen by anyone in China since Fortune's time. The first flowers of the hybrid Syringa hyacinthiflora opened this year on May 2 and were still in good condition on May 20th. It is a large, round-topped shrub of excellent habit, with leaves resembling in shape those of S. oblata but not thicker than those of the common Lilac, and small clusters of small semi-double, extremely fragrant flowers. Interesting from its origin S. hyacinthiflora is the least valuable of the hybrid Lilacs as a garden plant. The fact, however, is interesting that it is usually the first Lilac to flower in the Arboretum collection.
Syringa Henryi, the general name which has been given to the third of the hybrid Lilacs, was obtained by the skilful French gardener L. Henry by crossing the Hungarian S. Josikaea with narrow leaves and small bluish-purple flowers in long narrow clusters with S. villosa with its large leaves and ample clusters of flesh-colored flowers. These are both late-flowering species as is the hybrid made from them. Plants of this hybrid are large, vigorous, perfectly hardy and grow rapidly. The leaves resemble those of S. villosa but the flowers are violet-purple or reddish purple and arranged in clusters from twelve to fifteen inches long and broad. The handsomest perhaps of this race, which has been named "Lutèce," has deep violet-purple flowers and is one of the most beautiful of all Lilacs. "Eximia," another of the hybrids, has not grown here to such a large size as "Lutèce" but it is one of the handsomely late-flowering plants in the collection, with compact clusters of rose-colored or reddish flowers which become pink after opening.

Lemoine has obtained another interesting hybrid Lilac by crossing forms of Syringa vulgaris with the violet-flowered form (var. Giraldbi) of the north China S. affinis. The plants of this parentage grow rapidly and are tall, narrow shrubs. Like their Chinese parent they bloom early and the flowers are fragrant. The best known of these hybrids have been called by Lemoine "Berryer," "Claude Bernard," "Lamartine," "Mirabeau," "Pascale," and "Vauban." Several of these have been flowering in the Arboretum during the past ten days and promise to be important additions to the collection. Lemoine's latest hybrid Lilac has been obtained by crossing the hybrid "Lutèce" with the Chinese S. tomentella. Lemoine speaks highly of this plant which has not yet reached the Arboretum.

Late Shad Bushes. The last of these plants to flower in the Arboretum are the American Amelanchier sanguinea and A. amabilis and the two old world species A. vulgaris and A. asiatica, which were all in good bloom on the 20th of May. A. sanguinea is a slender shrub sometimes 6 or 7 feet high and does not spread by stoloniferous stems or from colonies. The leaves, which appear before the flowers open, are oval to oblong-oval, pale green and often somewhat glaucous, the upper ones nearly erect. The large and showy flowers are produced in many-flowered, flexuous or drooping racemes sometimes nearly five inches in length. The fruit, which ripens in August or September, is almost black, covered with a glaucous bloom, sweet, juicy and of a pleasant flavor. This beautiful shrub grows in dry, rocky or gravelly soil and is widely distributed from eastern, northern and central Maine, through Vermont and western Massachusetts to Quebec, Ontario and Michigan and south, through New York and along the Appalachian Mountains to Alabama. Amelanchier amabilis, which was once considered a variety of A. sanguinea, differs chiefly from that species in its larger and even more beautiful flowers. It is less widely distributed than A. sanguinea, having been found only from the neighborhood of Cooperstown in Otsego County, New York, in central and eastern New York and in Ontario. A handsome plant, it is less beautiful when in flower than the hybrid between the two arborescent species, A. canadensis and A. laevis, now known as A. grandiflora, which when in flower is the most beautiful of the Shad Bushes which grow in the
Arboretum. The two old world species are geographically interesting but have less value as garden plants than most of the American Shad Bushes.

**Hawthorns.** There have not before been as many species of Hawthorns in bloom in the Arboretum as there are this week as many of the plants which have been raised here from seed since 1900 and planted on the eastern slopes of Peters Hill are flowering this year for the first time. Many of these trees are covered with flowers and the older and larger plants are all flowering while many of the Crabapples and Lilacs this year have flowered sparingly or not at all. Judging by the appearance of the Hawthorns this year it looks as if at the end of four or five years more the flowering of these plants would be the great flower event of the Arboretum year. That many of these plants can be improved at least in habit by good cultivation and skilful pruning appears this year in some of the Tenuifoliae species which grow naturally as small shrubs with numerous stems but have become here small, symmetrical, single-stemmed trees. Two good examples of this change of habit can be seen in *Crataegus Forbes* and *C. pastorum*, two species from Worcester County, Massachusetts, now in flower on Peters Hill. Judging by these two plants it is possible that nearly all the shrubby species can be grown, with the exception of some of the species of the Intricatae Group, in good soil into small trees. As usual *Crataegus nigra* was the first Hawthorn in the collection to open its flowers. This native of western Europe is a shapely tree with pale bark and large deeply lobed leaves. The flowers, which are arranged in compact clusters, have twenty stamens with anthers faintly tinged with pink, and are followed by handsome black lustrous fruits, which ripen in summer and give greater value to this tree than the flowers which are less beautiful than those of many of the American Hawthorns. The flowers of *Crataegus nigra* have soon been followed by those of several trees of the Molles Group like *C. arnoldiana*, *C. mollis*, *C. submollis*, *C. Ellwangeriana*, *C. champlainensis*, and *C. Treleasi*; these have been soon followed by *C. pedicellata*, *C. Pringlei*, *C. lobulata*, *C. diatata*, *C. pruinosa*, and *C. sertata*. During the next two weeks lovers of Hawthorns will be able to see the flowers of more than two hundred species, and there will be Hawthorns flowering in the Arboretum now continually until July; by the middle or end of August the fruit of a few of the species will be ripe.

**Daphne genkwa** is a shrub with slender stems sometimes three or four feet high, and in its native country sometimes spreading by root-suckers; the leaves are pointed, from one to two inches long, and covered below with pale, silky hairs; the lilac-blue flowers are produced in April and May in stalked clusters from the joints of the naked wood of previous years. The long, slender wands of bloom and the unusual color of the flowers among early flowering shrubs make this Daphne an exceptionally attractive garden plant. A native of central China it appears to have been early carried to Japan where it was first found by Von Siebold. It was introduced into England in 1842 by Fortune, probably from a Shanghai garden. Twenty years later plants were sent from Japan by Thomas Hogg to the Parsons Nursery at Flushing, Long
Island. One of these Japanese plants flowered in the Arboretum in 1880, but generally they have never grown well in this country and it is doubtful if any of them are now in existence. In 1900 Wilson found this Daphne growing wild near Ichang in Hupeh and plants from his seeds were grown at the Arboretum. Some of these were killed by the severe winter of three or four years ago but the remnant of one of them has been flowering this year on Hickory Path near Centre Street. It is, however, probable that this beautiful shrub will never be a permanent success in eastern Massachusetts. A few plants have been sent by the Arboretum to more southern gardens where they are growing well and have given great satisfaction. *Daphne genkwa* is now extremely rare in the United States and every one with a plant should save all the seeds it produces, for Daphnes can only be successfully obtained from seeds, as it is practically impossible to increase them from cuttings.

*Berberis Dielsiana* is now in flower with the new Chinese Barberries on Bussey Hill. It is a magnificent plant already nearly ten feet high and from eight to ten feet in diameter with wide spreading slightly pendulous branches. The flowers are in drooping racemes like those of the common Barberry and are equally fragrant. *Berberis Dielsiana* is one of Purdom's discoveries, who found it in Shensi and among the new Barberries is only surpassed here as an ornamental plant by *B. Vernae* another of Purdom's discoveries which will not be in bloom yet for two or three weeks. Two years ago *Berberis Dielsiana* opened its flowers as early as the middle of April, but the middle of May seems to be the normal time for it to flower here, and that is before any of the other species of this group are in bloom.
American Crab Apples. Among the small North American trees still imperfectly known to botanists and wood-lovers and scarcely known at all to gardeners are the different species, varieties and hybrids of the Wild Apple. Nine species of these trees are now recognized, with several varieties, and two hybrids and their varieties. They have white or pink fragrant flowers which do not open until the leaves are partly or entirely grown, and green or pale yellow fragrant fruit which hangs on slender stems and, with the exception of that of the species from the northwestern part of the country is depressed-globose, usually from an inch to two and a half inches in diameter and covered with a waxy secretion. All the species spread into thickets and are excellent plants for the decoration of wood-borders and glades. Some of the species have only been distinguished in recent years, and although the species and many of the varieties are now growing in the Arboretum several of these have not yet flowered; only two or three of these Crab Apples can be found in commercial nurseries.

Malus glaucescens, which is named from the pale glaucous color of the under surface of the leaves, is the first of the American species to flower here and has been blooming for more than a week. It is a shrub usually rather than a tree, not more than fifteen feet high, with stems four or five inches in diameter. The flowers are white or rose color, up to an inch and a half across, and the pale yellow fruit is often from an inch to an inch and a half in diameter. It is common in several western New York counties and ranges to western Pennsylvania, southern Ontario and Ohio, and occurs on the southern Appalachian Mountains to northern Alabama.
Malus ioensis begins to open its flowers several days later than *M. glaucescens*. This is the common Crab Apple of the northern middle western states, and in a number of varieties has a wide range southward through Missouri to western Louisiana and Texas. It is a tree sometimes thirty feet high with a trunk often eighteen inches in diameter, a wide open head of spreading branches and usually incised leaves tomentose on the lower surface, flowers often two inches wide with white or rose-colored petals, and fruit hanging on stout hairy stems, and up to an inch and a half in diameter. The common form of this tree in southern Missouri, Arkansas and eastern Oklahoma (var. Palmerti), a small tree with spiny branches and smaller leaves, is flowering in the Arboretum for the first time this year. A form of this tree with double flowers (var. plena), the Bechtel Crab, named for the man who found it several years ago growing in the woods in one of the western states, has opened its pale rose-colored flowers which look like small Roses. When in flower this is one of the popular trees of the Arboretum, judging by the number of persons who want to get close to it. This double-flowered Crab can now be found in many of the large American nurseries, but these nursery trees are often short-lived, probably because the common orchard Apple on which they are usually grafted does not suit them as stock. Persons buying the Bechtel Crab should insist that it be grafted on one of the American Crab Apples, the best for the purpose being the single-flowered type of *M. ioensis*.

Malus coronaria, sometimes called the Garland Tree, is the common eastern species, although it does not approach the coast north of Pennsylvania and Delaware and ranges west to Missouri. It is a beautiful tree sometimes twenty-five feet high with a short trunk, pink flowers rather more than an inch in diameter and depressed globose fruit. From *M. glaucescens* it is distinguished by the green under surface of the leaves, and from *M. ioensis* by the absence of pubescence on the leaves, fruit stalks and young shoots. The calyx on one variety (var. dasycalyx) not rare in Ohio and Indiana is thickly covered with white matted hairs. A form with long acuminate leaves (var. elongata) which sometimes forms dense impenetrable thickets grows in western New York to Ohio, and on the southern Appalachian Mountains from West Virginia to North Carolina. Recently a double-flowered form of *M. coronaria* has been found growing in the woods near Waukegan, Illinois (var. Charloettae or the Charlotte Crab). The flowers are larger and whiter than those of the Bechtel Crab, and there is no reason why the Charlotte Crab should not become as great or a greater garden favorite. It is now growing in the Arboretum but the plants are too young to flower.

Malus platycarpa has fruit much broader than high, often two and a half inches in diameter with a deep cavity at base and apex. The flowers are about an inch and a half wide with a glabrous pedicel and calyx, but in the var. Hoopesii with a pubescent calyx. There is a large tree of this variety in the old Malus collection opposite the end of the Meadow Road. *M. platycarpa* is a handsome tree well worth a place in collections for its beautiful fruit valuable for cooking and jellies. The so-called Mammoth Crab is probably a hybrid of this species and the orchard Apple-tree.
Malus fusca, the only native Apple-tree of the Pacific States, where it ranges from Alaska to southern California, is in flower. This differs from the other American Crab Apples in its short-oblong, yellow-green flushed with red or nearly entirely red fruit from half an inch to three-quarters of an inch long, without the waxy exudation which is peculiar to the eastern American species, and with thin dry flesh. The calyx of the flower, unlike that of the eastern species, but like that of many Asiatic species, falls from the partly grown fruit.

Malus angustifolia is the last Crab Apple in the Arboretum to flower. This is a tree sometimes thirty feet tall with a trunk eight or ten inches in diameter, wide-spreading branches, bright pink exceedingly fragrant flowers an inch in diameter, and depressed-globose fruit. From the other species it differs in the only slightly lobed or serrate leaves on the ends of vigorous shoots and in the rounded apex of the leaves on flower-bearing branchlets. Malus angustifolia is a southern species which naturally does not grow north of southeastern Virginia and southern Illinois, ranging to northern Florida and western Louisiana. Plants raised here many years ago from seed gathered in northern Florida are perfectly hardy in the Arboretum where they bloom every year late in May and have proved to be handsome and valuable plants here. The other American species, M. glabrata of the high valleys of the mountains of North Carolina, M. lanceifolia, widely distributed from Pennsylvania to Missouri and western North Carolina, and Malus bractata, a common species from Missouri to Florida, with many of the varieties of Malus ioensis are now established in the Arboretum but the plants are still too young to flower.

Malus Soulardii, which is believed to be a natural hybrid between M. ioensis and some form of the orchard Apple (M. pumila) which, not rare and widely distributed in the middle west, is a tree as it grows in the Arboretum, nearly as broad as it is high with spreading, slightly drooping branches. Last year it was thickly covered with its pale pink fragrant flowers, which, for ten days at least, made it one of the most attractive objects in the Crabapple Collection at the eastern base of Peter's Hill. This year it has bloomed only sparingly. It is a curious fact that M. Soulardii flowers in the Arboretum fully two weeks earlier than either of its supposed parents. Several varieties of Soulard's Crab are distinguished by western pomologists. Some of them are in the Arboretum collection, but the 'Fluke Apple' is the only one which has flowered here yet. This resembles Soulard's Crab in size and shape, and in the color of its equally abundant flowers, and as an ornamental plant is of equal value.

