



ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

APRIL 21, 1922

On the morning of November 26th eastern Massachusetts was visited by a storm of frozen rain which was more serious in its injury to trees than any previous storm of this character in the state of which there is an authentic record. Branches of trees were covered with a coat of ice often in the case of terminal branchlets several times thicker than their diameter, making a load which taxed the strength of the strongest trees. The amount of the rainfall varied in different parts of the region affected and the damage to trees was often local. Fortunately the rain was not accompanied by a high wind. For some reason not easy to explain the damage was largely confined to trees with deciduous leaves, and conifers were generally uninjured. Even the White Pine (*Pinus Strobus*) suffered rarely, although no tree which grows naturally in Massachusetts has more brittle branches which are usually broken by storms of this character. Fortunately the Arboretum was on the edge of the region of greatest damage, and in Franklin Park and Forest Hills Cemetery only half a mile to the southward trees were not injured. In the Arboretum the injury was confined to the region east and south of the summit of Bussey Hill, to the neighborhood of the Centre Street Gate, and in a less degree to the southern slope and to the summit of Peter's Hill. The trees which were most injured were the Willows in the belt along the northern margin of the north meadow which makes the boundary between the Arboretum and the Boston Parkway. These Willows lost many large and small branches but will soon recover. The damage to Birch-trees was more serious and no other group of trees here has suffered so severely. Nearly every plant in the collection was injured and the damage to the River Birches

(*Betula nigra*) was serious. It has been necessary to remove entirely two large specimens and the others were badly mutilated. The trees in the group of Green Ashes (*Fraxinus pennsylvanica*) suffered almost as much as the River Birches although other Ash-trees growing in the same general region on the northeastern slope of Bussey Hill escaped injury. Although the Elm-trees of eastern Massachusetts were more mutilated by this storm than other trees, the Elms in the Arboretum escaped serious injury with the exception of the plants of the Asiatic *Ulmus pumila* on Bussey Hill Road above the Lilac Collection. These were badly broken, including the fine form of this tree from Turkestan. This was one of the rarest and most interesting trees in the Arboretum. It is not dead and new trees can be propagated from it, but twenty or thirty years must pass before the Arboretum can show its visitors such a handsome specimen of this tree as the one which was injured by the November storm. Hickory-trees, in spite of their strong tough branches have been generally much injured in the storm area, and in the Arboretum a few trees of the species with slender branches, like the Bitternut (*Carya cordiformis*) and the others with small fruit (*C. glabra* and *C. ovalis* and its varieties) have lost a great deal of wood. Fortunately the Arboretum's large specimen of the Pecan-tree was uninjured. In the Poplar Collection on the southern slope of Peter's Hill the trees of the Siberian *Populus laurifolia* were badly broken, as were the two largest specimens of the Chinese *Populus Simonii*. The trees of *Populus Maximowiczii* from northeastern Asia growing with these species did not lose a twig. This is a matter of congratulation for this is one of the handsomest of all Poplar-trees, and of the trees with deciduous leaves brought from Asia to North America in recent years it is the one which promises the greatest usefulness here. Although the storm brought to the ground many hundred loads of branches and left few deciduous-leaved trees entirely free of injury, the Arboretum as compared with other parts of the state has been fortunate; its important collections are generally still in good condition and the injuries will soon disappear.

On the morning of February 17th the thermometer in the Arboretum registered 12° below zero. This and the following were the only really cold days of the winter and were followed by several weeks of unusually mild weather. It is not possible yet to determine the damage caused by the low temperature of February. It has evidently injured the flower-buds of a number of plants. In Massachusetts orchards the buds of Peach-trees appear to have been generally killed. On April 12 the pink and white-flowered forms of the wild Peach of northern China (*Prunus Davidiana*) were in bloom, although not more than ten per cent. of the buds were able to open. The flowering of Forsythias will on many plants be again irregular and poor as many flower-buds are killed. The north China *Rhododendron mucronulatum* was first raised in the Arboretum in 1882. It is the earliest of the Rhododendrons and Azaleas to flower, and only occasionally in past years have the flower-buds been injured. A few of the plants under the shade of Pine-trees on the lower side of Azalea Path were covered last week with their rose-colored flowers, but on other plants growing near them but beyond the shade of the Pines every flower-bud had been killed.

The buds of the Japanese *Corylopsis Gotoana* have for the first time been injured, and those of *C. pauciflora*, which has never been very hardy in the Arboretum, are destroyed.

As compared with last year the season is a late one. The Silver Maple (*Acer saccharinum*) was in flower, however, on the 15th of March, only six days later than last year. Other flowers which were to be seen in the Arboretum this year in March were those of half a dozen species of Hazel (*Corylus*), *Salix acutifolia*, *S. gracilistyla*, the native *Alnus incana*, and those of several exotic Alders. On March 29th the native Arbor Vitae (*Thuja occidentalis*) and the native White Cedar (*Chamaecyparis thyoides*) were in bloom.

Magnolia stellata. On March 26th last year the flowers of *Magnolia stellata* were opening; this year the plants in front of the Administration Building were nearly in full bloom on April 15th and have not yet been injured by the late frost which often destroys their flowers after they have opened. This *Magnolia* is a perfectly hardy shrub of excellent habit and good foliage; it never fails to cover itself with flower-buds, and if it could be persuaded to bloom two weeks later it would be one of the best plants for the decoration of small New England gardens which has been brought from Japan.

The Siberian *Rhododendron dahuricum* blooms as early or a little later than *R. mucronulatum*, but the flowers are more sensitive to cold than those of that plant and are usually disfigured or destroyed by frost after they have opened. Although some of the flower-buds had been killed on the plants on Azalea Path, they were well covered with expanded flowers by the 12th of April and have not yet been injured. The variety with persistent leaves (var. *sempervirens*) has lost more of its flower-buds than the typical deciduous-leaved plant. Like *Magnolia stellata* this little *Rhododendron* would be a better garden plant in New England if it would flower two or three weeks later.

Erica carnea began to flower in the Shrub Collection during the first week in April. This is a common European plant often covering in the northern countries considerable areas of sandy or gravelly soil. It is an evergreen plant only a few inches high, with dark green leaves and small rose-red flowers. There is also a variety with white flowers. This is an excellent plant for the rock garden or to form the edging for walks. When it finds the soil and position which suit it it will soon spread into a broad mat. There are no Heaths native to the New World, and the neighborhood of Cape Town in South Africa, where there are some four hundred species, is the place where they are most abundant. They flourish, too, in the countries adjacent to the Mediterranean and in central Europe but of them all only *Erica carnea* is really hardy in New England, although one or two other species, especially *E. Tetralix*, can with care be kept alive here for a few years.

Prinsepia sinensis is covered with its bright yellow flowers. It is a hardy shrub with long gracefully ascending and spreading branches furnished with stout spines, and covered with bright green leaves which are almost the first to appear on any plant in the Arboretum and are

about half grown when the flowers open in clusters from their axils. The fruit is red with the general appearance of a small oblong plum. There are large specimens of this shrub, which has been growing in the Arboretum since 1903, on the walk near Centre Street and in the Shrub Collection. On the whole it is the most valuable shrub for our gardens the Arboretum has obtained from Mongolia. Unfortunately it is still rare, for only a few fruits have ever been produced in the Arboretum, and the plant has proved difficult to increase by cuttings. If the Arboretum plants become more fruitful it will be possible to increase this *Prinsepia* as the few seeds which have ripened germinated readily.

Mr. J. G. Jack of the Arboretum staff will conduct a Field Class on Saturdays during the spring and early summer, to assist those who wish to gain a more intimate knowledge of the native and foreign trees and shrubs which grow in New England. Instruction will be given in informal outdoor talks and in the examination of the plants. Different botanical groups will be examined at each meeting, although any trees or shrubs found may form subjects for study. No technical knowledge or special preparation is required in order to join the class as the instruction is intended to be simple in character, affording opportunities for questions and answers relating to the specimens under observation. Unless otherwise notified the class will meet promptly at ten o'clock in the morning, on Saturdays, in the Arboretum, at the Forest Hills entrance, beginning April 29th. The class will close on the 24th of June. The fee for the course is \$5.00 payable in advance.

An illustrated Guide to the Arboretum containing a map showing the position of the different groups of plants can be obtained at the Administration Building, and will be found useful to persons unfamiliar with the Arboretum. It can also be obtained from the Old Corner Book Store, Bromfield Street, Boston, and from the Secretary of the Massachusetts Horticultural Society, 300 Massachusetts Avenue, Boston. The price is 50 cents.

Automobiles are not admitted to the Arboretum but visitors who desire carriages to meet them at the Jamaica Plain or Forest Hills entrances can obtain them by telephoning to P. F. Keane, Jamaica 344.

The subscription to these Bulletins is \$1.00 per year, payable in advance.

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JAMAICA PLAIN, MASS.

APRIL 28, 1922

Some effects of the Winter. Although evidences of a severe winter are seen in dead or badly browned plants of the Red Cedar (*Juniperus Virginiana*), the native Arbor Vitae (*Thuja occidentalis*), and in many Rhododendrons in some of the Boston suburbs, evergreen plants in the Arboretum have suffered less than in several of the severe winters of recent years. The collection of conifers as a whole is in good condition. Even such trees of doubtful hardiness as the California *Picea Breweriana* and the Japanese *Abies Mariesii*, two trees which have proved difficult to establish here, are as green and fresh as they were in the autumn. The Cedars of Lebanon are uninjured, although twice in recent winters severe cold has destroyed their leaves. Plants of the native White Cedar (*Chamaecyparis thyoides*) in low wet ground are injured or killed, although within twenty miles of the Arboretum there are hundreds of acres of undrained swamp land covered with this tree. It is interesting that plants of the White Cedar on a comparatively dry hillside in the Arboretum have never suffered from severe cold. The Arboretum Junipers, the Japanese Umbrella Pine (*Sciadopitys*), the different forms of the Japanese Yew (*Taxus cuspidata*), and the variety *repandens* of the European *Taxus baccata* are uninjured. Other forms of the European Yew have suffered in the loss of leaves or in the ends of branches, and only the variety *repandens* can be depended on in New England. Our native Yew (*Taxus canadensis*), the Ground Hemlock of northern woods, is more badly browned than usual but will recover with the loss perhaps of a few branches. The buds of the Chinese *Pinus sinensis* and of some of its varieties do not appear injured, but these Pines will lose most or all of their old leaves. This

is remarkable in the case of the typical species which is a northern tree common and of large size on the plains and mountain sides in the neighborhood of Peking, where conditions for successful tree growth are as unfavorable as they can well be. The fact that this tree of northeastern Asia is not perfectly hardy here shows that the ability of a tree to flourish in any region in which it does not grow naturally cannot be determined by the knowledge of the climate and soil conditions where it grows naturally, and that only experiments carried on through long periods can show the value of an exotic tree in any foreign country. The variety *densata* of *Pinus sinensis* has suffered even more than the type, although the plants of most of them will probably recover. This variety reaches higher altitudes than the other Chinese Pines, growing up to 12,000 feet in western Szech'uan, where it is common, and southward forms great forests. This tree as Wilson saw it resembles the Scotch Pine (*Pinus sylvestris*) in habit and general appearance, with a tall clean trunk, massive branches forming a rounded or flattened head, and pale red bark on the upper stem and branches. The variety *yunnanensis* of *Pinus sinensis* has suffered less than the var. *densata*, although it is a tree of river valleys and lower levels in southwestern Szech'uan and ranges much farther south. This tree differs from other forms of *Pinus sinensis* in its longer, more slender, darker green, drooping leaves, in its longer cones, in the brighter red bark on the upper stems and large branches, and in its usually more pyramidal habit. If this Pine, which was raised at the Arboretum in 1909, really succeeds in this climate it should make a valuable addition to the comparatively small list of ornamental conifers which can be grown successfully in New England. In the Arboretum *Pinus Thunbergii*, the great Black Pine of Japan which lines many of the highways of southern Hondo, has again lost many leaves, and although this tree was uninjured here for nearly a quarter of a century it has suffered so much in some of the severe winters of recent years that it now seems doubtful if it can adapt itself permanently to this climate. It is unfortunate, for no Pine-tree is more picturesque in habit or more distinct in its beautiful white buds. It is a matter of interest that the new Chinese Spruces have been uninjured by the winter. The introduction of these plants into cultivation is one of the important results of the botanical exploration of China undertaken by the Arboretum, and of these Spruces only *Picea Sargentii* has shown itself unable to grow in this climate.

