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ARNOLD ARBORETUM

HARVARD UNIVERSITY



BULLETIN

OF

POPULAR INFORMATION

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ARNOLD ARBORETUM
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BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

APRIL 25, 1925

In spite of the dry autumn, the absence of snow during the winter, and the occasional extremely cold days plants have suffered less in the Arboretum probably than in any previous winter. The Conifers and Taxads are entirely uninjured; even the beautiful prostrate coast Juniper of Japan (*Juniperus conferta*) where it is common as far north as Hokkaido is uninjured, although in previous years it has always been half killed in the Arboretum. The broad-leaved Rhododendrons, except for an occasional yellow leaf, are in perfect condition with the exception of the flowers of the hybrid *Rhododendron praecox* (*R. ciliatum* x *dahuricum*) which were killed by the frost of the 19th of April, as happens five years out of six. It has been an extraordinarily early spring. The Silver Maple (*Acer saccharinum*) began to flower in February. On the 1st of March *Erica carnea*, which is still in bloom, began to flower; on the 20th of March a newly introduced Honeysuckle from Korea, *Lonicera praeflorens*, was in bloom as was the European *Cornus mas*, the so-called Cornelian Cherry, and its eastern Asiatic representative, *Cornus officinalis*. *Cornus mas*, which has grown in European gardens for at least three centuries, is still rarely seen in those of the United States, although it was first brought to America more than a hundred years ago. The Cornelian Cherry is especially valuable in this climate for the small bright yellow flowers which are arranged in many-flowered clusters and remain in good condition for three or four weeks, are never injured by frost. It is a broad, shapely shrub or sometimes a small tree with bright green leaves, and scarlet or rarely yellow fruit which ripens late in summer and is cherry-like in appearance. The Red Maple (*Acer rubrum*) and its form with yellow

flowers (var. *pallidiflorum*) were also open this year as early as the 20th of March when many species of Alder, Willow, Poplar and Hazel were blooming. The Chinese Cherry, *Prunus Davidiana*, and its white-flowered variety were in full bloom before the end of March.

Forsythias, which have never bloomed more profusely in the Arboretum and generally in the neighborhood of Boston, are still in good condition and are most effective when planted in a large crowded mass on a sloping hillside, as they have been in the Arboretum just where the Meadow Road joins the Bussey Hill Road. The recently introduced *Forsythia ovata* discovered in 1918 by Wilson on the Diamond Mountains in northern Korea was in flower as early as March 26th or nearly two weeks earlier than the other Forsythias. It is a large shrub with light yellow branches, broad, long-pointed, coarsely toothed leaves from four to five inches in length and from three to four inches in width, and clear primrose colored flowers rather smaller than those of *F. Fortunei* or of any of the forms of *F. intermedia*. This Korean Forsythia promises to be an extremely valuable introduction as it will be possible to grow it much further north than the other species of the genus, and in this climate the flower-buds will probably never be injured as they often are on other species, especially on the hybrids of *F. intermedia* of which several forms are in the collection. They were obtained by crossing the flowers of *F. suspensa* var. *Fortunei* with those of *F. viridissima* which is the most tender and southern species. As a flowering plant one of these hybrids called *spectabilis*, which originated in Germany, is the handsomest of all the Forsythias, but in severe winters many of the flower-buds are killed. Other handsome hybrids are var. *primulina* with primrose colored flowers and var. *pallida* with straw-colored flowers; the former appeared spontaneously in the Arboretum a few years ago. In the crowded mass of Forsythias which makes the great show in the Arboretum it is hard to distinguish the species and hybrids, but all of them with the exception of *F. ovata* can be studied in the Shrub Collection as individual plants.

Pyrus ussuriensis has been in bloom since April 17th. This tree is a native of Korea, north China and northern Japan, growing further north probably than any other Pear-tree, and sometimes forming forests of considerable extent. It is, too, the largest of all Pear-trees for Wilson photographed in 1918 a tree growing near Shinan in the province of Nogen, Korea, sixty feet tall with a girth of trunk of fourteen feet and a head of branches seventy-five feet across. The small fruit varies in size and shape, and, judging by American standards, has little value. It is believed that the hardness of this tree may make it valuable as a stock on which to grow some of the European garden pears, and experiments with it as stock are being made in Dakota. There are several plants now in bloom in the Arboretum but the most easily seen are those on the southern slope of Bussey Hill where they are growing in the collection of Chinese pear-trees.

Prinsepia sinensis is again covered with clusters of bright yellow flowers which spring from the axils of the half grown leaves. This Prinsepia is a tall broad shrub with long gracefully ascending and spread-

ing branches and stems armed with many spines. This member of the Rose Family is perfectly hardy and the handsomest shrub Manchuria has yet contributed to western gardens. The two specimens in the Arboretum were sent here from St. Petersburg in 1903 and 1906, and have been found difficult to propagate. In recent years fortunately one of the plants has produced a few seeds, and as these have germinated there is reason to hope that if the Arboretum plants become more fruitful this shrub may become a common ornament in northern gardens. It has much to recommend it as a hedge plant. The species from northern China can be seen to most advantage in the Shrub Collection. *Prinsepia uniflora* from western China is a spiny shrub with small white flowers, and though it has little beauty its value for forming impenetrable hedges may prove considerable.

Corylopsis Gotoana bloomed this year on the 3rd of April and has never before been so full of flowers which, however, are now beginning to fall. *Corylopsis* is an Asiatic genus of the Witch Hazel Family with fragrant yellow flowers in long drooping clusters and leaves which have a general resemblance to those of the Witch Hazel. *C. Gotoana* was introduced into the Arboretum from central Japan and is the largest and handsomest species, growing from five to six feet tall in this climate, and can be considered one of the handsomest of the early spring flowering shrubs. In the Arboretum it can best be seen on the Centre Street Path. The other Japanese species, *C. pauciflora* and *C. spicata*, are also hardy but in very severe winters the flower-buds are often injured, and they are neither of them as desirable garden plants in this climate as *C. Gotoana*. There are several Chinese species in the Arboretum but their flower-buds are usually killed here.

Rhododendron mucronulatum, a native of northern China, which has been growing in the Arboretum for more than forty years, has been covered with fragrant rose-colored flowers this year since the 1st of April and as usual has proved one of the most beautiful and satisfactory of the early flowering shrubs introduced by the Arboretum. It is not easy to explain why this plant, which has so much to recommend it and is so easily propagated, has remained so uncommon in American gardens. The variety *ciliata* discovered by Wilson in Korea is flowering for the first time and promises to be as hardy as the type and even a handsomer plant as the flowers are darker colored. The plants, however, are too young to form any proper estimate of their garden value. They are planted with the type on the lower side of Azalea Path.

Asiatic Cherries. When this copy of the Bulletin reaches its readers in eastern Massachusetts the most interesting display of flowers will be made by some of the Cherry-trees of eastern Asia and by early flowering Apricots and Plum-trees. As in previous years, the earliest of these trees to flower is *Prunus concinna*, a native of the mountains of China where it was discovered by Wilson. It is a small tree less than three feet high; the flowers, which are white with a bright red calyx, are less beautiful than those of several of the other Asiatic

Cherry-trees, but they are produced in the greatest profusion and are not injured by spring frosts, and as small plants flower so freely it well deserves a place in a collection of spring flowering trees and shrubs. It is best seen in the Arboretum in the border of Chinese plants on the southern slope of Bussey Hill. The Japanese *Prunus incisa* is now in bloom on the right-hand side of the Forest Hills Road. It is a shrub or small tree with white or rarely pale rose-colored flowers which appear before the deeply lobed leaves unfold; the petals fall at the end of a few days after the buds open, but the calyx which gradually turns red remains on the fruit for two or three weeks and is decidedly showy. Although *P. incisa* is a common plant in Japan on the Hakone Mountains and on Fuji-san, it is extremely rare in American gardens.

The Spring Cherry of the Japanese (*Prunus subhirtella*), the most delightful and floriferous, travellers say, of all Japanese Cherries, is again thickly covered with flowers and has not before been more beautiful. This is a large shrub which is not known as a wild plant in Japan. Although somewhat cultivated in the gardens of western Japan, it is uncommon in those of Tokyo, and has failed to attract generally the attention of visitors to the Flowery Kingdom. The rather small drooping flowers are pink when they first open but gradually turn white, and those of no other Cherry-tree in the collection remain in good condition for so many days. This plant is extremely rare in American and European gardens. It can, however, be increased by grafting, and soft wood cuttings in the hands of a skilful propagator can be made to grow. Seeds, which the Arboretum plants produce in great quantities, do not reproduce the parent plant, however, and the seedlings usually grow into the tall slender trees which botanists know as *Prunus subhirtella* var. *ascendens*, which is a common tree in the forests of central Hondo and is really the type of the species. This tree has generally been overlooked or neglected as a garden plant, but is now flowering in the Arboretum. Much better known is the form of *P. subhirtella* (var. *pendula*), which was long a favorite garden plant in Japan and was sent many years ago to Europe and then to the United States. This beautiful plant, which is perfectly hardy in Massachusetts, has often grown badly here and died long before its time because European Cherries have been used as stock for multiplying. The proper stocks for the Weeping Cherry are the seedling plants of *Prunus subhirtella* or its varieties. Seeds of the pendulous form sometimes produce plants with pendulous branches and such plants are occasionally found among the seedlings of *Prunus subhirtella*.

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ARNOLD ARBORETUM
HARVARD UNIVERSITY



BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

APRIL 30, 1925

Prunus serrulata sachalinensis. Although the flowers of this tree, often called the Sargent Cherry, will have faded when this number of the Bulletin reaches its readers; it is well to call attention to it as when in flower it is the handsomest of the large trees yet introduced into the United States and Europe by the Arboretum. It was first raised here from seeds sent from Japan in 1890 by Dr. J. Sturgis Bigelow of Boston, and again in 1892 from seeds gathered in Japan by Professor Sargent. The trees raised from these seeds have flowered now for several years but never so beautifully as this year. As they produce fruit abundantly which ripens in June there is no reason why this splendid tree should not become common in the northern states. Why will not some American city or town make itself famous by planting a long avenue of these trees which, when they have become, like the largest trees in the Arboretum, forty feet high or more and are in bloom will make the town which has planted them famous and attract visitors from the remotest parts of the country.

This the Mountain Cherry of northern Japan (*Yama Jakura*) is the parent of many of the finest Japanese double-flowered Cherry-trees which when well grown are the most beautiful of all flowering trees. They are rarely seen, however, in good condition of any size either in the United States or Europe because the attempt has been made to graft them on European Cherries which now it has been clearly shown are not suited for the purpose. The double-flowered Cherries imported from Japan are grafted on the white-flowered form of *Prunus Lan-nesiana* which although not very hardy has flowered better this year than ever before in the Arboretum. It is also the parent of several

of the finest double-flowered Cherry-trees. The double-flowered forms of this and of *Prunus serrulata* do not succeed as they come from Japan as they are all grafted on *Prunus Lannesiana* and the bark of that species is thin and is apt to split. Double-flowered trees imported from Japan which have been grafted or budded at the ground level often get on to their own roots and are hardy and permanent but they are shrubs rather than trees. It is evident, in spite of the protest of American and European nurserymen, that all the double-flowered Japanese Cherries must be grafted on the variety *sachalinensis* of *P. serrulata* if large and healthy trees are wanted, and the best plants will be obtained by inserting the grafts at the top of stems six or eight feet high that they may have a vigorous, rough-barked trunk. This means a slow and expensive operation before the trees are ready for sale, and it is probably safe to say that large and healthy double-flowered Japanese Cherry-trees will not soon be common in this country. Two other varieties of *Prunus serrulata*, var. *pubescens* and var. *spontanea*, are well established in the Arboretum and although still small have flowered well this spring. To see how the lovely Spring Cherry of Japan (*P. subhirtella*) can be propagated nurserymen are invited to examine the two plants by the Prince Street entrance to the Superintendent's house at the corner of Centre Street. These were grafted on seedlings of the type plant on January 19, 1907; they were planted in the nursery in the spring of the same year and placed in their present position in the spring of 1919. They show that there is no difficulty in raising good specimens of this plant if nurserymen are willing to give a little attention to them.

Prunus yedoensis has not before flowered as well in the Arboretum as this spring. There is a plant of this species on the right hand side of the Forest Hills entrance, another on the southern slope of Bussey Hill, and a third in the nursery on the top of Peter's Hill. This is the Cherry so generally planted in the parks, cemeteries and streets of Tokyo, and its flowering heralds an annual national holiday decreed by the Emperor. It was believed that over two hundred and fifty thousand trees were growing in the precincts of Tokyo before the destruction of a large part of the city a few years ago by fire and earthquake. The oldest authentically known trees were in the Imperial Botanic Garden at Koishikawa and were planted less than fifty years ago. This Cherry is a quick-growing and apparently short-lived tree with wide-spreading and slightly drooping branches forming a wide flattened head. The bark is pale gray and smooth, becoming darker and somewhat rough on old trunks. The slightly fragrant flowers are produced in clusters of two or several, usually before the leaves but occasionally at the same time, and vary in color from white to pale pink. It is this tree which was presented by the Government of Japan to our Government and is the principal Japanese tree which has been planted in the streets of Washington. This Cherry produces seeds abundantly now in the Arboretum and in Washington, and it ought to be much more generally planted a little further south than Massachusetts where the flower-buds are too often injured by severe winters. It grows perfectly well in New York, and thousands of trees might well find a place in Central Park, where so many of the original plants have disappeared, and in all the regions south of Washington.

Prunus nigra. Among American Plums in the Arboretum *Prunus nigra*, the so-called Canada Plum, is the earliest to bloom, and, although it opened its flowers at the end of last week, is still in fair condition. It is a native of the northern border of the United States from New Brunswick westward, and is distinguished from the more southern *Prunus americana* by its larger and earlier flowers, the blunt teeth of its leaves and by darker and closer bark; the flowers turn pink as they fade. The Canada Plum has produced some excellent seedling forms of garden Plums which are esteemed and largely grown by pomologists. A form of the Canada Plum found growing in Seneca Park, Rochester, New York, near the gorge of the Genesee River, and believed to be a native plant in that region, is when in bloom one of the most beautiful Plum trees in the Arboretum Collection and well worth propagating as a garden plant.

Prunus salicina, better known perhaps as *P. triflora*, flowers only a little later than the Canada Plum, and the flower-buds which completely cover the wide-spreading branches are already opening. This tree is interesting because it is the only native Plum in eastern Asia and the tree from which the so-called Japanese Plums of gardens have been developed.

Prunus dasycarpa. This plant, which is a native of eastern Siberia or Manchuria, is known as the Purple or Black Apricot on account of the dull purple color of the fruit. It has never flowered more abundantly than it has this spring but the flowers are now beginning to fade.

Prunus triloba. Among the flowers of early spring few are more lovely than those of this small Almond from northern China which, in spite of the fact that it has flowered in the Arboretum every spring for the last twenty years, is still very little known, although the form with double flowers (var. *plena*) is a common garden plant in this country and is often successfully forced under glass for winter bloom. The single-flowered plant should be better known. It is a tall shrub of rather open irregular habit of growth. The flowers, which are pure clear pink in color, are produced every year in profusion, and among the shrubs introduced into the Arboretum in the last thirty years none excel the single-flowered form of *P. triloba* in the beauty of their flowers. It can be seen on the right-hand side of the Forest Hills Road not far below the entrance, and there is a fine plant on the southern slope of Bussey Hill.

Amelanchiers. The Shad Bushes, as Amelanchiers are often called because they are supposed to bloom when shad begin to ascend the rivers from the sea, add much in early spring to the beauty of the Arboretum. This genus in North America contains nearly all the species as only one small shrubby species grows on the mountains of central Europe and another in China and Japan. In North America it grows in many forms from the Atlantic to the Pacific and from Newfoundland to the Gulf States. Two of the species are trees and the others large or small shrubs, the flowers usually appearing before the leaves or when they are partly grown. They all have handsome flowers, with usually

long white petals and small, dark blue or nearly black, rarely yellow, pome-like fruit open at the top, the flesh of which in most of the species is sweet and edible. The earliest species to bloom, *A. canadensis*, has been for more than a week in flower. This is the largest species of the genus and a tree occasionally growing to the height of sixty feet with a tall trunk eighteen inches in diameter. The leaves begin to unfold as the flowers open and are then covered with silky white hairs, making the whole plant look white at this time of the year. This beautiful tree does not grow naturally nearer Boston than western Massachusetts. It is common in western New York, and the common and often the only species in the southern states in which it grows to the Gulf coast. Owing to an old confusion in determination and names, this fine tree, which was originally described by Linnaeus, has long been rare in gardens, a different plant having usually appeared in them under this name. This is a second tree species, differing from *A. canadensis* in the red color of the young leaves which are destitute or nearly destitute of any hairy covering, and should be called *Amelanchier laevis*; it is a native of the Arboretum and is now in flower. A natural hybrid of the two arborescent species, *A. grandiflora*, is not rare in the woods in the neighborhood of Rochester, New York. It promises to become a tree here and has the largest flowers of any of the Shad Bushes. The flowers of a form of this hybrid (var. *rubescens*) are more or less deeply tinged with rose color and are more beautiful than the flowers of the other species or varieties. *Amelanchier oblongifolia*, which is the largest of the shrubby species, is a common wild plant in the Arboretum and has been planted in considerable numbers along the roads, especially along the Valley Road. It is a vigorous and handsome shrub often ten or fifteen feet high and broad through the branches. It is an inhabitant of moist woods and rocky uplands from New Brunswick to Pennsylvania, Missouri and Minnesota.

There are supposed to be a dozen more American small shrubby species or hybrids growing in the Arboretum, but there is still doubt about the identity of several of them. Some of these are in flower in the Meadow Road Group, and others will be in bloom later. The species of central and southern Europe, *A. ovalis*, is well established in the Arboretum, as are the Japanese *A. asiatica* and its Chinese variety *sinica*. These foreign species bloom later.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



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POPULAR INFORMATION

JAMAICA PLAIN, MASS.

MAY 5, 1925

Crabapples. The Crabapples when in flower make one of the chief spectacular displays of the year in the Arboretum and only the flowers of the Lilacs attract a larger number of visitors. Many of these plants are covered with buds, a few will flower sparingly or not at all this year, but the general display will be an average one but not as good as that of last year when all the plants 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 gate at the corner of South and Bussey Streets. The oldest and largest plants are near the Forest Hills gate but there are a larger number of species and varieties on Peter's Hill.

The genus *Malus* extends around the northern hemisphere and is best represented in eastern Asia. The North American species are found from the Atlantic to the Pacific and bloom much later than the Asiatic species, and will be discussed in a later Bulletin. The two European or eastern Asiatic species, *Malus pumila* and *M. sylvestris*, are not in the collection although the former is perhaps the most valuable tree in the world as it is the parent of the edible apple. A few of the early Asiatic Crabapples are—

Malus baccata mandshurica, which began to open its flower-buds more than a week ago, is the earliest of the Asiatic plants to flower. It is a native of Manchuria, Korea and northern Japan, and is an eastern form of the better known *M. baccata*, the Siberian Crabapple, which reached Europe more than a century ago and for a long time was one of only two of the Asiatic Crabapples known in European

gardens. *M. baccata mandshurica* as it grows in the Arboretum is a tree twelve or fifteen feet tall and broad; the flowers are pure white, rather more than an inch in diameter 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 for the fragrance of the flowers alone should find a place in all collections of these plants. The best Arboretum plant is in the Peter's Hill Group where another form of *M. baccata* (var. *Jackii*) is also growing. This plant was brought from Korea by Professor Jack in 1905 and is distinguished by its larger dark scarlet fruit. Another form of *M. baccata* (var. *gracilis*) raised from seeds collected by Purdom in northern China, promises to be a handsome tree, differing from the ordinary form of *M. baccata* in its gracefully pendent branches, narrower leaves hanging on slender petioles and in the smaller flowers and fruit.

Malus robusta is one of the earliest of the Asiatic Crabapples to flower. It is believed to be a hybrid of *M. baccata* with *M. prunifolia*. In good soil and with sufficient space for free development it will grow into a large shapely tree with a broad, round-topped, irregular head of spreading and often drooping branches. The flowers are fragrant and larger than those of the other Asiatic Crabapples with pure white or occasionally greenish petals. The globose dull red fruit varies greatly in size on different individuals and is rarely more than three-quarters of an inch in diameter. To this hybrid belong many of the trees cultivated for their fruit in cold winters under the general name of the "Siberian Crabs;" of these trees the well known "Red Siberian" is a typical representative. A form of *M. robusta* (var. *persicifolia*) raised from seeds collected by Purdom in northern China, distinct in its narrower peach-like leaves, is now established in the Arboretum and may when better known prove to be worth general cultivation.

Malus micromalus, which is also an early flowering plant, is one of the least known of the Crabapples. It was first sent to Europe from Japan by von Siebold in 1853 under the name of "Kaïdo," a name which in Japan was given to *M. Halliana*. In Japan *M. micromalus* is known only in gardens, and by Japanese botanists is believed to have been introduced from China and to be a hybrid of *M. baccata* with *M. spectabilis*. The habit of this plant is more pyramidal than that of other Crabapples, and this habit makes it conspicuous in the collection. It first came to the Arboretum from the Paris Museum in 1888 and the plants now growing here are descendants of that plant. It is still one of the rarest of the Asiatic Crabapples in western gardens.