Malus Dawsonii is a hybrid of the western M. fusca and the common Apple which appeared in the Arboretum many years ago from seed collected in Oregon. It has grown to more than double the size of M. fusca, to which it shows its relationship in the oblong fruit of the shape and color of that of its Oregon parent but of about twice the size. The leaves are less pubescent than those of the common Apple, and the flowers are rather larger. The hybrid blooms at about the same time as M. ioensis and a few days earlier than M. fusca.
**Early American Azaleas.** Four species, now called Rhododendrons, are in flower, *R. canadense*, the Rhodora, of which there are only a few small plants in the Arboretum, *R. Vaseyi*, *R. nudiflorum* and *R. roseum*. Of these *R. Vaseyi* is the first to open its clear pink or occasionally nearly white flowers. The Arboretum plants in large masses along the Meadow Road are still small but have been covered with flowers during the past week. On the lower side of Azalea Path *R. nudiflorum* and *R. roseum* growing side by side with numerous individuals can be compared. On different plants of *R. nudiflorum* the flowers vary considerably in color, and on a few plants are nearly white. For most persons *R. roseum* with the deep rose-colored flowers is a handsomer plant and perhaps the handsomest of the American Azaleas with the exception of *R. calendulaceum* with its yellow or flame-colored flowers. The fragrance of the flowers of *R. roseum* is only equalled among Azaleas by that of the summer blooming *R. viscosum* of northern swamps.

**The first Roses.** Three Asiatic species of Rose are the first to flower in the Arboretum, *Rosa Ecae* which opened its first flowers on May 21 one day before those of *R. Hugonis* and *R. omeiensis*. *Rosa Ecae* is still rare in gardens. A native of Afghanistan and Turkestan it is a large fast-growing shrub, with small lustrous leaves, strongly and pleasantly fragrant throughout the season, and pale yellow flowers about an inch in diameter. The flowers are paler in color, slightly smaller, and less crowded on the branches than those of *R. Hugonis* but it is a more vigorous and satisfactory plant and the persistent and unusual fragrance of the foliage greatly adds to its value. *Rosa omeiensis* which is common on the mountains of western China, gets its name from Mt. Omei, one of the sacred mountains of the Empire. It is a hardy, fast-growing shrub with erect stems covered with bright red prickles and white fragrant flowers hardly an inch in diameter which are followed by handsome red fruits on elongated yellow fleshy stalks. In its native country this Rose sometimes grows to a height of twenty-five feet. A good hedge for New England gardens might be made with it.

**Wisterias.** There are no flowers this year on the Chinese and Japanese Wisterias on the trellis on the south side of the Shrub Collection, but an old plant of the white flowering Japanese *W. floribunda* which has been allowed to ramble at will on the trees and shrubs on the left hand side of the Valley Road close to the Centre Street Gate is covered with flowers and is one of the most beautiful objects in the Arboretum during the last days of May.
Laburnums, small European trees or large shrubs, sometimes called "Golden Rain," can furnish our gardens in June and early July with the handsomest yellow flowered trees which can be grown in this climate. The best known Laburnum in this country is Laburnum anagyroides, or as it is more often called Laburnum vulgare. This is a native of central and southern Europe and a shapely tree from twenty to thirty feet in height. It is one of the most generally planted and popular exotic plants in England and probably was brought early to the United States where it has been more generally planted than the other Laburnums. Although not always perfectly hardy in Massachusetts large plants are occasionally found in the neighborhood of Boston and these are now covered with their drooping racemes of golden colored flowers. A number of varieties of Laburnum anagyroides are propagated in European nurseries but these are curiosities and certainly not better as garden plants than the type of the species. One of the most distinct of the abnormal forms, var. bullatum, with its curiously twisted and contorted leaflets is now in bloom in the Arboretum. The Scotch Laburnum (L. alpinum), probably so called because it is a most cultivated and favorite garden plant in Scotland, flowers later than L. anagyroides and is a hardier plant in this part of the country with longer racemes of flowers. When the plants growing in the Arboretum are covered with their long drooping flower clusters they are objects of great beauty and it is surprising how little this plant is known to American garden makers. Another Laburnum, L. Watereri, a natural hybrid between L. alpinum and L. anagyroides, which is intermediate between its parents in botanical characters and in the time of flowering, and is a beau-
tiful small tree better suited to the New England climate than *L. anagyroides*, and a good plant for the decoration of a June garden. *L. Watereri* appears to be little known in this country. The third species of Laburnum, *L. caramanicum*, a native of Greece and Asia Minor, has been planted in the Arboretum but has not proved hardy here.

**Arborescent Viburnums.** Four Viburnums assume the habit of small trees in the Arboretum. Three of these are eastern American, *V. prunifolium*, *V. Lentago* and *V. rufidulum*, and one is Japanese, *V. Sieboldii*. *Viburnum prunifolium*, which is known popularly as the Black Haw, is a common shrub in the middle Atlantic states where in early spring, on rocky hillsides and along roadsides and the borders of woods, it rivals in the beauty of its flowers the flowering Dogwood (*Cornus florida*) which naturally grows in open woods and not in such exposed positions as the Black Haw. *Viburnum nudiflorum* is a large arborescent shrub or a small tree rarely thirty feet high, with a short trunk usually less than a foot in diameter, rigid spreading branches beset with slender spine-like branchlets, ovate to suborbicular, thick, dark green and lustrous leaves which, handsome through the summer, are splendid in the autumn with their dark vinous red or scarlet colors. The white flowers in slightly convex clusters have been produced here this spring in the greatest profusion; in the autumn they will be followed by red-stemmed drooping clusters of dark blue fruit covered with a glaucous bloom, and from half an inch to three-quarters of an inch long. The Black Haw, which is one of the handsomest of the small trees of the eastern United States, takes kindly to cultivation and is quite hardy north of the region of its natural distribution which is in southern Connecticut. It has generally escaped the attention of American nurserymen who in recent years have made better known our northern arborescent *Viburnum Lentago*, the Sheepberry or Nannyberry, a usually larger and for some persons a handsomer plant. The flowers, which are arranged in larger and rather flatter clusters, are pale cream color and not white, but the fruit is as handsome as that of the Black Haw and rather larger. The leaves, too, are larger, equally lustrous, and also assume brilliant autumn colors. This Viburnum can grow in the shade of larger trees or in open situations which it prefers. In both May and early June the Arboretum owes much beauty to the flowers of these tree Viburnums, especially to those of *V. Lentago* which has been planted in large numbers along the drives and in the border plantations and is now covered with flowers. *Viburnum Jackii*, evidently a hybrid between *V. Lentago* and *V. prunifolium* with characters intermediate between those of its parents, was detected a few years ago by Professor Jack in one of the Arboretum plantations. An interesting plant it is not more valuable for the decoration of gardens than either of its parents. More beautiful than the Black Haw or the Nannyberry, the common tree Viburnum of the southern states, *V. rufidulum* is perhaps the handsomest of all the Viburnums with deciduous leaves. When it has grown under the most favorable conditions this Viburnum is a tree often forty feet high, with a tall stout trunk and branches which spread nearly at right angles from it; the leaves are thick, dark green and lustrous on the upper surface, with winged stalks covered, as are the winter-buds, with a thick felt
of rusty brown hair; the flowers are creamy white and the fruit is dark blue covered with a glaucous bloom. This Viburnum has been growing in sheltered positions in the Arboretum for several years, and a plant on the upper side of Hickory Path near Centre Street has not before been more thickly covered with flower-buds. The Japanese Viburnum Steboidii under favorable conditions can grow to a height of twenty-five feet although it is often a shrub in habit. It has long, bright green oblong, coarsely toothed leaves, and flowers in flat clusters from two and a half to four inches in diameter and handsome oblong fruit pink at first when fully grown becoming black and lustrous at maturity and then soon falling from the branches. The leaves when crushed emit a most disagreeable odor. For the decoration of American gardens this Japanese plant is inferior to either of the three American arborescent species.

The Mountain Halesia or Silver Bell Tree. (Halesia monticola). Until the beginning of the present century the botanists who visited the high Appalachian Mountains took it for granted that the Halesia which grows at altitudes above 2500 feet was the same as the bushy tree of the foothills and upland valleys of the Piedmont region and southward. This idea having been generally accepted, and as the lowland plant had for more than a century been common in gardens, no attempt was made to cultivate the mountain tree, and the gardens of the United States and Europe have been deprived of one of the handsomest trees of the North American forests. The tree of the high mountains is not rarely eighty or ninety feet high with a straight trunk sometimes from three to three and a half feet in diameter, often free of branches for fifty or sixty feet from the ground, and covered with bark separating into great platelike scales like those of a scaly-barked Hickory or a Swamp Cottonwood. The flowers are somewhat larger and the fruit is twice as large as the flowers and fruit of the lowland tree. The habit of the plant and the size of the flowers and fruits are reproduced in the seedlings which begin to grow as trees with a single stem. The seedlings show no variation in habit, and the young trees grow with a single straight stem with short branches which form a narrow symmetrical pyramidal head. The young trees often begin to flower and to produce fertile seeds before they are ten feet tall. This mountain tree has proved to be perfectly hardy in the Arboretum where it is growing rapidly and where it has now flowered and produced fruit since 1913. It is a tree which seems destined to play an important part in the decoration of American parks and which may prove useful for street and roadside planting.

Neillia sinensis is now in great beauty on the upper side of Hickory Path growing in the shade of a Japanese Walnut-tree. It is a shrub from western China introduced by Wilson and the best representative of a genus of the Rose Family which has been grown in the Arboretum. It is a large wide-spreading shrub with slender stems and dark green, long-pointed coarsely serrate leaves with prominent veins deeply impressed on the upper side of the leaf. The flowers are cylindric, clear pale pink in color and nearly half an inch long; they are borne in slender, nodding racemes from three to four inches in length, terminal
on short lateral branchlets of the year, and do not open until the leaves are nearly fully grown. It has been found in the Arboretum that the plant grows best in partial shade in moist but well drained soil. There are several other species of Neillia in the Arboretum collection. None of them, however, have any value as garden plants in this climate. Some of them are killed to the ground nearly every year and the flowers of others are inconspicuous. Neillia sinensis, however, is a garden plant of so much value that it seems destined to become popular as soon as it is better known.

*Crataegus Canbyi* is now well established in the Peter's Hill collection of American Hawthorns and is now covered with flowers. It is a native of Newcastle County, Delaware, and has been found on the shores of Chesapeake Bay, near Perrysville, Cecil County, Maryland, and occasionally in eastern Pennsylvania. It is a tree sometimes twenty feet high with a trunk up to eighteen inches in diameter, and long, spreading branches which form an open head which is occasionally from thirty to thirty-five feet in diameter. The leaves are pointed, dark green, lustrous, and nearly fully grown when the flowers open; these have usually ten stamens and small rose-colored anthers. The fruit, which ripens in October, and does not fall from the branches until after the beginning of winter is short-oblong, dark crimson in color and very lustrous. *Crataegus Canbyi* is one of the handsome species of the great *Crus-galli* group which is distributed in many forms from the valley of the St Lawrence River to the shores of the Gulf of Mexico, in western Florida, and westward to the borders of the Great Plains in Kansas, Oklahoma and Texas. This tree is named for the late William M. Canby, of Wilmington, Delaware, one of the most industrious and intelligent of the collectors and students of the North American flora, by whom it was first distinguished in his careful investigations of the Hawthorns of his native state.

*Malus transitoria* which is still covered with flowers is the last of the Asiatic Crabapples to bloom in the Arboretum. It was discovered by William Purdom in the Chinese Province of Shensi, and as it grows here is a large round topped shrub as broad as high, and not a tree. The flowers are more or less deeply tinged with rose color as the buds open but the petals become pure white. The fruit is ellipsoidal in shape, rose-pink, darker on one side than on the other, very lustrous, and about three quarters of an inch long. *Malus transitoria* which when covered with flowers as it is this year is a handsome plant; it has, too, a special value in prolonging the flowering period of the Asiatic Crabapples, among which are found some of the most beautiful flowering trees which can be successfully grown in New England.

*Aesculus carnea*. Two forms of this tree, the so-called red-flowered Horsechestnut, now attract much attention in the Arboretum; they are the var. *Briotii*, with scarlet flowers, and the var. *planteiroensis*, with large clusters of pale pink flowers marked with red at the base of the petals. This was raised several years ago in a French nursery and is sometimes believed to be a hybrid of the European *A. Hippocastanum* and *A. carnea*. Whatever its parentage it is when in flower one of the most distinct and beautiful of all the Horsechestnuts.
The Mountain Laurel (Kalmia latifolia) at the northern base of Hemlock Hill is well covered with flower-buds which will have opened when this Bulletin reaches its Massachusetts readers. The flowering of the Laurels is the last of the great Arboretum flower shows of the year, and none of those which precede it are more beautiful, for the Mountain Laurel or the Calico Bush as it is often called, is in the judgment of many flower-lovers the most beautiful of all North American shrubs or small trees. Many Rhododendrons have larger leaves and larger and more brilliantly colored flowers, but of all the broad-leaved evergreen plants which can be grown successfully in this climate the Laurel is the handsomest and most satisfactory. It is not perhaps strange that so little attention has been paid to it by American gardeners, for the American gardeners, of the earlier generations at least, derived their inspiration almost entirely from England, and usually despised American plants as too common for their attention. For some reason which is not easy to explain Kalmia latifolia has never been a popular plant in England where it is still not often seen and where it certainly grows less freely than many species and hybrids of Rhododendron. For this reason, perhaps, no distinct forms of the Laurel and no hybrids have been developed by cultivators and the few recognized variations in the flowers and leaves have all been found on wild plants. Of these there are forms with pure white flowers (var. alba), and there is a form with deep pink, nearly red flowers and rather dark leaves (var. rubra). Between these extremes there are others with flowers of all shades of pink, and there is one with flowers conspicuously marked by a chocolate band (var. fuscata). There is a dwarf form (var. myrtifolia) with
small leaves and small clusters of minute flowers; and there is one in
which the corolla is deeply divided into narrow lobes (var. polypetala).
A form with broad, handsome, Rhododendron-like leaves (var. obtusata),
rarely flowers, and another with a six-lobed corolla has recently been
found growing on the Blue Ridge in North Carolina. The Laurel col-
lection is easily and quickly reached from the Walter Street and South
Street entrances of the Arboretum.