Broad-leaved Evergreens have suffered from the extreme and unusual heat of several March days followed by days and nights of low temperature. The damage in the Arboretum is less, however, than in several other gardens in eastern Massachusetts. The Arboretum Rhododendrons, thanks to the exceptionally good position where they are planted, look unusually well. Of the small number of species which can be grown in this climate none have suffered, and of the Catawbiense Hybrids only a few have been slightly injured in the loss of an occasional branch or a few leaves. Laurels (*Kalmia latifolia*), which are rarely hurt by extreme cold or March changes of temperature, are now disfigured by brown and dried leaves at the ends of the branches of several plants; and leaves on the large plants of the native Inkberry

(*Ilex glabra*) on Bussey Hill Road have not in any previous spring been as discolored as they are now. Many of the leaves are killed but the plants will recover, and the temporary injury should not be counted against this beautiful plant which is one of the best of the broad-leaved Evergreens which can be grown in this climate. It is a handsomer plant than the black-fruited Evergreen *Ilex crenata* from Japan. This Holly in both its broad and narrow-leaved forms grew well in the Arboretum during many years but has gradually been killed by cold, and the last survivor growing on Azalea Path now looks as if it could not survive. This Japanese Holly grows well and is a handsome plant in the neighborhood of Philadelphia, but the New England climate is too severe for it.

Pieris (Andromeda) floribunda, judged by an experience of fifty years, is the only broad-leaved Evergreen to which nothing ever happens here. Borers do not weaken the stems, the leaves are never discolored, and the flower-buds formed in autumn and conspicuous during the winter are never injured by the lowest temperature which has been recorded in southern New England. It is a round-topped shrub of compact habit, occasionally eight or ten feet across and four or five feet high, with small pointed, dark green leaves and short terminal clusters of white flowers. A native of high altitudes on the southern Appalachian Mountains, this *Pieris* is rare and local in distribution as a wild plant, but for more than a century it has been esteemed in England and largely propagated by English nurserymen. Plants can now be found in several American nurseries.

Prunus subhirtella will be in bloom when this bulletin reaches its Massachusetts readers, and when it is covered with its drooping pink flowers this, the Spring Cherry of the Japanese, is the most charming plant which can be seen in the Arboretum at any time during the entire year. It has been described as the most floriferous and delightful of all the Japanese Cherries; and it is certainly the most satisfactory of them all in this country, for it is hardy, the flower-buds are rarely injured, and the flowers last in good condition longer than those of any other Cherry-tree. This tree or large bush is not known as a wild plant, and although it has been much planted in the gardens of western Japan it is rarely seen in those of Tokyo and Yokohama. For this reason perhaps it has not often been imported from Japan into the United States and Europe. Another reason for its rarity is the fact that although it bears every year abundant fruit, the seeds do not produce plants similar to the parent but always trees of its varieties, principally the var. *ascendens* which is a narrow tree fifty or sixty feet high with a tall trunk. This tree has the rather small drooping flowers of the better known Weeping Japanese Cherry (*P. subhirtella pendula*) which is not now uncommon in American gardens. For these reasons the typical *Prunus subhirtella*, a plant of the first class for the decoration of northern gardens, is still extremely rare in this country. It can be increased from cuttings without much trouble but a better way to propagate it is by grafts on its own seedlings. If anyone wants to raise stock for this purpose seeds can be obtained from the Arboretum.

Prunus serrulata var. *sachalinensis*, sometimes called the Sargent Cherry, should also be in flower at the end of this week. It is believed to be the handsomest of the large Cherry-trees of eastern Asia. First raised at the Arboretum in 1890 from seeds brought from Japan by Dr. William Sturgis Bigelow of Boston, this tree has grown well here.

Prunus concinna. As usual this Chinese Cherry is the first of its genus to open its flowers in the Arboretum. It is a tree-like shrub three or four feet high, with a single stem. The flowers, which appear before the leaves, are produced in the greatest profusion in few-flowered clusters, and their bright red calyx makes a handsome contrast with the white petals. The loose lustrous red bark of this plant is perhaps its most attractive character, and for this beautiful bark it is well worth a place in our gardens, although several of the Asiatic Cherries are superior to it as flowering plants. *Prunus concinna* can be seen in the collection of Chinese shrubs on the southern slope of Bussey Hill.

Plum-trees are often beautiful objects when in flower, and the value of several of the American Plums for the decoration of parks and gardens has not yet been generally recognized in this country. One must travel in early spring through southern Kansas, eastern Oklahoma and eastern Texas, where Plum-trees and Plum-bushes are more numerous and of more different kinds than in any other part of the world, to realize how wonderful these plants are when covered with flowers. *Prunus nigra*, the so-called Canada Plum, is the earliest of these trees to flower here. 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, by the blunt teeth of the leaves, and by the darker and closer bark. The flowers turn pink as they fade. The next Plum-tree in the collection to flower is *Prunus salicina* which is the most important Plum-tree of eastern Asia, and is best known perhaps as the origin of the so-called Japanese Plum now largely cultivated in the United States. The Arboretum plants were raised from seeds collected by Wilson in western China and their flowers will be opening during the next week. The flowers of *Prunus nigra* and *Prunus salicina* will soon be followed by those of *Prunus americana*, of the eastern United States, of the blue-fruited *P. alleghaniensis*, a native of southern Connecticut and western Pennsylvania, and a species of considerable ornamental value, of *P. Watsonii*, the Sand Plum of Kansas and Oklahoma, of *P. Munsoniana* of the Kansas and Texas region, and of *P. hortulana*, a native of the region from southern Illinois to southern Missouri and Oklahoma. This is perhaps the handsomest of the American Plum-trees, and with the exception of *P. maritima* of the New England coast, the last to flower. In cultivation it is a round-topped tree with wide-spreading branches. The flowers are small, only half an inch in diameter, and open before the leaves which are long-pointed and lustrous. The globose fruit is scarlet, very lustrous and perhaps is more beautiful than that of any of the American species. The Plum-trees will be found at the entrance to the Shrub Collection from the Meadow Road, and there is a supplementary collection with many American species and varieties near the top of Peter's Hill.

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MAY 5, 1922

The Norway Maple. Following the native White and Red Maples and the Box Elder (*Acer Negundo*), the Norway Maple (*Acer platanoides*) is now covered with its clusters of yellow flowers; and of the trees of large size which grow in New England only the Red Maple and some of the Willows are more conspicuous in early spring. The Norway Maple, which in spite of its common name in this country is not exclusively a Scandinavian tree but is widely distributed over Europe and reaches the Caucasus, is one of the few European trees which grows well and attains old age in our northeastern states. There are, however, a few other European trees which have grown to a large size here, and the Horsechestnut, the White and the Fragile Willows, some of the Poplars, three or four of the Lindens, the Elms, the Beech and the Birches often are as much at home as they are in western Europe, but no other European tree has been more generally planted in the eastern states during the last fifty years than the Norway Maple which flourishes from southern New England to the Potomac. It is a round-topped tree with wide-spreading branches, sometimes a hundred feet high, with a trunk three or four feet in diameter, although trees of such size have not yet been produced in America; it has comparatively smooth light brown bark, smooth pale branches and dark green lustrous leaves with pointed lobes, which turn yellow in the autumn. The flowers, which open before the leaves appear, are arranged in compact round clusters. The fruit is clustered and smooth with large spreading wings. The Norway Maple is able to bear without injury the conditions of American city life, but its branches naturally spread so wide that it cannot wisely be used except to shade exceptionally wide side-

walks. Few of our native trees grow so well in the immediate neighborhood of the seacoast. The seedlings of few trees have shown a greater tendency to variation, and many of the varieties of the Norway Maple have been largely propagated by European nurserymen. There are a dozen or more of the most distinct of these varieties in the Arboretum collection, and among them are some handsome plants. The variety *columnare* is one of the best of the trees with fastigate branches although it is broader and less columnar than the form of the Sugar Maple with erect growing branches (*Acer saccharum* var. *monumentale*), or the fastigate Red Maple (var. *columnare*). One of the handsomest of dwarf trees is the variety *globosum*, a round-topped bush branching from the ground. The large and symmetrical specimen of this plant which had been growing since 1888 in the Arboretum was badly injured by the heavy snow and high winds of the severe winter of 1919-20. It has now made new branches and will soon be as handsome as ever. Forms of this tree with deeply divided leaves are var. *dissectum* and var. *cucullatum*, the Eagle Claw Maple. These are small trees which are more curious than beautiful. The most popular of the varieties of the Norway Maple is the var. *Schwedleri*. Early in the season this tree has bright red leaves which before summer turn dark dull green. The color of the spring leaves attracts nurserymen, and this tree has been planted largely in the neighborhood of eastern cities. The dull unnatural color of the mature leaves makes this, however, an undesirable tree for general planting. More attractive is the variety *Stollii* with large three-lobed leaves, purple as they unfold but later dark green. This is one of the most distinct of all the forms of the Norway Maple in the Arboretum collection.

Acer saccharum, the Sugar Maple and one of the great trees of eastern North America, will also soon be in bloom. The flowers are paler in color than those of the Norway Maple, and arranged in gracefully drooping clusters do not make the tree as conspicuous in the spring. The individual flowers are more delicate, however, and better worth close inspection by the lovers of beautiful flowers.

Amelanchiers. Shad Bushes, as Amelanchiers are often called because they are supposed to bloom when the shad begin to ascend the rivers from the sea, add much to the beauty of the Arboretum in the month of May. Amelanchier is a genus in which North America has almost a monopoly; one small shrubby species grows on the mountains of central Europe, and there is another shrubby species in China and Japan. All the other species are natives of North America where Amelanchiers grow with many species from the Atlantic to the Pacific, and from Newfoundland to the Gulf States. Some of the species are trees and others large or small shrubs; they flower in the spring before the leaves appear or when they are partly grown, or, in the case of a few species, when the leaves are nearly fully grown, the period of flowering of the different species extending through several weeks. The species all have handsome flowers, with long delicate white petals, and small, dark blue, or nearly black pome-like fruit open at the top, with flesh which in most of the species is sweet and edible. It is these edible fruits which probably have earned for these plants

one of their popular names, Service Berry. *Amelanchier canadensis*, which is the first species to bloom in the Arboretum, has been in flower for several days. It is a tree which occasionally grows 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 pale gray silky hairs, making the whole plant look white at this time of the year. This beautiful tree does not grow naturally nearer Boston than the western part of Massachusetts; it is common in western New York, and it is 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 named by Linnaeus, has been rare in gardens, an entirely different plant having long appeared in books and gardens under the name of *Amelanchier canadensis*. This is also a fine tree, differing conspicuously from *A. canadensis* in the red color of the young leaves which are destitute or nearly destitute of any hairy covering. This tree is now called by botanists *A. laevis*. It is one of the native trees of the Arboretum, and there are a number of specimens growing naturally on the bank above the Crabapples on the left-hand side of the Forest Hills Road which begin to flower a few days later than *A. canadensis*, and are easily recognized by the color of the young leaves. Another species which is a native plant in the Arboretum, *A. obovalis*, is a large shrub rather than a tree with young leaves like those of *A. canadensis* covered with white silky hairs. Large numbers of this shrub which has been planted along the drives and in other Arboretum shrubberies will still be in bloom when this Bulletin reaches its Boston readers making this week one of the pleasanter of the year to visit the Arboretum. Five or six other species of the eastern states are now well established in the Arboretum collection on the grass path which follows the left-hand side of the Meadow Road; they are small shrubs rarely more than five or six feet high, in some species spreading from the roots into clumps of considerable size. They are all delightful plants well suited for the decoration of small gardens or the margins of shrubberies. Generally, however, they are unknown to garden lovers.