Malus Halliana var. *Parkmanii* is the semidouble form of a Crabapple which Wilson found growing wild in western China on the Tibetan border. As the double-flowered form had long been a favorite in Japanese gardens, where it is frequently cultivated under the name of "Kaïdo," this tree before Wilson's discovery was believed to be a native of Japan. The Parkman Crab, as the semidouble-flowered form is generally known in this country, was one of the first to reach the United States direct from Japan as it was sent to Boston in 1862 where it was first planted by Francis Parkman, the historian, in his

garden on the shores of Jamaica Pond. From this tree has been produced most of the plants of this Crabapple now growing in America and probably in Europe. The Parkman Crab is a small, vase-shaped tree with erect and spreading branches and dark bark. It flowers profusely every year and the flowers, which droop on slender stems, are rose red and unlike in color those of other Crabapples. The fruit, which is borne on long red stems is dull in color and hardly more than an eighth of an inch in diameter. When in bloom the Parkman Crab is one of the handsomest and most distinct of all Crabapples, and its small size makes it one of the best for small gardens.

Malus theifera, discovered by Wilson in central and western China, gives every promise of being a decorative plant of the first class in this country. It is a tree with long, upright, irregularly spreading, zigzag branches thickly studded with short spurs which bear numerous clusters of flowers which are rose red in the bud and become pale or almost white when the petals are fully expanded. In central China the peasants prepare from them their "red tea." The largest plants in the Arboretum flower profusely every year. There is a variety (var. *rosea*) with deeper-colored petals also in the collection.

Malus prunifolia rinki is an interesting tree, for this is the Apple cultivated by the Chinese and from China taken to Japan where it was the only Apple cultivated as a fruit tree before the advent of American apples. The wild type of this tree discovered by Wilson in western China is also growing in the Arboretum.

Malus floribunda. By many persons this is considered when in bloom the most beautiful of Crabapples. It was introduced into Europe by von Siebold in 1853 from Nagasaki, Japan. The place where this tree grows wild still remains unknown, although possibly it is one of the high mountains of Kyushu. Japanese botanists and nurserymen have confused it with the Parkman Crab, and Wilson did not find it in Japanese gardens. It is a broad, round-topped, treelike shrub sometimes twenty-five feet tall with stout branches and slender, arching, pendant branchlets. The clusters of flowers are white when fully expanded and are rose red in the bud, and as they open in succession the two colors make a handsome contrast. The fruit is about the size of a pea, yellowish or yellowish brown; from some plants it falls in the early autumn and on others it remains on the branches during the winter or until devoured by birds who find it one of the most palatable winter foods. *M. floribunda* rarely fails to produce abundant crops of flowers and in this climate has proved to be one of the most satisfactory of all ornamental shrubs or small trees which have been planted in eastern Massachusetts. A hybrid between *M. floribunda* and probably *M. robusta* appeared in the Arboretum with a lot of seedlings of *M. floribunda* in 1883 and has been named *M. arnoldiana*. It has the habit and abundant flowers of that species but the flowers and fruit are nearly twice as large as those of *M. floribunda*. It is a handsomer plant distinguished by its long arching branches and one of the handsomest Crabapples in the Arboretum.

Malus spectabilis is said to have been cultivated by the Chinese from time immemorial. Like several of the other Asiatic Crabapples it is not known in a wild state, but is probably of hybrid origin. It is a tree from twenty-five to thirty feet tall with a wide vase-shaped crown and short branchlets. The flowers are pale pink, more or less semi-double and fragrant. The fruit is pale yellow, subglobose and about three-quarters of an inch in diameter. *M. spectabilis* is a perfectly hardy and free-flowering plant, and well worth a place in gardens where space can be allowed for its development. What is probably a hybrid of *M. spectabilis* and some unknown species, possibly *M. micromalus*, is *M. Scheideckeri* and is also worth a place in a collection of these trees.

Early Flowering Viburnums. *Viburnum alnifolium*, the Hobble Bush or Moosewood of cold northern woods, one of the handsomest of the American species, is now in bloom, as is *Viburnum Carlesii*, one of the hardiest and most beautiful shrubs which the gardens of America have obtained from eastern Asia. It is a dwarf, compact shrub with white flowers in small globose clusters which open from rose-colored buds and are delightfully fragrant. Fortunately it has at last been taken up by American nurserymen and can now be obtained by lovers of beautiful plants.

Double-flowered Japanese Cherries. There are now growing in the Arboretum thirty-two double-flowered forms of *Prunus Lannesiana* and eighteen forms of *Prunus serrulata sachalinensis*. These are arranged on the southern slope of Bussey Hill and the handsomest of them are the following forms of *Prunus serrulata sachalinensis*: *Alboprosea*, *Fugenzo*, *Sekiyama*, *Kirin*, *Horinji*, and *Hisakura*. The best six double-flowered forms of *Prunus Lannesiana* are, *Jonioi*, *Miyako*, *Sirotae*, *Amanogawa*, *Ojochin*, and *Ochichima*.

Early Azaleas. Two or three of the early Azaleas are beginning to open their flowers and during the next week *Rhododendron (Azalea) Schlippenbachii* will have opened its pale pink flowers which are about three inches in diameter and are marked with red-brown spots, and are perhaps more beautiful than those of any other Azalea which has proved hardy in the Arboretum. It is one of the commonest shrubs in Korea and often forms the dominant undergrowth in open woods. This plant grows further north than any other Azalea with the exception of the North American Rhodora, and there is no reason why it should not flourish in the colder parts of New England. Two flowering plants can be seen on Bussey Hill on the upper side of Azalea Path. Still rare in gardens it seems safe to predict that the time is not far distant when this inhabitant of the Diamond Mountains will be one of the chief ornaments of American gardens during the early days of May.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



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JAMAICA PLAIN, MASS.

MAY 8, 1925

Early-flowering Broad-leaved Evergreens. The most interesting of these plants in the Arboretum now is probably the Japanese *Rhododendron Metternichii* which, although it has been growing here in a shady position close to the Bussey Brook for five years, is flowering this spring for the first time. The rose pink flowers on one form have six or seven petals and on another only five petals (var. *pentamerum*). This last is the form growing in the Arboretum and probably the common form generally planted. This *Rhododendron* forms great masses from five to ten feet high on the borders of Lake Yumoto among the Nikko Mountains at an elevation of five thousand feet above the sea. *Rhododendron venustum*, which has been more generally cultivated under the name of *R. Jacksonii*, has been an inhabitant of the Arboretum since 1908. It is perfectly hardy here always and it is now covered with its expanding pink flowers. It is considered a hybrid of the of the Himalayan *R. arboreum* and *R. caucasicum*, and was raised in England by William Smith at Kingston in 1889. By English writers on *Rhododendrons* it is considered one of the most valuable early spring-flowering *Rhododendrons* for all gardens. It is perfectly hardy and will grow in an exposed position in the poorest soil. It is easily and cheaply raised from layers and probably when better known will be largely used in this country for the edging of beds of broad-leaved evergreen plants. The white-flowered form which is occasionally cultivated in Europe is not yet in the Arboretum. *Pieris (Andromeda) floribunda*, judging by an experience of over fifty years, is the only broad-leaved evergreen to which nothing happens in this climate. It is not attacked by borers, the leaves are never discolored, and the

flower-buds formed in autumn and almost as conspicuous in the winter as the flowers are not injured by the lowest temperature which has been recorded in southern New England. It is a round-topped shrub of compact habit sometimes eight or ten feet across and five or six feet high, with small, pointed, dark green leaves and short terminal clusters of pure white flowers. A native of the high altitudes on the southern Appalachian Mountains, it is rare as a wild plant, but for more than a century it has been valued in England and largely propagated by English nurserymen. It is certainly one of the most valuable early flowering spring plants which can be successfully grown in this climate, and although it flourishes in exposed positions the flower-clusters, when the plant is grown in comparatively dense shade, are sometimes twice as long and much handsomer than when the plant grows in the open. The Japanese *Pieris japonica* is less hardy and rarely flowers well in this climate. This year, however, a plant in the shade of Hemlock Hill is covered with flowers, showing like many other evergreen plants that shade is essential to its well being. Unlike the American species, the flowers are borne in a terminal cluster of slender pendulous racemes each from three to six inches in length. It is easily distinguished from the American species by the narrower leaves tapering at the base, by the pendulous inflorescence, and by the absence of hairs on the young wood and flower-stalks. Even in England it is often injured by frost. The American Mahonias in the Shrub Collection have not before been so full of flowers or in such good condition, thanks to a light covering of Hemlock branches, as they are this spring. The handsomest, although not the hardiest, is *Mahonia Aquifolium*, the Oregon Grape, an evergreen shrub sometimes reaching the height of six feet but usually not more than two or three feet high. The spineless stems are little branched, and spread by underground suckers. The leaves are six to twelve inches long, pinnate, consisting of five to nine leaflets which are sessile or nearly so, vary greatly in shape except the terminal one, an inch and a half to three inches and a half long, glossy dark green, turning purplish in the winter, and furnished with slender marginal spiny teeth. The racemes of flowers are erect, produced in a crowded group from just beneath the terminal bud, each two to three inches long, thickly set with golden yellow, slender-stalked flowers. The fruit is abundant, black, ornamental and covered with a fine violet-colored bloom. This handsome plant is a native of western North America from Vancouver Island southward. It is a common and very popular plant now in Great Britain, but to flourish in the eastern states like so many evergreens it should be grown in the shade. The other North American species, *Mahonia repens*, from the Rocky Mountain region is a hardier plant usually less than a foot high but spreading freely by underground stems. The pinnate leaves consist of three, five or seven leaflets which are ovate, pointed, one to two and a half inches long furnished with spiny teeth, and are of dull bluish green. The flowers are produced in racemes an inch and a half to three inches long in clusters at the ends of the branches. The deep yellow flowers are now opening, and the black fruit is covered with a dense bloom. An unnamed hybrid is growing with these two species in the Shrub Collection but has little to recommend it as an ornamental plant in comparison with its supposed parents.

Rhododendron (Azalea) reticulatum. This Japanese plant was introduced into the Arboretum by Professor Sargent who sent seeds from the Nikko region in the autumn of 1892. The plants have grown slowly but have proved hardy and each spring have flowered profusely. This handsome species does not appear to be very common in cultivation but is certainly worth a place in New England gardens. It is sometimes known as *Rhododendron dilatatum* or as *R. rhombicum*. In the Nikko region of Japan, on the lower slopes of Mount Fuji and on the Hakone Mountains it is extremely abundant in thickets, on margins of woods and in forests. The plants form a much-branched bush or bushy tree from three to twenty-five feet tall with numerous erect or spreading, slender but rigid branches, and the leaves do not unfold until the corymbs fall.

Rhododendron (Azalea) yedoense poukhanense. This Korean Azalea is usually a compact, densely branched shrub up to three feet in height. The leaves are quite or partially deciduous according to climate, and in the autumn are tinged from orange to crimson. The flowers are in clusters from two to several and remarkably fragrant, with a corolla rose to rosy purple. This is the common Azalea of Korea from about the latitude of Seoul, the capital city, southward. It is partial to open country and on grassy mountain slopes and in thin Pine-woods it forms dense mat-like masses from a few inches to a yard high. It grows from the sea-level up to nearly five thousand feet altitude. This Azalea was introduced into the Arnold Arboretum by Professor Jack who sent seeds from Poukhan-san in the autumn of 1905.

Some additional Asiatic Crabapples. *Malus Sargentii* from salt marshes in the neighborhood of Mororan in northern Japan, where it was discovered by Professor Sargent in 1892, has qualities which give it a field of usefulness peculiarly its own. It differs in habit from all other Crabapples. It is a dwarf with rigid and spreading branches, the lower flat on the ground, and the whole plant hardly more than two feet high. 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 it remains on the plants until spring. It is possible that only the plants raised from the seeds collected in Japan represent the species as the plants raised from the seeds collected in the Arboretum and sold by nurserymen as *Malus Sargentii* are tall broad shrubs often ten or twelve feet high but bear flowers and fruit similar to the type.

Malus Sieboldii was introduced from the gardens of Japan into Europe by von Siebold in 1853. It is a low dense shrub of spreading habit with the leaves on vigorous branches three-lobed, small flowers tinged with rose and small yellow fruit. Von Siebold's Crab is really a dwarf form of a tree common on the Korean island of Quelpaert, and on the mountains of central Japan in Hokkiado, to which the name *M. Sieboldii* var. *arborescens* has been given. This is a tree often thirty feet or more tall with ascending wide-spreading branches, 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. *M. atrosanguinea* is believed to be a hybrid of *M. Sieboldii* and the Parkman Crab. It is a low broad-branched tree with dull red showy flowers, and is now often seen in American gardens. *Malus sublobata*, which is believed to be a hybrid between *M. prunifolia rinki* and *M. Sieboldii*, is also in flower. The plants in the Arboretum are already thirty feet high and, unlike other Crabapples, form a tall trunk covered with pale bark and a narrow head. The large white flowers are chiefly produced on upper branches and are followed by bright clear yellow fruits about three-quarters of an inch in diameter.

American Plum-trees. North America is the real home of Plum-trees as it is of Hawthorns. They range across the continent from the valley of the St. Lawrence nearly to the Rio Grande. They are most abundant in eastern and southern Kansas, eastern Oklahoma, southern Arkansas, and Texas from the valley of the Red River to the Edwards Plateau. In this region Plum-trees are represented by more species than are found in all the world outside of North America. Some of the trees are of considerable size and others are large or small shrubs which frequently spread in sandy soil by means of shoots. From the fruit of nearly all the American Plums good jellies and preserves can be made, and selected seedling forms of several of the species have received the attention of Pomologists and are now cultivated as fruit trees in parts of the world where the varieties of the old world *Prunus domestica* cannot be successfully grown. The handsomest of the American Plums, *Prunus hortulana*, the most beautiful of all Plum-trees, is common from southeastern Illinois to eastern Kansas and Oklahoma. It is a tree from twenty to thirty feet high with a clean trunk and wide-spreading branches, which form a round-topped shapely head. The leaves are unusually large for a Plum-tree, and smooth and lustrous on the upper surface. The fruit is scarlet, lustrous, and from three-quarters of an inch to an inch in diameter. A well-fruited tree of *Prunus hortulana* is more beautiful in October than any other small tree which can be grown in the northern states.

Early Flowering Currants. The two yellow-flowered American Currants are perhaps the most attractive of these plants. The better known of them, the so-called Missouri Currant (*Ribes odoratum*) is found in many old gardens and grows naturally from South Dakota to Texas. *Ribes aureum*, a smaller plant from the northwest and the Rocky Mountain region, with slender branches, smaller flowers and black or orange-colored fruit, appears to be extremely rare in cultivation. These two plants are growing in the Shrub Collection with another of the Rocky Mountain Currants (*R. cereum*) with small white flowers, and as usual is an attractive plant at this season.

Early Flowering Lilacs. Several hybrids of *Syringa affinis* var. *Giraldii* and the common Lilac are already in bloom. It is believed that Sunday, May 17, will be the best day for the Lilacs.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

MAY 12, 1925

Prunus Avium plena, the double-flowered form of the European Gean Cherry, although it has probably been cultivated in Massachusetts for nearly a century, is now rarely seen here, more attention being paid in recent years to the Japanese double-flowered Cherry-trees which have so far proved short-lived and unsatisfactory here and in Europe owing largely to the use of unsuitable stock on which these plants have been grafted and ignorance of the best methods for their cultivation. Unlike the Japanese Cherries, the flowers of this European tree are pure white, and an English writer describes it as "one of the most beautiful of all flowering trees." It is perfectly hardy here, grows to a large size and never fails to flower profusely, every branch and twig being wreathed with drooping clusters of flowers which last a long time in good condition. There are only two young trees in the Arboretum, one on the right-hand side of the Forest Hills Road and the other and larger one in the Peter's Hill nursery.

Prunus lanata, an American Plum-tree which blooms at about the same time as *P. americana*, from which it differs in the thick pubescence on the lower surface of the leaves, is exceptionally beautiful this year. It is a small tree rarely thirty feet tall, of dense habit, with slightly drooping branches, and of wide distribution from southern Indiana to Kentucky, Oklahoma, eastern Texas, and through Louisiana to Dallas County, Alabama. The Arboretum plant was raised from seed collected by Reverchon near Dallas, Texas.

Sorbopyrus auricularis bulbiformis. This interesting bi-generic hy-

brid is flowering remarkably well this year on the left-hand side and close to the Forest Hills Gate. *Sorbopyrus auricularis*, called in Europe the Bollwyller Pear, is a deciduous-leaved tree from twenty to sixty feet high, forming a round bushy head, with ovate or oval leaves rounded or heart-shaped at base, covered above with loose, early deciduous down, and flowers from three-quarters of an inch to an inch in diameter. The fruit is pear-shaped, an inch to an inch and a quarter long and wide, red, each on a stalk from an inch to an inch and a half long, with sweet yellowish flesh. It is said to have originated at Bollwyller in Alsace, and was first mentioned by Bauhin as early as 1619. For three hundred years it has been propagated by grafts, for it produces few fertile seeds. The variety in the Arboretum, sometimes called *Pyrus malifolia*, differs chiefly from the type in its broadly top-shaped fruit two inches long and wide and deep yellow when ripe. Spach named and described this tree in 1834 and said that the original specimen at that time grew in the garden of the King of France in Paris, and was thirty feet or more high. This and the Bollwyller Pear are certainly little known in this country and deserve a place in all collections of flowering trees.

Berberis Dielsiana, which was raised from seeds collected by Purdom in the province of Shensi, in China, is one of the handsomest and most vigorous of the Barberries of recent introduction. The largest plant in the Arboretum is growing among the new Chinese Barberries on Bussey Hill where it is already eight or nine feet tall and broad. It is one of the species with flowers in drooping racemes like those of the common Barberry. It is not only a vigorous and handsome plant but is valuable for its early flowers which have opened in the Arboretum as early as the middle of April. It first flowered here in 1916 and is now in bloom.

Enkianthus perulatus. The fine plant of this Japanese shrub on the southern side of Azalea Path, which is the earliest specimen of the genus to bloom here, has not before been so thickly covered with its white flowers. It is a compact, round-headed bush, and in the autumn the leaves turn bright scarlet. This is a popular plant in Japan and may be often seen in Japanese gardens cut into a round ball. The Arboretum plant has never produced seeds, and this species has remained extremely rare in this country.

Acer griseum, one of Wilson's discoveries in western China, is in bloom on Bussey Hill for the first time in the Arboretum. It is a small tree distinct in the orange color of the trunk and branches, the three-foliolate leaves and large yellow flowers in drooping few-flowered clusters. The male and female flowers are produced on different plants, and the tree on Bussey Hill is a male. This handsome tree is not common and the Arboretum will be glad to obtain fertile seeds of it.

American Crabapples. Following the last of the eastern Asiatic Crabapples the American species begin to flower. Nine species are now recognized, with several varieties and two hybrids. They have white or pink fragrant flowers which do not open until the leaves are partly or nearly grown, and green or pale yellow fragrant fruit which hangs

on the slender stems and, with the exception of that of the species of the northwestern part of the country and its hybrid, is depressed-globose, usually broader than high, from an inch to an inch and a half in diameter and covered with a waxy exudation. All the species spread into thickets and are excellent plants for the decoration of wood borders and glades. *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 bloom here. This is a shrub usually rather than a tree, not more than fifteen feet high, with stems four or five inches in diameter. The pale yellow fruit is often an inch and a half in diameter. This is a common plant in western New York, western Pennsylvania, southern Ontario and in Ohio, and occurs southward on the mountains to northern Alabama. *Malus ioensis* opens its flowers several days later than *M. glaucescens*. It is the common Crabapple of the northern middle western states and in a number of varieties has a wide range south 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. A form of this tree with double flowers (var. *plena*), the Bechtel Crab, named for the man who found it growing in the woods in one of the western states, has pale rose-colored flowers which look like small Roses. When in flower this is one of the popular trees in the Arboretum. This double-flowered Crab can now be found in many American nurseries, but these nursery trees are usually short-lived because the common orchard Apple on which they are generally grafted does not suit them as stock. Persons buying the Bechtel Crab should insist that it be grafted on one of the American Crabapples, 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. A form with long acuminate leaves (var. *elongata*) which sometimes forms dense thickets, grows in western New York to Ohio and on the southern Appalachian Mountains. A double-flowered form of *M. coronaria* has been found growing in the woods near Waukegan, Illinois, and is called var. *Charlottae* or the Charlotte Crab. The flowers are larger and whiter than those of the Bechtel Crab, and there is no reason why this should not become as great or a greater garden favorite than the Bechtel Crab. *M. platycarpa* has fruit broader than high and 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 in diameter with a glabrous pedicel and calyx, but in the variety *Hoopesii* with a pubescent calyx. There is a large tree of this variety in the 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. *M. fusca*, the only native Apple-tree of the Pacific states, where it ranges from Alaska to central California, is an interesting tree. This differs from the other American Crabapples in its short-oblong, yellow-green flushed with red or nearly entirely red fruit from half an inch to three-quarter-

ters of an inch long and without the waxy exudation which is peculiar to the eastern American species. The calyx of the flower, unlike that of the eastern species but like that of many Asiatic species, falls from the partly grown fruit. *M. angustifolia* is the last Crabapple in the Arboretum to flower. It is a tree sometimes thirty feet tall with a trunk eight inches in diameter, wide-spreading branches and bright pink exceedingly fragrant flowers. From the other species it differs in the slightly lobed or serrate leaves on the ends of vigorous shoots, and in the rounded apex of the leaves on the flower-bearing branchlets. It 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 seeds gathered in northern Florida are perfectly hardy in the Arboretum where they bloom every year and have proved to be handsome and valuable additions to the collection. The other American species, *M. glabrata* of the high mountains of North Carolina, *M. lancifolia*, widely distributed from Pennsylvania to Missouri and western North Carolina, and *M. bracteata*, a common species from Missouri to Florida, with many of the varieties of *M. ioensis*, are now established in the Arboretum. *M. Soulardii*, which is believed to be a natural hybrid between *M. ioensis* and some form of the orchard Apple (*M. pumila*) is a widely distributed and not rare tree in the middle west, and is one of the attractive plants in the Crabapple Collection at the eastern base of Peter's Hill. It is a curious fact that this hybrid flowers in the Arboretum fully two weeks earlier than either of its supposed parents. Several varieties of Soulard's Crabs are distinguished by western pomologists. *Malus Dawsoniana* is a hybrid of the western *M. fusca* and the common Apple which appeared in the Arboretum many years ago from seeds collected in Oregon. It has grown here to more than double the size of *M. fusca* with 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 and the flowers are rather larger. This hybrid blooms at about the same time as *M. ioensis* and a few days earlier than *M. fusca*.