Rhododendrons. Although the hot weather of last week ruined the
flowers of the early Rhododendrons and although the late flowering
species and hybrids have not yet opened, a large number of the varie-
ties of the Catawbiense hybrids are now in bloom. Persons who may
desire to cultivate Rhododendrons must remember that they, including
nearly all Azaleas, cannot live in soil impregnated with lime and that
with the exception of the native R. maximum they are not hardy north
of Massachusetts, and that south of Maryland, except at high altitudes
on the Appalachian Mountains, the summers are too hot for them. The
range therefore in eastern North America where these plants can be
successfully cultivated is comparatively small, but probably the north-
west coast of North America from southern British Columbia to north-
ern California is as well suited for these plants as any part of the
world, and in this region there can be grown in addition to all the varie-
ties common in European gardens the Himalayan and Chinese species
which here in the east can only be kept alive in glass houses, and in
Europe thrive only in a few exceptionally favorable places like Cornwall
or in the neighborhood of the Italian Lakes.

Rhododendrons, although they are moisture-loving plants, do not
thrive in undrained positions; they do best in soil in which loam, peat
and sand have been equally mixed, although peat is not always essential
to the successful cultivation of these plants. They should be planted
where the roots of trees cannot take away moisture from them, and
the best position for these plants is on the north side but not too near
coniferous trees as they have been planted in the Arboretum. In such
positions they are protected from the direct rays of the sun in March
and April, for in this climate where the roots are in frozen ground in
winter and therefore cannot take up moisture, it is important to reduce
as much as possible winter and early spring evaporation from the
leaves. It is this evaporation from the leaves of evergreens growing
in frozen soil which makes it impossible to keep alive many of them
in this part of the country; and this is the reason why it is desirable
here to water thoroughly Rhododendrons just before the ground freezes
in the autumn. Of the species of evergreen Rhododendrons only the
eastern American R. maximum, R. catawbiense, R. carolinianum and
its variety with white flowers (var. album), R. minus and its moun-
tain form, the Caucasian R. Smirnovii and R. caucasicum at least in
some of its forms, are truly hardy in Massachusetts. The two species
of the European Alps, R. hirsutum and R. ferrugineum can live here
sometimes for a number of years, but they are usually short-lived and
unsatisfactory plants in this climate. The Japanese R. brachycarpum
formerly lived in Massachusetts gardens for many years and longer
trials will probably show that it can be successfully cultivated in this
climate. Including this still doubtful Japanese species and the two
little European species, there are only nine species of this great genus
of several hundred species, hardy in this climate, and there is little
hope that another species able to support this climate will be found.
The poverty of our gardens in this plant appears when the Arboretum
collection is compared with that in a garden in Cornwall in England,
in which some three hundred and sixty species are growing and in
which on a day in May sixty-five species have been in flower. Such a
collection, and perhaps even a better one, can be made in a garden in
the neighborhood of Portland, Oregon, or in some favorable place on
the shores of Puget Sound, but the sooner it is realized that northeastern
North America is not a good Rhododendron country in any broad
sense the better it will be for the gardens in this part of the United
States. For the last seventy years a large amount of thought, labor
and money have been expended in attempts to cultivate these plants
in the New England and Middle States; during this time many hun-
dreds of thousands of these plants, principally hybrids of the Ameri-
can *R. catawbiense*, have been imported from Europe but the collections
of Rhododendrons in the eastern states at all satisfactory or compre-
hensive can be counted on the fingers of one hand. In this climate
unfortunately only a few of the Catawbiense hybrids, which are the
popular Rhododendrons here, can be grown. The American parent of
these hybrids is perfectly hardy, but the influence of the tender Him-
layan species with which it has been crossed has made most of the
varieties of this hybrid unsuited to this climate. The influence of the
tender *R. ponticum*, the stock on which these plants have been almost
universally grafted in European nurseries, may account in part for the
fact that plants of these hybrids which have lived here for thirty or
forty years have then died without any other apparent cause. If ever-
green Rhododendrons are ever to become hardy and permanent features
of eastern gardens we must give up trying to make European-grown
plants successful here, and confine our efforts to the few species which
are hardy here and to crossing these among themselves in the hope of
obtaining hybrids which will be able to grow here permanently. Some-
thing can be accomplished by the selection of seedlings For example,
the flowers of *R. catawbiense* are of a peculiar shade of magenta which
does not harmonize with any other color but white. Comparatively few
seedlings, however, of *R. catawbiense* have ever been raised and prob-
ably not much attention has ever been paid to selecting from among
the plants growing on the high Appalachian peaks individuals with
flowers of unusual colors. *R. catawbiense* is perhaps the hardiest here
of all Rhododendrons; the habit is excellent and the leaves are hands-
somer than those of the other hardy species. Improvement in the color
of the flower is all that is needed to make it a first rate plant for this
climate. It is doubtful if this can be accomplished by crossing it with
other species, but through patient selection it may be improved and
possibly a white-flowered form discovered. Hybrid Rhododendrons are
hardier or less hardy than their parents. The few hybrids which have
been made between *R. catawbiense* and *R. maximum*, the hardiest of
all Rhododendrons here, are less hardy than their parents. On the other
hand by crossing some of the Catawbiense hybrids with *R. Metternichii*,
a delicate Japanese shrub, a race of hybrids has been produced in Eng-
land which is quite hardy in the Arboretum; and the hybrids of the two
species of the European Alps crossed with one of the forms of the American \textit{R. minus} are excellent dwarf garden plants here. In this country the breeding of Rhododendrons for American gardens has never been systematically undertaken with full knowledge of the species available for the purpose. The field is an inviting one, for these plants and other hardy broad-leaved evergreens are greatly needed in American gardens. Of the early-flowering Rhododendrons those which have proved most satisfactory in the Arboretum are varieties of hybrids of \textit{R. caucasicum}, and the Appalachian \textit{R. carolinianum}. The best of the Caucasianums are the varieties called “Boule de Neige,” “Mont Blanc” and “Coriaceum.” The first is a round-topped plant rarely three feet high and occasionally six feet in diameter with handsome foliage and snow-white flowers faintly tinged with pink in the bud, in compact clusters. “Mont Blanc” is a taller and narrower plant with flowers rose-color when the buds open but soon becoming white. “Coriaceum” is also a more upright growing plant than “Boule de Neige” and in the rusty brown under surface of the leaves and in the flowers deeply tinged with yellow it resembles the wild plants of \textit{R. caucasicum} which grow on the mountain slopes of the Caucasus. Two specimens of “Coriaceum” have been growing in the Arboretum for many years and are among the most satisfactory plants in the collection. \textit{Rhododendron Smirnowii} flowers only a little later than \textit{R. carolinianum} and the Caucasian hybrids. It is a plant with which Americans interested in the cultivation of Rhododendrons would do well to become acquainted, for it is not only a beautiful plant but may prove exceedingly valuable in the production of a new race of hybrid Rhododendrons better suited for this climate than any which we now have. It is a large shrub with pale gray-green leaves coated below with a thick mat of pale felt, and large pink or rose-pink flowers in medium-sized clusters. The leaves are not as handsome as those of \textit{R. catawbiense} and its hybrids, and when the plants are fully exposed to the sun the leaves sometimes curl up in very hot weather. The felt on their lower surface protects them from the attacks of the lace-leaf fly from which other Rhododendrons suffer so seriously here. Hybrids of this plant with \textit{R. catawbiense} hybrids which have been raised in England show no trace of the covering of felt on the lower surface of the leaves and are less hardy and less desirable plants here than their Caucasian parent. In the Arboretum collection of Catawbiense hybrids are plants raised in England, the United States and Germany. English nurseries have been longer engaged than those of other countries in raising hybrid Rhododendrons and have had a larger variety of material to work with and as a rule the English Catawbiense hybrids are more desirable plants for this country than at least those in the Arboretum collection which have been raised in the United States and Germany. Nearly all the colors which have been obtained in the flowers of these hybrids will be found among the English plants which are hardy in the Arboretum. A list of such plants should include those called “Album elegans,” “Catawbiense Album,” “Charles Dickens,” “Atrosanguineum,” “Caractacus,” “Lady Armstrong,” “H. W. Sargent,” “Roseum elegans,” “Mrs. C. S. Sargent,” “Henrietta Sargent,” “Everestianum,” “Purpureum grandiflorum,” and “Purpureum elegans.” With these if proper soil and a good position for the plants is selected a fine display of foliage and flowers can be obtained.
The **Yellow Wood or Virgilia**, common names of *Cladrastris lutea*, has been covered during the past week with long drooping clusters of pure white pea-shaped flowers which make it one of the most beautiful trees in the forests of eastern North America. It is a round-topped tree sometimes sixty or seventy feet in height, with pale smooth bark which resembles that of the American Beech-tree, and large light green compound leaves which turn clear yellow in the autumn before falling. In the forest this is a rare and local tree, and is found growing, usually on river cliffs, from western North Carolina to Tennessee, Kentucky and northern Alabama, and in southern Missouri and northern Arkansas. It is most abundant probably in the neighborhood of Nash-ville, Tennessee. Sent to France by its discoverer, the elder Michaux, it has been in cultivation for more than a century. One of the first, and perhaps the first specimen planted in the United States was standing a few years ago in the grounds of the Philadelphia Cricket Club near that city. The Yellow Wood was planted in Massachusetts, where it is perfectly hardy, at least eighty years ago. This tree flowers well in France and Germany, but rarely produces flowers in Great Britain where the sun is not hot enough to ripen sufficiently the flowering wood. Here the trees flower only once in two years and, with few exceptions, all individuals planted in the northern states flower the same year. Although one of the handsomest trees that can be used for the decoration of parks and gardens in the eastern states, the Virgilia seems to be less commonly used here than it was seventy-five years ago. Fortunately it can still be obtained in a few American gardens.
**Styrax japonica.** The large plant of this Japanese shrub on Hickory Path near Center Street is now opening its abundant flowers. These are bell-shaped, white, and arranged in two- or three-flowered racemes which hang down from the branches on long stems and make this shrub during a week or ten days a beautiful and interesting object. The glabrous, drupe-like dry fruit is not particularly ornamental and the leaves fall late in the autumn without change of color. That *Styrax japonica* is perfectly at home in its present position in the Arboretum is shown by the numerous seedlings which every year spring up under the plant. There appears therefore to be no good reason why this handsome shrub should be so rare in American gardens. Although at least one hundred species of *Styrax* are now recognized by botanists, with four species in the southern United States and one in California, only two species, *S. japonica* and another Japanese species, *S. obassia*, have been successfully established in the Arboretum. The latter is a small tree thickly covered with nearly round leaves from eight to ten inches in diameter. These entirely hide the flowers which are nearly three-quarters of an inch long, fragrant and arranged in drooping racemes from six to eight inches in length. The healthy specimen of this plant on the upper side of Azalea Path bloomed earlier in the season. *Styrax americana*, a native of the southeastern United States from Virginia to Florida, lives in the Arboretum in sheltered positions and has occasionally produced its small fragrant flowers here, but it is not hardy enough ever to become valuable in northern gardens.

**Summer-flowering American Viburnums.** For many flowers the Arboretum is indebted in early summer to four American species of *Viburnum* which have been used in large numbers in its borders and roadside plantations. The earliest of these, *V. dentatum*, is already in bloom; it has handsome dark green leaves conspicuously toothed on the margins, and broad flat clusters of white flowers which are followed in early autumn by bright blue fruit on erect stems. This is a common roadside and meadow shrub in the northeastern part of the country. The second of these four *Viburnums*, *V. cassinoides*, is also in bloom. It is a native of swamps in the northeastern part of the country where it sometimes grows twenty feet high with slender straggling stems. In cultivation it forms a broad, low round-topped bush, and has proved one of the handsomest of all the *Viburnums* introduced into the Arboretum. The leaves are thick and lustrous and vary greatly in size on different individuals. The fruit is larger than that of the other summer-flowering American species, and at first yellow-green later becomes pink, and finally blue-black and covered with a pale bloom, fruit of the three colors occurring in early autumn in the same cluster. The third of these summer-flowering *Viburnums*, *V. venosum*, resembles in its general appearance *V. dentatum*, but it flowers two weeks later, and the young branchlets and the lower surface of the leaves are thickly covered with a coat of stellate hairs. This *Viburnum* is found growing naturally only in the neighborhood of the coast from Cape Cod and Nantucket to New Jersey. A larger and a handsomer plant with larger leaves, showier flowers and larger, later-ripening fruit, *V. Canbyi* is the fourth of these species. It is a native of eastern Pennsylvania and northern Delaware where it is not common, and of central Indiana; and
it is the last of all the Viburnums in the Arboretum to flower. There are large specimens of this plant in front of the Administration Building and at other points on the Meadow Road. All these Viburnums can be improved by cultivation and with generous treatment grow into larger and handsomer bushes than the wild plants, and bear larger leaves and better flowers and fruit. Few shrubs better deserve a place in American parks and gardens where they are still less often seen than they should be. Two rare American Viburnums can now be seen in flower in the Arboretum, *V. molle*, a native of southern Kentucky and southern Missouri, with which *V. venosum* was once confused, and *V. bracteatum* which is known to grow naturally only on the cliffs of the Coosa River near Rome, Georgia. One of the few plants in cultivation is on Hickory Path near Centre Street. *V. molle* is in flower near it.