Early flowering Pear-trees. The first Pear-tree to flower in the Arboretum this year, *Pyrus usuriensis*, was in bloom by the 25th of April. 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 some extent. It is probably, too, the largest of all Pear-trees for Wilson photographed in 1918 a tree growing near Shinan in the Province of Nogen, Korea, which was sixty feet tall with a trunk fourteen feet in girth and a head seventy-five feet across. The fruit varies in size and shape, and, judged by American standards, has little or no value. It is believed, however, that the hardiness of this tree may make it valuable as stock on which to grow some of the European garden pears, and experiments with it as stock are being planned in Dakota. A Chinese form of this Pear-tree, var. *ovoidea*, is probably better worth growing for the decoration of parks and gardens. The flowers are larger and open in the Arboretum about ten days later; the fruit, which differs in shape from that of other Pear-trees, is broad at base and gradually narrowed at apex, and although not large is juicy

and of such good flavor that it has to be picked in the Arboretum when only half grown to prevent the breaking down of the branches by marauding visitors. Unlike those of other Pear-trees the leaves turn bright scarlet before falling. This is an old inhabitant of the Arboretum, and the large tree on the left of the Forest Hills Road near the entrance is still covered with flowers.

Pyrus Calleryana and its varieties raised from seeds collected by Wilson in western China have now for a week been covered with flowers. They are growing with other Chinese Pear-trees on the southern slope of Bussey Hill, and are narrow, shapely, pyramidal trees now about twenty feet high. The flowers are smaller than those of the other Chinese species, and the globose brown fruit is not much more than a third of an inch in diameter. To American pomologists *Pyrus Calleryana* is now of more interest than the other Pear-trees raised at the Arboretum from seeds collected by Wilson in China, for they believe that they have found in it a stock on which to graft garden pears more resistant to blight than any which has yet been found, and the seed produced in the Arboretum is in great demand by the Department of Agriculture of the United States and by nurserymen.

Pyrus serotina, another Chinese Pear-tree introduced by Wilson from western China, is also in flower. To students of cultivated plants this is a tree of particular interest for this native of the mountain forests of western China is now believed to be the origin of the brown or yellowish, round, hard and gritty Sand Pears which in many varieties the Japanese have cultivated from time immemorial and which must have been introduced into Japan probably by way of Korea. In the early days of western intercourse with Japan many varieties of the Sand Pear were brought to the United States and Europe, but except for the beauty of their flowers and fruits they have proved to be of little value, for the fruit is so hard and so full of grit that it is not even worth cooking. It was probably forms of the Sand Pear which produced the Leconte and Kieffer Pears from which much was at one time expected in this country, especially in the southern states, but which have proved so susceptible to blight that the cultivation of these trees has now been generally abandoned. The flowers of *Pyrus serotina* are larger and more beautiful than those of other Pear-trees, but there is little beauty in the small brown fruit; and the habit of the tree with its long spreading branches forming an open irregular head is not particularly attractive.

Prunus incisa has been as full of flowers as it has been every spring for the last six years, although many flower-buds have been killed on other Japanese Cherry-trees by the cold of the past winter. This Cherry is a native of Japan and is abundant on the eastern and southern slopes of Fuji-san and on the Hakone Mountains. It is a large shrub or under favorable conditions a small tree twenty-five or thirty feet high; the flowers appear before the deeply cut leaves in drooping clusters; their calyx is bright red; the petals are white or occasionally tinged with rose color, and the anthers are bright yellow. The petals fall early, but the calyx, which gradually grows brighter in color, remains for some time on the young fruit and is showy.

COMPLIMENTARY

NEW SERIES VOL. VIII

NO. 4

ARNOLD ARBORETUM
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BULLETIN
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JAMAICA PLAIN, MASS.

MAY 9, 1922

Asiatic Crabapples. The conspicuous plants in flower this week are some of the early flowering Chinese and Japanese Crabapples. The flowers of these trees make one of the principal spectacular displays of the year, and only the flowers of the Lilacs attract a larger number of visitors. Among these Crabapples are several small trees and shrubs which should find a place in every northern garden, for few plants which can be easily and successfully grown from Canada to the Potomac and from the Atlantic to the Pacific are more beautiful when covered in April or northward in May with their white or rose-colored flowers, or in autumn when their branches are loaded with brilliant red, scarlet or yellow fruits. These Crabapples grow best in cool, rich, deep, well-drained soil, and lime does not interfere with their successful development. Some of the wide-branching species lose their beauty of habit unless sufficient space is allowed for their free growth, and nearly all these Crabapples look better as isolated specimens than when crowded together in too compact groups. Crabapples, like many other plants of the Rose Family, are liable to be attacked by the San José scale which unless kept in check can seriously injure them. For many years much attention has been paid at the Arboretum to these plants, and a large and now almost complete collection of the species and recognized hybrids has been assembled. In the future it can be undoubtedly increased by the introduction of new hybrids for these plants hybridize freely, and from seeds gathered from species in a collection like the one in the Arboretum distinct new forms are certain to appear. The Asiatic Crabapples are arranged in two groups. The oldest of them is on the left hand side of Forest Hills Road and the other, which is

larger and more complete, at the eastern base of Peter's Hill. A few only of the more interesting can be mentioned in this Bulletin.

Malus baccata mandshurica is the earliest of these Crabapples to open its flower-buds in the Arboretum. A native of Manchuria, Korea and northern Japan, it is an eastern form of the better known *Malus baccata*, the Siberian Crabapple, which reached Europe more than a century ago and for a long time was one of only two Asiatic Crabapples known in western gardens. The Manchurian plant as it grows in the Arboretum is a tree twelve or fifteen feet tall and broad; the flowers, which are produced in profusion, are pure white, rather more than an inch across, and more fragrant than those of any other Asiatic Crabapple. The fruit is round, yellow or red, and not larger than a large pea. The Manchurian Crabapple, which is still rare in this country, should, for the fragrance of the flowers alone, find a place in all collections. This plant is in the Peter's Hill Group. Another form of *Malus baccata* (var. *Jackii*) is also growing in the Peter's Hill Group. This plant was brought from Korea by Professor Jack in 1905 and is distinguished by its much larger, dark scarlet fruit. The Arboretum plants of this Group are still small but flower and produce fruit freely and promise to be valuable additions to the collection. Another form of *M. baccata* (f. *gracilis*) raised from seeds collected by Purdom in northern China promises to be a handsome tree. It differs from the ordinary form of *M. baccata* in its gracefully pendent branches, in the narrower leaves hanging on slender petioles, and in the smaller flowers and fruits.

Malus robusta is one of the earliest of these plants to flower. This is believed to be a hybrid of *M. baccata* with *M. spectabilis*. In some of the earlier issues of these Bulletins it has been called *M. cerasifera*, a name now found to have been incorrectly applied to it. In good soil and with sufficient room 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 but 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 countries under the general name of "Siberian Crabs;" of these trees the well known "Red Siberian" is a typical representative. A new form of *M. robusta* (f. *persicifolia*) raised from seeds collected by Purdom in northern China, distinct in its narrow 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 "Kaido," a name which in Japan belongs to *Malus Halliana*. In Japan this tree is rare and known only in gardens, and by Japanese botanists is believed to have been introduced into their country from China and to be a hybrid possibly of *M. baccata* with *M. spectabilis*. The habit of this plant is

more pyramidal than that of other Crabapples and this habit makes the plants conspicuous in the collection. The largest plants are covered this year with their small, pale pink, delicate flowers which will be followed by light yellow fruit, often rose color on one cheek. A plant of *Malus micromalus* 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 at high altitudes in western China on the Thibetan border. As the double-flowered form had long been a favorite in Japanese gardens, where it is frequently cultivated under the name of "Kaido," this tree before Wilson's time 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 Japanese plants 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 the flowers of other Crabapples. The fruit, which is borne on long erect stems, is dull in color and hardly more than one-eighth of an inch in diameter. The Parkman Crab when in flower is one of the handsomest and most distinct of Crabapples, and its small size makes it one of the best of them all to plant in small gardens. The Chinese single-flowered form, *M. Halliana*, is not in the Arboretum collection.

Malus theifera is one of Wilson's early discoveries in central and western China, and gives every promise of being a decorative plant in this country of the first class. It is a tree with long, upright and irregularly spreading, zigzag branches thickly studded with short spurs which bear numerous clusters of flowers which are rose-red in the bud, but become pale or almost white when the petals are fully expanded. In central China the peasants collect the leaves and prepare from them their "red tea." From this fact the specific name of the tree has been formed. The largest plant in the Arboretum is now fourteen feet high and flowers profusely every year. There is a var. *rosea* with deeper-colored petals which is also in the collection.

By European botanists the now well known *Malus floribunda* has usually been considered a hybrid of uncertain Chinese origin, and the plant cultivated in American and European gardens is certainly the parent of several hybrids. The handsomest of these probably is *Malus arnoldiana* which appeared many years ago in this Arboretum among seedlings of *M. floribunda*. The other parent is probably the hybrid *M. robusta*. It is a low tree with wide-spreading, slightly pendulous branches with the abundant flowers of *M. floribunda*, but the flowers and fruits are nearly twice as large as those of that tree. There is

not perhaps a more beautiful Crabapple in cultivation. Like other hybrids, it can only be increased by grafts or cuttings, and is still rare in gardens. A better known hybrid of *M. floribunda*, *M. Scheideckeri* appeared in Germany several years ago. The broad pyramidal habit of this tree suggest *M. spectabilis* which is probably the other parent. This hybrid flowers here earlier than *M. floribunda*. The bright rose pink flowers which are often semidouble are produced in great profusion and are followed by bright yellow fruit sometimes three-quarters of an inch in diameter. The excellent habit and early flowers of this hybrid make it a valuable addition to the group.

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 branchlets three-lobed, small flowers tinged with rose in color, and small yellow fruits. 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 and Hokkaido, to which the name var. *arborescens* has been given. This is a tree often thirty feet or more tall, with ascending wide-spreading branches, twiggy branchlets and minute fruit yellow on some and red on other individuals. Although the flowers are small, they are produced in immense quantities, and this species has the advantage of flowering later than the other Asiatic Crabapples. *Malus atrosanguinea* is believed to be a hybrid of *M. Sieboldii* and the Parkman Crab. It is a broad-branched low tree with rather dull red showy flowers and is now often seen in American gardens.