The Chinese Redbud, *Cercis chinensis*, a native of western China and growing on the Centre Street Path, has never before been so beautiful. Although it is only a shrub, the flowers are larger and of a better color than those of the American species, and this little Redbud is certainly one of the most beautiful of early-flowering shrubs. Unfortunately the flower-buds are sometimes killed here in cold winters.

Also in bloom are *Cytisus Beanii*, *C. elongata* and *C. glabrescens*, *Vaccinium corymbosum*, *Viburnum bitchiuense*, *Diervilla florida venusta*, *Eoichorda Giralddi Wilsonii*, and the first of the Hawthorns, *Crataegus arnoldiana*.

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Lilacs. Judging by the number of persons who visit the Arboretum when the Lilacs are in bloom, these are still more popular than any other group of shrubs here. The Lilac for the general public means the varieties of *Syringa vulgaris* which reached England from Constantinople in 1597. When it was first brought to the United States is unfortunately not known, and the earliest mention of it in American literature is the fact that it was sent by the Quaker Peter Collinson to John Bartram in Philadelphia in 1735. Washington, who probably obtained his plants from Bartram, planted it at Mount Vernon as early as 1785 and the descendants from these plants are still growing there, although Virginia is too far south for this shrub to really succeed there. There are plants on Bussey Hill in the Arboretum planted along one of the garden walks probably more than one hundred years ago. These plants flower well and are interesting as they represent the Lilac of old gardens as our ancestors enjoyed them before they were changed and sometimes improved by selection and hybridization by skilful gardeners in Europe and the United States. Until a few years ago it was believed that *Syringa vulgaris* was a native of western Asia but it has now been discovered growing apparently as a wild plant on the high mountains of Bulgaria. Plants raised from seeds collected in Bulgaria from these wild plants are growing in the Arboretum collection. The common Lilac is a cold country plant, and judging by the growth here the climate of Massachusetts even is not cold enough for them. Better plants can be seen in old gardens near Portsmouth, New Hampshire, than can be found near Boston, and the largest plants known to the Arboretum were growing a few years ago on

an island in Lake Superior where there were tree-like specimens thirty to forty feet high and nearly as much through their round-topped heads. Of the important varieties there are now two hundred named sorts in the Arboretum, a few of which have not flowered here yet. There are probably a larger number of these named varieties in the municipal parks of Rochester, New York, where a great deal of attention has been paid to the Lilac Collection. Many of these named varieties can hardly be distinguished from each other as they resemble each other too closely, and a selection of twenty or twenty-five varieties is all that is needed in any private collection to include everything that is best among these plants, both those with single and double, purple, red and white flowers. The Arboretum used to publish a list of the varieties which were considered here the most beautiful, but this plan is now given up for the selection of these plants depends on individual taste. They are all hardy, all have practically the same habit and foliage, and only differ in their flowers. 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 good stock for 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 recommended by many good growers of Lilacs but others still believe that the best plants are raised from cuttings which can be made from hard wood but better 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.

Syringa persica. 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 laciniately lobed leaves. For many years it was universally believed that because Linnæus 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. *Syringa Josikaea*, the second of the European Lilacs to reach American gardens is this Hun-

garian species which often does not bloom here until after the middle of June.

Syringa oblata was the first Lilac from eastern China to reach England where it was sent some sixty years ago by Robert Fortune who had found it in a Shanghai garden. It reached the United State certainly as early as 1869 and perhaps earlier. It is a round-topped shrub with 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. This plant has not been found growing wild and there is no record that it has been seen by anyone in China since Fortune's time. It is probably a garden form of *S. affinis*, a white-flowered form commonly planted and probably the only Lilac in the gardens of Peking. Another form probably of *S. oblata* is the purple-flowered plant from northern China usually called the variety *Giraldii* of *S. affinis*. The Korean *S. dilatata* is probably also only a wild form of *S. oblata*. The two best known of the Lilacs of eastern Asia, *S. pubescens* and *S. villosa*, were raised here from seeds sent in 1883 by Dr. Bretschneider of the Russian Legation in Peking. *S. pubescens* is a tall shrub with erect stems, small leaves and broad clusters of small pale mauve flowers with a long slender corolla tube. For the fragrance of the flowers, which is more pungent and delightful than that of any other Lilac, *S. pubescens* should find a place in every northern garden. The plants in the United States have failed to produce seeds, and as this species is unusually difficult to increase by cuttings it has remained one of the rarest Lilacs in American gardens. *S. villosa* 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, and broad or narrow clusters of flesh-colored or nearly white flowers which have a rather disagreeable odor like those of the Privet. In spite of this drawback *S. villosa* is a valuable plant; its habit is excellent, it flowers freely every year, and the flowers do not open until most of those of the other Lilacs have faded. Of the new Lilacs from western China and Korea raised from seeds collected by Wilson and other travelers the most promising are *S. Meyeri*, *S. microphylla*, *S. Julianae*, *S. tomentella*, *S. reflexa*, *S. Komarovii*, *S. Sweginzowii* and *S. dilatata*.

Hybrid Lilacs. The first hybrid Lilac appeared in the Botanic Garden in Rouen in 1810 and was the result of crossing *S. vulgaris* and *S. persica*. It is one of the most delightful of all Lilacs and grows into a bush ten or twelve feet high and broad and of rather open habit. It is very hardy and blooms freely every year, and should be in every garden where Lilacs are grown. Its flowers resemble those of the Persian Lilac and are produced in massive clusters sometimes two feet in length, and are so heavy that the slender branches can hardly support them. There are forms with darker red flowers and with nearly white flowers. Through a misunderstanding of its origin this plant unfortunately must be called *S. chinensis*.

The next hybrid Lilac to appear was *S. hyacinthiflora* which is the result of crossing *S. oblata* with *S. vulgaris coerulea plena*. It is a large, round-topped shrub of excellent habit, with leaves resembling in shape those of *S. oblata*, and small clusters of semi-double, extremely

fragrant flowers. It blooms earlier than any of the forms of *S. vulgaris* but has little to recommend it as a garden plant.

The general name of *Syringa Henryi* has been given to a group of hybrid Lilacs between *S. Josikaea* and *S. villosa* which was obtained in Paris. The handsomest of this breed, *S. Lutèce*, is a valuable addition to the late-flowing Lilacs. Another interesting hybrid was obtained by Lemoine by crossing *S. vulgaris* with the variety of *S. affinis* with fragrant violet-colored flowers (var. *Giraldii*). The plants grow rapidly and are tall narrow shrubs. Like their Chinese parent they bloom early and the flowers are fragrant. Forms of this hybrid, *Berryer*, *Claude Bernard*, *Lamartine*, *Mirabeau*, *Pascale* and *Vauban* are in the Arboretum Collection.

A lover of Lilacs living in Manitoba has recently obtained a hybrid of *S. pubescens* and *S. villosa* which promises to be interesting, and there is still much work to be done in raising new hybrids between the species of western China.

Rhododendron (Azalea) obtusum var. **Kaempferi** is the only red-flowered Azalea which is hardy in this climate. It has been largely used in the Arboretum and is now flowering at least two weeks earlier than usual. Its flowers furnish the most surprising and spectacular display of the year. They are delicate, however, and when fully exposed to the sun lose their color; and this Azalea gives most satisfaction when it is planted in the shade of trees or on the northern border of a wood of conifers. It is planted in masses at the lower end of Azalea Path and in a large group under the shade of the Hemlocks on Hemlock Hill and on the northern edge of Hemlock Hill in a long narrow band between the Hemlocks and the Laurels. The tallest plants in the Arboretum are now more than ten feet high and rarely fail to flower profusely even when growing in complete shade. This is one of the best shrubs which has been introduced by the Arboretum.

Rhododendron (Azalea) Vaseyi from the southern Appalachian Mountains is flowering profusely this year. The pure pink flowers appear on the leafless branchlets and in delicacy and purity of color are not surpassed by the flowers of any other plant. It is only in comparatively recent years that this Azalea has been known to botanists or has found its way into gardens. It is perfectly hardy, the flower-buds are not injured by severe cold, and in time it will grow into a tall, usually rather narrow shrub. This beautiful Azalea has been planted on both sides of the Meadow Road, the largest group being at the northern end of the first pond.

Rhododendron (Azalea) luteum, a native of the Caucasus, has bloomed in the Arboretum several times and, although the buds are often injured, is in good condition this year. It is growing on the right hand side of Azalea Path below the plant of *Rhododendron (Azalea) reticulatum*. If the flower-buds of this Caucasian plant were hardier this would be one of the most delightful of all Azaleas as the flowers are charming in color and more fragrant than those of any other Azalea.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

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Hawthorns. The genus *Crataegus* is widely distributed through the northern hemisphere, being found in the three northern continents. In Europe it extends with a few species from the Atlantic coast into western Asia; it is rare but widely distributed with not more than six species in eastern Asia, with two in Japan, and in North America is found its greatest number of forms and widest distribution.

American Hawthorns. In 1894, when the fourth volume of Sargent's "Silva of North America" was published, fourteen species of *Crataegus* were recognized, one of these being a small shrub. Five years later a more systematic study of the genus in this country was undertaken, and more than a thousand species with several varieties have now been described. In North America Hawthorns are distributed from Newfoundland and northern Quebec to northern Florida and northern Mexico, and from the Atlantic to the Pacific. The genus is much more abundant in species east of the eastern borders of the great plains than in the Rocky Mountain and Pacific regions where they range northward into British Columbia and southward into northern California. So far as is now known the species are most abundant in the valleys of the streams which flow from the north and south into Lake Erie, and in the region which extends from southern Missouri to the valley of the Red River in Arkansas. New York and Pennsylvania are rich in species, and southward along the Appalachian Mountains, and in the southeastern states the species are not rare. They have now been arranged in twenty-two groups distinguished by the shape and character of the leaves, the size of the flowers and the size and shape of

the fruit. It is interesting that while some species of these groups are widely and generally distributed those of others are chiefly confined to particular sections of the country, as the *Flavae* to the southeastern states, the *Douglasianae* to the northwest, and the *Tenuifoliae* to the middle and northeastern states. The *Macracanthae*, which is one of the common northern groups with many large trees, is extremely rare in the southern states and in Arkansas and eastern Texas is represented by only a few small shrubs. The *Intricatae*, composed mostly of small shrubs, has its greatest number of species in Pennsylvania and adjacent states but is extremely rare in the Mississippi valley and westward is unknown. The characters and history of this Group are interesting. It is distinguished by leaves usually cuneate at the base, large flowers in few-flowered clusters with ten or twenty stamens, and yellow, rose-colored or red anthers with conspicuously glandular bracts and bractlets and subglobose, short-oblong or pear-shaped, red, orange, greenish or bright yellow fruit. A few Appalachian trees are now placed in this Group but the rest are small shrubs. This is one of the largest groups with no less than eighty-two species; thirty-two of these have been recognized in Pennsylvania and seven in New York. The Group is represented in western New England and in Michigan by several species, and only a few species have been found in the Missouri-Arkansas region. Birmingham, Alabama, is the most southern station where a member of this Group has been found. In spite of their abundance and well-marked characters these plants were entirely overlooked by the older American botanists who did not preserve specimens of any of the species in their herbaria, and it was not until 1894 that a Dane described the first species, *C. intricata*, from a plant cultivated in the Copenhagen Botanic Garden. The small size of the plants, their large and handsome flowers and conspicuous fruits make these little Thorns valuable garden plants. The *C. Macracanthae*, of which *C. tomentosa* of Linnaeus is the type is an interesting group because it differs from all the other forms of *Crataegus* in the deep pit on each side of the inner surface of the seeds. They are all large and handsome trees. The species in the different groups are chiefly distinguished by the number of stamens, which varies from twenty to twenty-five, and the color of the anthers which is red in some species and yellow or nearly white in others, in the shape of the leaves, the time of flowering, the size, color and shape of the fruit which is usually red but occasionally yellow or orange color. In a well known species, *C. punctata*, the anthers and the fruit are red, but in one form the anthers and the fruit are yellow. This is the only species in which such variation has been noticed. There are now probably about five hundred American species growing in the Arboretum and it is of course impossible to call attention to all of them in one of these Bulletins. They can all be seen on the eastern slope of Peter's Hill as well as in other parts of the Arboretum, and species will be blooming here for at least two months more. *Crataegus arnoldiana* is the first species to flower in the spring and the flowers are already fading. This tree was discovered growing naturally in the Arboretum; it grows also on the banks of the Mystic River in Medford, Massachusetts, and near New London, Connecticut. It belongs to the Molles Group which are trees of which a number of species have been distinguished by their large size, large

early flowers which usually open before the unfolding of the leaves, and by the large, often edible, red or rarely yellow fruits. The species are found from the valley of the St. Lawrence River in the Province of Quebec to Texas but are most numerous in the region west of the Mississippi River, and are almost entirely wanting in the southeastern states. They all have large handsome fruit and that of *C. arnoldiana* ripens in August while that of some of the other species remains on the branches until late in the autumn. The two species of western Europe, *Crataegus oxyantha* and *C. monogyna*, and many of their varieties, are established in the Arboretum. These are the only foreign species ever naturalized in North America where they are now abundant in some parts of Nova Scotia. Forms of these species occur with red and with pink flowers and with double flowers.

Early Roses. Four species of Asiatic Roses have been the first to flower in the Arboretum this year, *Rosa Ecae*, *R. Hugonis*, *R. omeiensis* and *R. koreana*. *R. Ecae*, still rare in gardens, a native of Afghanistan and Turkestan, is a tall, perfectly hardy, fast-growing shrub with pale yellow flowers about an inch in diameter; they are paler in color and slightly smaller than those of *R. Hugonis*, but it is a more vigorous and satisfactory plant and the fragrance of the leaves adds to its value. It has never before been as full of flowers as it is this year, and this week it is one of the handsomest plants in the Arboretum. *R. omeiensis*, which is common on the mountains of western China and is named for Mt. Omei, one of the sacred mountains of the Empire, is a hardy, fast-growing shrub with erect stems covered with prickles. In its native country this Rose sometimes grows to the height of twenty-five feet and a good hedge might be made with it for New England gardens. *R. koreana* is flowering this year only for the second time in cultivation and it is a perfectly hardy little plant with white flowers not more than the size of a ten-cent piece. The handsomest of the so-called Scotch Roses (*Rosa spinosissima*), the variety *altaica*, with petals fringed with yellow toward the base, is just beginning to open its flower-buds. Like the other forms of *S. spinosissima* it has stems covered with prickles, rather small leaves and comparatively large black shining fruits.

Early Flowering Rhododendrons. One of the best Rhododendrons for New England is *Rhododendron carolinianum*, a native of high altitudes among the Appalachian Mountains of North Carolina. It is a low, compact shrub with pale rosy purple flowers. First described as a species in 1912 by Rehder (*Rhodora* xiv. 97), it has only recently become common in American gardens through the agency of the Kelsey nursery. It was introduced, however, into England more than a century ago, as a figure of it was published in 1915 in the *Botanical Register* as a variety of *R. punctatum*. There are small plants of a white-flowered variety of *R. carolinianum* in the Arboretum collection. *R. caucasicum* is unfortunately not in the Arboretum except in the form of small seedlings, but some of its varieties are hardy and beautiful plants of dense habit with dark green leaves and handsome and usually abundant white flowers slightly tinged with pink or rose color. There is much confusion in regard to the history of these plants and their

breeding. The best of them here are called Boule de Neige, Mont Blanc, and Coriaceum. Boule de Neige has white flowers faintly tinged with pink when they first open and is one of the best Rhododendrons that can be planted in New England. The Arboretum will be glad of information about its history. Mont Blanc has deep rose colored flower-buds and flowers which soon become pure white; this is a taller and not as wide-spreading a plant as Boule de Neige. *R. coriaceum* has been in the Arboretum for many years and, although it flowers a week or two later than the plants already mentioned, it appears to be of Caucasian blood. Very beautiful this spring is a plant with large pink flowers which came to the Arboretum in November, 1898, as *Rhododendron Smirnowii*, No. 16. As it is flowering this year it is one of the handsomest Rhododendrons which has ever been planted in the Arboretum, but unfortunately the flower-buds have been often injured in other winters.

Bush Honeysuckles. Many of the Bush Honeysuckles are again covered with their fragrant flowers. No shrubs, not even the Lilacs, are more valuable garden plants in regions of extreme cold. They are very hardy; they flower freely every year, and many of the species and hybrids are covered with scarlet, yellow or blue fruit. To obtain the greatest beauty they must be planted in good soil with sufficient space between them for their free growth. An example of well grown Bush Honeysuckle can be seen on the right hand side of the Bussey Hill Road opposite the Lilacs where there are several large plants. There is a collection of smaller plants in the Shrub Collection, and a supplementary collection along the grass path in the rear of the Linden Collection on the Meadow Road, and another on the slope between the Meadow Road and Bussey Hill Road, nearly opposite the entrance of the Shrub Collection. Attention is called again to *Lonicera Morrowii* because the plant usually sold in American nurseries under that name is a hybrid of that species with the Tartarian Honeysuckle, and of little value for those who want a plant of the peculiar habit of *L. Morrowii*. This species is a native of northern Japan and eastern Siberia, and one of the handsomest of the Bush Honeysuckles. It is a comparatively low round-headed shrub with lower branches which cling close to the ground and spread over an area much broader than the height of the plant. The leaves are gray-green, and the flowers are large, pale yellow or white. The fruit, which remains a long time on the branches, is red and lustrous. It was introduced into the United States by the Arboretum many years ago, and at one time was largely planted in the Boston parks where can still be seen some large specimens. Attention is also called to the forms of the Tartarian Honeysuckle with white, pink, and rose-colored flowers, and to *L. minutiflora*, *L. muscaviensis*, *L. Xylosteum*, *L. orientalis*, *L. chrysantha*, one of the earliest to bloom, *L. bella*, *L. notha*, and *L. microphylla*. The last is an attractive little shrub from central Asia. The pale canary yellow flowers are longer than the small pale blue leaves and stand up well above them. The bright red long-stalked fruit of this shrub is also attractive.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



BULLETIN
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Horsechestnuts and Buckeyes. These are the English names of the species of the genus *Aesculus* which are widely distributed in the northern hemisphere, with one species in southeastern Europe, two in northern India, two in China, one in Japan, one in southern California, and seven with numerous varieties and hybrids in the southeastern United States. The Arboretum Collection is a good one but the Indian, one of the Chinese, the Californian, and one of the eastern North American species have not proved hardy here. It is arranged on the valley road beyond the Lindens, and many of the plants are now in flower. Horsechestnuts and Buckeyes differ in the presence of a resinous covering on the winter buds of the Old World and Californian species (Horsechestnuts) and in its absence from those of the other American species (Buckeyes). The European species (*Aesculus Hippocastanum*), a native of the mountains of Greece, is when in flower one of the most splendid trees which can be grown in the northern states when it can be planted in deep, rich, damp but well drained soil remote from the dust and dirt of large cities. This tree was first cultivated in England in 1633, having probably been sent there from Constantinople. The first knowledge we have of it in the United States was on April 18, 1746, when seeds were received by John Bartram of Philadelphia. There is now no evidence that it was planted at Mt. Vernon by Washington, who was a constant visitor at Bartram's garden, and the Arboretum does not know of any very large or old trees in the neighborhood of Philadelphia or New York. The handsomest Grecian Horsechestnut seen in the United States by officers of the Arboretum is in a garden in Salem, Massachusetts. This tree was planted one

hundred and ten years ago and is now seventy feet high with a trunk ten feet in girth and a perfectly shaped head eighty feet across. There are several varieties of the Grecian Horsechestnut in cultivation but none of them grow to such a large size or are as handsome in habit or in their flowers as the original tree. The double flowers of one of these abnormal varieties, however, have the advantage of lasting longer on the tree before fading. Among the red- and pink-flowered Horsechestnut trees, hybrids of *A. Hippocastanum* and a red-flowered American Buckeye, probably *A. Pavia*, are often handsome trees. The best known of these hybrids, *A. carnea*, which originated a good many years ago in Europe, is now a common tree in the suburbs of Boston. More conspicuous is a form of that tree with deep red flowers known in nurseries as *Aesculus Briottii* which was first raised in France. The trees in the Arboretum of this variety are now full of flowers.

Aesculus turbinata, the Japanese Horsechestnut, first introduced into the Arboretum in 1881, is in Japan a magnificent tree, often growing to the height of eighty or ninety feet and forming a tall trunk occasionally seven feet in diameter. Like the European Horsechestnut, the leaves are composed of seven leaflets but these are thinner and more lustrous and the leaf-stalks are longer. The Japanese tree in summer therefore appears less dark and massive than the Grecian species. The flower-clusters are narrower and the flowers, which are white with scarlet marking at the base of the petals, are handsomer. *Aesculus turbinata*, which grows to its largest size in central and northern Japan, is hardy in New England.