**Red-fruited Viburnums.** With the exception of the two species which belong to the Opulus Group no American Viburnum has red fruit, but in eastern Asia there are several red-fruit species. The handsomest of these in the Arboretum is *V. dilatatum*, which is a native of Japan, Korea and western China. It is a large, shapely and vigorous shrub with broad, abruptly pointed leaves and wide flat clusters of flowers which are followed by small bright red fruits. This is a good shrub for the decoration of summer and autumn gardens. It is in the general Viburnum collection, and there are good plants on the right hand side of the Bussey Hill Road opposite the upper end of the Lilac Group. There is a form with yellow fruit (var. *xanthocarpum*) which is an attractive and interesting plant. The fruit of *V. dentatum* is smaller and less showy than that of another red-fruit Japanese species, *V. Wrightii*. This is a smaller shrub and flowered some time ago. The flower-clusters are smaller than those of *V. dilatatum* and the plants are not always perfectly hardy in exposed situations, but the fruit is larger and handsomer than that of the other red-fruit Viburnums of eastern Asia. Another of these plants, *V. theiferum*, from western China is not yet in flower. It is a tall narrow shrub with erect stems, small leaves and small flower-clusters. It has little to recommend it as a flowering plant but the fruit is large, abundant and of good color, and the plant has an economic interest as an infusion of the leaves is the ‘sweet tea’ used by the monks of the monasteries on Mt. Omei, one of the five sacred mountains of China.

**Hydrangea petiolaris.** The specimens of this vine, the Japanese Climbing Hydrangea, on the southeast corner of the Administration Building is now one of the great sights of the Arboretum as it is covered with flower-clusters from the ground to the eaves of the building. The leaves of few plants unfolded here as early in the spring and there is but one other climbing plant with conspicuous flowers really hardy in this climate, *Schizophragma*, able to attach itself firmly to a brick or stone wall or to the trunk of a tree. The flower-clusters of the Climbing Hydrangea are surrounded by a circle of white sterile flowers and are from eight to ten inches in diameter; they are terminal on short lateral branches which stand out from the main stem of the plant and give it an irregular surface which adds to its beauty and interest. This Hydrangea was first raised at the Arboretum in 1878 and can now be occasionally
seen in American gardens. It might well be better known and more generally used for there is no other plant so well suited to cover the brick or stone walls of tall buildings in the northern United States. *Schizophragma hydrangeoides*, also a native of Japan, can be seen on the wall of the Administration Building next to the Hydrangeas. It blooms later.

**Rhododendron (Azalea) calendulaceum.** The plants of this Appalachian Azaleas now in flower on Azalea Path and the Laurels and Rhododendrons at the northern base of Hemlock Hill have been during the past ten days the brilliant features of the Arboretum. The flowers of this Azalea vary from clear yellow to flame color, and unlike the Azaleas which bloom in early spring like the Appalachian *R. Vaseyi* and the Korean *R. Schlippenbachii* the leaves are fully grown before the flowers open. This adds to the beauty of this Azalea when it is flowering and makes it for many persons the most beautiful as it is the showiest of the American Azaleas. The flame-colored Azalea has been largely used in Europe in the making of the Ghent Hybrid Azaleas, and these are hardly, long-lived and valuable in this climate in proportion to the preponderance of this American plant in their parentage.

**Cornus kousa.** The attention of northern gardeners is again called to this tree which is the Japanese representative of the "Flowering Dogwoods" of North America. Here in Massachusetts the western species *Cornus Nuttallii*, which has never been a particularly successful plant in cultivation, is not hardy; and the flower-buds of the eastern species (*Cornus florido*) and its varieties are often killed in severe winters unless the trees are in exceptionally protected and sheltered positions. During the past winter the flower-buds on nearly all the trees in eastern Massachusetts were killed, with the exception of those on the branches which had been covered by snow. It is interesting therefore to find that the Japanese tree has not before been more thickly covered with open and uninjured flowers than it is this week. The flower-bracts, which are the conspicuous part of the inflorescence, are narrower than those of *Cornus florido* and are pointed, not rounded at apex. The individual inflorescence of the American tree is larger and perhaps more beautiful than that of the Japanese tree, but as this does not open until the leaves are nearly full grown *Cornus kousa* at this season of the year is an object of exquisite beauty. The form of this tree discovered by Wilson in western China and now growing with other Chinese plants on the southern slope of Bussey Hill is also now covered with uninjured flowers and their bracts. The bracts are wider and closer together than those of the Japanese plant making the Chinese form even a handsomer garden plant. In the American plants the scarlet drupes are gathered in an erect head but are not united, but in the Asiatic plants they are firmly joined together in a compact globose head which is suspended from the branch on a slender stem. This habit of the fruit adds to the beauty of the plants in autumn when the leaves assume as brilliant a color as those of the American plant. The Chinese form of *Cornus kousa* produces quantities of fruit in the Arboretum and there is no reason why it should not become common in American gardens.
Philadelphus. Among the shrubs which give beauty to northern gardens in early summer Philadelphus, or as it is popularly called Syringa or Mock Orange, is perhaps only surpassed in interest and value by the Rose and the Laurel (Kalmia). It is only the abundant and often delightfully fragrant white flowers of the plants of this genus which are beautiful; for the fruit is a dry capsule; the habit of the plants is not different from that of many other shrubs, and their leaves fall in early autumn without having changed their color. The plants are natives of eastern and western North America, Japan, China, the Himalayas and southeastern Europe. In the Arboretum collection there are some thirty species, several distinct varieties of some of the species, and a large number of hybrids for in few genera of plants has the hybridizer been more successful in producing new and valuable forms. Plants in this group are in bloom in the Arboretum during fully six weeks, the earliest being a form of Philadelphus Schneckii, named variety Jackii, for Mr. J. G. Jack who discovered it in Korea, which in ordinary season opens its flower-buds during the last week of May, and the latest, or almost the latest, the hybrid P. insignis, which does not flower before the middle of July. Among the species which seem best worth a place in the garden is the European species P. coronarius, the Mock Orange of old gardens, which was cultivated in England before the end of the sixteenth century and was probably one of the first shrubs brought to America by the English. It is a large and hardy shrub and is chiefly valuable for the fragrance of its flowers which are faintly tinged with yellow. A number of seminal forms of this plant are cultivated, including one with yellow leaves, one with double flowers, and one with nar-
row, willow-like leaves, but none of them have any particular value or interest for the decoration of gardens.

Among the American species which should find a place in all collections of hardy shrubs are *P. inodorus*, *P. pubescens* and *P. microphyllus*. The first is a medium-sized plant with arching branches and large, solitary, pure white, cup-shaped, scentless flowers and by many persons considered the most beautiful of the whole genus. *P. pubescens*, sometimes called *P. latifolius*, and *P. grandiflorus*, and known in gardens under various names, is a native of the southern Appalachian region and a shrub sometimes twenty feet high with stout erect stems and branches, broad leaves, and large, slightly fragrant flowers arranged in erect, from five- to ten-flowered racemes. *P. microphyllus* is a Rocky Mountain species with leaves less than an inch long, and small, intensely fragrant flowers. This is a compact shrub, about three feet high and broad, but unfortunately not always hardy here.

The most distinct and the handsomest of the Asiatic species which flowers here is *Philadelphus purpurascens*, discovered by Wilson in western China. It is a shrub with long arching stems from which rise numerous branchlets from four to six inches long and spreading at wide angles. On these branchlets the flowers are borne from base to apex on drooping stalks; they are an inch and a half long with a bright purple calyx and pure white petals which do not spread as they do on most of the species but form a bell-shaped corolla, and are exceedingly fragrant. This is one of the handsomest of the shrubs brought from western China to the Arboretum. *Philadelphus Magdalenae* from central China is another handsome plant well worth general cultivation. It is a broad tall shrub with arching stems, small, dark green finely toothed leaves and pure white fragrant flowers an inch and a quarter in diameter and arranged in drooping, leafy, many-flowered panicles from six to ten inches in length. *Philadelphus pekinensis* from northern China and Mongolia is a stout bush rather broader than high which every year produces great quantities of small flowers tinged with yellow and is well worth a place in the garden. Another interesting plant, *P. Falconeri*, which is certainly Asiatic and probably Japanese, has narrow, lanceolate leaves and fragrant flowers in from one- to six-flowered racemes, and is distinct in the shape of its leaves and in its long narrow petals. This plant was sent to the Arboretum many years ago by the Parsons Nursery at Flushing, Long Island, but nothing more is known of its origin or history.

In few genera of garden shrubs have natural cross fertilization and the art of the plant-breeder produced greater results than in *Philadelphus*. The first of these hybrids to attract attention was raised in France before 1870 by a Monsieur Billard and is sometimes called “Souvenir de Billard,” although the correct name for it is *Philadelphus insignis*. This hybrid is one of the handsomest of the tall-growing *Syringas*; it has large, snow-white flowers in long clusters, and its value is increased by the fact that it is the last of the whole group to flower. The largest *Syringa* in our northern gardens, where plants thirty feet high and correspondingly broad are sometimes found, appears to be a hybrid between *P. coronarius* and some unrecognized species. To this plant, whose history is unknown, the name of *Philadelphus maximus* has been given. Another hybrid called *Philadelphus splendens* appeared
in the Arboretum several years ago and is supposed to be a hybrid between two American species, *P. inodorus* and *P. pubescens*. It is a large and shapely shrub with pure white, only slightly fragrant flowers an inch and three-quarters in diameter and borne in erect clusters. This hybrid is a free-flowering plant and when the flowers are open it is the showiest plant in the Syringa Group.

These early hybrids are the result of natural cross fertilization, and the systematic breeding in the genus dates from the time when Lemoine first crossed the Rocky Mountain *P. microphyllus* with *P. coronarius* and produced a plant to which he gave the name of *P. Lemoinei*. Lemoine then crossed his *P. Lemoinei* with *P. insignis* and produced a race to which the general name of *P. polyanthus* has now been given. Well known forms of this plant are "Gerbe de Neige" and "Parvillon Blanc." To another race of the Lemoine hybrids the name of *Philadelphus cymosus* has been given. This race was obtained by crossing *P. Lemoinei* and *P. pubescens* or some related species. "Conquête" is considered the type of this group. Other well known plants which are thought to belong here are "Mer de Glace," "Norma," "Nuée Blanche," "Rosace," "Voie Lactée," and "Ferle Blanche." Another race of hybrids with double racemose flowers raised by Lemoine and of doubtful origin is called *P. virginialis*. The type of this group is Lemoine's "Virginal." Other plants referred to it are "Argentia," "Glacier," and "Bouquet Blanc."

**Tree Lilacs.** As the flowers of the late-flowering group of the true Lilacs fade the earliest flowers of the so-called Tree Lilacs begin to open. There are three of these Lilacs which all bear large clusters of white or yellowish white flowers with a corolla shorter than the stamens, while in other Lilacs the corolla is longer than the stamens which are hidden in its throat. The flowers of the Tree Lilacs are white and all have the disagreeable odor of the flowers of the Privet; the leaves fall in the autumn without change of color. The first of these plants to flower, *Syringa amurensis*, a native of eastern Siberia as its name implies, is a shrub in habit, twelve or fifteen feet high with dark close bark, broad thick leaves dark green above and pale below, and short, broad unsymmetrical flower-clusters. *S. pekinensis* from northern China flowers next. This is also shrubby in habit, sometimes twenty or thirty feet tall and broad, with stout, spreading stems covered with yellow-brown bark separating readily into thin plates like some of the Birch-trees, dark green, narrow, pointed leaves and short and unsymmetrical flower-clusters usually in pairs at the ends of the branches. This species holds its leaves later in the autumn than the others, and produces great quantities of flowers every year, the other species usually flowering abundantly only every other year. The last of the Tree Lilacs to flower, *S. japonica*, is a native of northern Japan, and is really a tree sometimes forty feet high with a tall straight trunk covered with lustrous brown bark like the bark of a Cherry-tree, a round-topped head of upright branches, broad, thick, dark green leaves, and erect, mostly symmetrical flower-clusters from twelve to eighteen inches long. This is one of the handsomest of the small trees which bloom here at the end of June or early in July. The first flowers of *S. japonica* are now opening; they promise to be in good condition until after
the first of July. The first Lilac flower, that of Syringa hyacinthiflora, opened here this year on the second of May. The season of Lilac flowers therefore extends here during fully two months. Fifty years ago when the Arboretum was begun the people of Massachusetts were able to enjoy the bloom of Lilacs only during a week or ten days.

**Late Flowering Hawthorns.** Different species of Hawthorn have been flowering continuously in the Arboretum since the early days of May and the last of these are now in flower. One of the last, C. tomentosa, the type of the Macracantheae or as it has often been called the Tomentosae group and one of the species known to Linnaeus, is a small tree widely distributed from the valley of the Hudson River westward and southward, with large pointed leaves, small flowers in compact clusters, and small oblong red fruit, translucent when fully ripe. As an ornamental plant this species is much less attractive than many of the other plants in this group. The Washington Thorn, so-called, Crataegus Phaenopyrum, probably still better known as C. cordata, is now in flower. It is a slender tree growing under favorable conditions to a height of from twenty-five to thirty feet. The dull green leaves are nearly triangular in shape, not more than two inches long and an inch and a half wide and in the autumn turn bright scarlet. The flowers are creamy white, smaller than those of most Hawthorns, and are arranged in small compact clusters. Few if any of the American species have less attractive flowers. The fruit, too, is small, barely more than a quarter of an inch in diameter; and the Washington Thorn owes its value as a garden plant to the brilliancy of its autumn foliage and to the beauty of its abundant fruits long persistent on the branches. A century ago Crataegus Phaenopyrum was much used as a hedge plant in the middle states, although there are many other American Hawthorns which are better suited to form handsome and impassable hedges.