Malus Sargentii from salt marshes in the neighborhood of Murooran in northern Japan, where it was discovered by Professor Sargent in 1892, has qualities which give it a field of usefulness peculiarly its own. This species is a dwarf with rigid and spreading branches, the lower branches flat on the ground. The flowers are in umbel-like clusters, saucer-shaped, round and of the purest white, and are followed by masses of wine-colored fruit which is covered by a slight bloom and unless eaten by birds remains on the plants well into the spring. The plant usually sold by American nurserymen as *M. Sargentii* is probably a hybrid of this species. It is dwarf although treelike in habit with a well formed stem, short spreading branches and small flowers tinged with pink.

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 foreigners. The wild type of this tree discovered by Wilson in western China is also growing in the Arboretum. *Malus sublobata* is the name which has recently been given to a Crabapple of unknown origin believed to be a hybrid of *Malus prunifolia rinki* and *M. Sieboldii*. The plants of this hybrid are, with a single exception, narrow, pyramidal, fast-growing trees taller than any other Crabapple in the collection, and looking now as if they might grow into big trees. This hybrid does not flower in the Arboretum very freely every year and the flowers are mostly confined to the upper branches.

COMPLIMENTARY

NEW SERIES VOL. VIII

NO. 5

ARNOLD ARBORETUM
HARVARD UNIVERSITY



BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

MAY 12, 1922

American Hawthorns. Some of these plants are now in bloom and the flowers of others will be conspicuous in this Arboretum during the next six weeks, and from the middle of August until midwinter Hawthorns will be brilliant here with fruit. No other group of plants is represented in the Arboretum by so many species; and no other group of small trees and shrubs with deciduous leaves can add so much beauty during such long periods of the year to our parks and gardens. The discovery, determination and cultivation of the large majority of these plants has been accomplished during the last twenty-three years. For until the end of the last century no one had formed any conception of the number, variety and distribution of these plants in North America. To the botanists of forty years ago fifteen or sixteen species with two or three varieties were known, and American gardeners were able to plant only two or three of these. There are now some five hundred species or forms established in the Arboretum, and an increasing number of these trees are flowering and producing their fruits here every year. Hawthorns are distributed in North America from Newfoundland and northern Quebec to northern Florida and northern Mexico, and from the Atlantic to the Pacific. They are much more abundant in species east of the eastern borders of the great plains than in the Rocky Mountain and Pacific regions, where they range northward into British Columbia and southward only into northern California. So far as is now known they are most abundant in species in the valleys of the streams which flow from north and south into Lake Erie, and in the region which extends from southern Missouri to the valley of the Red River in Arkansas. New York and Pennsylvania are rich in

species, and southward along the Appalachian Mountains and in the southeastern states species of *Crataegus* are not rare. The species have now been arranged in twenty-three groups distinguished by the shape and character of the leaves, the size of the flowers and the size and shape of the fruit, and it is interesting that while species of some of these groups are widely and generally distributed those of others are chiefly confined to particular sections of the country, as the Flavae to the southeastern states, the Douglasianae to the northwest, and the Tenuifoliae to the northeastern and middle states. The Macracanthae, which is one of the common northern groups, with many large trees, is extremely rare in the southern states and in Arkansas and eastern Texas is represented by only a few small shrubs. The Intricatae, composed mostly of small shrubs, has its greatest number of species in Pennsylvania and adjacent states, but is extremely rare in the Mississippi valley and unknown westward. The Molles Group, which contains the largest number of species which become trees of considerable size, is common in the northeast, almost unknown in the southeastern part of the country, and most abundant in Missouri, Arkansas and Texas to the valley of the San Antonio River and the Edwards Plateau. Descriptions and figures of twenty-five species of this Group are included in the new edition of Sargent's *Manual of the Trees of North America*, and there are already indications that the number can be enlarged. Trees of this Group are the earliest of the American Hawthorns to bloom in the Arboretum, and three of them are now covered with open flowers. These three species are *Crataegus arnoldiana*, *C. arkansana* and *C. mollis*. They are all large and handsome trees, and have some historical interest for students of American Hawthorns, for it was these plants which first attracted attention at the Arboretum to differences in their flowers in the number of stamens and in the color of anthers, which first led to the critical study of *Crataegus* which has been going on here ever since and which among other things has led to the sowing of 4269 different lots of *Crataegus* seeds.

Crataegus arnoldiana was found growing as a large rather misshapen shrub in the dense shade of large trees on the bank opposite the southern end of the Meadow Road. It has only been found outside of the Arboretum in the valley of the Mystic River at West Medford, Massachusetts, where a number of years ago there were several trees, and near Lyme, Connecticut. *C. arnoldiana* has taken kindly to cultivation and there are now a number of large and shapely specimens growing in the Arboretum. The largest of them are the two trees on the left hand side of the Valley Road close to the Centre Street entrance, and there are other good specimens on the left hand side of the Valley Road in front of the White Oak Collection and in the old *Crataegus* Collection between the Shrub Collection and the Arborway boundary. The flowers of *C. arnoldiana* are about three-quarters of an inch in diameter, and are arranged in broad, many-flowered clusters. Like those of most of the eastern species of this group, they have ten stamens and yellow anthers. The fruit is bright crimson, subglobose, slightly hairy at the ends and about three-quarters of an inch in length. It begins to ripen the middle of August and falls early in September. The early ripening fruit of no other Hawthorn is so conspicuous.

Crataegus arkansana, which is a native of the bottom lands of White River, near Newport, Arkansas, was first raised at the Arboretum in 1880. It is a tree some twenty feet high with a tall straight stem, a wide, rather irregular head and flowers an inch in diameter in broad clusters; like those of most of the western species they have twenty stamens and rose-colored anthers. The fruit is short-oblong to slightly obovoid, bright crimson, very lustrous, three-quarters of an inch in diameter and ripening late in October falls gradually during several weeks. This is perhaps the handsomest of the species with large, late-ripening fruit. There are plants in the Arboretum in the old *Crataegus* Group and on the left hand side of the South Street entrance to the Arboretum.

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

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

tempts to transplant them. The seedlings, too, make only one growth in the season and so increase slowly. It is therefore doubtful if the spread of this plant will be as rapid in American gardens as was hoped a few years ago when it was first brought to this country.

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

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

ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

MAY 17, 1922

Lilacs. A brief summary of the Lilacs now in cultivation will serve to show how large has been the addition to the material available for the making of gardens in cold countries in comparatively recent years. And what is true of Lilacs is true also of *Malus*, *Pyrus*, *Crataegus*, *Philadelphus*, *Diervilla*, *Viburnum* and many other genera of trees and shrubs. Before the middle of the last century gardeners in Europe and America had at their disposition the common Lilac (*Syringa vulgaris*), and a few of its varieties including the forms with lilac and white flowers, the forms of the so-called Persian Lilac (*Syringa persica*), with rose-colored and white flowers and one with deeply divided leaves (var. *laciniata*), the Himalayan Lilac (*S. Emodi*) and the Hungarian Lilac (*S. Josikaea*). In the Botanic Garden at Rouen in France a hybrid between *Syringa vulgaris* and *S. persica* appeared or was artificially produced in 1810 for which the correct name is unfortunately *Syringa chinensis*, a name first given to it by mistake. This hybrid, which has slender stems, leaves intermediate in size between those of its parents and immense clusters of narrow-tubed, red-purple fragrant flowers, is still one of the best of Lilacs. There is a form with nearly white flowers (var. *alba*). As early as 1843 a Belgian nurseryman had raised a double-flowered form of the common Lilac which was called *S. vulgaris azurea plena* and which was later used by Lemoine in his plant breeding attempts to improve the flowers of the common Lilac. In 1850, therefore, it was possible to plant four species of Lilac with a few varieties of two of these species and one hybrid Lilac. In 1857 one of the so-called Tree Lilacs which had been found in the valley of the Amour River in eastern Siberia by Russian botanists was described

in St. Petersburg under the name of *S. amurensis*. This handsome plant was growing in the Harvard Botanic Garden in Cambridge ten years later. The first of the Chinese Lilacs to reach Europe, *Syringa oblata*, was described in London in 1859 and was imported from England into the United States as early as 1869 and perhaps earlier. This is one of the first Lilacs to bloom in the spring and produces large, very fragrant, lilac-colored flowers in comparatively small-flowered clusters. From all other Lilacs it differs in its thick lustrous leaves which turn scarlet in the autumn. It is a large round-topped, handsome shrub, but the flower-buds are often injured by extreme winter cold or spring frost. A hybrid between the double-flowered *Syringa vulgaris azurea plena* and *S. oblata* made by Lemoine in 1859 produced the second hybrid Lilac, *S. hyacinthiflora*, a large, round-topped shrub with small clusters of semidouble, lilac-colored, remarkably fragrant flowers. In 1878 this Arboretum first raised the great Japanese Tree Lilac (*Syringa japonica*) from seed received from Sapporo in Hokkaido. For the introduction of new Lilacs into the United States 1882 is an important date, for in that year the Arboretum received from Dr. Bretschneider the physician of the Russian Embassy in Peking, seeds of *Syringa villosa*, *S. pubescens* and *S. pekinensis*. *S. villosa*, which has proved a valuable plant in this country where it is a round-topped, handsome bush ten or twelve feet high and wide, with large, broadly elliptic to oblong leaves bright green and dull on the upper surface, and compact, broad or rarely narrow clusters of flesh-colored or nearly white flowers. As a garden plant this is one of the handsomest of the Lilacs for its habit is excellent, and it flowers freely every year, the flowers remaining in good condition for several days. Unfortunately they have a rather disagreeable odor like those of the Privet. *S. villosa* does not open its flowers until after those of all the forms of *S. vulgaris* have disappeared. By some persons it is considered the most attractive of all Lilacs. Certainly the flowers of no other Lilacs are so delightfully fragrant, and for this fragrance this shrub might well find a place in every northern garden. Unfortunately plants in the United States have not yet produced fertile seeds, and as this species has proved unusually difficult to increase by cuttings it is still one of the rarest Lilacs in American gardens. It can of course be increased by grafting it on other Lilacs or on Privet, and sooner or later no doubt fertile seeds will be produced on some of the plants established in Massachusetts. *S. pubescens*, which has been in bloom for several days, is one of the earliest Lilacs to flower. It is a tall shrub with erect stems, small leaves, and broad clusters of pale lilac-colored flowers with a long slender corolla-tube, and unusually fragrant. In the hands of the skillful French gardener L. Henry *Syringa villosa* crossed with *S. Josikea* has produced the third race of hybrid Lilacs to which the general name of *S. Henryi* has been given. Plants of this breed are large, very vigorous, perfectly hardy and grow rapidly. The foliage resembles in a general way that of *S. villosa*, but the flowers are violet-purple or reddish purple, and are produced in great clusters twelve or fifteen inches long and broad. One of the handsomest of this race has violet-purple flowers and has been named Lutèce. The var. *eximia* has more compact clusters of rose-colored or reddish flowers which after opening

become light pink. The third Lilac, raised here in 1882 from Dr. Bretschneider's seeds, *Syringa pekinensis*, had been discovered and described as early as 1859, and was growing in Paris before it was raised in the Arboretum. It is a large tree-like shrub with wide-spreading and drooping branches, and short unsymmetrical clusters of white flowers.