Eastern American Horsechestnuts and their hybrids are interesting trees but have none of the splendor when in flower which gives so great value to the European species and some of its hybrids. The largest American specimens in the Arboretum are two trees of the Ohio Buckeye (*A. glabra*) close to the left hand side of the South Street entrance. These are among the oldest trees planted in the Arboretum as they were raised from seeds gathered in Ohio in 1873. Several of the self-sown seedlings of these trees are now flowering in the general collection on the right hand side of the Meadow Road. The var. *Buckleyi* of *A. glabra* is the first of the Buckeyes to bloom in the Arboretum. This is a rare tree most abundant in Jackson County, Missouri, and is distinguished by the seven instead of the five leaflets. A little later to flower than the typical plant is the variety *leucodermis*, distinguished by its smooth pale bark and glabrous leaves pale green or glaucescent below. This is the common form in southern Missouri, Arkansas and probably Oklahoma. A related species, *A. arguta*, is now covered with its yellow flowers; this is a small narrow shrub tree-like in habit but only a few feet tall which has been found in west central Oklahoma and in a few places in northern and central Texas. This should prove an excellent May and June flowering shrub for small gardens. *Aesculus georgiana* is covered again with its compact clusters of large red and yellow flowers, and is certainly one of the best of the plants which have been brought into our gardens in recent years by the Arboretum. When first discovered it was believed to be confined

to the neighborhood of Stone Mountain in central Georgia and always to be shrubby in habit. It is now known to range northward in the Piedmont region of North Carolina and to grow into a small tree, and the oldest plants in the Arboretum are beginning to assume a treelike habit. *Aesculus discolor* var. *mollis* is also well covered with flowers. The type of this species has red and yellow flowers, but in the variety *mollis*, which is the only form in the Arboretum, the whole flower is bright scarlet. It is a common plant from northern Georgia to central Alabama, and westward to the valley of the Guadalupe River in Texas, ranging west of the Mississippi River northward to southeastern Missouri, and appearing in southwestern Tennessee. In the southern states no other plant is more brilliantly conspicuous, and its unexpected hardness in New England is an important discovery. *A. Harbisonii*, which is a hybrid of *A. discolor* var. *mollis* and *A. georgiana*, is the last of the Buckeyes, with the exception of *A. parviflora*, to bloom in the Arboretum and probably will not open its flowers for a couple of weeks. It is a shrub with broad clusters of large flowers each with a rose-colored calyx and canary yellow petals tinged with rose toward the margin. Still extremely rare, it deserves to be better known. *Aesculus woerlitzensis* is a plant of doubtful origin with red and yellow flowers, of which there are a number of handsome young specimens in the collection. It came originally from Europe and it is not certain whether it is a hybrid or a species. Where it grows naturally, if it is a species, is still unknown. Perhaps the handsomest of the hybrid Buckeyes raised in Europe is one to which the name of *A. mutabilis penduliflora* has been given. This is a shapely young tree with narrow leaflets and drooping red and yellow flowers which was presented in 1902 to the Arboretum by the Späth Nursery in Berlin. It is considered to be a hybrid of *A. discolor mollis* and *A. neglecta*, another hybrid.

American deciduous-leaved Magnolias. Several of these trees are in bloom in the group on the right hand side of the Jamaica Plain entrance. Unlike most of the Asiatic species, American Magnolias flower after the appearance of the leaves; they are hardy and handsome trees. One hundred and fifty years ago letters of English plant lovers written to their American correspondents contained many appeals for Magnolia plants and seeds, and one hundred years ago these trees were to be found in the principal collections of plants in the middle states. They are scarcely known to the present generation, and it is only in a few American nurseries that an occasional plant of one of the species can be found. There are six of these Magnolias but one of them, *M. pyramidata*, grows only in the extreme southeastern corner of Alabama and adjacent Florida and would not be hardy here. Of the other species the so-called Mountain Magnolia, *M. Fraseri*, is the first to open its flowers in the Arboretum. It is a small tree rarely more than forty feet high, with an open head of long branches, leaves often a foot in length and deeply divided at the base, and creamy white, sweet-scented flowers eight or ten inches in diameter and very conspicuous as they stand well above the crowded leaves at the end of the branches. This tree is a native of the southern Appalachian region, and is perfectly hardy in eastern Massachusetts. The next to flower is *M. cor-*

data which for several days has been covered with cup-shaped, bright canary yellow flowers unlike in color those of any other *Magnolia*. This tree was discovered by the French botanist and traveler Michaux on one of his journeys from Charleston, South Carolina, up the valley of the Savannah River and was introduced in French gardens by him. For more than a century every attempt to rediscover this tree failed, and it is only within the last ten years that it was found by the Berckmans brothers growing in the woods not many miles distant from Augusta, Georgia, where plants only a few feet high flower profusely. Grafts from Michaux's trees preserved this species in cultivation, and the large plants in the Arboretum were raised from grafts taken from old trees in the Harvard Botanic Garden for which they were imported from Europe when the Garden was laid out, that is more than a century ago. With these species bloom the Umbrella-tree, *M. tripetala*, a bushy tree thirty to forty feet high with large pure white flowers, widely distributed in the Appalachian Mountain region, but nowhere very abundant, from the valley of the Susquehanna River in Pennsylvania to southern Alabama, middle Kentucky and Tennessee, growing westward to southwestern Arkansas and southeastern Oklahoma; and the Cucumber-tree, *M. acuminata*, the tallest of the American *Magnolias*, sometimes ninety feet high, with green or greenish yellow flowers covered with a glaucous bloom. This fine tree is a native of mountain slopes and rocky banks of streams from southern Ontario and western New York, to Ohio, Indiana, and Illinois and along the Appalachian Mountains to northern Georgia and to central Kentucky and Tennessee, northern Alabama, Mississippi and Louisiana. It is the largest and most widely distributed of the American *Magnolias*, and grows to its largest size at the base of the high mountains of the Carolinas and Tennessee. Later *Magnolia macrophylla* and *M. virginiana* will bloom. The first has the largest leaves and the largest flowers of any North American tree, and the latter, which is perhaps the most attractive of the group, has the smallest flowers. The size, however, is made up by their delightful fragrance and by the beautiful leaves lustrous above and silvery white below which remain late on the branches. As they flower attention will be called later to these two species.

The Way to grow Wisterias. Wisterias which do not climb naturally are usually supported on trellises or grown on rods or frames attached to buildings. This means that they have to be more or less pruned every year and in this way lose much of their flowering wood and often have a stiff and unnatural appearance. How to grow them naturally can be seen from a plant of the white Japanese Wisteria growing close to the Centre Street gate of the Arboretum. This was planted many years ago in what was then a nursery and has been allowed to grow naturally over some tall bushes close to the drive into the Arboretum; it now extends over a large area and this year, as in many past seasons, the whole plant is loaded down with its long racemes of flowers. It is now one of the most beautiful and interesting objects in the Arboretum, and well worth the attention of all persons who like to see plants growing naturally and as they grow in their native countries as wild plants.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



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Evergreen Rhododendrons. Only a comparatively few of these plants can be cultivated in New England. Three species of eastern North America are hardy here, as are *Rhododendron Smirnowii* of the Caucasus, and hybrids of still uncertain origin of *R. caucasicum* of the same region. In southwestern China is found the greatest number of these plants, and hundreds of new species have been discovered there in recent years and introduced into England where many of them have already flowered in Cornwall, a region particularly well suited to the growth of these evergreens. Unfortunately only one Chinese species, *R. micranthum*, from northern and western China, which has little to recommend it as a garden plant, is hardy in the Arboretum. Most persons in this part of the country who think and talk about Rhododendrons have in mind the hybrids raised in England in great variety between the eastern American *R. catawbiense* and primarily one of the Himalayan species, *R. arborescens*. There are hundreds of these Rhododendrons with beautiful foliage and flowers varying from deep red to pink, rose-color, dark purple and white. They are usually grafted on *R. ponticum*, a tender plant which appears to affect the hardiness of these hybrids. The first Anthony Waterer of the Knaphill Nursery at Woking in Surrey, from whom most of the large collections of these hybrids have been obtained in this country, used to propagate his best varieties by layers. Such plants have proved hardier and longer lived than the plants grafted on *R. ponticum* stock. Among the handsomest and hardiest of the Waterer Rhododendrons may be mentioned *Atrosanguineum*, Charles Dickens, Mrs. C. S. Sargent, Henrietta Sargent, *Catawbiense album*, *Album elegans*, *Roseum elegans*, H. W. Sargent,

Discolor, Melton, Album grandiflorum, Purpureum elegans and Lady Armstrong. In November, 1908, the Arboretum received from T. J. Seidel, in whose nursery near Dresden is one of the greatest collections of hardy Rhododendrons, a number of his catawbiense hybrids. Seidel uses as stock for his hybrids one of the hybrids of *R. caucasicum* called Cunningham's White, which was raised about 1830 by James Cunningham in his nursery near Edinburgh by crossing *R. caucasicum* with *R. ponticum* it is said. This makes a hardier stock than *R. ponticum* and is easily and cheaply propagated from cuttings. The plants on this stock are dwarfer than those which have been raised in England and appear to be generally hardier. In the Seidel collection in the Arboretum are the following named varieties: Adalbert, Adam, Alarich, Albert, Annedore, Anton, Arno, Attila, August, Bella, Bismarck, Callope, Daisy, Desiderius, Diana, Donar, Echse, Eli, Eva, Fee and Viola. There is much difficulty in this country with the cultivation of both the English and German hybrid Rhododendrons. The leaves suffer seriously from the attacks of the lace-wing fly and to destroy this it is necessary to spray the plants two or three times during the year. The plants require a deep mulch in winter, and some of the varieties planted in exposed situations are better for a winter covering of evergreen branches. It is no longer possible under the Federal laws to import these plants with soil at their roots and American nurserymen who may still have a few plants ask such exorbitant prices for them that it is foolish to buy them. In the future perhaps some American nurserymen will take up the propagation of these hybrids on stock of Cunningham's White or some other of the Caucasian hybrids, but until this is done the cultivation of plants established in this country or of new collections of these plants is not promising.

Rhododendron Smirnowii. This is a plant from which a great deal can be expected here. It has been growing in the Arboretum for several years and has not suffered from cold or drought. When the plant is fully exposed to the sun the leaves often droop and their edges in-fold, and it does better in partial shade. The leaves are pale grayish green above and below are thickly covered with pale felt which successfully protects them from the attacks of the lace-wing fly. The flowers are of good size and of pleasant shades of pink or rosy pink, and are borne in large clusters. As compared with the dark green leaves of *R. catawbiense* and its hybrids those of this plant are less attractive, but the flowers are beautiful in color and are equally large. Several hybrids of *R. Smirnowii* and hybrids of *R. catawbiense* have been raised in Europe and there are a few of these in the Arboretum collection. They have proved to be good garden plants here, flowering earlier than *R. Smirnowii* and producing larger pink flowers. They have never been injured in the Arboretum, but as there is only a trace of the felt left on their leaves they will probably suffer from the lace-wing fly. *R. Smirnowii* is now at its best. The flowers of *R. catawbiense* and many of its hybrids are opening, but the flowers of *R. carolinianum* have already faded and those of *R. maximum* will not be out for another fortnight. The Rhododendron Collection is planted at the eastern base of Hemlock Hill and extends along the Bussey Brook to the corner of Bussey Street. The southern end of the collection is

close to the South Street entrance to the Arboretum and is within a short walk of the Forest Hills Station.

Azaleas, which all botanists call *Rhododendrons* now, are still conspicuous features in the Arboretum. As the flowers of *R. roseum* and *R. nudiflorum* begin to fade those of *R. calendulacea* have already opened their orange, yellow or reddish flowers. This shrub is an inhabitant of the mountain regions from southern New York to Georgia, and is often extremely abundant in North Carolina and Tennessee. In flower it is the most showy of the American Azaleas in the Arboretum and one of the most beautiful of all flowering shrubs. This plant has already been largely planted on the southern slope of Bussey Hill, and it is proposed to make it a special feature of the Arboretum. The conspicuous flowers of different shades of red of the Japanese *R. Kaempferi*, which has never bloomed more profusely in the Arboretum than it has this year, are beginning to fade and are followed by those of another Japanese species, *R. japonicum*. Although the flowers of this species are less brilliant than those of the better known *R. Kaempferi*, it is probably the handsomest of the Japanese Azaleas. The flowers are flame color and are more than three inches in diameter. As it grows here this Azalea is a round-topped, rather compact hardy shrub blooming freely every year. There is a bright yellow variety (var. *aureum*) which is also in the collection. *R. japonicum* was raised at the Arboretum from seeds collected in Japan by Professor Sargent in 1892 and has been growing here as long as *R. Kaempferi*. Long confused with the hybrid *Azalea mollis* of gardens, less attention has been paid to it, and it is only lately that its specific characters and value have been understood. One of the parents of the hybrid *A. mollis*, it is a handsomer, longer-lived and more satisfactory plant than that popular and well known Azalea which lives here only a short time. In gardens *R. japonicum* is still one of the rarest of all the hardy Azaleas. Many of the so-called Ghent Azaleas with yellow and different shades of red flowers are also in bloom. These are excellent plants raised by crossing in Europe many years ago various North American species with one of the yellow-flowered species, possibly *R. luteum* or *japonicum*. The origin of these plants, however, is very uncertain. They are among the best of the hardy garden Azaleas and are still occasionally met with in this country.

Arborescent Viburnums. Four Viburnums assume the habit of small trees in the Arboretum; three of these are eastern American, *V. prunifolium*, *V. Lentago*, *V. rufidulum*, and one is Japanese, *V. Sieboldii*. *V. prunifolium*, which is the first to bloom, is a tree often thirty feet high, with a short trunk usually less than a foot in diameter, rigid spreading branches beset with slender spine-like branchlets, thick, dark green, lustrous leaves which, handsome in summer, are splendid in the autumn with their dark red or scarlet colors. In the autumn the plants are conspicuous, too, from the 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. This plant 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 *V. Lentago*, the Sheepberry or Nannyberry a usually larger and for some persons a handsomer plant than the Black Haw. The flowers, which are arranged in larger and rather flatter clusters, are pale cream color and not white, and the fruit, which is as handsome as that of the Black Haw, is rather larger. The leaves, too, are larger and equally lustrous, and also assume brilliant autumn colors. At the end of May and early in June the Arboretum owes much of its beauty to the flowers of the Sheepberry which has been planted in large numbers along the drives and in the border plantations, and is now covered with flowers. *Viburnum Jackii*, which is 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 grown under the most favorable conditions it 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 hairs. The flowers are creamy white and the fruit is dark blue with a glaucous bloom. This *Viburnum* has been growing in sheltered positions in the Arboretum for several years and has flowered here several times. The Japanese *V. Sieboldii* under favorable conditions will grow to the height of twenty-five feet, although it is often a shrub in habit. For the decoration of American gardens this Japanese plant is inferior to either of the three American arborescent species.

Symplocos paniculata is the only representative of a family of plants which can be successfully grown in the Arboretum. It is a native of Japan and western China, and grows also on the Himalayas. The Arboretum plants are Japanese, and this form was introduced into the Parsons Nursery at Flushing, Long Island, at least fifty years ago. Although a distinct and beautiful plant, it appears to be still little known in gardens, and in England where it flowers freely it does not produce fruit. In this country it will not grow in soil impregnated with lime. In the Arboretum this *Symplocos* is a shrub from twelve to fifteen feet tall and broad, branched to the ground, with dark green leaves, axillary clusters of small white flowers which are followed in the autumn by beautiful blue fruit about a third of an inch in diameter. The unusual color of the fruit is probably its chief attraction. There is a plant in the Shrub Collection, but the three largest specimens are on the left hand side of the Bussey drive, just above the Lilacs, and in the grass border between the drive and the walk, and one of these plants is now more fully covered with flowers than any of them have ever been covered before.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JUNE 11, 1925

Laurels. The flowering of the Laurel (*Kalmia latifolia*) is the last of the great flower shows of the year in the Arboretum, and none of those which precede it are more beautiful, for the Mountain Laurel, or Calico Bush, as it is often called, is for many persons the most beautiful of all North American shrubs or small trees. It is certainly the most satisfactory of the broad-leaved evergreen plants which can be grown in this climate, for it is perfectly hardy, flowers freely every year, and the leaves are not injured by the lace-wing fly which is so destructive to those of most Rhododendrons. It is not perhaps strange that so little attention has been paid to this plant by American gardeners for those of 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 *K. latifolia* has not 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 Rhododendrons. 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, and a form with deep pink, nearly red flowers and rather darker leaves; and between these extremes there are others with flowers of all shades of pink, and one form with flowers distinctly marked by a chocolate band. There is a dwarf form with small leaves and small clusters of minute flowers, and there is one in which the corolla is deeply divided into narrow lobes. A form with broad handsome Rhododendron-like leaves, which rarely flowers, was

found a few years ago near Pomfret, Connecticut. These forms are all established in the general *Kalmia* Collection which is planted on both sides of Hemlock Hill Road at the northern base of Hemlock Hill. On the right hand side of this road are groups of the dwarf *Kalmia angustifolia*, the well-known Sheep Laurel of northern pastures with bright red flowers, and of *K. carolina* from southern swamps and woods from Virginia to South Carolina, with flowers very similar to those of the Sheep Laurel but with leaves pale pubescent on the lower surface. *K. polifolia*, a straggling shrub with leaves white glaucous beneath and rose-purple flowers, is also growing in the Arboretum but it is not a particularly satisfactory plant in cultivation.

Cornus kousa is a small tree which enlivens the forests of eastern Asia as *C. florida* enlivens those of eastern North America and *C. Nuttallii* those of western North America. The three species have the large white or creamy white bracts under the flower clusters which make the inflorescence so conspicuous but the Asiatic tree differs from the American trees by the union of the fruit into a globose fleshy head, while the fruits of the American trees are not united together. *C. kousa* is a small tree rarely exceeding twenty feet in height, and the floral bracts are narrower, more pointed and not as pure white as those of the American trees. It is valuable, however, because it flowers three or four weeks later than *C. florida*. *C. kousa* is a native of central Japan. It is now in flower on the right hand side of the Centre Street Path where the tree, raised from seeds produced in Mr. H. S. Hunnewell's garden in Wellesley, is now the best specimen in the Arboretum. A handsomer tree is the form var. *chinensis*, discovered by Wilson on the mountains of Hupeh in western China. The bracts under the flower clusters are broader than those of the Japanese form and overlap below the middle so that they form, like those of the American species, a cup at the end of a branch. The Chinese Flowering Dogwood is rare in cultivation, and the specimen among the Chinese plants on the southern base of Bussey Hill is probably the only large one in this country. For several years it has ripened a few seeds and it is not improbable that this year the seeds may be more numerous. It is an interesting fact that here in Massachusetts the Chinese and Japanese Flowering Dogwoods are hardier than the native species as *C. florida* loses many of its flower-bracts in severe winters and is often killed or severely injured here by the extreme cold.

Late-flowering Magnolias. The Sweet Bay, *Magnolia virginiana*, or as it is more often called *M. glauca*, opened its fragrant cup-shaped flowers several days ago and will continue to open them until midsummer. A plant for every garden, great or small, how often is the Sweet Bay found in those of modern construction? *M. macrophylla* flowers a few days later than *M. virginiana* and is the last of the American species to open its flowers here. It is a handsome tree with leaves silvery white on the lower surface and often thirty inches long and ten inches wide, and flowers a foot in diameter. A southern tree with its northern stations in the Piedmont region of North Carolina and in Kentucky, it is perfectly hardy in eastern Massachusetts, although here as elsewhere the leaves are often torn by the wind unless a sheltered

position is selected for it. It is interesting as the leaves and flowers are larger than those of any other tree which grows in extra tropical regions. *M. Watsonii*, a shrub which was first found in a Japanese nursery, and is unknown as a wild plant, is also in flower. Its relationship is with *M. parviflora*, a small Japanese tree which grows as far north as Korea; it has usually not been hardy in the Arboretum, but two years ago and this year the plant on the upper side of the Centre Street Path has been covered with flowers which are extremely fragrant, differing in this from those of *M. parviflora*.

Indigofera amblyantha is in flower as usual on the left hand side of the Centre Street Path. It is a slender shrub with small leaves and axillary clusters of small rose-colored flowers which appear continuously for two or three months. This is one of the most beautiful of the small shrubs introduced by Wilson from western China where he found it growing on river cliffs in Hupeh at altitudes up to six thousand feet above the sea-level.

Sophora viciifolia. There are not many shrubs with blue flowers which are perfectly hardy in this climate, and none of them are as satisfactory as this *Sophora* which is a native of central and western China where it is a common undershrub in dry hot valleys. In the Arboretum it is a shapely, perfectly hardy plant four or five feet high, and produces small blue and white pea-shaped flowers in great profusion blooming here every year. In the Arboretum it has proved one of the most attractive of the small shrubs of recent introduction. It can be seen now in flower on the right hand side of the Centre Street Path and in the Bussey Hill Collection.

Cornus controversa is a widely distributed plant in Korea and western China where it sometimes grows to a height of sixty feet with a trunk seven feet in girth. The largest of these trees in the Arboretum is in the Peter's Hill Nursery and is now about twenty-five feet high with a short trunk and a head from twenty-five to thirty feet in diameter. The branches are long, crowded, and spread at right angles with the stem, drooping slightly at the ends, the lowest sweeping the ground. The upper side of the branches is thickly covered with flat flower-clusters six or seven inches in diameter. The flowers are white or white faintly tinged with yellow and are followed by black shining fruits which are eaten by birds as fast as they ripen. As it grows on Peter's Hill this *Cornel* is a magnificent plant, and the handsomest of the species of *Cornus* in the Arboretum with the exception of the species with white floral bracts. To the student of botanical geography *C. controversa* is interesting as a living witness of the relationship between the floras of eastern Asia and eastern North America, for in the genus *Cornus* with many species widely distributed over the world there are but two with alternate leaves, *C. controversa*, common in eastern Asia, and *C. alternifolia*, common in eastern North America, also in flower at this time.