It has generally been supposed at the Arboretum that C. Phaenopyrum was the last Hawthorn to flower here, but this year C. Chrysocarpus has flowered a few days later. This is a native of river banks in the southern Appalachian Mountain region and in southern Missouri and is another member of the Macracantheae group. It is a larger and handsomer tree than C. tomentosa with shorter obtuse obovate leaves, flowers with only from five to ten stamens, and globose fruit.
Catalpas are trees of the Bignonia Family and grow naturally only in eastern North America, the West Indies and northern and central China. They all have large simple leaves, and large terminal clusters of two-lipped flowers followed by long slender pods containing many thin seeds furnished at the ends with long tufts of pale hairs. All the Catalpas and one or two of their hybrids are growing in the Arboretum with the exception of the species from the West Indies. The first Catalpa, *C. bignonioides*, which attracted the attention of botanists and gardeners was sent from South Carolina to England early in the eighteenth century. This for a long time was the only American species cultivated in Europe or the United States, but forty or fifty years ago it became known that another species grew in the valley of the Ohio River and along the Mississippi River as far south as western Tennessee and northeastern Arkansas. To this Catalpa the name *speciosa* has been well given as it is now known to be the largest, the fastest growing, the hardiest and the handsomest of all Catalpa-trees. It is the earliest of all the species, too, to bloom, and it is now covered with flowers which are larger than those of the other species. On the rich alluvial bottom lands of the Mississippi River this tree has often grown to the height of one hundred and twenty feet and formed a trunk four and a half feet in diameter. In New England it will never grow to that size, but although it was introduced into the eastern states less than fifty years ago trees in eastern Massachusetts are already fully forty feet high and have been flowering and ripening their seeds for many years. Catalpas produce soft wood which is remarkably durable when placed in contact with the soil, and in some of
the middle western states large plantings of *Catalpa speciosa* were made forty or fifty years ago to furnish fence posts and railway ties. Unfortunately the friends of *Catalpa speciosa* put too high a value on the wood of this tree and less is heard of it now than formerly as a timber tree. Of the remarkable durability of the wood when placed in contact with the soil there can be no question; and no tree with perhaps the exception of the Locust (*Robinia*) which is hardy in the northern states can produce as good fence posts in as short a time, and unlike the Locust it is not attacked by borers which too often ruin that tree, but the wood has proved too soft for railway ties and it is no longer planted to supply them. The other American species, *Catalpa bignonioides*, probably originated somewhere in the southeastern part of the country, but it has been so spread by escapes from planted trees that it is no longer possible to determine the location of its first home. It was for many years one of the common planted trees in the middle and southern states, and specimens are still occasionally seen in southern New England. Now, however, when one wants to plant a Catalpa-tree in this country he finds in nurseries only *C. speciosa*. The more southern species is a smaller tree with shorter-pointed leaves; it grows less rapidly and blooms two or three weeks later than the northern species. The flowers are smaller, in shorter and more compact clusters, and the pods are smaller with thicker walls. There is a dwarf form of *Catalpa bignonioides* (var. *nana*) which grafted on the stem of one of the tree Catalpas has in recent years been largely planted in this country for the supposed decoration of gardens which are more or less formal in character. It is not known where the dwarf plant originated, and if it has ever flowered the fact is not known at the Arboretum. The fact that it is universally sold in American nurseries under the name of *Catalpa Bungei* causes confusion for that name properly belongs to a tree from northern China. This Chinese tree has narrow, long-pointed dark green leaves, small yellowish flowers and small pods. It has been growing in the Arboretum since 1904, and was perfectly hardy until the winter of 1916–17 when one of the trees was killed to the ground and others were more or less injured. They have now recovered, but this Catalpa has not yet flowered in the Arboretum. Compared with the American species it has no value as an ornamental tree. Another Chinese species, *Catalpa ovata*, was sent many years ago to this country from Japan where it has long been cultivated. It is a small tree with comparatively small, dark green leaves, many-flowered clusters of small, yellowish spotted flowers, and slender pods. This tree, which will grow in regions too cold for the American species, has been somewhat planted in the United States, although as an ornamental tree it does not have much to recommend it. In this country it has proved most valuable as one of the parents of the natural hybrid, *Catalpa hybrida*, which appeared several years ago in the Teas Nursery at Baysville, Indiana, and is often called *C. Teasii* and "Teas' Hybrid Catalpa." This is a fast-growing and hardy tree with flowers like those of *C. bignonioides*, the American parent, although smaller but in larger clusters, and leaves in shape resembling those of *C. ovata*. The two species introduced by Wilson from central China, *Catalpa Duclosii* and *C. Fargesi*, are still living but give little promise of ever becoming valuable additions to the number of summer-flowering
trees which can be successfully used for the decoration of New England gardens.

**Late Magnolias.** All the North American species of Magnolias are hardy and can be easily grown in Massachusetts with the exception of *Magnolia pyramidata*, a rare and local shrub or small tree of southern Georgia, western Florida and southeastern Alabama, and the evergreen *M. grandiflora*. The first of the hardy Magnolias, *M. Fraseri*, opened its large pale yellow flowers as the leaves were unfolding. This was followed by *M. acuminata* and *M. cordata* which also flower as the leaves open; the Umbrella Tree, *M. tripetala*, was in flower early in June. The last of these trees to flower are *Magnolia virginiana*, better known as *M. glauca*, and *M. macrophylla*.

**Magnolia virginiana.** In all North America there is not a more satisfactory shrub or small tree to plant in a garden or one that will give a larger return in beauty and fragrance. The leaves are dark green and very lustrous on the upper surface and silvery white on the lower surface. The flowers, which are smaller than those of the other American Magnolias, and continue to open here from the middle of June until August, are cup-shaped, creamy white and emit a pungent fragrance which in the evening fills the air for a long distance from the plant. At the north *M. virginiana*, which has bright green glabrous branchlets, rarely grows thirty feet in height but in the Gulf States the variety *australis* is a large tree occasionally nearly a hundred feet high with branchlets thickly covered with matted white hairs and leaves which remain bright and green during the winter and fall in spring. In spite of its beauty and value as a garden plant *Magnolia virginiana* appears to be little known or appreciated by American gardeners of the present generation due perhaps to the fact that it is difficult to find it at least in any quantity in American nurseries. A hybrid of this tree and the Umbrella Tree (*M. tripetala*), known as *M. major* or *Thompsoniana*, has the general appearance of *M. virginiana* but the leaves are larger and the flowers are larger and whiter but equally fragrant.

**Magnolia macrophylla** is the last of the Magnolias to flower in the Arboretum. A native of the southern States it is perfectly hardy in Massachusetts, where it has sometimes grown to a height of from twenty to thirty feet and formed a wide round-topped head of branches spreading at nearly right angles to the trunk. This Magnolia is distinguished by the fact that it has the largest leaves and the largest flowers of any tree growing in any part of the world beyond the tropics. The leaves are silvery white on the lower surface and are from twenty to thirty inches in length and eight or nine inches in width. The expanded flowers are often a foot in diameter. Although perfectly hardy here *Magnolia macrophylla* is best planted in a position sheltered from the wind which often badly tears the large and delicate leaves.

**Robinia Hartwigii**, one of the shrubby Locusts from the high Appalachian Mountains of North Carolina is now in flower in the collection of these plants on the right hand side of the Meadow Road. It is a tall vigorous shrub with leaves composed usually of nineteen short-
stalked, oblong-ovate, acute, slightly hairy leaflets, gradually narrowed and rounded at base, bright green above and pale below. The branchlets of this shrub, the leaf stalks, the stem of the flower-clusters and the calyx of the flowers are thickly covered with gland bearing hairs. The flowers are arranged in erect axillary racemes shorter than the leaves, and are interesting from the contrast between the pure white petals and the dull red calyx. This tall shrub differs chiefly from the arborescent *R. viscosa* in habit and in the less viscid secretions from the glands which are common to the two plants; and it is not improbable that when better known, they may prove to be varieties of one species. Whatever its specific rank, *R. Hartwigii* is an attractive and useful addition to the hardy shrubs which flower here at the end of June.

**Cornus Amomum**, the Silky Cornel, is just beginning to open its flower-buds. 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 this Cornel should have a clear space with a diameter of not less than twenty feet in which to spread. It is well suited for the front of groups of trees and shrubs, and there is no better shrub to plant by the margins of ponds and streams 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 value 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 its value for planting near water can be seen on the borders of the small pond in the rear of the Cornel Group.

**Cornus alternifolia** is also in flower. It is a tree growing sometimes to the height of thirty feet with long branches spreading at right angles from the stem, from which rise lateral branchlets bearing the terminal flower clusters. The distinctive character of this Cornus is found in the alternate leaves, the leaves of the other American species being opposite. The handsome blue or rarely yellow fruit ripens in October. *Cornus alternifolia* has always proved difficult to transplant and for a long time was not well represented in the Arboretum, but there are now several healthy plants growing on the slope at the right hand side of the Roslindale entrance. There is also a plant which has grown spontaneously at the eastern base of the hill on which the Juniper collection is established. The Cornus from eastern Asia, *Cornus controversa*, is another species with alternate leaves and with spreading branches. It is a larger and handsomer tree than its American relative with larger flower-clusters. In western China it sometimes grows to the height of sixty feet and now promises to grow to a large size here and to become one of the important trees introduced by the Arboretum into the United States. This Cornel flowers here at the end of May or early in June.
Linden-trees. The earliest of these trees are already blooming, and now for several weeks their fragrant flowers, frequented by swarms of bees, will perfume the air. The studies of Linden-trees at the Arboretum have shown that the European species grow more rapidly and give every promise of being better trees in this climate than the American and Asiatic species. This is unusual, for of other European trees only the Beech and White Willow grow better here than their American relatives, and except Lindens all eastern Asiatic trees are more at home in eastern North America than the trees of Europe. The five European species, *Tilia platyphyllos*, *T. cordata*, *T. vulgaris*, *T. tomentosa*, and *T. petiolaris*, and several varieties of the first are growing here in a satisfactory manner. The first of these trees is easily distinguished by the hairs which cover the lower surface of the yellow-green leaves and the young branches. This tree is the first of the European species to flower. It has long been cultivated in the eastern states; indeed it appears to be the common European Linden sold by American nurserymen, although as an ornamental tree it is the least desirable of the European Lindens. *Tilia cordata*, distinguished by its small cordate leaves pale and glaucous on the lower surface, is the last of the Lindens to flower. It is a beautiful tree which in Europe grows to a large size, but is not very often seen in this country, and if there are large specimens here they have escaped the attention of the Arboretum. It is an interesting fact that the Linden-tree which has been growing in eastern Massachusetts long enough to show its value in this climate is generally believed to be a hybrid between *Tilia platyphyllos* and *T. cordata*, which is variously known as
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*T. vulgaris*, *T. europaea* and *T. intermedia*. The leaves, which are intermediate in size between those of its supposed parents, are dull green on the upper surface, pale on the lower surface and destitute of hairs with the exception of those which form the clusters in the axils of the veins. The largest and handsomest Linden-trees in the neighborhood of Boston are this hybrid and larger and handsomer specimens can sometimes be seen in the Middle States. The shapely and healthy young trees which have been planted to shade the *Louis Pasteur Avenue* in Boston are good specimens of this tree and show what city street-trees should be.

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

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

In North America fifteen species and a few varieties of Linden-trees are now recognized; that is more than in all the rest of the world. One of the northern species, *Tilia glabra* or *americana* as it is still often called, is the American species which has been most often cultivated; it is a splendid tree at the north and although usually much smaller reaches occasionally the height of 120 feet with a trunk from three to four feet in diameter. This tree is easily distinguished by the lustrous under surface of the leaves which are destitute of hairs with the exception of those which form on the lower surface the conspicuous rusty brown axillary tufts. This tree has been much planted in Canada and the northern states as a park and street tree; it is more satisfactory northward for in southern New England and the Middle States the leaves especially on street trees are often disfigured by red spiders which however can be kept in check by dry sulphur spray. The second northern species, *Tilia neglecta*, although it was described many years ago in Europe from cultivated trees was not recognized by American botanists and tree lovers until a comparatively short time ago. This
tree is readily distinguished from *Tilia glabra* by the short, firmly attached grey hairs which cover the under surface of the leaves during the season. This is a smaller tree than *Tilia glabra* rarely growing to the height of 75 feet. In Canada it has been found as yet only in the neighborhood of Montreal; it ranges to the coast of southern New England and New York, through the Middle States and along the Appalachian Mountains to those of North Carolina and Tennessee and from western New York to northern Wisconsin. This tree is now well established in the Arboretum where it has grown rapidly and is now well covered with flowers which open a week or ten days before those of *T. glabra*. The leaves of this tree have not been attacked here by red spiders. Two other American Lindens are established in the Arboretum, *Tilia heterophylla* var. *Michauxii* and *T. monticola*. The lower surface of the leaves of these trees is covered during the season with silvery white felt. The handsomer of these trees, *Tilia monticola*, grows naturally only on the Appalachian Mountains at altitudes between 2000 and 3000 feet and from southwestern Virginia to eastern Tennessee and western North Carolina. This Linden is always a conspicuous object for the leaves which are very oblique at the base droop on long slender stalks and are oblong and larger than those of the other American Lindens. This promises to be an excellent tree for more general cultivation in northern parks and gardens. The other hardy species, *T. heterophylla* var. *Michauxii*, has grown more slowly in the Arboretum and is less distinct and beautiful. These two species and *T. neglecta* are growing side by side and close to the grass path in the rear of the Linden collection and can be easily compared. The Linden collection now contains some thirty species and hybrids and forms one of the most satisfactory and interesting groups of trees in the Arboretum. It is arranged in the meadow on the right hand side of the Meadow Road.