No additional species of *Syringa* was added to the Arboretum collection until 1902 when the introduction of eastern Asiatic species recommenced and during the next fifteen years the following Chinese and Korean species were obtained: *S. Koehneana*, 1902, *S. affinis*, 1904, *S. affinis Geraldiana*, 1906, *S. Wolfii*, 1906, *S. tomentella*, 1907, *S. Julianae*, 1907, *S. Meyeri*, 1908, *S. Sweginzowii*, 1910, *S. pinnatifolia*, 1911, *S. reflexa*, 1911, *S. Sargentiana*, 1911, *S. microphylla*, 1913, *S. yunnanensis*, 1915, *S. velutina*, 1917, *S. dilatata*, 1917, *S. formosissima*, 1917, *S. Palibiniana*, 1917. Varieties of the common Lilac crossed by Lemoine with the north China *S. affinis* var. *Geraldiana* have founded the fourth race of hybrid Lilacs. Varieties of this hybrid are tall, fast growing plants with large clusters of unusually fragrant flowers. Of the new species of Lilac introduced by the Arboretum during the last twenty years the most promising as garden plants are *Syringa Sweginzowii*, *S. Julianae*, *S. reflexa* and *S. Wolfii*. *S. Sweginzowii* is a narrow shrub with slender erect branches and long narrow clusters of slightly fragrant flowers, with a slender corolla-tube, flesh-colored in the bud and becoming nearly white after the flowers open. This plant blooms freely every year and the flowers are produced in great profusion. Its relationship is with *S. pubescens* but it is a smaller shrub; the flowers are less fragrant, and usually ten or twelve days later. *S. Julianae* is also related to *S. pubescens* and has the same shaped flowers with long narrow corolla tubes, but although fragrant the flowers are less fragrant than those of that species and are produced in shorter clusters. The beauty of the flowers is increased by the contrast between the violet-purple color of the outer surface of the corolla and the white inner surface of its lobes. *S. reflexa* resembles *S. villosa* in size, habit and foliage, and differs from other Lilacs in its narrow pendent flower-clusters. *S. Wolfii* is a native of Mongolia or northern Korea and is still little known either as a wild plant or in gardens. It reached the Arboretum in 1906 from St. Petersburg where it had been sent by the Russian traveler and botanist Komarov. The foliage resembles that of *S. villosa* but the flowers are produced in much larger clusters and are smaller and violet-purple; in color they resemble that of the flowers of the hybrid Lilac Lutèce but they are smaller and in denser clusters than those of that plant. When *Syringa Wolfii* is better known it will probably be considered one of the handsomest of this group of late-flowering Lilacs.

Lovers of Lilacs can now see growing in the Arboretum twenty-five species of Lilacs, the four hybrids and their forms, and some two hundred varieties, raised chiefly in France and Germany, of the common Lilac. Three or four species found in remote parts of China, and described by botanists, have not yet been introduced into gardens, and

by the use of some of the recently introduced species plant breeders may be able to produce new races which may add new and valuable varieties for garden makers.

Crataegus coccinioides. The large plant of this handsome Thorn is now covered with flowers in the old Crataegus Collection on the bank between the Shrub Collection and the Boston Parkway. It belongs to the Dilatatae Group of the genus, so named on account of the broad leaves. The five species have flowers from three-quarters of an inch to an inch in diameter, with twenty stamens and rose-colored anthers, and dull or bright, subglobose red fruit, often blotched with green, crowned by the much enlarged calyx of the flower and nearly an inch in diameter. Five species of this Group are recognized; of these four are trees and the fifth, *C. speciosa* from southwestern Missouri, and one of the handsomest of the American Hawthorns, although sometimes arborescent, has usually been considered a shrub. Of the other species one is distributed from the coast of Rhode Island and eastern Massachusetts to the neighborhood of Montreal, one grows in southern Quebec and Ontario, and another is now known to grow only on the hills in the neighborhood of Albany, New York. *C. coccinioides* has been found only in dry woods in the neighborhood of St. Louis and in eastern Kansas. It differs from the other species in its very compact, nearly globose few flowered flower-clusters and its dark crimson fruit flattened at the ends, with flesh deeply tinged with red. *C. coccinioides* as it grows in the Arboretum is a shapely tree with a broad, dense, round-topped head from twenty-five to thirty feet across and a well-formed trunk. This tree was raised in the Arboretum from seeds planted in 1880, and shows that in the New England climate and on New England soil forty years are needed to produce a large and shapely Hawthorn tree.

Cytisus elongatus. Plants of a European Broom growing on the upper side of Azalea Path have been covered with bright yellow flowers during the last two or three weeks. Earlier plantings of this beautiful plant have not succeeded in the Arboretum, but the plants on Azalea Path raised here from seed have been growing in their present position for two years and appear perfectly hardy. *Cytisus elongatus* is a common plant in Hungary and Bulgaria, and by some botanists is considered a vigorous form of *C. ratisbonensis*. The Arboretum plants are nearly three feet high and covered from end to end of the stems with bright yellow flowers an inch in length. *Cytisus Beanii* is also in flower on Azalea Path. This is a semiprostrate little shrub which appeared at Kew in 1900 and is supposed to be a chance hybrid of *C. Ardoini* and *C. pungens*. It is a beautiful yellow-flowered little plant but, judging by its parentage, not likely to be very hardy or long-lived in this climate.

ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

MAY 23, 1922

American Crabapples. Following the last of the eastern Asiatic Crabapples, *Malus Sargentii* and *M. Sieboldii*, which were covered with flowers the end of last week, some of the American species are in bloom. Nine species of these trees 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 entirely grown, and green or pale yellow fragrant fruit which hangs on slender stems and, with the exception of that of the species from the northwestern part of the country is depressed globose, usually broader than high, and usually from an inch to two and a half inches in diameter and covered with a waxy secretion. All the species spread into thickets and are excellent plants for the decoration of wood-borders and glades. Some of the species have only been distinguished in recent years, and although the species and many of the varieties are now growing in the Arboretum several of these have not yet flowered, and most of these Crabapples cannot be found in commercial nurseries.

***Malus glaucescens*,** which is named from the pale glaucous color of the under surface of the leaves, is the first of the American species to flower here and has been blooming for more than a week. It is a shrub usually rather than a tree, not more than fifteen feet high, with stems four or five inches in diameter. The flowers are white or rose color, up to an inch and a half in diameter, and the pale yellow fruit is often an inch and a half in diameter. This plant was first distinguished several years ago in the neighborhood of Rochester, New York; it is now known to be common in several western New York counties

and to range to western Pennsylvania, southern Ontario, and Ohio, and to occur on the southern Appalachian Mountains to northern Alabama. The discovery and introduction of this interesting plant into gardens is due to the officers of the Park Department of the city of Rochester.

Malus ioensis begins to open its flowers several days later than *M. glaucescens*. This is the common Crabapple of the northern middle western states, and in a number of varieties has a wide range southward through Missouri to western Louisiana and Texas. It is a tree sometimes thirty feet high with a trunk often eighteen inches in diameter, a wide open head of spreading branches and usually incised leaves tomentose on the lower surface, flowers often two inches in diameter with white or rose-colored petals, and fruit hanging on stout hairy stems, and up to an inch and a half in diameter. A form of this tree with double flowers (var. *plena*), the Bechtel Crab, named for the man who found it several years ago growing in the woods in one of the western states, has opened its pale rose-colored flowers which look like small Roses. When in flower this is one of the popular trees of the Arboretum, judging by the number of persons who want to get close to it. This double-flowered Crab can now be found in many of the large American nurseries, but these nursery trees are often short-lived, probably because the common orchard Apple on which they are usually grafted does not suit them as stock. Persons buying the Bechtel Crab should insist that it is 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. From *M. glaucescens* it is distinguished by the green under surface of the leaves, and from *M. ioensis* by the absence of pubescence on leaves, fruit-stalks and young shoots. The calyx on one variety (var. *dasycalyx*) not rare in Ohio and Indiana is thickly covered with white matted hairs. A form with long acuminate leaves (var. *elongata*) which sometimes forms dense impenetrable thickets grows in western New York to Ohio, and on the southern Appalachian Mountains from West Virginia to North Carolina. Recently a double-flowered form of *M. coronaria* has been found growing in the woods near Waukegan, Illinois (var. *Charlottæ* or the Charlotte Crab). The flowers are larger and whiter than those of the Bechtel Crab, and there is no reason why the Charlotte Crab should not become as great or greater garden favorite. It is now growing in the Arboretum but the plants are too young to flower.

Malus platycarpa has fruit much broader than high, often two and a half inches in diameter with a deep cavity at base and apex. The flowers are about an inch and a half in diameter with a glabrous pedicel and calyx, but in the var. *Hoopesii* with a pubescent calyx. There is a large tree of this variety in the old Malus Collection opposite the end of the Meadow Road. *M. platycarpa* is a handsome tree well

worth a place in collections for its beautiful fruit valuable for cooking and jellies. The so-called Mammoth Crab is probably only a selected form of this species.

Malus fusca, the only native Apple-tree of the Pacific States, where it ranges from Alaska to central California, is in flower. 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-quarters of an inch long, without the waxy exudation which is peculiar to the eastern American species, and with thin dry flesh. The calyx of the flower, unlike that of the eastern species but like that of many Asiatic species, falls from the partly grown fruit.

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

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

Malus Dawsonii is a hybrid of the western *M. fusca* and the common Apple which appeared in the Arboretum many years ago from seed collected in Oregon. It has grown here to more than double the size of *M. fusca*, to which it shows its relationship in the oblong fruit

of the shape and color of that of its Oregon parent but of about twice the size. The leaves are less pubescent than those of the common Apple, and the flowers are rather larger. This hybrid blooms at about the same time as *M. ioensis* and a few days earlier than *M. fusca*.

Crataegus pruinosa has been covered with flowers during the past week. This is the type of the Pruinosae Group of American Hawthorns, distinguished by its large flowers with ten or twenty stamens and rose-colored or yellow anthers and five styles, and hard and often angled pruinose fruit which is red or remains green until it falls, the prominent and enlarged calyx of the flower being raised on a distinct tube. The Group is northern with southern representatives in northwestern Georgia and southern Missouri, and the species are usually shrubs only four being admitted as trees in Sargent's New Manual of the Trees of North America. The type of the Group, *P. pruinosa*, which was first distinguished in Europe from cultivated plants, is in spring and late autumn one of the handsome species of the genus. It is a small tree from fifteen to twenty feet high, with a slender stem, spreading horizontal branches forming an irregular head and broad-lobed leaves. The flowers are an inch in diameter, in few-flowered clusters, with twenty stamens and deep rose colored anthers. The fruit is strongly angled, apple-green, and covered with a glaucous bloom until nearly ripe late in October when it is subglobose, barely angled, nearly an inch in diameter, dark purple-red and very lustrous. There is a good specimen of this Thorn in the old Crataegus Collection, and in the Peter's Hill Collection this Group is well represented by a large number of species.

Early American Azaleas. Three of the seven American Azaleas which are hardy and successfully grown in this Arboretum are in bloom. They are *Rhododendron (Azalea) Vaseyi*, *R. (Azalea) nudiflorum* and *R. (Azalea) roseum*. The first is a native of the southern Appalachian Mountains, with delicate pink or rarely white flowers which open before the leaves. The flowers of few Azaleas are more delicate in color, and few shrubs of comparatively recent introduction are better worth the attention of garden lovers. There is now a large mass of this Azalea at the end of the first of the small ponds on the left hand side of the Meadow Road. The other species now in flower are native to and widely distributed in the eastern states. They have pink or rose-colored flowers. Of the two species *R. roseum*, which opens its flowers a few days later than *R. nudiflorum*, is a more beautiful plant with darker-colored and very fragrant flowers and, with the exception of the Appalachian flame-colored Azalea (*R. calendulaceum*), the handsomest of the American Azaleas which are hardy in Massachusetts. Although this plant was cultivated in England more than a hundred years ago, it has through wrong determination and confusion in names been little understood by American botanists and gardeners, and is still rare in cultivation. The fragrance of the rose-colored flowers is not surpassed by that of any other Azalea. *Rhododendron nudiflorum* and *R. roseum* are now growing on the lower side of Azalea Path, and there is a mass of larger plants of the latter on the right hand side of the Meadow Road in front of the Lindens.

ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

MAY 27, 1922

Crataegus nitida belongs to the Virides Group of the genus. This is one of the most distinct of the natural groups into which the genus is divided, well marked by its small flowers in many-flowered corymbs with twenty or rarely ten stamens and yellow or occasionally rose-colored anthers, small usually red fruit and leaves with rare exceptions pointed at the ends. The species are trees with the exception of two or three which grow only in western Texas, and descriptions and figures of thirteen of them are found in the new edition of Sargent's Manual of the Trees of North America. The plants of this Group are distributed from the extreme southeastern part of Virginia, southward in the region east and south of the Appalachian Mountains to northern Florida, through the Gulf States to Texas and up the valley of the Mississippi River to Iowa and southern and western Illinois. Of the type of the Group, *C. viridis*, there are probably more individuals now growing than of any other Hawthorn in the world, for it is pretty generally distributed over the whole region in which species of this Group grow, and although rare in the Atlantic and east Gulf States it covers with dense thickets great areas of swampy ground in western Louisiana, the coast region of eastern Texas, southern Arkansas, and all the region adjacent to the Mississippi to the northern limits of its range. Its pale gray bark nearly as close as that of a Hornbeam and scarlet or orange fruit mostly persistent on the branches during the winter, and from an eighth to a quarter of an inch in diameter, make it an easy species to recognize. The large plants of *Crataegus nitida*, raised from seed gathered in 1880 on the bottom lands of the Mississippi in the neighborhood of East St. Louis, and growing in the

old *Crataegus* collection near the Forest Hills gate, are as handsome as any Thorns in the collection. They are trees some twenty feet high with horizontally spreading branches forming a rather flat-topped head broader than the height of the tree. The leaves are thick and coriaceous, very dark green and lustrous on the upper surface, from two to three inches long and from an inch to an inch and a half wide, and in the autumn turn bright scarlet and orange. The flowers are produced in broad, many-flowered clusters which cover the branches from end to end, and are about three-quarters of an inch in diameter with from fifteen to twenty stamens and yellow anthers. The fruit, which does not ripen until the end of October, hangs in drooping clusters, and is dull red, thickly covered with a glaucous bloom, and occasionally nearly half an inch in length. *Crataegus nitida* must find a place among the six most beautiful Hawthorns which can be grown in Massachusetts.

Crataegus punctata is the type of the Group which takes its name from this tree, and is represented by at least a dozen species. Of these five species are found in the region east of the Mississippi River and the others in the territory extending from Missouri to eastern Texas. The species are distinguished by short-stalked leaves wedge-shaped at the base, with prominent veins, flowers of medium size in wide, many-flowered clusters, with twenty or in the case of two species ten stamens, and yellow or rose-colored anthers, and by short-oblong to subglobose often punctate fruit. The type of the Group, *C. punctata*, is a tree often thirty feet high with a trunk occasionally a foot in diameter, and stout horizontally spreading branches forming usually a round-topped or flat head occasionally fifty feet across. The flowers are about three-quarters of an inch in diameter and are arranged in many-flowered hairy clusters; there are twenty stamens, and on some trees the anthers are rose-colored, and on others they are yellow. The fruit, which ripens and falls in October, is short-oblong to subglobose, flattened at the ends, marked by numerous white dots, up to an inch in length and dull red on some trees and bright yellow on others, the trees with yellow anthers producing the yellow fruit. *Crataegus punctata* is one of the most distinct and generally distributed Thorns of the northeastern states, although it has not been found in eastern Massachusetts. In Canada it is common from the valley of the Chateaugay River in Quebec to that of the Detroit River in Ontario, and westward in the United States to central Iowa, the only place where it has been found west of the Mississippi River; it is very common in the middle states, ranging southward along the Appalachian Mountains, and ascending in North Carolina and Tennessee to altitudes of nearly six thousand feet. Although one of the most distinct and perhaps more easily recognized at a glance than any other American Hawthorn, it escaped the attention of early American botanists or was entirely misunderstood by them, and was first distinguished by an Austrian botanist from plants cultivated in Europe. There are a number of plants on the southern slope of the Bussey Hill overlook.

Crataegus succulenta. This is a native of a large and widely distributed group now called the *Macracanthae*, although until recently

known as the Tomentosae, so-called from one of its best known species, *C. tomentosa*. This Group is well distinguished from the others by the deep longitudinal pits on the inner faces of the nutlets of the fruit, which are found also but in a much less developed form in two other North American groups. Ten species of the Macracanthae are treated as trees in the new edition of Sargent's Manual of the Trees of North America, and there are many species which are shrubs. The Group is chiefly northern, perhaps the greatest number of its representatives being in Quebec, Ontario and Michigan. Plants of this Group, however, are common in all the northern states east of the Mississippi River and range southward among the mountains to northern Georgia and central Alabama. West of the Mississippi, where they are found from central Iowa to Kansas and eastern Texas, they are much less abundant, growing usually as small shrubs. *Crataegus succulenta* is a tree occasionally twenty feet high with a slender stem and stout ascending branches forming a broad irregular head. The flowers, which are about two-thirds of an inch in diameter, hang on long stalks in broad, lax, many-flowered, villose clusters; the stamens are usually twenty, occasionally fifteen, and the anthers are deep rose color. The fruit, which is arranged in broad, loose, many-fruited, drooping clusters, is globose, about two-thirds of an inch in diameter, bright scarlet, very lustrous, and soft and pulpy when fully ripe toward the end of October when the plants are objects of such great beauty that *Crataegus succulenta* must also be included among the six handsomest American Hawthorns for Massachusetts. This is another of the trees which was entirely overlooked by American botanists and was first distinguished in Europe from cultivated plants. Another instance of the slight attention formerly paid to American Hawthorns is found in another species of the Macracanthae Group named *C. prunifolia*, which has been cultivated in Europe for at least one hundred and twenty-five years and which until recently has been considered a form of the Cockspur Thorn belonging to an entirely different group without the pits in the inner faces of the nutlets which are prominent in those of *C. prunifolia*. Although certainly American and not rare in European gardens, this handsome plant has not been found in recent years growing wild in this country. There are two good specimens in the old *Crataegus* collection near the Forest Hills Gate, and one of these is covered with flowers.

Rosa Ecae. This native of Afghanistan and Turkestan was again this spring the first Rose in the Arboretum to bloom. Among the yellow-flowered Roses which are hardy in this climate only the flowers of *R. Hugonis* are more beautiful. It is a hardier and more vigorous plant, however, than *R. Hugonis*, of better habit and with handsomer dark green, very lustrous and fragrant leaves. The flowers are of the same size as those of *R. Hugonis*, but a little paler in color and less thickly set on the branches but more fragrant. The plant of *R. Ecae* in the Shrub Collection is now about eight feet high and five or six feet through, and has not before this year been so covered with flowers. *Rosa Ecae* as it grows in the Arboretum is one of the most beautiful of all the species of Roses, but it is doubtful if it can be found in any American nursery.

Early Locusts. *Robinia Kelseyi* and *R. Michauxii* are already in flower in the collection of these plants on the Meadow Road. *R. Kelseyi*, discovered a few years ago on the southern Appalachian Mountains, is a slender-stemmed shrub from six to eleven feet high with lighter-colored and smaller flowers than those of the better known Rose Acacia (*Robinia hispida*). From that plant it differs, too, in the absence of glandular hairs on the branches and of the abundant root shoots which often make that plant such a troublesome weed. *Robinia Slavini* which is believed to be a hybrid of *R. Kelseyi* and *R. pseudo-acacia*, appeared a few years ago in the nursery of the Rochester, New York, Park Department and promises to be a handsome flowering tree. It is growing in the Arboretum but has not yet flowered here. *R. Michauxii* has the glandular hairs and the rose-colored flowers of *R. hispida*, but the flowers are rather smaller and the stems are three or four feet tall. Unlike *R. hispida*, which is not known to have ever produced fruit, *R. Michauxii* bears abundant crops of glandular pods. Although discovered by the French botanist Michaux in the foothill region of the southern mountains one hundred and twenty five years ago and known for many years in a few old northern gardens, the true character of this handsome plant has only recently been recognized.

Xanthoceras sorbifolia. This Chinese shrub or small tree has flowered unusually well in the Shrub Collection this year. It has dark green leaves and erect and spreading racemes of white flowers marked with red at the base of the petals, and fruit somewhat like that of a Buckeye. This interesting plant is related to the so-called Texas Buckeye, *Ungnadia*, and to *Koelreuteria*, the yellow-flowered Chinese tree which blooms here at midsummer. It is very hardy but has a way of dying without any apparent cause, and for this reason it is not as often cultivated as it might be for when it flowers as it has here this year few shrubs are more beautiful.

Symplocos paniculata, or as it is often called, *S. crataegoides*, is a native of Japan, China and the Himalayas. The form which is cultivated here is Japanese, and is a tall broad shrub, with large, obovate, dark green deciduous leaves, small white flowers in abundant, compact panicles which open after the leaves are nearly full grown and are followed in the autumn by bright blue fruits about one-third of an inch in diameter. The plants are attractive when in flower; the fruit of a color unusual among that of hardy shrubs is the most interesting thing about it. Although introduced into the United States by the Parsons Nursery at Flushing, New York, nearly sixty years ago this beautiful shrub is still rare and difficult to obtain.

Two native Viburnums. The Arboretum owes much of its late spring and early summer beauty to the two tree Viburnums of the northern states, *V. Lentago* and *V. prunifolium*, which have been generally planted, especially the former, by many of the drives and in many of the border shrubberies. These plants are now covered with flowers, and are in splendid condition this year, showing what care and cultivation can do for our commonest native plants. They show, too, that the Viburnums of eastern North America surpass in beauty and usefulness as American garden plants the Viburnums of all other parts of the world.

ARNOLD ARBORETUM

HARVARD UNIVERSITY



BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JUNE 2, 1922

Rhododendrons. Although the flowers of a few of the plants will have faded and those of others will not have opened, the largest number of evergreen Rhododendrons in the Arboretum will be in flower when this Bulletin reaches its Massachusetts readers. Flower-buds are abundant and the brilliant display made by these plants promises to be an exceptionally good one. The Rhododendron collection is at the base of Hemlock Hill and adjoins the South Street gate.

Comparatively little success in the cultivation of these plants has been obtained in the eastern United States in spite of all the time, thought and money which have been expended on them in the last seventy-five years. This climate is hostile to all broad-leaved evergreens, and of the hundreds of species of evergreen Rhododendrons now known only the species of eastern North America, five exotic species and a few hybrids can be grown in the open ground in Massachusetts; and among them are none of the really beautiful trees and shrubs which are the glory of a few gardens in more favored regions. A few more hybrids may be added to the Arboretum collection, but it is not probable that there are now anywhere species to discover which will prove hardy in this climate. In the neighborhood of Portland, Oregon, or near the shores of Puget Sound and not in the east collections of evergreen Rhododendrons may be established which may well rival or surpass those in the gardens on the shores of the Italian Lakes or in Cornwall, although in one Cornwall garden some four hundred species are growing and nearly seventy species have been in flower on the same day.