Laburnum alpinum is still covered with its long racemes of clear yellow flowers and has shown, as it has now for many years, its value

in our northern gardens. *L. alpinum* is a native of the elevated regions of southern Europe, and is usually spoken of as the "Scotch Laburnum" probably because it is a favorite in the gardens of northern Britain. In those of New England it is extremely rare, although it is the handsomest large shrub with yellow flowers which is perfectly hardy here. It is hardier than *L. vulgare*, or, as it is often called, *L. anagyroides*, the small tree with shorter racemes of flowers which has been a good deal planted in the eastern states and which at the north is not always hardy, although occasionally good specimens are to be seen in the neighborhood of Boston. There are several garden forms of this Laburnum. A better plant for New England than *L. vulgare* is its hybrid with *L. alpinum*, known as *L. Watereri* or *L. Parksii*, already out of bloom. This is a hardy small tree and when in flower the handsomest tree with yellow flowers which can be grown in this climate.

Some Asiatic Spiraeas. One of the handsomest of all Spiraeas is *S. trichocarpa*, a common and widely distributed shrub in northern Korea where Wilson found it on the Diamond Mountains in the autumn of 1917, and sent seeds to the Arboretum. He describes it as a dense bush about three feet high with spreading rigid, and slightly drooping branches. It promises, however, to grow to a larger size in cultivation in this country. The flowers are white, and arranged in rounded or dense, conical, many-flowered clusters an inch and a half in diameter, at the end of short lateral leafy branches. This Spiraea has proved perfectly hardy in the Arboretum and promises to be an important addition to American gardens. A copy of a photograph of the wild plant made by Wilson in Korea appeared in the Gardeners' Chronicle, of London, August 11, 1923. *S. Henryi* is a taller shrub, growing to a height of eight or ten feet with spreading branches, and branchlets sparingly pilose or nearly glabrous, obovate or oblong to oblanceolate leaves cuneate at the base and acute or rounded at the usually coarsely dentate apex. The flower-clusters are about two inches across and the flowers are a quarter of an inch in diameter. This is one of Wilson's introductions from western China, and has proved an excellent garden plant in this country. These two plants can best be seen on the lower side of the Centre Street Path. *S. Sargentiana*, another of Wilson's discoveries in western China, now growing with other Chinese plants on the southern slope of Bussey Hill, has not always proved perfectly hardy in this climate but this year for the first time is flowering profusely. It is a graceful shrub, very similar to *S. canescens*, growing to the height of about six feet with slender spreading branches, terete branchlets first puberulous but soon becoming glabrous, with oblong-elliptic leaves narrowed into the petiole, slightly toothed at the apex, puberulous above and villose below. The flowers are produced in dense flat corymbs an inch to an inch and three-quarters across, and the white flowers are a quarter of an inch in diameter with a villose calyx.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



BULLETIN
OF
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JAMAICA PLAIN, MASS.

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Philadelphus. Many new plants in this genus have been found in recent years by travelers in eastern Asia or have been made by plant breeders, and it now constitutes one of the largest groups of garden shrubs hardy in the northern states and to be ranked with the Lilacs, Bush Honeysuckles, Viburnums, Azaleas and Cornels. The popular names of these plants, Syringa and Mock Orange, are unfortunate for Syringa is the Latin name of the Lilac, and Mock Orange, given to them no doubt on account of the fragrance of the flowers of *Philadelphus coronarius* of southeastern Europe, which for many years was the only one of these plants to be found in gardens, does not describe the flowers of all species as many of them are destitute of odor. Species of *Philadelphus* are native in the United States in the southern Appalachian Mountain region, western Alabama, western Texas, on the southern Rocky Mountains of New Mexico and Colorado, and in the northwestern states. Many species have been found in Japan, Korea, Manchuria and western China, and the genus is represented on the Himalayas, the Caucasus, and in the Balkan peninsula. Plants of this genus are not particularly interesting in habit; the leaves are dull and fall without change of color, and the fruit, which is a dry capsule, does not add to their attraction which is to be found in their abundant, white, often fragrant flowers. The flowering period of the thirty odd species, with numerous hybrids and varieties in the Arboretum, extends through five or six weeks, and most of the plants flower every year. They require rich, well drained soil, and the presence of lime has no bad effect on them. Better than most plants, they can support shade, and their ability to grow and flower under trees gives

them a special value for the undergrowth of border plantations. The type of the genus and the only species in the gardens of the eighteenth century, *P. coronarius*, is now rarely found except in old-fashioned gardens in New England, but it is a delightful plant and the flowers of no other species are more pleasantly fragrant. In the Arboretum collection there are varieties of this plant with double flowers of which the variety *deutziaeflorus* with narrow petals is the handsomest; a variety with narrow leaves (var. *salicifolia*) is more curious than beautiful, and there is a dwarf compact form which never flowers and one with yellow leaves. Among the American species which should find a place in all collections of hardy shrubs are *P. inodorus* and *P. pubescens*. The first is a medium-sized plant with arching branches which are studded from end to end with large, cup-shaped, scentless flowers, and by some persons considered the most beautiful of the whole genus. *P. pubescens*, sometimes called *P. latifolius* and *P. grandiflorus*, is a native of the southern Appalachian Mountain region, with stout erect stems and branches, broad dark green leaves and slightly fragrant flowers arranged in erect from five- to ten-flowered racemes. *P. pubescens* and some of its hybrids are common garden plants in this country. The most important and distinct of these has been called *P. splendens* which appeared in the Arboretum several years ago, and its other parent is believed to be *P. Gordonianus*. It is a tall, broad, shapely shrub with pure white, slightly fragrant flowers borne in clusters and an inch and three-quarters in diameter. This plant when in bloom makes a more conspicuous display than any Philadelphus in the collection. The Rocky Mountain *P. microphyllus* has the smallest leaves and flowers of any plant in this genus; it is a shrub with slender stems, rarely growing more than three feet tall, with delightfully fragrant flowers.

The earliest Philadelphus in the collection to bloom is the Korean variety *Jackii* of the Manchurian *P. Schrenkii* which Mr. Jack discovered a few years ago and which often blooms here during the last week in May. It is a tall, rather narrow pyramidal plant and an excellent addition to the plants of this group. The most distinct and probably the handsomest of the Asiatic species which flowers here is *P. purpurascens*, discovered by Wilson in western China. It is a shrub with long arching stems from which rise numerous branches from four to six inches long which spread at right angles, and on these the fragrant flowers are borne 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 very fragrant. This is probably one of the handsomest shrubs brought from western China to the Arboretum. *P. Magdalenae* from central China is another handsome plant well worth general cultivation. It is a 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 long. *P. pekinensis* from northern China and Mongolia is a compact bush three or four feet high which every year produces flowers tinged with yellow, and is well worth a place in every garden. Another eastern Asiatic plant, *P. Falconeri*, which is probably Japanese, has narrow lanceolate leaves and fragrant flowers in few-flowered

racemes, and is distinct in the shape of its leaves and long narrow petals. This plant was sent to the Arboretum from the Parsons Nursery at Flushing, Long Island, but nothing more is known of its origin or history.

Few genera of garden shrubs have given better results from natural cross fertilization or to the art of the plant-breeder than *Philadelphus*. The first of these hybrids to attract attention was raised in France sometime before 1870 by Monsieur Billard and is sometimes called "Souvenir de Billard." 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 *Philadelphus* in northern gardens, where plants thirty feet high and correspondingly broad are sometimes found, appears to be a hybrid between *P. coronarius* and an unrecognized species. To this plant, whose history is unknown, the name *P. maximus* has been given.

These early hybrids were the result of natural cross-fertilization, and the systematic breeding in this genus dates from the time when Lemoine in France first crossed the Rocky Mountain *P. microphyllus* with *P. coronarius* and produced the plant to which he gave the name of *P. Lemoinei*. Lemoine then crossed his hybrid with a hybrid of *P. insignis* and produced a race of beautiful plants to which the general name of *P. polyanthus* is now given. Well known forms of this hybrid are "Gerbe de Neige" and "Parvillon Blanc." To another race of the Lemoine hybrids the name of *P. cymosus* has been given. This was obtained by crossing *P. Lemoinei* with *P. grandiflorus* or some related species. "Conquête" is considered the handsomest of this group and is one of the largest-flowered of all *Philadelphus*. Other well known plants which are believed to belong here are "Mer de Glace," "Norma," "Nuée Blanche," "Rosace," "Voie Lacte," and "Perle Blanche." To another race of hybrids with double racemose flowers raised by Lemoine and of doubtful origin the name of *P. virginalis* has been given. The type of this group is his "Virginal." Other plants referred to it are "Argentine," "Glacier," and "Bouquet Blanc." The introduction of *P. microphyllus* into France, where it was sent by the Arboretum in 1877 or 1878, made possible in the hands of Lemoine the production of these races of beautiful plants which are among some of the important contributions to northern gardens during the last thirty years. The *Philadelphus* Collection is planted in the Shrub Collection and in a larger special group on the right hand side of the Bussey Hill Road opposite the Lilacs.

Zenobia pulverulenta is now in bloom in the Shrub Collection, and during the past week has been the most beautiful shrub probably in the Arboretum. *Zenobia* is related to the *Andromedas* and is chiefly distinguished by its open campanulate flowers and four-awned anthers. The leaves are thickly covered with a glaucous bloom, and the ivory white flowers, about half an inch long and broad, are borne on slender stems in axillary clusters forming long terminal racemes on the upper parts of the branches of the previous year. There is a form of this shrub (var. *nitida*) with leaves green on both surfaces. *Zenobia* is a southern genus with a single species. The green-leaved variety grows in countless thousands along the borders of the great swamp across

the river from New Berne on the coast of North Carolina; the white-leaved form, which was found by William Bartram on the lower Cape Fear River in North Carolina, appears to be less common and apparently has not been collected in recent years. It is interesting that the two forms of this plant, which grow in a region which could not be expected to produce plants hardy in Massachusetts, are well established and flower every summer in the Arboretum.

Helianthemum. A collection of the varieties of *Helianthemum nummularium*, better known perhaps as *H. chamaecistus* or *H. vulgare*, has been established in one of the borders on the southern slope of Bussey Hill and is flowering well this year. These are half evergreen or evergreen, low prostrate shrubs with leaves green on both surfaces, hairy or nearly glabrous, and from half an inch to an inch and a half in length, and flowers normally yellow but varying from rose pink, orange or white, and about an inch in diameter in many-flowered loose racemes. This species is a native of Europe, western Asia and northern Africa, and perhaps not as often cultivated as it should be in this country where low plants are needed to cover the ground among shrubs. The curious fact about it is that the flowers are only open before noon and close entirely in the afternoon.

Rhododendron (Azalea) calendulaceum, with its orange yellow or reddish flowers which are not fragrant, has been perhaps the most brilliant plant in the Arboretum during the past two weeks. It is an inhabitant of mountain regions from southern New York to Georgia, and is extremely abundant on the lower slopes of the high mountains of North Carolina and Tennessee. A large mass of this shrub has been planted on the lower slope of Bussey Hill on Azalea Path, and occasional specimens can be seen in border plantations along the roads.

Rhododendron (Azalea) ameliense is a hybrid between *R. calendulaceum* and *R. arborescens* which appeared originally in the Arboretum probably in 1896 and is intermediate between its two parents, and promises to be a good garden plant with large, fragrant, pinkish or white flowers marked with a yellow blotch. It was mentioned without a name by Zabel in 1903 and later has been produced by artificial crossing of its parents at the Hunnewell estate in Wellesley.

Rhododendron delicatissimum is a plant probably raised by Anthony Waterer at the Knaphill Nursery in England and has been known in this country since 1870. It is a hybrid undoubtedly with *R. maximum* as one of its parents, and possibly one of Waterer's Catawbiense hybrids as the other parent. It is perfectly hardy, blooms every year, and is now in full flower about two weeks later than Waterer's other Catawbiense Hybrids and earlier than his hybrid *R. Wellesleyanum* between *R. maximum* and *R. catawbiense*. The flowers of *R. delicatissimum* are slightly tinged with pink in the bud but become white or nearly white when fully expanded. This is perhaps one of the most beautiful and hardiest of all hybrid Rhododendrons which can be grown in this climate.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



BULLETIN
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The Value of Native Shrubs for the decoration of American parks and gardens has we believe been demonstrated by the Arboretum and has never been more clearly shown than during the past month. The flowers of the late-flowering *Viburnums* have been conspicuous during the whole month of June. There are four of these species which deserve the attention of garden makers. The flowers of the earliest, *Viburnum dentatum*, have already passed. This shrub 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 fruits on erect stems. This is a common roadside shrub in the northeastern part of the country. The second of these plants, *V. cassinoides*, has also flowered. It is a native of swamps in the northeastern part of the country where it sometimes grows nearly 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 the *Viburnums* in the Arboretum. The leaves are thick and lustrous, varying greatly in size and shape; the flowers, which are slightly tinged with yellow and open in slightly convex clusters, vary greatly in size; the fruit is larger than that of some of the early-flowering American species, and at first yellow-green later becomes pink and finally black covered with a pale bloom, fruit of the three colors occurring in the early autumn in the same cluster. The third of these late *Viburnums*, *V. pubescens*, resembles in general appearance *V. dentatum* but flowers two weeks later and the young branchlets and 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 handsomer plant, with showier flowers and larger later-ripening fruit, *V. Canbyi* is the fourth of these species. It is the last of all the Viburnums in the Arboretum to flower. There are specimens of this plant on the right hand side of the entrance to the Administration Building which are now ten or twelve feet high and as much in diameter and covered with flowers. This is the largest and handsomest of American Viburnums and by some botanists is considered a variety of *V. pubescens* which it somewhat resembles, but the leaves and flower-clusters are larger and it blooms ten or twelve days later, and the flowers and fruits are larger. Its home, too, is not on the seacoast but in northern Delaware and the adjacent parts of Pennsylvania, and in central Indiana. This Viburnum reproduces itself from seeds and there is therefore no reason why it should remain so rare in gardens.

Two other native plants, *Cornus racemosa* and *Rosa virginiana*, are in bloom and the pure pink flowers of the Rose harmonize so well with the cream white flowers of *Cornus racemosa* that these two plants can well be used together in natural planting. *R. virginiana* is confined to the northeastern seaboard region of the continent and in its best form is a tall shrub with lustrous leaves and pure pink flowers which now perfume the borders of the roads in some parts of the Arboretum. This Rose has been used successfully on the left hand side of the Valley Road in the border between the road and the gravel path and it is, with the exception perhaps of the Prairie Rose, the handsomest of the North American species, beautiful when in flower, in the autumn with its yellow leaves and handsome fruit, and in winter with its shining bright red fruit.

Cornus rugosa, or *C. circinata*, the name by which it is best known, is a shrub sometimes ten feet high which with plenty of space spreads into a broad bush. The young branches are green blotched with purple, becoming purple as they grow older; the leaves are broad, sometimes nearly circular and dark bluish green; the flowers are ivory white, in compact clusters, and are followed in the early autumn by bright blue or nearly white fruits. It can be seen in the Cornel Group at the junction of the Meadow and the Bussey Hill Roads, and there are masses of it among the Hickories in the groups of these trees which well show the value of this shrub in park planting where broad compact masses of foliage are needed.

Cornus amomum, the Silky Cornel, which has been largely used in the Arboretum, is now covered with flowers. In cultivation it is not a satisfactory plant unless there is sufficient room for its wide-spreading branches, for when crowded by other plants the branches become erect and it loses its real beauty. 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. There is no better shrub to plant by the margins of ponds and streams where its graceful branches can hang over the water. The purple stems are attractive in winter, and the bright blue fruit which ripens in the autumn adds to the value of this native shrub. Its value for planting near water can be seen on the borders of the small ponds on the Meadow Road.

Sambucus canadensis. As the flowers of the Laurel (*Kalmia latifolia*) fade those of the native Elder (*Sambucus canadensis*) open. This is the last of the native shrubs to make here a conspicuous show of flowers. There are great masses of it now in full bloom in the north meadow, and there are many individual plants along Bussey Brook which have grown from seeds sown by birds. Few native shrubs make a greater show than this Elder with its broad heads of white flowers and lustrous black fruits. There is in the Arboretum a form with leaflets deeply divided into narrow segments (var. *acutiloba*), one with dull yellow fruit (var. *chlorocarpa*) and a plant which originated a few years ago in a European nursery (var. *maxima*) with flower-clusters three times as large as those of the wild plant and such large and heavy bunches of fruit that the branches are hardly able to support them.

The last of the Azaleas. As the yellow or flame-colored flowers of *Rhododendron calendulaceum* fade those of another Appalachian species, *R. arborescens*, begin to open. The deliciously fragrant flowers are white with bright red stamens and style 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 fifteen or twenty feet. On the Carolina Mountains it is often not more than three or four feet tall, forming at altitudes of about five thousand feet above the sea great thickets often acres in extent. Its value as a garden plant is not generally understood or appreciated. The flowers vary greatly in size and in the length and diameter of the corolla-tube, and although the corolla is pure white a form is now known in which the corolla is suffused with rose (var. *Richardsonii*), in another it is more or less striped with rose, in another tinged more or less deeply with yellow, and in another it is marked with a yellow blotch. All these forms are well worth a place in a collection of Azaleas, and it is possible that if seedlings were raised perhaps more varied and distinct forms might occur among them. There is a group of this Azalea on the Valley Road in front of the Hickory Group and another on the opposite side of this Road. A mass of the plant, too, has been planted on the western slope of Azalea Path. The last of the Azaleas, *Rhododendron viscosum*, begins to open its flowers a few days later than those of *R. arborescens*; they are white and more fragrant than those of other Azaleas, but smaller than those of *R. arborescens* with a long slender corolla-tube. There is also a form on which the flowers are tinged with rose-purple. The Clammy Azalea, or Honeysuckle, as it is called in the country, is an inhabitant of swamps and is common in the Cape region of Massachusetts and southward. In cultivation it grows as freely and flowers as abundantly on dry hillsides as it does in its native swamps, and masses of it on the lower side of Azalea Path are now covered with opening flower-buds.

Crataegus phaenopyrum. The so-called Washington Thorn, a native of western North Carolina to southern Missouri, which is now in flower is the last of the Hawthorns to bloom in the Arboretum. It is a slen-

der tree growing under favorable conditions to a height of twenty-five or thirty feet. The leaves are nearly triangular in shape, not more than two inches long and an inch and a half wide, and are dull green, turning to bright scarlet in the autumn. The flowers are creamy white, smaller than those of most Hawthorns and arranged in small compact clusters. Few if any of the American species have less attractive flowers. The fruit, too, is small, barely more than half an inch in diameter, and the Washington Thorn owes its value as a garden plant to the brilliancy of the autumn foliage and to the abundance of the fruits long persistent on the branches.

Hawthorns began to flower in the Arboretum before the first of May and they have been flowering here almost continuously ever since. In less than a month some of the species will begin to ripen their fruit and the fruit of others will still be on the branches in April. There are not therefore many weeks in the year when Hawthorns in this climate cannot furnish either flowers or fruit, and in cold countries like New England no other group of plants has such a long season of flowers except the Viburnums, and none of these retain their fruit into the winter. When in bloom some of the American Hawthorns are objects of great beauty, and only the fruit of some Crabapples is more conspicuous than that of the large-fruited species. As they grow naturally over a large part of eastern North America, although more sparingly in the west, there are few parts of this country or Canada where some of the species cannot be successfully grown. They all thrive in cultivation and respond to generous treatment with larger size, more treelike habit and handsomer foliage and fruit.

Pentactina rupicola. This plant, the only representative of a genus of the Rose Family closely related to Spiraea, is now in flower again in the rockery connected with the propagating department of the Arboretum on Prince Street. Discovered in 1916 by a Japanese botanist among the Diamond Mountains in northern Korea, Wilson collected seeds which he sent to the Arboretum the following year. In speaking of the region where this plant grows Wilson says,— "In all the East I know of no place more lovely and interesting than the Diamond Mountains. In the glens and ravines, on the cliffs and peaks, there are a great variety of plants, and several like *Pentactina* are not known to grow elsewhere." This monotypic genus grows on the steep slopes near the Makaeon Monastery. It is a tufted plant with slender arching stems and alternate tufted leaves. The flowers are borne in terminal pyramidal panicles each from three to four inches in length. The individual flowers are small with a pale-colored calyx with reflexed lobes and narrow, spreading, strap-shaped petals; and the fruit is dry and surrounded by the persistent stamens which are reflexed. From *Spiraea* this genus may be distinguished by the shape of the petals and by the two-ovuled fruit opening along both sutures. This little shrub is a hardy and useful subject for a shady rockery but probably will not stand full exposure to the sun as its natural home is on the cliffs of well shaded ravines.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JULY 2, 1925

Beech-trees. The deciduous-leaved Beech-trees, to which the name of *Fagus* is given, are confined to eastern North America, northern and central Europe, southwestern Asia, western China and Japan. Ten species are recognized. Several evergreen Beech-trees, now placed in the genus *Nothofagus*, grow on the high Andes of Chile and southward to the straits of Magellan, and in Australasia. Some of these southern species are established in English parks and gardens, but none of them will grow in the eastern United States, and it is doubtful if they have been tried in southern California where some at least may be expected to grow. Eight of the ten species of *Fagus* and several varieties are established in the Arboretum. Two species, *F. multinervis*, found only on Dagelet Island in the Japanese sea fifty miles from the coast of central Korea, and *F. Hayatae*, known only to grow on a mountain in the Head Hunters' country of Formosa, have never been cultivated. Wilson visited Dagelet in 1907 and collected small plants of *F. multinervis* which unfortunately died before they reached the Arboretum. One species, *F. grandifolia*, is confined to eastern North America where it is a common tree from eastern Canada to Florida and eastern Texas, and to Minnesota and Oklahoma. At the north it grows on uplands and mountain slopes, often forms pure forests of considerable extent, and is rarely more than seventy or eighty feet tall; at the south it is taller, and in the Mississippi valley in northern Louisiana and western Mississippi it is often a magnificent tree one hundred and twenty feet high with a tall trunk from three to four feet in diameter. At the north it differs from other species of *Fagus* in the habit of often producing stems from the roots. These often grow into small

trees which form dense thickets round the parent trunk. The bark of all Beech-trees is smooth and pale, but that of the American tree is paler than that of the other species, and the pale blue bark of the stem and large branches make this one of the most beautiful of the inhabitants of the forests of eastern North America. It is a native tree in the Arboretum and there is a fine group planted on the western slope of Bussey Hill near the Valley Road. The oldest trees in this group were planted fifty years ago, and in it there is a specimen of the variety *caroliniana*, a southern form, which differs from the type in its thicker, more closely toothed leaves which remain on the branches nearly through the winter, and in the less crowded prickles on the fruit. This is a common tree on the bottom lands of southern streams and on the borders of swamps.