**The last Azaleas.** As the yellow or flame colored flowers of *Rhododendron* (Azalea) *calendulaceum* wither those of another Appalachian species *R. (Azalea) arborescens* begin to open. The flowers are white with bright red stamens and style and deliciously fragrant and do not open until after the leaves have grown nearly to their full size. The home of this plant is on the Appalachian Mountains on which it is found from western Pennsylvania to northern Georgia, in the neighborhood of streams in the rich soil of sheltered valleys growing to the height of from fifteen to twenty feet; and on the Carolina Mountains is often not more than three or four feet tall forming at altitudes of about 5,000 feet above the sea, great thickets often many acres in extent. Recent studies of this plant show that its value as a garden plant is not generally understood and appreciated. The flowers vary to an unusual degree in size and in the length and diameter of the corolla-tube and although the corolla is usually pure white a form is now known in which the corolla is suffused with rose; in another it is more or less striped with rose; in another form the corolla is tinged more or less deeply with yellow, and in another it is marked by a yellow blotch. These forms are all worth places in a collection of Azaleas, and it is possible that if seedlings were raised from them other and perhaps more
distinct forms might occur among them. The last of the Azaleas, *Rhododendron viscosum*, begins to open its flowers a few days later than those of *R. arborescens*. They are white in color and more fragrant than those of other Azaleas and smaller than those of *R. arborescens* with a long slender corolla-tube. There is also a form on which the flowers are deeply tinged with rose-color. The Clammy Azalea or Honeysuckle as this Rhododendron is called in the country is an inhabitant of swamps and is common in the Cape Cod region and southeast. In cultivation this shrub grows as freely and flowers as abundantly on dry hillsides as it does in its native swamps and masses of it on the low side of Azalea Path are now covered with flowers.

**The Fernleaved Beech-Tree.** At the meeting last month in Newport, Rhode Island, of delegates and members of the Garden Clubs of America, the fine specimen of the Fernleaved Beech-tree which stands in the grounds attached to the Redwood Library attracted interest and curiosity among the members judging by the questions which have come to the Arboretum about it in the last few days. The Redwood Library tree is not a Red-wood tree (*Sequoia sempervirens*) as many persons living in Newport once believed it to be, but a form of the European Beech-tree, to which the names heterophylla, asplenifolia, incisa, laciniata, and salicifolia have been given. The leaves of this variety assume different shapes even on the same tree, and are sometimes long, narrow and nearly entire, and sometimes divided nearly to the midrib with narrow lobes. The origin of this tree which has been cultivated in Europe certainly since the beginning of the 18th century is not known. It was probably first found growing naturally in the woods as the original Purple Beech was found, but where it was first seen and the names of the men who found and propagated it are not recorded. Neither is it known at the Arboretum who planted the tree in front of the Redwood Library. Judging by its size this tree must be at least a hundred years old, and so far as is known here it is the largest specimen in the United States. There are three shapely specimens of the Fernleaved Beech-tree in this Arboretum which were planted in 1885 and 1886 and are growing rapidly.

*Ehretia accuminata* a member of the Burrage Family is flowering on Hickory Path near Centre Street for the first time in the Arboretum. This interesting tree is a native of southern Japan, southern and central China and southward, and sometimes grows to a height of sixty feet. The leaves are alternate, light yellow green, pointed at the ends, from 6-8 inches long and from 2-2½ inches wide and are somewhat pendant and incurved on their long petioles. The minute white flowers are borne in axillary panicles shorter than the leaves, and form a compound terminal inflorescence from 12-18 inches in length. The flowers which have a strong rather disagreeable odor are followed by drupe-like fruits at first orange but becoming black at maturity. The plants of *Ehretia accuminata* growing in the Arboretum were raised from seed collected by Wilson in western Hupeh and sown here in 1908. The tree now in flower is about 12 feet high. *Ehretia accuminata* has not always proved entirely hardy in the Arboretum and it is not probable that it will ever grow to a large size here.
Summer Flowering Trees. After the flowers of the Linden trees have mostly passed those of a few other trees add to the interest of the Arboretum in the last weeks of July and in August.

*Koelreuteria paniculata* is the first of these summer-flowering trees to bloom. It is a round-topped tree from 30 to 40 feet high with long compound dark green leaves and great erect clusters of golden yellow flowers which are followed by bladder-like pale fruits. This tree, which is a native of northern China and an old inhabitant of American gardens, is quite hardy in eastern Massachusetts, but has been more often planted in the Middle States than in New England. In American trade catalogues it usually appears as "the Japanese Lacquer tree" although it is not a Japanese tree and does not yield lacquer or anything else but beauty. The trees in the Arboretum are on the right hand side of the Meadow Road. There is a handsome specimen near the northwest corner of the Public Garden in Boston.

*Maackias* are small summer flowering trees of the Pea-family with short erect spikes of small white flowers. The flowers of the best known of these trees, *M. amurensis*, from eastern Siberia have already faded but the variety *Buergeri* from northern Japan differing in the presence of a coat of soft down on the lower surface of the leaves, flowers a week or ten days later than the Siberian tree and is now in bloom. What promises to be a handsomer tree here than either of these is the still little known species from western China, *M. chinensis*, which first flowered in the Arboretum five years ago when it was called *M.*
Hupehensis; this year it will be covered with flowers toward the end of the month. A Maackia from Korea, *M. Faurei*, is in the collection but has not flowered here.

**Sophora japonica**, which is growing near the Maackias on the right hand side of the Bussey Hill Road, is covered with flower-buds which will open in the course of the next few weeks. This is a Chinese tree in spite of its name which has been cultivated in Japan for more than a thousand years, but which as it first reached Europe from Japan was supposed to be a native of that country and so received a misleading name. The bark of the young branches and the leaves are dark green and the small white pea-shaped flowers which open here in August are produced in great numbers in narrow, erect terminal clusters. This Sophora has a trunk covered with rough pale bark and the old trees in the streets and squares of Peking where it has been much planted look from a distance like great Oak-trees. There are in the Arboretum collection in addition to the type the form with long pendant branches (var. *pendula*) a favorite, although it rarely if ever flowers, with those who fancy trees of abnormal growth. There are also in the collection young specimens of the tree with erect branches (var. *pyramidalis*) and of the form (var. *rosea*) on which the flowers are slightly tinged with rose color. There is a handsome tree of *Sophora japonica* near the northwest corner of the Boston Public Garden, and a much larger one in Roslyn, Long Island.

The **Aralia Family** furnishes the Arboretum with three summer flowering trees, *Acanthopanax rivicifolium*, *Aralia spinosa*, and *Aralia chinensis*. The Acanthopanax is a tree which is common in the forests of northern Japan and Korea where it is often seventy or eighty feet high with a massive trunk and great wide-spreading branches armed, like the stems of young trees, with many stout prickles. The leaves hang down on long stalks and are nearly circular, five- or seven-lobed and often fifteen or sixteen inches in diameter. The small white flowers are produced in compact, long-stalked clusters which form a flat compound terminal panicle from twelve to eighteen inches across and are followed late in autumn by shining black fruits which do not fall until after the beginning of winter. This tree is perfectly hardy in the Arboretum where it has been growing for thirty years and where it has flowered and ripened its seeds now for several seasons. It is one of the most interesting trees in the collection and, because it is so unlike other trees of the northern hemisphere, it is often said to resemble a tree of the tropics. *Aralia spinosa*, the so-called Hercules' Club of the southern states where it is a common inhabitant of the borders of woods and the banks of streams, is a tree often thirty feet high with a tall trunk and wide-spreading branches covered with stout orange-colored prickles. The leaves, which are borne at the ends of the branches, are long-stalked, twice pinnate, and from three to four feet long and two and one-half feet wide. The small white flowers are arranged in compound clusters which rise singly or two or three together above the leaves and are three or four feet long. The fruit is black, rather less than a quarter of an inch in diameter, and ripens in early autumn. It is now well established on the slope at the northern
base of Hemlock Hill in the rear of the Laurel plantation and is spreading rapidly there over a considerable area by shoots from underground stems. The Asiatic tree Aralia resembles in general appearance the American Hercules' Club, but is distinct from that tree in the absence of stalks to the leaflets. There are a number of geographical forms of this tree; the one which is most commonly cultivated in this country is a native of Manchuria and eastern Siberia (var. mandshurica) which is sometimes found in commercial nurseries under the name of *Dimorphanthus mandshuricus*. The Japanese form (var. glabrescens) is chiefly distinguished from it by the pale color of the under surface of the leaflets; it is less hardy than the Manchurian form and is not often seen in this country.

**Oxydendrum arboreum**, or as it is often called the Sorrel-tree or the Sour Wood, is with the exception of the Hercules' Club the only North American tree hardy in the Arboretum which does not begin to flower before the middle of July. It is a native of the southern Appalachian mountain forests and the only tree of the Heath Family which can be grown in this climate, with the exception of the Laurel (*Kalmia latifolia*) and the Rose Bay (*Rhododendron maximum*) which are shrubs at the north and only exceptionally trees in a few favored valleys of the southern mountains. The Sorrel-tree in its native forests grows fifty or sixty feet high, but at the north as it begins to flower abundantly when only a few feet tall, it is not probable that in this climate it will ever attain a considerable size. It is well worth growing, for its bright green shining leaves which have a pleasant acidulous flavor and in autumn turn bright scarlet, for its white Andromeda-like flowers erect on the branches of spreading or slightly drooping terminal clusters, and for its pale fruits which in the autumn are conspicuous among the brilliant leaves. There is a group of these plants among the Laurels at the northern base of Hemlock Hill which will flower at the end of July or early in August.

**Stewartia pseudo-camellia** is another summer flowering tree. It was one of the early plants which came direct to the United States from Japan, and before 1870 was distributed from the Parsons Nursery at Flushing, Long Island. It produces in August its pure white, cup-shaped flowers, which resemble those of a single Camellia; the autumn color of the leaves is dark bronzy purple, distinct from that of any other plant in the Arboretum and handsome and interesting; the smooth pale gray bark which separates in large pale plates adds, too, to the interest of this tree. There are two specimens on the upper side of Azalea Path.

**Evodias** are handsome little trees which also flower here after midsummer. They belong to the Rue family, and are widely distributed in eastern Asia and occur also in Australia and Madagascar. The species have pinnate leaves, white or pinkish unisexual flowers in small clusters terminal on the shoots of the year, and dry, capsular fruit. Like the Phellodendrons, to which Evodia is related, they are protected from the attacks of insects by the pungent aromatic oil with which the leaves abound. Evodia has been growing in the Arboretum since 1905 when Professor Jack brought the seeds of *E. Danielli* from Korea.
This handsome tree has flowered now for several years in the Arboretum. *E. Henryi*, a common inhabitant of western Hupeh where Wilson found it growing to a larger size than the other Chinese species of this genus, is also established and flowers in the Arboretum.

**Summer Flowering Shrubs.** Many handsome shrubs which can be grown successfully in this climate do not bloom till after midsummer. There are few Americans who have travelled in Scotland in summer who have not been impressed by the beauty of the Heather (*Calluna vulgaris*) or have not felt the desire to introduce it to their homes. The Heather, however, has remained a comparatively rare plant here although it is hardy and easy to grow in nearly all parts of the northern states and eastern Canada where the soil is not impregnated with lime. In one or two places in northern Massachusetts and in Nova Scotia it has become completely naturalized, and on one New England estate where it was planted only a few years ago it is spreading rapidly over large areas. Heather should be planted in well drained sandy soil in situations exposed to the sun, and the plants look better and flower better if the stems are cut down close to the ground in early spring. This prevents a straggling growth and insures a better bloom. There are a number of handsome and interesting varieties of the Heather in the Arboretum collection. Some of the best of these are the variety *alba* with white flowers; the variety *alba minor*, a plant of dwarfer habit than the last; var. *rubra*, a dwarf compact variety with crimson flowers, and one of the earliest to flower and one of the handsomest of the set; var. *tomentosa*, a compact plant with gray-green foliage and red flowers; var. *alba Serlet*, a tall growing form with white flowers; vars. *alba tenella* and *alba rigida* with white flowers; var. *Alportii*, a tall growing form with crimson flowers; and var. *hynoide*, a very compact, small-leaved plant producing only sparingly its small purple flowers. These plants can be seen in the Shrub Collection; quantities of Heather have also been planted on the side of the Valley Road.

Among other shrubs still to flower in the Arboretum are *Aesculus parviflora*, from the southeastern United States, and the North American and Japanese Clethras or Spice-bushes. North American and Japanese Hydrangeas, many Spiraeas, Hypericums, Callicarpas, Lespedezas with their abundant purple flowers, and the Chinese Buddleias will later give interest to the Shrub Collection, in which the silver leaved Lead plant (*Amorpha canescens*) of the western plains and prairies has not yet opened its showy blue-purple flowers.

Perhaps the most generally planted shrub in the United States among those which bloom in summer is the form of the Japanese *Hydrangea paniculata* (var. *grandiflora*), in which the whole inflorescence is composed of sterile white ray flowers which surround the inflorescence of the normal form of many other *Hydrangeas*. This abnormal inflorescence is oblong, bluntly-pointed, and often a foot or more in length and so heavy that the slender stems are often not able to support it. The flowers, which are white when they open, turn to a rather dirty red color; and it is not easy to find an uglier garden shrub.

These Bulletins will now be discontinued until the autumn.
The Arboretum is suffering from the severe drought of the last two months. September is reported to have been the driest in the last fifty-one years, and, in spite of the exceptionally heavy snowfall of the winter, the precipitation for the year is now some eight inches below the average. The result of this has been that the leaves which take on their autumn colors usually in early October have dried up and are already falling from many plants.

The Autumn Color of Leaves. It does not appear to be generally understood that the leaves on different individuals of the same species do not assume the same shades of color, and that there is considerable variation on different individuals in the time of change. This is well illustrated by the collection of Red Maples (Acer rubrum) in the Arboretum. From many of the plants the leaves have changed color and have already fallen; from others probably one-third of the leaves have fallen and on others the leaves are as fresh and green as they were in July, all the plants growing practically under the same conditions. The Red Maple tree across the drive and opposite the entrance to the Administration Building has been during the past week the most brilliant object in the Arboretum. Landscape gardeners who may wish to use trees and shrubs for autumn effects can find useful suggestions in this tree, for it has been raised from a graft taken from a tree with leaves of exceptionally brilliant autumn color. This exceptional color has been preserved, and indicates that it is possible to multiply by grafting plants with leaves of unusually brilliant autumn color just as it is possible to propagate trees with leaves abnormally marked with yellow or
otherwise abnormal, or with double or other unusual flowers, or with improved fruits. Little has yet been done anywhere to propagate trees with exceptionally brilliant autumn foliage, but the field is an interesting and an important one for the makers of autumn gardens. That the making of such gardens will sooner or later receive attention in this country there can be little doubt, for the pleasantest months of the year in eastern North America are the autumn months, and in no other part of the world is the autumn foliage so brilliant and varied, and nowhere else are the fruits of trees and shrubs more abundant, varied and interesting.