Plants of the native *Rhododendron maximum* collected in the middle and southern states have been planted in recent years in considerable numbers in this part of the country, but the Rhododendrons chiefly used in the gardens of eastern North America are hybrids of *R. catawbiense* of the high slopes and summits of the southern Appalachian Mountains. Names have been given to a large number of plants made originally by crossing this species with the Himalayan *R. arboreum* and other Indian species, with the Caucasian *R. ponticum* and with *R. maximum*, and by raising seedlings from these hybrids. Most of these hybrids and their offspring have been raised in England; several good varieties have originated in Germany and Belgium, and a few have been produced in the United States many years ago chiefly in the Parsons Nursery in Flushing, Long Island. The best of these hybrids for this country have been made in England but only a comparatively small number of them are hardy, the hardiest being those in which the *catawbiense* and *maximum* blood predominate. *Rhododendron ponticum*, a tender species, has been used almost exclusively for the stock on which these hybrids have been grafted, and the tenderness of the stock has evidently affected the constitution of the graft; and it is this stock which may cause the death without other apparent causes of plants which have flourished in this country for thirty or forty years. *R. ponticum* is favored by nurserymen because the plants are quickly and cheaply raised and easily worked, but for really hardy and reliable Rhododendron hybrids for this country *R. catawbiense*, although more difficult to work, should be used for stock. Even better than any grafted plants are those obtained from layers, a slower and more expensive process, formerly much practiced in the Kanphill Nurseries by Anthony Waterer who raised the best Catawbiense Hybrids which have been planted in New England. A few of the hardiest and handsomest of these plants which can be grown in this climate are *Atrouanguineum*, Charles Dickens, Mrs. C. S. Sargent, Henrietta Sargent, *Catawbiense album*, *Album elegans*, *Roseum elegans*, Hannibal, H. W. Sargent, *Discolor*, Melton, *Album grandiflorum*, *Purpureum grandiflorum*, *Purpureum elegans* and *Lady Armstrong*.

The hardiest Rhododendrons in this climate are *R. maximum* and *R. catawbiense*; the former, which in the valleys of the southern mountains is sometimes a bushy tree up to forty feet in height, but at the north is much smaller, is distributed in isolated stations from Nova Scotia through New England and eastern New York to Pennsylvania; from Pennsylvania southward along the Appalachian Mountains it is very abundant at low altitudes, often covering the slopes of narrow valleys with almost impenetrable thickets. The flowers are white or pale rose color, and are produced in rather compact clusters, which as the flowers do not open until late in June or early in July are a good deal hidden by the branches of the year which rise well above them. The long comparatively narrow leaves up to a foot in length make this Rhododendron valuable in a climate in which few broad-leaved evergreen plants can be successfully grown. *R. catawbiense* is a round-topped, rather compact shrub with broad, dark green and lustrous leaves. It is very hardy but grows slower than many of its hybrids, and is handsomest before the flowers open or after they have

faded, for they are of a disagreeable rose-purple color which has spoiled the flowers of many of its hybrids or of their varieties like the hardy and popular *Everestianum*. The flowers of *R. carolinianum*, one of the first species to flower here, are fast fading. This little shrub of the southern Appalachian Mountains, although distinguished only a few years ago, is becoming popular in northern gardens where it grows well under the shade of trees and in full exposure to the sun. It is a plant rarely three feet high, with small, dark green and compact clusters of pink flowers. There is a form with white flowers. The other Appalachian species, *R. minus*, blooms after the Catawbiense hybrids. This shrub has been in cultivation for more than one hundred years, usually under the name of *R. punctatum*. Although a larger plant than *R. carolinianum*, with slightly larger pink flowers, it is not as good a garden plant for the flowers, like those of *R. maximum*, are hidden by the shoots of the year which rise above them. *R. coriaceum*, which came to the Arboretum thirty years ago from the Kanphill Nursery in England, resembles *R. caucasicum* of the mountain slopes of the Caucasus. The shape of the leaves, the covering of brown felt on their lower surface, and the white flowers on long pedicels in few-flowered clusters do not greatly differ from those of the wild plant in shape and size. In the Arboretum *R. coriaceum* is now between three and four feet high and broad with erect stems; it flowers abundantly every year and the leaves and flower-buds are not injured by the cold of eastern Massachusetts. It flowers, however, nearly two weeks later than the plants which are usually considered hybrids of *R. caucasicum*, although nothing very definite appears to be known of their origin. The best of these plants which have been grown in the Arboretum is called *Boule de Neige* and is believed to have been raised in France. It is a low, broad round-topped bush which is perfectly hardy and every spring is covered with flowers which are as white as it is possible for flowers to be. This is the earliest evergreen Rhododendron to flower in the Arboretum with the exception of the plant called *Christmas Cheer*, which is said to be a hybrid of *R. caucasicum* and the Indian *R. arborescens*, and every year loses its flowers by spring frosts. *Boule de Neige* is considered the handsomest and most satisfactory of the early-flowering Rhododendrons which can be grown in this climate. Almost as good is the plant called *Mont Blanc* with flowers which are pale rose color when the buds first appear but soon become pure white. The handsome red-flowered *Jacksoni* too often loses the flower-buds in severe winters. The Caucasian *R. Smirnowii* is as usual in good condition this spring and none of the Rhododendrons which can be grown here have more beautiful pink flowers. The thick coat of pale yellow felt which covers the lower surface of the leaves protects them from the attacks of the lace-wing fly which has in recent years done so much damage in this country and Europe to the leaves of Rhododendrons and *Kalmias*. A few hybrids of *R. Smirnowii* crossed with hybrid Catawbiense varieties have been raised and among them are plants of considerable promise, although none of them retain the covering of felt on the lower surface of the leaves of their Caucasian parent. Still rare in American gardens, *R. Smirnowii* deserves the attention of planters of Rhododendrons. It will probably prove valuable in breeding a race of Rhododendrons suited to the climate of the northeastern United States.

Crataegus aprica is a representative of the large and still imperfectly known Flavae Group, distinguished by its few-flowered corymbs, conspicuously glandular like the cuneate leaves; usually twenty stamens, rose-colored or yellow anthers, and usually zigzag often pendulous branches. The species are usually trees but occasionally shrubs, fifteen being admitted into Sargent's New Manual of the Trees of North America. The plants of this Group are confined almost exclusively to the southeastern states from southwestern Virginia to central Florida and southern Alabama. They occur in eastern Mississippi, and one species grows near the banks of the Mississippi River near Bayou Sarah, Louisiana, the most western station known for any species of the Group. The species are most abundant in the lower parts of the states of South Carolina and Georgia and in northern Florida, but a few species occur on the Appalachian Mountains up to altitudes of about three thousand five hundred feet. Most of the high country species are established in the Peter's Hill Group and six or seven of them have flowered sparingly during the past week. The best known in the Arboretum, *C. aprica*, was first raised here in 1876 from seed presented by Asa Gray as *C. coccinea*, the name usually applied in those days to most American Hawthorns. This is the most northern species of the Group and appears to ascend to higher altitudes than any of the others. The branches are less zigzag than in most of the species, and the flowers have only ten stamens with yellow anthers. The fruit is subglobose, often slightly hairy at the ends and dark orange-red. *C. aprica* is a tree occasionally twenty feet tall with a trunk from six to eight inches in diameter, covered with deeply furrowed and scaly bark, and spreading branches forming an open head. *C. aprica* is not one of the handsomest or a typical species of the Group but its hardiness makes it a good representative of the Flavae in northern collections in which most of the other species grow badly even if they grow at all. The old plant of *C. aprica* on the bank near the Forest Hills Gate is not flowering this year but there are flowers on the younger plants in the Peter's Hill Group.

Lonicera Morrowii has been growing in the Arboretum since 1884 and is now only mentioned here in order to call attention to the remarkable groups of the plants of this species near the crossing in Franklin Park, Boston, of the park drive and the traffic road which divides the park from north to south. In these groups the plants now covered with flowers are from twenty-five to thirty feet in diameter and eight or ten feet high and are round-topped and perfect in shape with lower branches spread out over the ground. Lovers of handsome hardy shrubs will be well repaid by a visit to these remarkable shrubs. *Lonicera Morrowii* is offered for sale by several American nurseries, but these nursery plants raised from seeds usually prove to be hybrids of *L. Morrowii* and *L. tartarica* with upright branches, greener leaves and smaller flowers, and as compared with the Siberian and Japanese plant now to be seen in Franklin Park of little value. *Loniceras*, or many of them, hybridize freely and only plants raised from cuttings can be depended on.

ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JUNE 8, 1922

Crataegus pedicellata belongs to the Coccinae Group in which are arranged a number of trees and tree-like shrubs with large, thin leaves usually broader than long, flowers from half an inch to an inch in diameter with from five to twenty stamens and rose-colored or very rarely yellow anthers. The plants of this Group are confined to the northeastern part of the country; they are common in Quebec, New England and New York; westward they are found in Ohio, southern Michigan, northern Illinois and southern Wisconsin; a few species occur in eastern and in western Pennsylvania, and so far as is now known the southern limit of the Group is reached in Delaware with one species. No representative of this Group has yet been found in the territory west of the Mississippi River. These plants are shapely small trees and among them are some of the handsomest Thorns which can be grown in northern gardens. *Crataegus pedicellata* is a good representative of the Group. It is a tree sometimes twenty feet high with a tall trunk up to a foot in diameter, and slender spreading and ascending branches which form a symmetrical head; the leaves are broad-ovate to rhombic with a wide, rounded or abruptly narrowed base, and are nearly fully grown when the flowers open. These are arranged in wide, many-flowered, slightly hairy corymbs, and are about half an inch in diameter with usually ten stamens and rose-colored anthers. The fruit, which ripens and falls in September, is pear-shaped until fully grown, becoming short-oblong when fully ripe when it is lustrous, bright scarlet and about three-quarters of an inch in length. This Thorn is common in central and western New York and occurs in western Pennsylvania and in southern Ontario in the neighborhood of

Toronto and London. In the neighborhood of Rochester, New York, a variety has been found (var. *gloriosa*) which differs in its rather larger flowers with pink anthers, larger and more lustrous fruit often mamillate at base and ripening a few days earlier than that of the typical and more common form. The species of this Group are well established among the Thorns on Peter's Hill and several of them have flowered and produced fruit for several years. A few of the other interesting plants of this Group are *C. Holmsiana* with usually five but occasionally from six to eight stamens and large, dark reddish purple anthers, and crimson pear-shaped fruit. This is a tree often thirty feet high with a tall trunk, or is often a large tree-like shrub with a range from the coast of Maine to Quebec, western New York, southern Ontario and eastern Pennsylvania. This tree is very common on the hills of Worcester County, Massachusetts. Handsomer is *C. Hillii* from northeastern Illinois with flowers three-quarters of an inch in diameter arranged in wide clusters, twenty stamens and pink anthers, and crimson pear-shaped fruit. *C. Pringlei*, which is easily distinguished by its yellow-green, drooping, conspicuously revolute leaves, is a tree sometimes twenty-five feet high and one of the widely distributed species of this Group, as it occurs in southern New Hampshire and ranges through southern Vermont to western Massachusetts and eastern New York, and occurs in western New York, Ontario, Ohio, and southern Michigan, finding its western home in northeastern Illinois.