Fagus sylvatica, the European species, is a large tree common except in the extreme north, and grows to its greatest perfection in England, Denmark, parts of Germany, and on the mountains of the Balkan peninsula, often forming pure forests and growing to the height of a hundred feet. It is a hardy and handsome tree in New England where it is perfectly at home, and grows faster and is handsomer than the American species. Unfortunately there is no record of the date of the introduction of this tree into the United States, but it was certainly more than one hundred years ago. The earliest American mention of *F. sylvatica* which the Arboretum has been able to find was in the nursery catalogue of William Prince of Flushing, New York, in 1820, in which this tree was offered. It is a remarkable and unaccountable fact that the green-leaved typical form of *F. sylvatica* has been so rarely planted in this country. It was not sent to John Bartram with other European trees from England, and there is no reason to believe that it was known to George Washington, a great lover and planter of trees; and the Arboretum has been unable to hear of any large or old specimens in the neighborhood of Philadelphia or New York. The finest specimens of this tree in New England are undoubtedly those planted by the late David Sears in one of the four squares in Longwood which he presented to the Town of Brookline. There are now fourteen of these trees growing on what is called Longwood Mall near the Sears' Church, which vary in girth of trunk from seven feet two inches to ten feet ten inches, with heads of wide-spreading branches sweeping the ground. Unfortunately no record has been found when these trees were planted; it was certainly before 1832, at the time of one of Mr. Sears' visits in Europe. Three or four of these trees are the purple-leaved variety and the rest are magnificent specimens of the typical green-leaved tree. These are the finest exotic trees which have been planted in Greater Boston, and probably form the finest grove of European Beeches in the United States. There was until a year ago a magnificent specimen of the green-leaved typical tree standing near the house of the late Marshall P. Wilder on Columbia Road in Dorchester. He moved into the house in 1832 and the tree was planted by Mr. Wilder or its previous owner, the Honorable Increase Sumner, at one time Governor of Massachusetts. This tree has now been cut down to make room for an apartment house which is to replace the Wilder mansion. There are four good trees of the green-

leaved form on the Sargent Estate in Brookline, one planted by the late Augustus P. Perkins when a boy on Warren Street, near the corner of Cottage Street, and three on Warren Street on what is generally known as the Head Place. The house on this land was purchased by Stephen H. Perkins in 1840 who probably planted the trees shortly afterwards, although his house was not taxed until 1844.

The European Beech was first planted in the Arboretum in 1875, but the proper pruning of this tree was too long neglected. As it did not promise to become a fine specimen it has been removed during the past year and replaced by a small tree. There are a number of varieties of *Fagus sylvatica* established in the Arboretum. The best known of these is the so-called Purple Beech (var. *purpurea*) with dark reddish purple leaves. This tree was originally found growing naturally in the forest in three or four places in central Europe, and the first account of it was published as long ago as 1680. Seedlings of this form often have purple leaves, and such seedlings often differ in shades of color, and to some of these seedlings names have been given. The Purple Beech is better known and more generally planted in this country than the typical green-leaved form, and for many years has been a favorite with tree planters in the northeastern states. The Copper Beech (var. *cuprea*), which is probably a seedling of the Purple Beech, has paler red leaves than those of that tree. An interesting form of *F. sylvatica* (var. *pendula*) is a comparatively low tree with slightly pendulous branches from which hang almost vertically the secondary branches, the whole forming a tent-like head almost as broad as high. This interesting form of the European Beech has been occasionally planted in the United States. The largest specimen in this country known to the Arboretum is growing in Flushing, New York, on what was formerly a part of the Parsons Nursery. A picture of this tree can be found in Wilson's "Romance of our Trees." Near it grows the finest specimen in America of the rare Chinese Golden Larch (*Pseudolarix*). These two trees have been in danger of destruction to make room for an apartment house, and it is good news that the city of Flushing has recently secured the land on which they are growing in order to preserve them. The Fern-leaf Beech (var. *heterophylla*) is distinguished by its variously shaped leaves, which on the same branch are long and narrow and more or less deeply lobed, pinnate or lacinate. Various names have been given to forms of this variety, but the variation is often so slight that it hardly seems worth while to distinguish them. The largest specimen of this tree in the United States grows on Bellevue Avenue in Newport, Rhode Island, on the grounds of the Redwood Library and Reading Room. Unfortunately it is not known when this tree was planted. Trees of this variety have been growing in the Arboretum since 1886. A form of the European Beech (var. *cristata*) with curled and twisted leaves, also obtained in England in 1836, is a slow-growing tree, only interesting as a curiosity and of no ornamental value. It is well established in the Arboretum, as is a dwarf form, a bush five or six feet high and ten or twelve feet in diameter, obtained as grafts from Kew in 1885 and doubtfully known in the Arboretum as var. *remillensis*. More interesting is the variety *fastigiata*, on which all the branches grow erect and form a narrow pyramidal head, which promises to become a handsome and

useful addition to the trees of this habit, like the fastigate Red and Sugar Maples, the fastigate European Oak, the fastigate Tulip-tree, European Hornbeam, etc. The original fastigate Beech is growing at Dawyck in Peeblesshire, Scotland, and is a recent addition to the Arboretum collection where it was first planted in 1913. A form of the European Beech of uncertain origin with small leaves and slightly drooping branches, for which the Arboretum has not found a name, grows on the Wilder Estate on Columbia Road, but unfortunately has been mutilated to make room for building purposes. A similar tree, rather smaller in size, is growing on the estate in North Easton of the late Oliver Ames, Governor of Massachusetts from 1886-1888, a great lover and planter of trees. Small grafted plants from the Wilder tree are growing in the Arboretum, and grafts have been sent to Europe. This tree seems to deserve further attention.

Fagus orientalis, which is distributed from Asia Minor to northern Persia, differs chiefly from the European Beech in the lower prickles of the fruit which are changed into oblong linear lobes. Plants received from Europe have been growing in the Arboretum now for twelve years, and have proved perfectly hardy, growing rapidly, and promise to become handsome trees in this climate. It is too soon, however, to speak with entire confidence of their future.

Chinese Beech-trees, so far as now known, do not occur north of the central provinces where three species have been found, *Fagus longipetiolata*, *Fagus Engleriana* and *Fagus lucida*. The first of these Wilson found to be the common Beech of central and western China where it grows with Oaks, Maples and other deciduous leaved trees. It is usually a small tree not more than fifty or sixty feet tall, but in western Szech'uan it is a stately and handsome tree with a single trunk rarely divided near the base, and covered with very pale gray bark. *Fagus Engleriana* is common on the high mountains of north-western Hupeh and eastern Szech'uan where it often forms pure forests. Wilson noticed that the trunk of this tree always divides at the base into several divergent stems which do not attain much thickness or any great height, the tallest of which there is a record being not over seventy feet high. *Fagus lucida* is distinguished from the other Chinese species by the duller gray bark of the trunk which does not separate at the base, and by its thick and spreading branches which form a broad, flattened and somewhat rounded head. It is a tree sometimes seventy-five feet in height with a trunk three feet in diameter. This tree is common in some parts of Hupeh and Szech'uan in mixed woods. Young plants of these three Chinese Beeches, which were brought to the Arboretum in 1911, have been growing in the open ground since their arrival, and there is no reason to suppose they will not become permanent and handsome trees here.

Japanese Beech-trees are better known in the Arboretum as *Fagus Sieboldii*, which was first raised here in 1893 from seed brought from Japan by Professor Sargent, and *Fagus japonica* which was raised here a few years later. The former is one of the great trees of Japan, often growing to the height of ninety feet and forming a trunk three feet in diameter.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



BULLETIN
OF
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JAMAICA PLAIN, MASS.

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Linden Trees. *Tilia*, the name of the Linden, is one of the widely and generally distributed arborescent genera of the northern hemisphere. It is absent from western North America, and no Linden has yet been found in the forests of the Himalayas. Eastern North America with fifteen species is richer in Lindens than all the rest of the world, and in North America Lindens are found from New Brunswick westward to Lake Winnipeg, and southward to northern Florida and northeastern Mexico. To the two species which grow in Canada another is added in New York and Pennsylvania, and southward in the forests which cover the high slopes of the Appalachian Mountains and in those of the coast region of the Carolinas and Georgia the number increases. Lindens are common in all the Gulf States, and abound in eastern and southern Texas where five species and several varieties occur, and where Linden trees grow by the scanty streams and under the bluffs of the Edwards Plateau, a region in which they could hardly be expected to flourish. The ability of the southern species to grow permanently in New England is still to be demonstrated in the Arboretum, and only three northern and one southern Appalachian Lindens are established. These are *Tilia glabra*, often called *T. americana*, *T. neglecta*, *T. heterophylla* var. *Michauxii*, and *T. monticola*. *Tilia glabra* is a splendid great tree in the forests of the north where it was once abundant, with individuals more than a hundred feet high with trunks from three to four feet in diameter. Such trees are no longer common for the wood of the northern Linden, usually known in commerce as white wood, has been in popular use for many years and a large number of trees have been cut. This Linden has been a good

deal planted as a shade tree in New England but the leaves are too often disfigured, especially in dry summers, by the attacks of the red spider. *T. neglecta*, which finds its northern station in the neighborhood of Montreal, is not rare in the northern states and along the Appalachian Mountains. It is easily distinguished from *T. glabra* by the short persistent gray down on the lower surface of the leaves, that of the leaves of *T. glabra* being green and lustrous and destitute of hairs with the exception of those which form the large tufts in the axils of the principal veins. In the Arboretum it is growing rapidly and now gives every promise of success. The other northern Linden, *T. heterophylla* var. *Michauxii*, is one of the several species with leaves covered below with a permanent coat of white tomentum. It is a common tree from Pennsylvania and western New York to southern Indiana and Illinois, Missouri and southward along the Appalachian Mountains. This handsome tree is growing well in the Arboretum and is well worth a place in collections of ornamental trees. It grows less rapidly, however, and is not as handsome as the other hardy American Linden, *T. monticola*. The flowers are larger than those of other Lindens and the leaves hanging on long slender stems, and swept by the slightest breeze as they turn their lower surface to the eye, make in contrast with the dark Hemlocks with which this Linden often grows one of the beautiful features of the splendid forests which still cover the slopes of the southern mountains. 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 species. This is unusual, for of other trees of western Europe only the Beech and white Willow grow better here than their American relatives, and, with the exception of the Linden, all Asiatic trees are more at home in eastern North America than the trees of Europe. The five European species and several of their varieties are growing here in a satisfactory manner. *Tilia platyphyllos*, easily distinguished by the hairs which cover the lower surface of the yellow-green leaves and the young branches, is the first of the European species to bloom. It has long been cultivated in the eastern states and appears to be the common European Linden sold by American nurserymen, although as an ornamental tree it is the less desirable of the European species. *T. cordata*, distinguished by its small cordate leaves 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 often seen in this country. A better tree here than either *Tilia platyphyllos* or *T. cordata*, *Tilia vulgaris* is generally believed to be a natural hybrid of these species. The leaves are dull green on the upper surface and destitute of hairs with the exception of those in the axils of the veins below. This tree, which is not rare in the northern and middle states, is one of the best trees to shade the streets of northern cities. The largest and handsomest Linden-trees in the neighborhood of Boston are of this hybrid. The two Lindens of eastern Europe, *Tilia tomentosa* and *T. petiolaris*, are distinct and handsome trees with leaves silvery white on the lower surface, and can be easily and successfully grown in southern New England; the former, 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. *Tilia petiolaris* is a more beautiful tree with pendulous branches which form a narrow head, and leaves drooping on long slender stems. It has proved to be one of the handsomest exotic trees which can be planted in the eastern states. It is too soon to speak with much knowledge of the value of the Asiatic species as ornamental trees in this climate; most of them have been introduced here in recent years, the oldest Asiatic Linden now in the Arboretum, *Tilia japonica*, having been raised here from seeds only planted in 1893. A comparatively large tree in Japan, the Arboretum specimens are now from twenty to twenty-five feet high with gracefully drooping branches and open habit. The leaves unfold earlier in the spring than those of any other Linden in the collection, and are small, cordate at the base and pale on the lower surface like those of the small-leaved European Linden (*T. cordata*) to which the Japanese tree bears some resemblance. This Japanese tree has flowered for a number of years in the Arboretum and the flowers are large, bright yellow, and, like those of other Lindens, very fragrant. For its flowers, which appear when few trees bloom in this climate and are beautiful and conspicuous, it deserves to be more generally planted. An Asiatic Linden which reached the Arboretum in 1882 was the north China *Tilia mongolica*. This is a small tree, at least in this country, with small, nearly triangular, lustrous leaves. It begins to flower and produce fertile seeds at the end of a few years. It has proved short-lived here and the original tree soon disappeared. All the other Asiatic species are or have been in the collection at different times; they are all hardy enough, but at best grow slowly and appear to lack vigor of constitution. Of the species lately introduced *Tilia Oliveri* now appears the most promising. One of the handsomest Linden-trees in the Arboretum collection, *Tilia spectabilis* is believed 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 its American parent but silvery white on the lower surface like those of *T. petiolaris*. What is believed to be a variety of this hybrid (var. *Moltkei*) originated many years ago at the Spaeth Nursery in Berlin. It is a tree of denser habit and greener leaves than *T. spectabilis*, and in the Arboretum it is a handsomer and faster growing tree than the original species.

Maackia. Two species of this genus of the Pea Family have been in flower during the last days of June. The better known of these species, *Maackia amurensis*, is a native of eastern Siberia; it is a small tree with a slender trunk, with smooth, lustrous, red-brown bark, small erect and spreading branches which form a rather flat-topped obconic head, and long, erect, narrow terminal spikes of small white flowers. Botanically and geographically interesting, the chief value of this *Maackia* from a garden point of view is found in the fact that its flowers open at a time when flowers can only be seen here on a few trees. A second species, *M. chinensis*, discovered by Wilson in central China, is covered with pale yellow flowers in rather shorter spikes than those of the Siberian tree. In early spring the silver gray hairs which thickly cover the unfolding leaves make this little tree conspicuous and interesting. The bark of *M. chinensis* is dull grayish green and less beautiful than that of the Siberian tree.

Rosa setigera, the so-called Prairie Rose, is the last of the American species to flower with the exception of *R. stellata* which will continue to open its flowers through the summer. No Rose is more beautiful than this inhabitant of the western states where it grows from Michigan to Texas; it is a free-flowering and perfectly hardy plant with tall arching stems, ample, bright-colored foliage and broad clusters of pink flowers. It can be trained over an arbor or against a building, but looks best when it is allowed to grow without any training whatever. The typical form is quite glabrous and appears to be less common than the variety *tomentosa*. Of the latter there is a mass on the right hand side of the Forest Hills Road in front of the Cherries in which the plants are now covered with expanding flowers.

Rosa multibracteata, the last of the Roses discovered by Wilson in western China, is now covered on the southern slope of Bussey Hill with its clusters of small flowers, the clear pale pink petals being deeply notched at the apex. Vigorous shoots of this Rose are thickly covered with bright red prickles and greatly add to its beauty at this season of the year and in winter. It does not always bloom as freely as it is blooming this summer, and during the severe winter of 1917-18 with several other of the Chinese Roses the Arboretum plants were killed to the ground.

Rhododendron maximum. There are three hybrids of this species which are good garden plants. The type of these hybrids must be considered *Rhododendron delicatissimum*, raised many years ago in England, the other parent being probably one of the white-flowered hybrids of *R. catawbiense*. A handsomer plant which was raised by Anthony Waterer at Knaphill several years ago and called by him *R. Wellesleyanum*, is apparently a rare plant and not in the Arboretum collection. There is a fine plant at Wellesley on the Hunnewell estate and four plants at Holm Lea. The flowers, which appear about a week earlier than those of *R. maximum*, are pure white with a large yellow blotch at the base of the corolla. Another hybrid which was raised several years ago by Charles Sander at Holm Lea in Brookline is not yet in the Arboretum and is still unnamed. It is a handsome, hardy plant with pure pink flowers, and was obtained by crossing *R. maximum* with one of the hybrids of *R. catawbiense* the name of which unfortunately is not known. The form of *R. maximum* with rose-colored flowers is a rare and beautiful addition to New England Rhododendron collections where unfortunately it is still rare. There is a large plant in the Hunnewell collection and it is also in the Boston park which was formerly the garden of Francis Parkman where it was planted by him. It blooms about the same time as *R. maximum*, and has the same habit of sending out its new shoots with or before the opening of the flowers. It has been received at the Arboretum from Connecticut as var. *superbum*. There is no indication in this herbarium that it is anywhere a wild plant.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



BULLETIN
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JULY 15, 1925

Plants of wide distribution. An herbarium which will show the distribution and forms of woody plants is an essential and perhaps the most important part of an establishment in which it is the purpose and duty to grow every specimen of tree or shrub which can be grown in the climate of eastern Massachusetts. It has already been found that several plants raised from seeds collected from one part of their range have proved hardy here and that those from other parts cannot support the Massachusetts climate. For example, the Douglas Spruce (*Pseudotsuga*) from the Pacific states is not hardy, but the same tree from the Rocky Mountains of Colorado, where it was discovered in 1862, has proved one of the most valuable conifers which can be grown in the eastern states. One of the handsomest of the Fir-trees, *Abies concolor*, grows on the Sierra Nevada of California and on the Rocky Mountains of southern Colorado. Both forms are in the Arboretum but the Colorado tree is much more vigorous and beautiful than the California form, and is now the handsomest Fir-tree in the Arboretum. The greatest of all Hemlock-trees (*Tsuga heterophylla*), often growing near the coast in Washington and Oregon to the height of two hundred feet, ranges inland through northern Idaho to Montana. Unfortunately plants from Montana have not yet been tested in the Arboretum, but two seedling plants gathered by Professor Jack at Glacier in eastern British Columbia have been growing here since 1904. Cupressus is an important genus of Conifers confined to western North America, Mexico, southeastern Europe, southwestern Asia, the Himalayas and China; one species, *Cupressus Macnabiana*, finds its northern home on the mountains of southern Oregon on which it ascends to altitudes of

nearly fifty-three hundred feet. Seeds gathered here in 1907 have produced plants which have grown well here up to this time and make an important addition to the Arboretum collection. One of the most important discoveries of the Arboretum is the fact that the Cedar of Lebanon can be successfully grown in Massachusetts. For centuries it was believed that this tree grew naturally only on Mt. Lebanon in Palestine and all the trees in cultivation were raised from seeds gathered on the Lebanon or from the trees grown from these seeds in England or France that grew in those countries to great size and beauty. The trees from Palestine were never hardy in New England, or really healthy in any part of the eastern states. A comparatively few years ago it was discovered that the Cedar of Lebanon formed forests on the Anti-taurus Mountains in Asia Minor about five hundred miles north and in a much colder region than the Lebanon. In 1901 the Arboretum sent a collector from Smyrna to the Anti-taurus to collect seeds of this tree. He succeeded in making a large collection which was distributed in the United States and in Europe. The seeds planted in the Arboretum grew well but the trees have grown irregularly in size; the tallest are now more than thirty feet high and among them are beautiful specimens. These trees can probably be considered perfectly hardy. During one exceptionally severe winter the leaves of a few of them were all killed but they were soon replaced by a new crop of leaves.

It is probable that the Arboretum can be greatly improved by the study and introduction of the geographical forms of many of the trees of the Old World, particularly of Europe and central China. The deciduous-leaved Oaks and the common Ash of western Europe grow here but never make fine trees, and are usually unsatisfactory and short-lived. Trees of these species have usually come to the United States from English nurseries and undoubtedly were raised from English-grown seeds. This is also true of the so-called Norway Spruce (*Picea Abies*) and the Scots Pine (*Pinus sylvestris*). These trees are widely distributed, and it is necessary to know more here of the limits of their distribution by the aid of a larger herbarium than the Arboretum now possesses of northern and western Europe, Siberia and the southern slopes of the Altai Mountains. Many of the trees of the valley of the Yangtse River in central China, which are growing well in Europe, have not proved hardy in the Arboretum, and it is desirable to follow their range north in order to obtain if possible hardier forms of these trees. This it is hoped may be in part accomplished at least by the Arboretum's present expedition into northern Tibet and extreme north-western China under the experienced leadership of Mr. J. F. Rock who is exploring a region into which no botanist has before penetrated. In some of the remote valleys of Persia and the eastern Himalayas plants should be looked for which will flourish in the Arboretum, and the exploration of such regions under intelligent botanical leadership is bound to be useful to this country, just as the exploration of the flora of every part of Japan and of central western China has enriched the forests, parks and gardens of the world. The making of an herbarium covering the trees of the world and showing their distribution is the work which should now occupy the chief attention of the Arboretum. It should not be long delayed for many species of trees are bound to disappear as the earth's surface is cleared for the cultivation

of food-crops for the human race, and especially the production of rubber to meet the demands which are made on it by the increased and rapidly increasing number of automobiles now in use. Such a world-wide exploration will require many years to accomplish, possibly a century, and will cost a great deal of money.