The "Flowering" Dogwoods. Among the smaller trees with scarlet or crimson autumn foliage none is more beautiful now than the so-called Flowering Dogwood (*Cornus florida*) which is unusually brilliant this year in its shades of crimson, scarlet and green. Its autumn beauty is increased by the contrast of the color on the upper and lower surfaces of the leaves for only the upper surface changes color, the lower surface retaining the pale sometimes nearly white color of the summer. For regions with a winter climate as severe as that of eastern Massachusetts the eastern Asiatic relative (*Cornus kousa*) of the native Flowering Dogwood is a more reliable plant. It is a smaller tree than the eastern American plant; the leaves turn as brilliantly in the autumn; the flower-buds are not killed or injured by the severest cold of our winters, and open from two to three weeks later, and the floral bracts which surround the clusters of small flowers and are the conspicuous feature of the inflorescence are narrower, further apart and pointed, not broad and rounded, at the apex. The fruit is even handsomer than that of the American plant for the individual fruits are united into a globose scarlet head which is raised on a long slender erect stem and are not, like those of the American plant, in clusters of separate fruits. The form discovered and introduced by Wilson from western China promises to be even a better plant in this climate than the Japanese form, for it appears to be equally hardy, and the floral bracts are larger and overlap below the middle, forming a cup like those of the American species. This plant is still rare, but as it produces good crops of seeds in the Arboretum it is to be hoped that it will soon be within the reach of lovers of handsome hardy trees.

The Sassafras. There is now no more beautiful tree on the margins of New England woods and by New England roadsides than the Sassafras, as the leaves have turned or are turning orange or yellow more or less tinged with red. The autumn colors of several trees are more brilliant but none of them equal the Sassafras in the warmth and delicacy of their autumn dress. The Sassafras is a handsome tree at other seasons of the year. In winter it is conspicuous by its deeply furrowed, dark cinnamon-gray bark and slender light green branchlets; in early spring before the leaves appear it is covered with innumerable clusters of small bright yellow flowers which make it at that season a conspicuous and delightful object. The leaves are thick, dark green and lustrous above, paler below, and vary remarkably in shape as they are sometimes deeply three-lobed at the apex and sometimes entire without a trace of lobes. The fruit is a bright blue berry sur-
rounded at the base by the much enlarged and thickened scarlet calyx of the flower and is raised on a long bright red stalk. No other northern tree produces such brilliantly colored fruits. Unfortunately there is little time to enjoy it for the birds eagerly seek it as it ripens. The living wood of the Sassafras is not attacked by borers and the leaves are not destroyed and are rarely disfigured by insects. The thick spongy roots of the Sassafras produce suckers freely and these with a little care can be safely transplanted. How many persons now plant the Sassafras and in what American nursery can it be found? It was, however, one of the first North American trees carried to Europe as it was established in England some time before the middle of the seventeenth century. Until 1879 when another species, _S. tsumu_, was discovered in central China, the American tree was believed to be the only Sassafras. The Chinese tree has been introduced into the Arboretum but unfortunately it has not proved hardy here.

**Buckeeyes**, as the American Horsechestnuts (_Aesculus_) and their numerous hybrids are usually called, are beautiful flowering trees and shrubs with yellow, scarlet or red and yellow flowers, but it is not perhaps generally realized that the color of their foliage in autumn often makes them as beautiful at this season of the year as they are when in flower. The autumn foliage is usually orange color but often orange and red, and rarely scarlet. The leaves of some of these plants in the Arboretum have already turned color and fallen; those of others are just beginning to turn from green to yellow, and others are still green. The first of these plants to assume autumn colors this year was the form of the Ohio Buckeye with leaves usually composed of seven leaflets (_Aesculus glabra var. Buckleyi_). From the group of trees of this variety the leaves had nearly all fallen two weeks ago. This variety grows chiefly in northern Missouri. On the variety of this tree from southern Missouri and Arkansas, distinguished chiefly by its pale smooth bark (_Aesculus glabra var. leucodermis_), only a few of the leaves are beginning to change from green to yellow. The most remarkable Buckeye, however, in the Arboretum this year has been one of the two plants of _Aesculus glabra_ growing on the left hand side of the South Street entrance. These are the oldest Buckeyes in the Arboretum and were raised here from seeds collected in 1873 at Mt. Victory, Ohio. Of these two trees every leaf on the one nearest the wall was about the middle of September bright clear scarlet; and it is doubtful if any plant in the Arboretum has ever made a more brilliant autumn display. The leaves on the companion plant turned a few days later green and red. The leaves of self sown seedlings of these trees were on the first of October green or green beginning to change to yellow. The leaves of another Buckeye, _Aesculus arguta_, the little shrub from Oklahoma and Texas, turn early bright orange color and have already nearly all fallen. This handsome plant is related to the Ohio Buckeye in its prickly fruit but differs from it in its leaves with nine narrower longer-pointed leaflets, more elongated flower-clusters and dwarf habit. The leaves of the yellow-flowered tree Buckeye of the Appalachian Mountain slopes, _Aesculus octandra_ and its variety _vestita_, turn yellow as do those of the summer flowering shrub _Aesculus parviflora_, the best known of all the Buckeeyes in American gardens.
Fruits. On the whole it is not a good year for fruits in the Arboretum. Many Asiatic Crabapples are without fruit, and when there is fruit on these plants the crop is a small one. Many Viburnums, too, are without fruit. Many of the Barberries and Cotoneasters, however, are now covered with ripe or ripening fruits, and on the Hawthorns (Cra taegus), more plants are covered with fruit than in any year since the collection of several hundred species was established.

Ilex geniculata. This rare Japanese Holly is as usual an object of beauty and interest in the Arboretum at this season of the year. It is a rather narrow shrub from three to four feet high, with small dark green leaves, and the small unisexual yellowish green flowers peculiar to most Hollies, and its beauty is found only in the small bright scarlet lustrous fruits which hang gracefully on their slender stems from three-quarters of an inch to an inch in length. This plant, which seems to be still almost entirely unknown in American and European gardens, was sent in 1904 from the Botanic Garden in Tokyo, and the following year Mr. J. G. Jack brought seeds home from Japan; seeds, too, were later collected by Mr. Wilson in Japan. It has been producing fruit here during the last seventeen years. It is a shrub well worth a place in any garden, and as the fruit continues to hang on the branches late into the winter without much change of color this will prove more valuable in winter bouquets and the winter decoration of homes than the better known Japanese Ilex serrata, quantities of the fruit-covered branches of which are sold in the streets of Japanese cities every autumn. This is a taller and much more common shrub than Ilex geniculata, and has been established for many years in the Arboretum where the male and female plants are on the upper side of Hickory Path near Centre Street. These red-fruited shrubby Hollies are commonly represented in the flora of eastern North America by two species, Ilex verticillata, the so-called Black Alder, and the less common but handsomer Ilex laevigata. These are large and shapely, fast-growing, hardy shrubs with larger but rather less lustrous fruit than the Japanese species. Of the two American species Ilex laevigata flowers and ripens its fruit the earlier; the flowers of the male plant are raised on long stalks; the fruit is rather larger and the leaves are of a darker green. Ilex laevigata is not a common plant in cultivation. The fruit-covered branches of the two species are well suited for the winter decoration of rooms, and those of Ilex verticillata are now occasionally seen in the shops of city florists.

Evonymus planipes is one of the shrubs which should be mentioned at least once every year in these Bulletins until it becomes common in American gardens. It is a native of northern Japan, with large dark green leaves, and large crimson fruits hanging gracefully on long slender stems and more showy and beautiful than those of any other Burning Bush which has ever produced fruit in this Arboretum.
Autumn Colors in the Arboretum. In spite of the dry summer and autumn it is doubtful if the leaves of the trees and shrubs in the Arboretum have ever assumed more brilliant colors than they have during the past two weeks; and it is doubtful, too, if there are anywhere two hundred and fifty acres which can show such a variety of autumn colors or on which the season of such colors is so long, for in the Arboretum are growing the trees and shrubs of the northern hemisphere, and the leaves of those from northeastern Asia usually change color sometime later than those of related North American plants. No pen can describe the beauty of the Arboretum in these October days, but in this number of the Bulletin a few of the plants which help to make this picture will be mentioned.

Quercus conferta, sometimes called Q. pannonica and the Hungarian Oak, is unusual among Oaks in the clear canary yellow color of its ripening leaves. This is the handsomest of the European Oaks which has been tried in the Arboretum in which it has grown rapidly and promises to become a large and valuable tree, distinct in its large, thick, lustrous, deeply lobed leaves. It is a common forest tree on low mountain slopes and hills in southeastern Europe where it is widely distributed and grows sometimes to a height of a hundred feet and forms a trunk from three to four feet in diameter. The Hungarian Oak is unfortunately still a rare tree in the United States, and the best specimen known to the Arboretum in the country is in the Morris Collection at Chestnut Hill, Pennsylvania. This tree has produced acorns for several years and plants have been raised from them here.
Asiatic Oaks. The autumn colors of the leaves of some of the Asiatic Oaks in the Arboretum are interesting. Those of the Japanese Quercus serrata are now yellow but less clear in shade than those of Q. conferta, and many of them are still partly green. Nearly all the leaves of the related Quercus variabilis which grows in Japan and northern China are still green and later will turn yellow. Yellow and green are now the colors of the leaves of Quercus dentata, another tree which grows in Japan and China and remarkable in its large leaves and winter-buds. The leaves of Quercus glandulifera, raised from acorns gathered in northern Japan, are now deep bronze color, while those on the trees of this species from western China are still green. Green, too, are the leaves of Quercus mongolica, its Japanese variety grosseserrata, and the Corean Q. aliena. The leaves of American Oaks are beginning to change color and before the end of another week should be the principal feature in the autumn picture.

Liquidambar styraciflua, or the Sweet Gum, is one of the brilliant objects of the autumn when its star-shaped fragrant leaves turn to brilliant shades of scarlet. The Sweet Gum is a southern tree, finding the northern limits of its range in southern Connecticut, but it grows fairly well in Massachusetts, although it will probably never attain the size here it does under more favorable conditions. Very abundant in the maritime region of the south Atlantic and Gulf States, and in the valley of the lower Mississippi River, it has become in recent years important for its wood used in the interior finish of houses and for furniture.

Oxydendron arboreum, the so-called Sorrel-tree or Sour Wood, is another southern tree conspicuous in the autumn from the bright scarlet color its leaves take on at this season of the year, making a handsome setting for the clusters of pale capsular fruits following the white Heath-like flowers which open in August.

Viburnum prunifolium, or as it is often called the Black Haw, is perhaps the handsomest of the small trees or large shrubs in the Arboretum with scarlet leaves. A common plant on hillsides in the middle states, the Black Haw, although not a native to Massachusetts, is perfectly hardy here and well deserves general cultivation, for it is an object of beauty and interest from early spring until the beginning of winter; the leaves are thick to coriaceous, dark green and lustrous above, pale below; the flowers are white in flat clusters up to four inches in diameter, and these are followed by oval or ovoid fruit from one-half to two-thirds of an inch long, pink at first, when fully grown becoming dark blue, and covered with a glaucous bloom when ripe, and persistent on the branches until winter. The southern relative of this plant with which it has been long confused, Viburnum rufidulum, is a larger and a handsomer tree with thicker and more lustrous leaves which turn deep purple in the autumn. This tree, which is the largest and perhaps the handsomest of the American Viburnums, is easily recognized by the dark rusty brown felt which covers the winter-buds, and is found on the stalks of the leaves, especially on those which appear early in the season. This Viburnum grows in the Arboretum where it flowers and ripens its fruit, but it is doubtful if it ever becomes more than a medium-sized shrub here.
Cotinus americanus is a relative of the European and Asiatic Smoke-tree (Cotinus coggygria), an old inhabitant of American gardens where it is much better known than the American plant. The "smoke" of the Old World plant, which is its chief beauty, is composed of the large clusters of the hairy stems of abortive flowers, differing in color from yellow-green to red. The "smoke" of the American plant is much less conspicuous, and its value as a garden plant consists in the brilliant scarlet and orange tones of its leaves in autumn. The American Cotinus is quite hardy in the Arboretum where it has been growing since 1882. For many years this tree or shrub was known only in what is now eastern Oklahoma; later it was found always in comparatively small isolated stations in southern Missouri, western Arkansas, northern Alabama, and on the banks of the Ohio River in Davies County, Ohio. Its real home, however, is in western Texas where it spreads over thousands of acres of mountain canyons and high hillsides, growing there usually as a low shrub.

Some Shrubs of the Heath Family. Of all the shrubs in the Arboretum not one surpasses or perhaps equals the High Bush Blueberry (Vaccinium corymbosum) in the splendor of the crimson of its leaves in autumn. It is handsome, too, in early spring, when its white, bell-shaped flowers open, and in August and September when the blue-black fruit covers the branches. A native of swamps, the High Bush Blueberry grows equally well here in dry gravelly soil, and the best plants in the Arboretum are on Bussey Hill near the entrance to Azalea Path from opposite the Overlook. The autumn color of the leaves of the other northern Blueberries and Huckleberries (Gaylussacia) is as brilliant as that of the High Bush Blueberry and some of these smaller plants, especially Vaccinium pennsylvanicum, the dwarfest of them, are invaluable for covering dry ground under Oaks and other hardwood trees. The white flowers are attractive; the bluish black berries, which are the earliest blueberries to ripen, have a fair flavor, and during a month or more in autumn the plants form broad masses of scarlet only a few inches high and more brilliant in color than that of the flowers of the Heather on the highlands of Scotland. Every encouragement, with excellent results, has been given in the Arboretum to the spread of these dwarf Blueberries.

Rhododendrons in autumn. The leaves of some of the American species with deciduous leaves (Azalea) are nearly as brilliant in autumn as those of the Blueberries, and their autumn colors greatly add to the value of these plants for the decoration of parks and gardens. For autumn beauty the yellow or flame-colored R. calendulaceum is the most conspicuous this year. But R. dahuricum from Siberia, one of the true Rhododendrons with deciduous leaves, growing by Azalea Path, is now in its autumn dress one of the conspicuous plants of the Arboretum and far more attractive than it was in early spring when its small rose-colored flowers were open.

Enkianthus. The Japanese species of this Asiatic genus of the Heath Family all grow well in the Arboretum and the group of these plants on the lower side of Azalea Path furnish pleasure to many persons in spring when they are covered with bell-shaped flowers, and in
late October when the leaves are of the brightest scarlet. The handsomest of these plants in the autumn, Enkianthus perulatus, is a compact round-headed shrub with white flowers. This is a popular plant in Japan and can be seen in many Japanese gardens cut into a round ball. It has never produced seeds in the Arboretum and has remained exceedingly rare in this country. More common is E. campanulatus which is sometimes in Japan a tree twenty-five or thirty feet high and which in the Arboretum has grown from seed in thirty years into a narrow shrub eight or ten feet tall. The yellow flowers tinged with red, or in one variety pure white, hanging gracefully in long racemes, are attractive. The plants produce quantities of seeds every year, and there is no reason why this beautiful shrub should not become a common garden plant in those parts of America where the soil is free of lime.

Dwarf Hawthorns. Many of these plants which were entirely overlooked by botanists until toward the end of the last century prove to be worth more general attention than gardeners have learned to give them. Some eighty species of these dwarfs have been distinguished. They are most abundant in Pennsylvania, New York, Ohio and Michigan, occurring as far north as Massachusetts and southward to Alabama. In the great Crataegus region west of the Mississippi River, in southern Missouri, Arkansas and eastern Oklahoma they are comparatively rare. Nearly all the species have large and conspicuous flowers in few-flowered clusters and handsome red or yellow fruit. Many of the dwarf plants are now well established in the Arboretum, and flowers and fruits are produced freely by several of them. Some of these plants are worth cultivating for the beauty of their autumn foliage which is not surpassed by that of any of the larger growing American Hawthorns. The Arboretum group of these dwarf plants at the eastern base of Peter's Hill, on the lower side of the road, is just now worth a visit. Many of the plants are covered with fruit and distinct and variously colored foliage.

Yellow leaves. The autumn picture owes much to the different shades of yellow to which the leaves of many plants turn in the autumn. Yellow leaves, especially those of many Maples, Birches, several Elms, Hickories and Poplars, however, ripen and often fall before the foliage of Oaks and many other trees and shrubs assume the red color of their autumn foliage. The yellow leaves of the Tulip-tree, the Japanese Cercidiphyllum, the Virgilia (Cladostris lutea), the Kentucky Coffee-tree (Gymnocladus dioicus) are conspicuous at this time. Conspicuous, too, now with their yellow leaves are the American Witch Hazels, Hamamelis virginiana, already in flower, and the winter-blooming H. vernalis with autumn leaves probably more beautiful in the delicate yellow tints of its fading leaves than any other plant in the Arboretum with yellow autumn foliage.
Conifers. The Arboretum collection of these plants has the reputation of being the largest and most complete in the United States, and no effort has been spared during the last fifty years to make it so. It shows perhaps fairly well which of these plants can be grown with more or less success in New England, but compared with what such a collection might be made in a climate really suited to these plants the Arboretum conifers have little to boast of. Of the twenty-eight genera of these plants which are now recognized fifteen only are represented in the Arboretum collection, with about one hundred and eight species and a large number of varieties. In the genera which cannot be grown in New England are some of the noblest and most interesting trees in the world, like the Sequoias, the Araucarias, the Taiwania, the Fitzroya, the most valuable of the cone-bearing trees of South America, the different species of Agathis, sometimes called Dammara or Damma Pines, and the Chinese Keteleerias. The Arboretum collection contains all the species of northeastern North America, a few European, Caucasian and central Asiatic species, the species of northeastern Asia, many of those of western China and of Japan, and of the northern Rocky Mountain region of North America. No conifer which grows south of the equator can be grown in New England. Mexico, the home of many conifers, especially of the genus Pinus, has contributed only one Pine-tree to the Arboretum collection. None of the important Pine-trees of the coast region of the southern United States are hardy at the north; and of the conifers of the Pacific States which do not range eastward into the Rocky Mountain region only Pinus ponderosa var. Jeffreyi is really successful here. The Incense Cedar (Libocedrus decurrens) has, however, grown fairly well in an exceptionally well sheltered
position. *Abies amabilis* is not injured by cold, but has not grown better in the Arboretum than it usually grows in cultivation; and the California form of the White Fir (*Abies concolor*), lives, but does not equal here in beauty the Rocky Mountain form of this tree. Other species of the region, *Pinus Balfouriana*, *Picea Breweriana* and *Cupressus Macnabiana*, are alive but still too young to give any adequate idea of their value, and plants of the two west coast species of Chamaecyparis only just keep alive. The regions therefore from which conifers can be drawn for New England plantations are restricted, and it is not now probable that another species suited to this climate will be discovered, except possibly on the northwestern borders of China or on the southern slopes of the Altai Mountains. The number of species in the collection does not of course represent its richness for many conifers, especially in the genera *Picea*, *Thuja*, *Tsuga* and *Juniperus*, produce many abnormal forms and there are more of these forms in the collection than there are species.

**Taxaceae.** What is true of conifers in New England is true also of the related Taxus Family, which with five genera is represented here by *Taxus*, *Torreya* and *Cephalotaxus*, and of its sixteen species eight, with several varieties, are more or less flourishing here.

If the plants growing in the Arboretum give but a poor idea of the conifers of the world it offers in its herbarium exceptional opportunity for the study of these plants, for in the Arboretum herbarium are representatives often in long suites of specimens of all the species with the exception of a few little known trees from the interior of New Guinea and New Caledonia. The Arboretum is well provided, too, with photographs of cone-bearing plants, and in its library are found all the important books and papers which have been published on these plants.

**Native Conifers.** The species of northeastern North America are the White Pine (*Pinus Strobus*), the Red Pine (*Pinus resinosa*), the Pitch Pine (*P. rigida*), and the Jack Pine (*P. Banksiana*), the White Spruce (*Picea glauca*), the Red Spruce (*P. rubra*), the Black Spruce (*P. mariana*), the Balsam Fir (*Abies balsamifera*), the Hemlock (*Tsuga canadensis*), the Arborvitae (*Thuja occidentalis*), the White Cedar (*Chamaecyparis thyoides*), the Red Cedar (*Juniperus virginiana*), the common Juniper (*Juniperus communis*) and its dwarf variety *depressa*, and the prostrate *Juniperus horizontalis*. Of these plants the White Pine, the Red Pine, the Hemlock, the Red Cedar and the Arborvitae are trees of great value and beauty, but in speaking of them it must not be forgotten that the White Pine is threatened by a serious disease which makes its planting on a large scale undesirable. Among the hard Pines *Pinus resinosa* is better worth growing than any of the exotic species which have been tried here. The other native Pines have little to recommend them as ornamental or timber trees. The White Spruce, which just reaches from the north the extreme northern part of the United States, is a handsome, fast-growing tree, but in Massachusetts, where the climate is too warm for it, it is apt to grow thin and unsightly before it is fifty years old. The Red Spruce, which is the timber spruce of the northeastern states and the Appalachian Mountains, grows naturally more slowly than the other trees of New England and in the Arboretum it has never proved a success. The Black Spruce is a small tree which grows naturally in deep swamps
and has little to recommend it either as an ornamental or a timber tree. The Fir-tree, in its native swamps in the northeastern part of the country, is with its narrow pyramidal head of dark green leaves silvery white below a beautiful object, but like many other Fir-trees it does not take kindly to cultivation and in the Arboretum has never lived more than a few years. The White Cedar, too, is a hard tree to establish, and although a common native tree in the swamps of eastern Massachusetts it has not always proved hardy in the Arboretum where it has grown best on dry gravelly slopes. Few trees have shown so great seminal variation as the eastern Arborvitae, and the collection of the forms of this useful tree is one of the most interesting in the Arboretum only excelled in variety by that of the forms of the Red Cedar. No other low-growing Juniper clings so close to the ground as Juniperus horizontalis, and few plants make a denser mat or a better ground cover.

**European Conifers in New England.** Seventy-five years ago three European conifers were much planted in the northeastern United States because native trees at that time were not often found in American nurseries, and because the idea prevailed and still prevails that exotic plants were more valuable than native ones. These three conifers were the Norway Spruce so-called (Picea Abies or excelsa), the Scotch Pine (Pinus sylvestris) and the Austrian Pine (P. nigra). These are hardy, fast-growing, and for several years here handsome trees. The introduction of the Norway Spruce must be considered a misfortune, however, for New England where it was planted and is still planted as an ornamental tree in great numbers. It grows rapidly while young and often remains in good condition until it is from thirty-five to forty years old; then it begins to fail, the leading shoot dying or failing to make a satisfactory growth and all the upper part of the tree gradually becoming thin and unsightly, with the result that there is now hardly a park or a country place in New England where the sad spectacle of such half dead trees cannot be seen. Further south the Norway Spruce often promises to become a longer-lived tree; and the best specimens known to the Arboretum are in the military cemetery at Gettysburg, Pennsylvania. The Scotch Pine, which in Europe is a magnificent tree and one of the most picturesque of all Pines, is hardy and grows rapidly here, often reproducing itself from self-sown seed. When about thirty years old it has the unfortunate habit of dying suddenly without obvious cause, and it is doubtful if many Scotch Pines more than fifty years old can be found in this country. Although inferior as an ornamental tree and probably as a timber producing tree to the native Red Pine, the Austrian Pine is hardy and grows rapidly here, but like the Scotch Pine often dies suddenly when only thirty or forty years old. These three conifers are easily raised and the seed is readily obtained. The young plants grow rapidly and they are therefore profitable plants for nurserymen to handle, and the public, in spite of the American experience with them continues to buy them. In some of the states they are raised by state agencies and given away or sold at a nominal price, or planted by the states in reforesting operations. Two conifers from southeastern Europe, although still insufficiently tested in this climate, promise to be valuable here. These are a White Pine, Pinus peuce, and a Spruce, Picea omorika. The former has been growing in the Arboretum since 1883; it is quite hardy, but as an ornamental
tree it has no advantage over the native White Pine or the western *Pinus monticola*. *Picea omorika* was first raised from seed at the Arboretum in 1881; it has proved hardy and has grown rapidly, but suffers somewhat from the weevil which does so much damage to the leader of the native White Pine. *Picea omorika* is the only Spruce-tree with flat leaves which is really hardy in this climate; and at the end of forty-two years it is by far the handsomest and most satisfactory Spruce-tree in the Arboretum.

**Conifers from Eastern Asia.** China, especially the western part of the empire, is the home of a large number of conifers. It has given us from the south the Golden Larch (*Pseudolarix amabilis*), the handsomest of all the conifers with deciduous leaves and one of the most beautiful trees which can be grown in eastern North America, and from the north the interesting Lace-bark Pine (*Pinus Bungeana*) with thin papery bark as white on the trunks of old trees as that of a Canoe Birch, various forms of the common and widely distributed hard Pine (*P. sinensis*), and *Juniperus chinensis* in numerous forms. Of the value of the numerous Firs and Spruces discovered by Wilson on the slopes of the mountains of western China and now growing in the Arboretum it is still too early to say anything beyond the fact that at this time *Picea Balfouriana* promises to be the most distinct and valuable. To Japan the Arboretum is indebted for several Spruces, Pines and Firs, including *Abies homolepis*, often sold in nurseries as *A. brachyphylla*, the best probably of all the Firs for this climate, one of the handsomest of Junipers (*J. rigida*), the Retinosporas (*Chamaecyparis*), the handsome *Thuja Standishii*, and the curious Umbrella Pine (*Sciadopitys*).

**The Rocky Mountain Region of North America** has done much for the New England lovers of conifers. Four trees which grow to their largest size in the forests of the Pacific states range inland to the continental divide and are hardy here. These trees in the north are *Abies grandis*, *Thuja plicata*, one of America's noblest trees, *Pinus monticola*, the western White Pine, and *Tsuga heterophylla*; the southern Rocky Mountain states have given us hardy forms of the Douglas Spruce (*Pseudotsuga*) and of the White Fir of California (*Abies concolor*), and the Engelmann Spruce (*Picea Engelmanii*), one of the world's handsomest Spruce-trees. This tree has been growing since 1873 in the Arboretum where it is perfectly hardy. It has grown rapidly and until four or five years ago formed a perfect pyramid with lower branches sweeping the ground. Then the lower branches began to die and the trunks are now bare of branches for a distance of four or five feet above the ground. The tops of the trees, however, are still in perfect health and are growing rapidly.

The want of space in these Bulletins forbids a detailed description of these and of many of the other conifers in the collection, but the following list of seven species which up to this time show here the greatest promise as ornamental trees may be useful. The Carolina Hemlock (*Tsuga caroliniana*) is placed first on the list as the most beautiful conifer now growing in the Arboretum; the others are the native White Pine (*P. Strobus*), the Japanese *Abies homolepis*, the Colorado *A. concolor*, the European *Picea omorika*, the Rocky Mountain *Thuja plicata*, and the Chinese Golden Larch (*Pseudolarix amabilis*).

These Bulletins will now be discontinued until the spring of 1924.
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