Koelreuteria paniculata. This Chinese tree is just beginning to open its yellow flowers which are perhaps the most conspicuous of those of any of the summer-flowering trees which are hardy in this climate. It is a round-headed tree rarely more than thirty feet high, with large, compound, dark green leaves and large erect clusters of golden yellow flowers which are followed by great clusters of bladder-like fruits. This tree, which is hardy in Massachusetts, has been a good deal planted in this country, especially in the gardens of the middle states. In American nursery catalogues it often appears under the name of "Japanese Lacquer-tree," although it is not a native of Japan and has not lacquer-producing sap.

The Sorrel-tree (*Oxydendrum arboreum*). This tree is the only representative of a genus of the Heath Family and one of the few genera of eastern American trees which is not represented in eastern Asia. The Sorrel-tree is a common tree of the forests of the Appalachian Mountains from southwestern Pennsylvania southward. It grows also but less abundantly from southern Ohio and Indiana to northern Florida, southern Alabama and Mississippi, and in eastern Louisiana. Growing under the most favorable conditions the *Oxydendrum* is a tree from fifty to sixty feet in height with a tall straight trunk sometimes twenty inches in diameter. The leaves are dark green, very lustrous and seven or eight inches long, and their bright color in the autumn is not surpassed by any other American tree; they are pleasantly acidulous, a character to which the tree owes its vernacular name. The flowers, which are shaped like those of an Andromeda, are erect on the branches of spreading or drooping clusters, and these are followed by pale capsular fruits which are conspicuous in contrast with the brilliant autumn foliage. Here at the north the Sorrel-tree begins to flower when only five or six feet high, and it is not probable that it will ever grow here to the size this tree attains on the lower slopes of the high southern mountains where many of the trees of eastern North America grow to their greatest size. There is a group of these trees among the Laurels (*Kalmia*) at the northern base of Hemlock Hill.

***Cornus asperifolia*.** This Cornel flowers a week or ten days later than the Silky Cornel and is still covered with its small cream-colored flowers in loose, broad or narrow, often paniced pubescent cymes, the peduncles an inch in length; these are followed by red-stemmed clusters of subglobose white fruit tipped with the remnants of the style and about a quarter of an inch in diameter. This is a widely distributed plant from southwestern Ontario southward to Ohio, Kentucky, Tennessee and Mississippi to western Florida, and westward to south-eastern South Dakota, southeastern Nebraska, central Kansas, north-western Oklahoma and western Texas. It is the tallest here of the American Cornels, with the exception of *Cornus florida*, often growing

to the height of twenty feet and forming a broad shrub with erect and slightly spreading branches. Southward, especially on the rich bottom-lands of southern Arkansas and eastern Texas, it becomes a tree sometimes fifty feet high with a short trunk eight to ten inches in diameter. There are large specimens in the Arboretum among the other Cornels near the junction of the Meadow and the Bussey Hill Roads and near the South Street Gate to Peter's Hill.

Tripterygium Regelii. Climbing plants with handsome foliage and conspicuous inflorescence which are hardy in New England are not numerous, and Mr. Jack's introduction several years ago from Korea of this vine made an important addition to the number. It is a near relative of the Bitter Sweet (*Celastrus*) and a native of Japan and Korea where it rambles over rocks and bushes, and often climbs with stems fifty and sixty feet long into the tops of trees. It has long-pointed dark green leaves often six inches in length, and small white flowers in terminal open clusters ten or twelve inches long which are followed by showy three-lobed and three-winged fruits from half an inch to an inch in length. By pinching the young shoots this vine can be grown as a shrub. As a vine it is growing on the trellis at the eastern end of the Shrub Collection, and there is a fine plant grown as a shrub and covered with flowers on the Centre Street Walk.

Periploca sepium. This is another handsome twining plant which Mr. Jack brought to the Arboretum from Korea. It is growing on a trellis near the *Tripterygium*, and is a plant with slender stems, pointed, dark green, very lustrous leaves about three and a half inches in length and not much more than half an inch in width, and small flowers in few-flowered clusters which are not showy but are pleasantly fragrant. Unfortunately the Arboretum plant has not yet produced its slender pod-like fruits, but as the plant sends up numerous root-suckers it might easily be propagated and become common in gardens. Much better known is *Periploca graeca* from southern Europe and western Asia which has not yet proved hardy in the Arboretum.

Fruits in the Arboretum. The Tartarian Honeysuckle (*Lonicera tatarica*) has been covered during the past week or ten days with its showy red or yellow fruits, and open the season of ripe fruits of many hardy trees and shrubs which are often more beautiful than when in flower. The climate of this part of the world is suited for the abundant production and the high color of the fruits of the trees and shrubs of northeastern Asia; and European plant lovers who come to the Arboretum in summer and autumn are always astonished and delighted with the abundance and beauty of the fruits they find here. On the Red and White Maples the fruit ripens in May, and until the first of November there will be a succession here of ripening fruits. The fruits of a few trees and shrubs will remain on the branches and keep much of their brilliancy until April, and there is therefore only a few weeks during the year when one cannot find showy fruits in the Arboretum.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JULY 22, 1925

Summer-flowering Trees. A few trees flower in summer here and add to the interest of the Arboretum at a season of the year when there are comparatively few flowers or ripe fruits to be seen. Among these are:

Sophora japonica, which is growing on the right hand side of the Bussey Hill Road, and is now covered with flower-buds which will open in the course of the next two 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. The bark of the young branches and the leaves are dark green, and the small, white, pea-shaped flowers are produced in narrow, erect terminal clusters. This tree has a trunk covered with a rough pale bark and the old trees in the squares of Peking, where it has been largely planted, look in the distance like great Oak-trees. There are in the Arboretum collection in addition to the type the form with long pendulous branches (var. *pendula*), a favorite with those who fancy trees of abnormal growth although it rarely ever flowers, the form with erect branches (var. *pyramidalis*), and the form (var. *rosea*) on which the flowers are slightly tinged with rose color.

Evodias are small summer-flowering trees of the Rue Family widely distributed in eastern Asia, and found also in Madagascar and Australia. The species have pinnate leaves, white or pinkish flowers in small clusters terminal on the shoots of the year, and dry, capsular fruit. Like the *Phellodendron*, to which *Evodia* is related, they are

protected from the attacks of insects by the pungent aromatic oil with which the leaves abound. The genus has been growing in the Arboretum since 1905 when Professor Jack brought from Korea the seeds of *Evodia Daniellii*. This handsome tree has flowered now for several years in the Arboretum. *Evodia hupehensis* and *E. Henryi*, common inhabitants of the forests of western China, are also growing in the Arboretum; the former is a larger tree than the other Chinese species and flowers here abundantly.

Rhus javanica is an eastern Asiatic Sumach which is perhaps better known as *R. Osbeckii* or *R. semialata*. It is one of the handsomest trees which flower in New England in August. Here, however, it is rarely twenty feet high with spreading branches which form a broad round-topped head of handsome light green pinnate leaves with a broad-winged petiole and rachis. The flowers are white in erect, long-branched, terminal clusters ten or twelve inches in length and stand well above the leaves. The fruit is globose, about a quarter of an inch in diameter, red and arranged in compact clusters. The leaves of few trees or shrubs turn in the autumn to a more brilliant scarlet. For its conspicuous inflorescence and the splendor of its autumn foliage this Sumach should more often find a place in our northern gardens.

To the Aralia Family the Arboretum is indebted for three handsome trees which flower in early summer or in autumn; these are *Acanthopanax ricinifolium*, *Aralia spinosa* and *A. chinensis*. *Acanthopanax ricinifolium* 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 on long stalks and are nearly circular, five- or seven-lobed and often fifteen or sixteen inches in diameter. The flowers are small, white and produced in compact, long-stalked clusters which form a flat, compound, terminal panicle from twelve to eighteen inches across and are followed in late autumn by shining black fruits which remain on the branches until after the beginning of winter. This tree is perfectly hardy in the Arboretum where it has been growing now for more than thirty years and flowers and ripens its seeds here every year. This tree can be seen on the right hand side of the Meadow Road close to the banks of the little pond near the junction with the Bussey Hill Road.

Aralia spinosa, the so-called Hercules Club of the southern United States, where it is a common inhabitant of the borders of woods and the banks of streams, is a tree often thirty feet in height with a tall trunk and wide-spreading branches covered with stout orange-colored prickles. The leaves are borne at the ends of the branches and are long-stalked, twice pinnate and from three to four feet in length and two and a half feet in width. 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 in length. The fruit is black, rather less than a quarter of an inch in diameter, and ripens in early autumn. This Aralia 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 and underground stems.

Aralia chinensis resembles in habit and general appearance the American Hercules' Club but is distinguished 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*), often found 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. These trees are growing near the *Acanthopanax*.

Summer-flowering Shrubs. Many shrubs with conspicuous flowers bloom in the Arboretum during the summer months. The list includes the Heathers (*Calluna vulgaris*) and several species of *Genista* and *Cytisus*. Of this European group the handsomest which can be grown here is the bright yellow-flowered *Cytisus nigricans*, the yellow-flowered *C. capitatus*, the white-flowered *C. leucanthus* and the yellow-flowered Woad Wax (*Genista tinctoria*) and its varieties, too well known in Essex County, Massachusetts, where escaped from cultivation it has ruined many hundred acres of hillside pastures. The *Lespedezas* with their abundant, purple, pea-shaped flowers, and the handsomest of the Chinese *Buddleias* are still in bloom, as is the hardy *Acanthopanax sessiliflorum*, a vigorous shrub of eastern Siberia, most conspicuous in winter when the compact round clusters of the shining black fruits are on the ends of the branches. The Japanese *Hydrangea paniculata* and its varieties, and the *Hydrangeas* of North America produce here the showiest July and August flowers. The early-flowered form of *H. paniculata* (var. *praecox*), a large and vigorous shrub and the handsomest of the group, was conspicuous in middle of July. The most popular of these shrubs is the form of *H. arborescens* (var. *grandiflora*) with snowball-like heads of sterile flowers which will bloom later. There is a similar abnormal form of the American species, *H. cinerea*, which is an attractive plant. More beautiful and one of the handsomest of the genus, *H. quercifolia*, a native of the southern states, has been blooming more freely this year than ever before. An important and valued garden ornament in the middle and southern states, it is sometimes killed to the ground here in cold winters.

Aesculus parviflora. The only truly shrubby species and the last of the Buckeyes to flower is covered with its tall narrow spikes of small, slender white flowers and is perhaps the most conspicuous of the summer-flowering shrubs hardy in the Arboretum, with the exception of some of the *Hydrangeas*. A native of the southern states from South Carolina to Alabama and nowhere abundant, it appears to be most common in Alabama. It is perfectly hardy, however, in Massachusetts and has long been a favorite in gardens in which it produces stems seven or eight feet high, and in good soil and with sufficient room spreads into great thickets often twenty or thirty feet across.

Indigoferas. Five species of this genus of the Pea Family are now flowering in the Arboretum. They are small plants with handsome flowers in terminal racemes, well suited to decorate a garden border. The species with pink flowers, *I. Kirilowii*, a native of northern China, Manchuria and Korea, *I. Potaninii* and *I. amblyantha* are perfectly hardy, and the last will continue to open its small flowers on the lengthening racemes until October. The other species, *I. Gerardiana* and *I. decora*, are killed to the ground here every winter, but like herbaceous plants produce new stems in the spring which never fail to flower during the summer. *I. decora* is a native of southern China, and in the Arboretum the flowers are pure white and very beautiful. *I. Gerardiana* is a native of the northwestern Himalayas and has gray-green foliage and rose-purple flowers. This is the least beautiful of the five species now growing in the Arboretum.

The Japanese Clethra (*C. barbinervis*) flowers about two weeks earlier than the native *C. alnifolia*. The Japanese species is the larger plant of the two and in Massachusetts has grown ten or fifteen feet high and is nearly as much through. The foliage is of a lighter green than that of the American plant; the flowers are less crowded in the racemes, and lack the perfume which makes *C. alnifolia* one of the most delightful of summer-flowering shrubs. In the Arboretum the Japanese Clethra has escaped the attacks of the red spiders which often disfigure those of *C. alnifolia*.

Calluna. Few Americans appear to realize that the Calluna, or Scotch Heather as it is usually called, can be successfully grown 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 fully 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 in the Arboretum collection. Some of the best of them are var. *alba* with white flowers, var. *alba minor*, a plant of dwarfer habit than the last, var. *rubra*, a dwarf compact variety with crimson flowers and the earliest to bloom, var. *tomentosa*, a compact plant with gray-green foliage and red flowers, the white-flowered varieties *alba tenella* and *alba rigida*, and var. *Alportii*, a tall-growing form with crimson flowers. These plants can be seen in the Shrub Collection and are not exceeded in interest by any of the summer-flowering shrubs in the Arboretum.

These Bulletins will now be discontinued until the autumn.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

OCTOBER 29, 1925

Autumn Foliage. Although the leaves of several trees which assume brilliant autumn colors have been injured by severe winds, rain, and even by an unseasonable snow storm, and have fallen prematurely this autumn, like those of the Red Maple (*Acer rubrum*), the Sugar Maple (*Acer saccharum*), the Kentucky Coffee-tree (*Gymnocladus*), many of the Cherry and Plum-trees, the Sassafras, most of the Poplars, *Phello-dendron amurense*, *Cercidiphyllum japonicum*, the Walnuts and some of the Hickories, there is now probably more brilliant color in the Arboretum than there has been earlier or than there will be later, for the leaves on many of the Oaks, of which the forests and many plantations in eastern Massachusetts are largely composed, the American Beech-trees, the Tulip-tree (*Liriodendron*), a few Maples, the Hornbeams (*Carpinus*), Hop Hornbeam (*Ostrya*), and of the Sorrel-tree (*Oxyden-drum*), are still brilliant in color. The autumn leaves of the Scarlet Oak (*Quercus coccinea*), the White Oak (*Quercus alba*), of a dwarf Oak (*Quercus ilicifolia*), and of the Red Oak (*Quercus borealis maxima*) make the greatest show in the Arboretum. Those of the Scarlet Oak are the deepest red or scarlet of any of the American Oak-trees. This tree is not a native of the Arboretum and is not common in the neighborhood of Boston, but a little further south and generally in the Cape region it is a common tree. There are not, unfortunately, many specimens in the Arboretum, and the best of them are among the trees on the lower side of the road near the top of Peter's Hill. The Scarlet Oak deserves to be better known to the planters of trees and to be more generally used by them. Nurserymen too often sell the Pin Oak (*Quercus palustris*), an inferior tree in the color of its autumn

foliage, when the Scarlet Oak is ordered. The leaves of the White Oak turn late to various shades of red, and are brilliant in favorable seasons during at least two or three weeks. The great beauty at this season of the year of *Quercus ilicifolia*, which is usually a tall shrub rather than a tree, is that with its bright lustrous leaves it often thickly covers sandy barrens and rocky hillsides near the coast from southern Maine southward, and is especially abundant on Cape Cod and its islands in situations where few other trees can grow. It grows well in the Arboretum and can be seen to advantage on the left hand side of the Valley Road beyond the group of native Swamp White Oaks (*Quercus bicolor*). The lustrous leaves of the Red Oak (*Quercus borealis maxima*) turn late to various shades of brown or red and retain their beauty for a long time. This large and fast-growing tree is the Oak which has been chiefly planted along the Boston and Brookline parkways and in the Boston parks, and has generally grown better in western and northern Europe than other American Oaks. On Peter's Hill, among the trees on the lower side of the road below the summit is an Oak tree which is not surpassed in the brilliant red color of its autumn foliage. Nothing is known of the origin or history of this tree which for years has been considered a *Quercus bicolor* with abnormally colored leaves. This year for the first time this tree has produced a few acorns, and these suggest that this handsome tree may be *Quercus Prinus* of Linnaeus, the so-called Basket or Cow Oak, a white Oak of the middle and middle western states. Nothing is known here of the autumn coloring of this tree, but if this guess as to the identity of the tree is correct it is curiously enough the only living representative in the Arboretum of one of the largest and handsomest of the Oak trees of eastern North America.

Cornus florida, the Flowering Dogwood of the eastern United States, more abundant southward than in Massachusetts where its flowers are sometimes injured by the cold of severe winters, has few equals among small trees for the autumn decoration of our parks and gardens. Its autumn beauty is increased by the contrast of the crimson, scarlet and green colors of the upper surface of the leaves with that of the lower surface which retains until the leaves fall the pale nearly white color of the summer. It is one of the plants on which the leaves turn early and retain their brilliant color during October, or for a longer period perhaps than any plant in the Arboretum with such early turning leaves. In regions with a winter climate as severe as that of eastern Massachusetts the eastern Asiatic relative (*Cornus kousa*) of our Flowering Dogwood is a more reliable plant. It is a smaller tree but the leaves turn brilliantly in the autumn, and the flower-buds are not killed or injured by the severe cold of our winters, and open from two to three weeks later; the floral bracts are narrower, further apart and pointed, not broad and rounded, at the apex like those of the American tree. The fruit is even handsomer 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 (*Cornus kousa* var. *chinensis*) promises to be even a better plant in this climate than the Japanese form and 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.

Zelkova serrata, the Japanese Keaki. The leaves of this tree, which are brown more or less tinged with yellow, make it conspicuous at this season of the year and remind us how little this valuable tree is known in the United States. The oldest tree in this country known to the Arboretum is growing on the estate of Mr. Henry Everett in Barnstable, Massachusetts. The seeds which produced it were brought from Japan in 1862 by John Wilson who gave them to Captain Hinkley. Only one plant was raised from these seeds. Fifteen years ago it was a broad-headed tree with a short stout trunk divided into several large spreading stems. A little later seeds of the Keaki were sent to the Parsons Nursery at Flushing either by Dr. Hall or by Mr. Thomas Hogg, and the best trees known to the Arboretum are in Dr. Hall's plantation at Bristol, Rhode Island. The largest of these trees are now fully seventy feet high with tall stems from two to two and a half feet in diameter. For years they have produced large crops of seeds, and quantities of seedlings spring up under the trees and at long distances from them, the seeds being widely scattered by wind. A specimen with a clean trunk and shapely head which had been planted by the roadside in Warren, near Bristol, fifteen years ago indicated that the Japanese *Zelkova* might be successfully used as a street or roadside tree. It is as a timber tree, however, that this tree deserves the attention of Americans. It is the most important hardwood tree of Japan and Korea. The wood is tough, elastic and durable in the ground, and when exposed to the air it is considered the best wood for building in the Empire, and furnishes the great round columns which support the roofs of Japanese temples. It is universally used in Japan for making jinrikishas, and quantities of the wood are sent from Korea into China for this purpose. It is the Keaki alone which has made the jinrikisha possible, just as the Hickory tree has made possible in this country the light wagon and the trotting horse. Great specimens of this tree can be seen in Japanese temple gardens and by the village roadsides. It is doubtful if this really noble tree, which is hardy and has grown rapidly in the Arboretum, can be found in any American nursery.

The Arboretum at this season of the year owes much to the highly colored leaves of the fragrant Sumach (*Rhus canadensis*), or as it was formerly called *R. aromatica*. This widely distributed North American shrub seldom grows more than five feet tall, and when planted in good soil is often broader than tall with lower branches spreading flat on the ground and upper branches erect, spreading or drooping. In early spring before the leaves appear the branches are covered with clusters of small bright yellow flowers which in June are followed by dull red fruits which are mostly hidden by the small compound leaves. Among the small shrubs in the Arboretum few are more brilliant at this season of the year for the leaves turn gradually to bright scarlet and orange. It has been largely planted along some of the drives as a border for larger plants, and no plant which has been tried in the Arboretum for this purpose has proved so successful. It is a remarkable fact that this beautiful and useful shrub is not found in American Nurseries.

No shrubs are more brilliant in their red or crimson coloring at this season of the year than the Blueberries and Huckleberries of eastern North America. None certainly are more beautiful than the Highbush Blueberry so called (*Vaccinium corymbosum*) and its variety *pallidum*. These plants, too, are handsome in early spring when their white bell-shaped flowers open, and in August and September when the blue-black fruit covers the branches. A native of swamps, the Highbush Blueberry grows equally well in gravelly ground, and the best plants in the Arboretum are on Bussey Hill near the entrance to Azalea Path and opposite the overlook. The autumn color of the other Blueberries and Huckleberries is as brilliant as that of the Highbush Blueberry, and some of them, especially *Vaccinium pennsylvanicum*, are invaluable for covering the 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 the autumn the plants make a broad mass of scarlet when only a few inches high and are more brilliant in color than those of the Heather on the Highlands of Scotland. The Japanese *Vaccinium ciliatum*, an upright growing shrub, is also covered now with bright red leaves. There is a group of these plants in the Shrub Collection, but they are seen to their best advantage on both sides of Azalea Path where nearly all the species are growing.

Many of the Viburnums are still brilliant, the most beautiful perhaps is the American *V. prunifolium* and *V. Lentago* which often grow to the size of small trees, *V. dentatum* and *V. scabrellum*, the Korean *V. Carlesii* and the two red-fruited Japanese species *V. Wrightii* and *V. dilatatum*. It is interesting that the leaves of *V. Canbyi*, sometimes considered a variety of *V. venosum*, are still perfectly green. This native of eastern Pennsylvania, Delaware and central Indiana, is the last of the American species to flower and the leaves are still perfectly green. Specimens from twelve to fourteen feet high and broad can be seen in the Arboretum near the Administration Building and by the border of the Meadow Road.

Of leaves which turn yellow in the autumn and are still brilliant and conspicuous are those of the winter-flowering Witch Hazel (*Hamamelis vernalis*), a native of southern Missouri and adjacent regions. This shrub deserves a place in gardens for its flowers which open in January and February, and for the beauty of its late persistent leaves.

The leaves of the Elm trees when they turn at all in the autumn usually turn to shades of dull yellow. There is a remarkable exception in *Ulmus parvifolia*, a native of the Yangtse valley in China with an outlying station in southern Japan. Plants of this tree were sent in 1909 by Wilson from China to the Arboretum. They have grown well here and are perfectly hardy, and the autumn leaves of most of the trees are bright clear yellow, but on two of the trees the leaves are bright red. This tree is certainly an exception in its autumn leaves to all the Elm trees known to the Arboretum.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



BULLETIN
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JAMAICA PLAIN, MASS.

NOVEMBER 9, 1925

Plants green in the late autumn. The beauty of the autumn foliage is increased by the fact that the leaves of few plants remain green late in the season without change of color and make a beautiful contrast with highly colored plants like the Oaks and Maples, the leaves of which turn so brilliantly to shades of yellow and red before falling. The most conspicuous of these trees is the European *Salix vitellina*, often erroneously called *Salix alba*, and the well known weeping *Salix babylonica*, called Napoleon's Willow because cuttings are supposed to have been brought from Napoleon's tomb at St. Helena. A fast growing Willow of eastern Asia, *Salix Matsudana*, which is a large and common tree in the streets of Peking, has grown rapidly in the Arboretum where it promises to become a large tree and where it holds its leaves as late as the European species. More beautiful is our Sweet Bay or Swamp Bay, *Magnolia virginiana (glauca)* which is one of the most beautiful trees of eastern North America, but unfortunately at the north is sometimes only a shrub and rarely more than twenty to thirty feet high. The leaves, which are covered when they unfold with long white silky hairs, are bright green, lustrous and glabrous above and nearly white below, and without change of color do not fall in Massachusetts until late in November or in early winter, and few American trees have more fragrant creamy white flowers opening during several weeks in the spring and early summer. The northern station of this tree was in Essex County, Massachusetts, in swamps of what is now the town of Magnolia, and it ranges southward usually in the neighborhood of the coast to the southeastern states where it often grows ninety feet high, differing from the northern tree in the thick

silky white pubescence on the pedicels and branchlets. The common Oak of western Europe, *Quercus robur*, and its variety *pedunculata*, also retain their leaves until late in the autumn without change of color. There are many varieties of these trees, including fastigiate and pendulous forms, but they are all short-lived in the eastern states and do not promise to become as large and important trees as they are in Europe.

A few shrubs also retain their leaves until the beginning of winter without change of color. The best known of these is the European Privet, *Ligustrum vulgare*, which retains its dark green leaves well into the winter and is perhaps the handsomest of all black-fruited shrubs in the Arboretum. During the first half of the nineteenth century it was a common garden plant in the northern United States where it was much used for hedges, and is now sparingly naturalized. Equally handsome but much less known is *Rhamnus Purshiana*, a taller shrub or occasionally a tree attaining the height of forty feet. A native of the Pacific coast from British Columbia to Mexico, this handsome shrub ranges eastward to Montana and Texas, and promises to be a useful plant in this part of the country. Another plant conspicuous by its green leaves at this season of the year is a form of the western Chinese *Evonymus Bungeana* (var. *semipersistens*), a large, round-topped shrub with leaves remaining on the branches until the middle of winter. The so-called Wayfaring-Tree, *Viburnum Lantana*, from Europe also holds its green leaves late in the autumn. It is a shrub, or occasionally in Europe a small tree with handsome dark green leaves which fall usually late in November. This beautiful plant bears rather small clusters of pure white flowers which are followed by bright red fruits changing to almost black.

A few vines also retain their leaves without change of color until late in the autumn or in early winter. The best known and most generally planted of these is *Lonicera japonica* which sometimes climbs to a height of twelve or fifteen feet with fragrant yellow flowers. There is a variety of this handsome plant with leaves marked with yellow (var. *aureo-reticulata*). The variety *Halliana*, introduced into this country by Dr. Hall and probably first cultivated in the Parsons Nursery, differs in flowering in the autumn. Another climbing Honeysuckle which retains its green leaves until late in the autumn is *Lonicera Henryi* from western China, probably little known yet in this country is to be seen among the vines in the Shrub Collection and on Bussey Hill among other Chinese plants. *Smilax hispida* is another vine widely distributed in North America from Ontario and Minnesota to Louisiana and Texas, with deciduous leaves which usually remain green without any change of color until late in November. Two Japanese vines, *Akebia quinata* and *A. lobata*, still retain the bright color of their summer foliage; the former, with leaves composed of five leaflets and with small dark purple flowers, is well known in American gardens. *A. lobata* is less well known in this country and differs from *A. quinata* in the three, not five rather larger leaflets which turn late in the autumn just before falling to a handsome bronze color. These vines rarely produce fruit here, which resembles in shape a short thick banana, is pale violet in color and contains many small seeds imbedded in sweet juicy pulp. Of *A. lobata* the Japanese are fond as the fruit

is found in great quantities in the markets of northern Japan. This species has never produced fruit in the Arboretum and occasionally has been killed nearly to the ground in severe winters.

Beech Trees. Of the northern genus *Fagus* the Arboretum now contains eight of the ten species which have been recognized by botanists. They inhabit eastern North America, eastern Europe, the Caucasus, western China and Japan. The leaves of most of the Beeches turn yellow in the autumn, exceptions being forms of *F. sylvatica* and its varieties.

The great Beech tree of the world is the European *Fagus sylvatica* which is distributed over a large part of Europe except in the extreme north growing to great perfection in England, Denmark, parts of Germany, and on the mountains of the Balkan peninsula, often forming pure forests and growing to the height of one hundred feet. It is a hardy and handsome tree in New England, where perfectly at home, growing faster and making a handsomer tree than the American species, it is probably the best European tree to grow in this climate. There is no record, unfortunately, of the date of the introduction of this tree into the United States, but, judging by the size of some of the trees here, it must have been at least one hundred years ago. The finest European Beeches in the neighborhood of Boston, and probably the finest collection of these trees in the United States, are on Longwood Mall, a strip of turf extending east from Kent Street and between Chatham and Beech Streets in Brookline. This Mall was laid out by David Sears at the time he was engaged in developing his Longwood property between eighty and ninety years ago, and it is probable that these Beech trees were planted at about that time. They are all short-stemmed specimens from sixty to seventy feet tall, with wide-spreading branches which on some of the trees sweep the ground. Several varieties of the European Beech have been found growing naturally in the woods in Europe and are propagated and sold by nurserymen. The best known of these varieties is the so-called Purple Beech with leaves which are pale red in early spring and deep red at maturity, falling in the autumn without change of color. This tree was found originally growing in the forests in three or four places in central Europe, and the first account of it was published in 1680. Seedlings raised from the Purple Beech sometimes have purple leaves and often different shades of color, and to some of these forms names have been given. The Purple Beech unfortunately is more generally planted than the typical green leafed form, and with many tree-planters has been a favorite in the northeastern states. An interesting form of the European Beech (var. *pendula*) is a comparatively low tree with horizontal and slightly pendulous branchlets from which hang almost vertically secondary branches, all forming a tent-like head almost as broad as high. This tree was at one time somewhat planted in this country, and the largest specimen known to the Arboretum is growing on what was once a part of the Parsons Nursery in Flushing, Long Island, which has recently been obtained for a park by the city of Flushing. The variety *remillyensis* is usually classed among the weeping Beeches but is really a shrub as broad or broader than it is high.

The Fern-leaf Beech (var. *heterophylla*) distinguished by its variously shaped leaves which on the same branch are long and narrow and usually more or less deeply lobed, pinnate or laciniate, is growing well in the Arboretum where it promises to become a handsome tree. The Arboretum knows two fine specimens of this variety in the United States. One of these grows on Bellevue Avenue, in Newport, Rhode Island, on the grounds of the Redwood Library and Reading Room. This tree was planted in 1834 and has a trunk nearly four feet in diameter, and a spread of branches about seventy feet across. The second is growing on Mr. Hendon Chubb's estate, in Llewellyn Park, near Orange, New Jersey, and is supposed to be seventy-five years old. This tree, which has branches drooping to the ground, is forty feet high with a head forty-five feet in diameter. A form of the European Beech (var. *fastigiata*) on which all the branches grow erect and form a narrow pyramidal head, promises to be a useful addition to trees of this habit, like the fastigiata Red and Sugar Maples, the fastigiata European Oak, and the fastigiata Tulip-tree. There is a great difference here in the time the different forms of the European Beech assumes its autumn colors. On some trees the leaves are still entirely green and on others the green is slightly tinged with yellow or a general brownish color. The leaves of the purple-leaved forms retain their color until they fall.

Climbing Plants. The Ivy, which is perfectly hardy forty miles south of Boston in the City of Providence, has been kept alive with difficulty in a sheltered place in the Arboretum; raised from seeds gathered at Riga in Russia, probably as cold a place as it grows in naturally. Its only substitute in this climate is *Evonymus radicans* var. *vegeta*, the handsomest form of this Japanese species which readily clings to the walls of a brick building and can be grown as a shrub by a little cutting or made into a low hedge, and when not too closely cut is thickly covered in the autumn with abundant and beautiful fruit. Further south, as on Long Island, this useful plant is badly injured by a scale insect.

ARNOLD ARBORETUM
HARVARD UNIVERSITY



BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

DECEMBER 18, 1925

Of the forty-eight genera now recognized of the Pine Family (*Pinaceae*, now considered with *Taxaceae* to constitute the class *Coniferae*) sixteen are more or less successfully established in the Arboretum collections. These are *Pinus*, *Picea*, *Abies*, *Tsuga*, *Pseudotsuga*, *Cedrus*, *Sciadopitys*, *Cryptomeria*, *Taxodium*, *Libocedrus*, *Thuja*, *Cupressus*, *Chamaecyparis*, *Juniperus*, *Larix* and *Pseudolarix*. In these sixteen genera are represented all the genera of *Pinaceae* in North America with the exception of *Sequoia* from California, Mexico, Europe, northern Africa, with the exception of *Tetraclinis*, Siberia, the Caucasus, Asia Minor, Japan, with the exception of *Thujopsis*, and northern China. None of the *Pinaceae* from south of the Tropic of Cancer are hardy in New England.

The best perhaps of the species of these sixteen genera for general cultivation in the northeastern United States among the Pines are *Pinus Strobus* and *P. resinosa* of northeastern North America. *Pinus Strobus*, if it can be protected from the White Pine blister rust by isolating it from species of Currants and Gooseberries (*Ribes*), is the handsomest and most reliable Pine with leaves in clusters of five for this climate. There are handsome and interesting dwarf forms of this tree in the collection. *Pinus resinosa* is the hardiest and handsomest of the so-called Pitch Pines with leaves in two- or three-leaved clusters for cultivation either as an ornament or as a timber tree which can be grown in this part of the country. A dwarf form of the Red Pine (*P. resinosa* var. *globosa* Rehder) which was discovered in New Hampshire a few years ago and is still rare and little known in cultivation, is established in the Arboretum.

The best Spruces in the collection which have been sufficiently tested are the Rocky Mountain *Picea Engelmannii* and the Serbian *Picea omorika*. *P. Engelmannii* is one of the important introductions of the Arboretum. It is the handsomest of the North American Spruce trees and the most valuable as a timber tree of them all. At its best it is sometimes one hundred and twenty feet tall with a trunk often nine feet in diameter, frequently forming great forests up to altitudes of ten or twelve thousand feet and is widely scattered about five thousand feet through the whole Rocky Mountain system from Alaska and British Columbia to southern New Mexico and northern Arizona. This tree has been grown in the Arboretum since 1879 when seeds collected by Dr. C. C. Parry were sent here from Pike's Peak in Colorado. It has grown rapidly here where it has always been perfectly hardy and has formed narrow pyramidal heads of pale gray-green leaves. Its only drawback as an ornamental tree is the tendency of the trees to lose their lower branches, an advantage rather than a defect in a tree which will be grown more for the production of timber than for ornament. The loss of the lower branches, too, discloses the exceptionally beautiful pale gray bark tinged with red. *Picea omorika* is another of the great conifers introduced into cultivation by the Arboretum where seeds sent by the late Dr. Carl Bolle of Berlin were planted in 1881 and have now grown into handsome compact pyramids of yellow-green leaves pale below. This is the important Spruce-tree of southeastern Europe where it forms or has formed great forests. The only drawback to this tree which has been seen in the Arboretum is the occasional destruction of the leading shoot by the insect which sometimes kills the leader of the White Pine.

Unfortunately the two Spruce trees which for years have been and are still generally planted in the northeastern part of the country, the so-called Norway Spruce of Europe (*Picea Abies* or *P. excelsa*) and the Rocky Mountain Blue Spruce (*Picea pungens*) from Colorado and eastern Utah to northern New Mexico and Wyoming, have not proved successful in the eastern states. Fifty or sixty years ago the Norway Spruce was very generally planted in southern New England where, however, it commences to fail at the top when about thirty years old and soon becomes ragged and unsightly, the leading shoot dying or failing to make a satisfactory growth and all the upper part of the tree gradually becoming thin, with the result that there is hardly a park or country place in New England where the sad spectacle of such half-dead trees cannot be seen. Easily raised from seed which is readily obtained, young plants grow rapidly, and they are therefore profitable plants for nurserymen to handle; and the public, in spite of the American experience with this tree, continues to buy it. In some of the states it is raised by state agencies and given away or sold at a nominal price, or is planted by the state in reforestation operations. Perhaps no other species of Pinaceae has produced so many dwarf forms and some of these are handsome and interesting plants.

The Colorado Blue Spruce is still one of the most popular conifers in the northern United States where it is propagated and planted in immense numbers in spite of the fact that it early loses its value as an ornamental tree. It is very hardy, is easily raised and grows rapidly. The young plants are of good shape and dense habit, their lower

branches resting on the ground. For the nurseryman the Blue Spruce has everything to recommend it; the easy germination of the seeds, quick growth and unusual beauty of the young plants lead to the certainty of a quick sale. To a planter looking for something more important than a plant for a city garden or a small suburban yard this tree has certainly proved a failure. This is not surprising for *Picea pungens* growing in small groves near streams in the valleys of the Rocky Mountains long before it attains its full size is a thin, scraggy, miserable looking tree with a few short branches near the top of the stem. This tree was discovered in 1862 and was planted the following year in the Harvard Botanic Garden, and one of the plants raised at that time is still alive in the Arboretum on the southern slope of Bussey Hill where it is kept as a warning for planters who are deceived by the beauty of young plants. There is a dwarf variety of the Blue Spruce (var. *compacta* Rehder) which appeared in the Arboretum a few years ago. Like the typical form, it early becomes unsightly by the loss of many of its branches.

Of the numerous Fir trees which are growing in the Arboretum collection the two most valuable are the Japanese *Abies homolepis*, more often called perhaps *Abies brachyphylla*, and the Colorado form of *Abies concolor*. *A. homolepis* is a large tree on the mountains of central Japan with dark green leaves silvery white on the lower surface and violet purple cones. The largest specimen in the Hunnewell Pinetum at Wellesley is now nearly sixty-five feet tall with branches sweeping the ground. The Arboretum trees are smaller but already produce their handsome cones. A variety of this tree (var. *umbellata*) with green cones and rather lighter-colored leaves is also established in the Arboretum where it has grown rapidly, the largest specimen raised from seeds planted in 1881 being now nearly forty feet high. With *Abies brachyphylla* the Rocky Mountain form of the western American *A. concolor* must be placed as a satisfactory and beautiful tree. The oldest specimens in the Arboretum were raised here from seed planted in 1872 and are now from sixty-five to seventy feet high with lower branches resting on the ground and are solid masses of gray green foliage.

Among the Tsugas which have been sufficiently tried in the Arboretum the most satisfactory are the common Hemlock (*Tsuga canadensis*) of the northeastern part of the country, which is seen to advantage in the natural grove of this tree which covers the eastern and part of the northern slope of Hemlock Hill, and the Carolina Hemlock (*T. caroliniana*), the third of the great *Pinaceae* first cultivated in the Arboretum, which by many persons is considered the most beautiful tree among all the *Pinaceae* in the Arboretum collection. It is a native of the Blue Ridge, the eastern range of the Appalachian Mountains, on which it grows from southwestern Virginia to northern Georgia usually in scattered groves on the rocky banks of streams at elevations between two thousand five hundred and four thousand feet. This beautiful tree escaped the attention of the numerous botanists who first explored the southern Appalachian Mountains, and its distinct character was first noticed in 1850 by Dr. L. B. Gibbes of Charleston, South Carolina, although it was not until thirty-one years later that it was first described by Engelmann. This tree was first raised at the Arboretum

in 1880 and the tallest specimen now is fully forty feet high. On the Blue Ridge it is usually not more than forty or fifty feet high, although occasionally trees up to seventy feet high occur, and the trunk has rarely a greater diameter than two feet. It is a smaller tree therefore than the northern Hemlock; the branches are more pendulous and the leaves are darker green and more lustrous than those of the northern tree. The leaves, too, are usually notched at the apex and slightly toothed, while those of the northern tree are rounded at the apex and are not notched. The two trees are best distinguished, however, by their cones; those of the southern tree are not stalked and their scales are much longer than broad with obviously pointed bracts, while those of the northern tree are stalked and the scales are about as long as wide with bracts broad and truncate at the apex. Many persons now see and admire the Carolina Hemlock in the Arboretum every year. It is still rare in cultivation, and probably ten thousand Colorado Blue Spruces are planted in this country every year for one Carolina Hemlock.

The interior region of North America has made it possible to cultivate in the eastern states a number of Pacific trees which are not hardy here when obtained from the coast. The most useful of these is the Douglas Spruce (*Pseudotsuga taxifolia*) and its dwarf varieties, and the Pacific coast Arbor Vitae (*Thuja plicata*) which collected in Idaho in 1880 has been growing here successfully ever since and is one of the beautiful *Pinaceae* of the Arboretum. Equally successful is the Japanese *Thuja Standishii* which gives every promise of becoming here a large tree with a handsome tall trunk.

The hardy form of the Cedar of Lebanon may perhaps best show the importance of the selection of trees from which to raise others for any particular climate, and the form of this tree from Asia Minor is the most important introduction of exotic trees made by the Arboretum. A comparatively short time ago it was found that this tree grows in Asia Minor on the Anti-Taurus far north of the Lebanon range in Palestine and in a much colder climate. As the Palestine Cedar had not proved hardy in New England the Arboretum had seeds of this tree collected on the Anti-Taurus with the view of introducing a hardy race of this beautiful tree into New England. The seeds were sown here in the spring of 1902 and a large number of plants were raised. They have all proved perfectly hardy and have not suffered from drought or cold. A few of them, however, have been lost in transplanting for no other tree has proved so difficult to move. The average height of these Cedars in the Arboretum is now over twenty feet, the tallest being more than thirty feet high.

Of the large collection of Junipers in the Arboretum those best worth raising here are probably *Juniperus virginiana* and its numerous varieties, the Japanese *J. rigida*, a small tree with gracefully pendulous branches, and the prostrate *J. horizontalis*, widely distributed from the coast of Maine to British Columbia, ranging south to Massachusetts, western New York, Illinois and Montana, and one of the handsomest of all prostrate Junipers, with branches hugging the ground and often extending over broad areas. The beauty and value of this plant is well shown in the Juniper collection.

The most valuable probably of the Larch trees in this climate is the

common European *Larix decidua*, a better tree than the eastern American species, but it does not grow as large as the western *Larix occidentalis* which, however, has not been sufficiently tried in this climate to show its true value. A hybrid (*L. eurolepis*) between the European and the Japanese Larch (*Larix Kaempferi*) grows more rapidly than any of the species, but it is still too soon to speak of its permanent value in New England.

Pseudolarix amabilis, the so-called Golden Larch of China, is one of the handsomest and hardiest of exotic trees which can be grown in the eastern United States into which it was introduced more than sixty years ago. As long ago as 1853 it was first made known by Robert Fortune who found it grown in pots, and it was not until eleven years later that he found it growing in the open ground of a monastery in Chekiang where it had grown to a height of a hundred and twenty feet with trunks two feet in circumference up to fifty feet above the ground. This tree has never become common in Europe apparently, and it is surprising how few specimens there are in the United States large enough to bear cones. It must be placed with the Carolina Hemlock as one of the most beautiful of all the *Pinacae* in the Arboretum collection. The largest tree in the United States was imported by S. B. Parsons in 1859 and planted in his Nursery at Flushing, Long Island. The ground on which this tree is growing has recently been purchased by the City of Flushing and the tree, still in perfect health, is fully eighty feet high with a broad symmetrical pyramidal head. The Golden Larch has been growing in the Arboretum since 1871 and has been producing for several years abundant crops of seeds. Of other trees in this country large enough to produce seeds the Arboretum only knows two plants in Wellesley, Massachusetts, the trees planted by C. A. Dana, at Dosoris, Long Island, the trees in the parks at Rochester, New York, and a tree which is probably still living in the neighborhood of Cincinnati, where it was planted by the late Mr. Probasco. The common name of this tree, Golden Larch, is due to the beautiful color of the autumn foliage. The Arboretum will be glad of information of other trees in this country large enough to produce seeds.

These Bulletins will now be discontinued until the spring of next year.

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