Crataegus Crus-galli gives its name to the Crus-galli Group in which are found a larger number of species than in any of the other groups. Twenty-five species are admitted as trees in Sargent's new edition of the Manual of Trees of North America, but these are certainly not all the arborescent species and there are many shrubs among the Cockspur Thorns, for nearly fifty species have been distinguished in Missouri which appears to be the headquarters of the group, and species are found in every part of eastern North America from the valley of the St. Lawrence River to the shores of the Gulf of Mexico in western Florida, and to Ontario, eastern Kansas and Oklahoma, eastern Texas and the Davis Mountains in southwestern Texas. Cockspur Thorns are very common in Pennsylvania and in all the southern Appalachian Mountain region, and in Georgia, Florida, Alabama, western Louisiana, Arkansas and eastern Texas. Most of the species have leaves broadest and rounded at apex, serrate except on vigorous shoots only above the middle, dark green and lustrous on the upper surface, usually thick and subcoriaceous, with veins often imbedded in the tissue of the leaf, rarely thin, with prominent veins. They have moderate sized flowers with ten or twenty stamens and rose-colored or yellow anthers, in many-flowered, naked or hairy clusters, and subglobose or short-oblong, usually dull red, hard fruit with dry mealy flesh. The branches of nearly all the species are armed with numerous long sharp spines. What is now considered the type of the genus, *Crataegus Crus-galli*, the familiar Cockspur Thorn, is a tree sometimes twenty-five feet high with a tall trunk a foot in diameter, and stout, ridged, spreading branches forming a broad, round-topped, handsome head. The leaves are thick and very lustrous with a thin midrib and veins enclosed in the leaf tissues. The flowers open late in May or early in June after the leaves are

nearly fully grown, and the stamens are ten with rose-colored anthers. The dull red fruit, which is covered with a glaucous bloom, is about half an inch in diameter and remains on the branches during the winter. *Crataegus Crus-galli* was cultivated in England as early as 1691; it has always been a favorite garden plant in Europe and the United States, and for many years could be found in American commercial nurseries. Many years ago the Cockspur Thorn was much used in the northern and middle states to form hedges, a purpose for which it is suited. *Crataegus Crus-galli*, as it is understood in the Arboretum, is distributed from the valley of the St. Lawrence River, where it grows on the slopes of low hills in the neighborhood of Montreal, southward to Delaware and on the Appalachian foothills to North Carolina, and westward through western New York to Pennsylvania and southern Michigan. One of several forms of the Cockspur Thorn (var. *pyracanthifolia*) with narrow pointed leaves, smaller flowers and small bright red fruit, is not rare in eastern Pennsylvania and in Delaware, and is occasionally found in gardens. A number of the species of the Cockspur Thorn are now established in the Arboretum, and several of them have flowered this year. One of the most interesting of these which was covered with flowers last week was one of the few thin-leaved species, *C. erecta*, which is from the region on both sides of the Mississippi River in the neighborhood of St. Louis. This tree has pointed leaves with prominent veins, flowers with ten stamens and yellow anthers, and subglobose dark dull crimson fruit. *Crataegus peoriensis*, a species from central Illinois, has also been covered with flowers. This tree chiefly differs from *C. Crus-galli* in its short-pointed leaves with veins prominent on their lower surface, and in its bright scarlet fruit and more slender spines.

Crataegus modesta is a good representative of the large and interesting Intricatae Group, distinguished by leaves usually cuneate at 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 yellow or bright yellow fruit. Four southern trees are now placed in this Group but the others are small shrubs. This is one of the largest groups; no less than thirty-two species have been recognized in Pennsylvania and seven in New York. The Group is represented in western New England and in Michigan by several species, but only a few species have been found in the Missouri-Arkansas region. Birmingham, Alabama, is the most southern station where a species 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, *Crataegus intricata*, from a plant cultivated in Copenhagen. The small size of these plants, their large and handsome flowers and conspicuous fruits make these little Thorns valuable garden plants. There is now a large collection of them growing at the eastern base of Peter's Hill. *C. modesta*, one of the characteristic species lately in flower rarely grows six or seven feet tall, and is a narrow shrub with slender, much-branched stems, and oblong-ovate, usually lobed

leaves which at the end of vigorous branches are often broad at base. The flowers with ten stamens and large yellow anthers, are nearly an inch in diameter, and are arranged in hairy, from three- to six-flowered clusters. The fruit is borne on erect stems, and is subglobose with flattened ends, or short-oblong or pear-shaped, and is bright yellow or orange with a red cheek, hairy at the ends and about half an inch in diameter. *C. modesta* was discovered near Rutland, Vermont; it grows also in eastern New York, Connecticut, and Berks County, Pennsylvania.

The Chinese Flowering Dogwood. This form of the Japanese *Cornus* from western China which was discovered and introduced by Wilson is showing this week more clearly than ever before its value as a garden plant in this part of the country, for the specimen among the Chinese plants on the southern slope of Bussey Hill has not before been so wreathed in flowers. The bracts under the flower-clusters, which are the conspicuous features of the inflorescence in all the so-called Flowering Dogwoods, 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 the branch. The seeds of the Asiatic Flowering Dogwoods are united into a solid globose mass, but in the American species do not become united. The Chinese Flowering Dogwood is rare in cultivation, and the specimen in the Arboretum is probably the only large one in this country. For several years the Arboretum plant has ripened a few seeds and it is not impossible 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, for *Cornus florida* loses many of its floral bracts in severe winters, and is often killed or severely injured here in winters like the last which greatly injured the bracts of most of these trees in this part of the country.

Rosa Moyesii, which was introduced by Wilson from western China and which has received a great deal of attention in England and in the middle United States where it is greatly valued as a garden plant, and as a parent in breeding new races of Roses, has proved until this year a failure in the Arboretum. The plants have not usually been entirely hardy here, and the flowers have been few and of poor quality. The plants, however, on the southern slope of Bussey Hill were not injured last winter and is now covered with flowers. *Rosa Moyesii* is a large shrub up to ten feet in height, with stout branches sparingly armed with short straight prickles and blood red flowers from an inch and a half to two inches and a half in diameter. The deep orange-red fruit is two and one half inches long, contracted below the apex, and as beautiful as the flowers.

Rhododendron (Azalea) calendulaceum, the flame Azalea of the southern Appalachian forests, which has been planted in numbers on Azalea Path and is scattered through the Arboretum shrubberies, is now the most conspicuous plant in the Arboretum. The most brilliant of the Azaleas which can be grown in the north, its only rival as the most beautiful flowering shrub in North America is the Laurel (*Kalmia latifolia*).

ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JUNE 14, 1922

Philadelphus, unfortunately called *Syringa* in popular language for *Syringa* is the scientific name of the Lilacs, is flowering rather earlier than usual this year. There is a good collection of these plants in the Arboretum, and the group is the largest here of the shrubs which flower in June. *Philadelphus* is a widely distributed genus with representatives in North America in the southern states, the southern Rocky Mountain region and the Pacific States, in Japan, Korea, China, on the Himalayas and in eastern Europe. The white and usually fragrant flowers are the only attraction of these plants; they are not interesting in habit; the leaves fall in the autumn without change of color, and the fruit, which is a dry capsule, is smaller than that of the Lilac. During the last twenty years several new species of this genus have been introduced into gardens from eastern Asia, and plant-breeders have made more valuable contributions to few groups of garden plants than to *Philadelphus*. Most *Syringas* bloom freely every year; they require rich well drained soil, and the presence of lime in it has no bad effects on them. Better than most shrubs they can grow and flower in shade, and are therefore valuable for undergrowth in border plantations of trees. There are now in the collection some thirty species with a few varieties and several hybrids.

The Mock Orange of all old gardens is *Syringa coronarius*, the eastern European species. The plant was first cultivated in England before the end of the sixteenth century and was probably one of the first garden shrubs brought to America by the English settlers. It is a medium-sized species often as broad as high. The flowers, too, are of

medium size and faintly tinged with yellow. This shrub has been somewhat neglected since species and hybrids with larger and showier flowers have found their way into gardens. This is unfortunate, for no other *Syringa* equals the old-fashioned Mock Orange in the delicate perfume of its flowers. Varieties of this plant with yellow leaves, with double flowers, and with narrow willow-like leaves can be seen in the Arboretum collection, but none of them have any particular decorative value. Among the American species which should find a place in all gardens are *P. inodorus*, *P. pubescens*, and *P. microphyllus*. The first is a native of the Appalachian Mountain region and grows to the height of six feet; it has arching branches and large, solitary, pure white, cup-shaped, scentless flowers. By some persons it is considered the most beautiful of all *Syringas*. *P. pubescens*, often called *P. grandiflorus* or *P. latifolius*, is also a plant of the southern Appalachian region. It often grows to the height of twenty feet; the branches are stout and erect; the leaves are broad, and the slightly fragrant flowers are arranged in erect, from five- to ten-flowered racemes. This plant is more common in gardens than the last and when it is in bloom it makes a great show. *P. microphyllus*, which rarely grows more than three feet tall, has slender stems, and leaves and flowers smaller than those of any *Philadelphus* in cultivation. What the flowers lack in size, however, is made up in fragrance which is stronger than that of any other *Syringa* and perfumes the air for a long distance. Unfortunately this shrub, which is one of the most attractive plants of the genus, is not always entirely hardy and was killed to the ground last winter in the Arboretum.

The most distinct and perhaps the handsomest of the Asiatic species in the Arboretum is *Philadelphus purpurascens*, discovered by Wilson in western China. It is a large shrub with long arching stems from which rise numerous branchlets from four to six inches long and spreading at right angles; on these branchlets the 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 exceedingly fragrant. This is one of the handsomest of the shrubs brought from western China to the Arboretum. *Philadelphus Magdalenae* is another Chinese species well worth cultivation. It is a tall broad shrub with arching stems, small dark green leaves and pure white fragrant flowers an inch and a quarter in diameter and arranged in drooping, leafy, many-flowered clusters from six to ten inches in length. *Philadelphus pekinensis* from northern China and Mongolia is a stout bush rather broader than high which every year produces great quantities of small flowers tinged with yellow. Another interesting garden plant, *P. Falconeri*, which is certainly Asiatic and probably Japanese, has narrow lanceolate leaves and fragrant flowers in from one- to six-flowered racemes, and is distinct in the shape of its leaves and in its long narrow petals. The origin and history of this plant is not known.

Hybrid Philadelphus. The first hybrid *Philadelphus* which attracted attention was raised in France before 1870 by a Monsieur Billard, and is sometimes called in gardens *Souvenir de Billard*, although the correct

name for it is *Philadelphus insignis*. This hybrid is one of the handsomest of all the tall-growing Syringas, and its value is increased by the fact that it is one of the latest of them all to flower. In a few old gardens in the neighborhood of Boston great Syringa-bushes occasionally thirty feet high and correspondingly broad are sometimes found. These plants are believed to be hybrids between *P. coronarius* and some unrecognized species. They are called *Philadelphus maximus*. Another hybrid, *P. splendens*, sprang up in the Arboretum several years ago and is supposed to be a hybrid between two American species, *P. inodorus* and *P. pubescens*. It is a large and shapely shrub with pure white only slightly fragrant flowers an inch and three-quarters in diameter and borne in erect clusters. *Philadelphus splendens* usually flowers very freely and when the flowers are open it is the showiest plant in the Syringa Group. It is not, however, as thickly covered with flowers this year as usual.

Lemoine Hybrid Philadelphus. These are among the most beautiful and interesting additions to summer-flowering shrubs, due to the intelligence and skill of the great French plant-breeder. The first of these hybrids, *Philadelphus Lemoinei*, was obtained by crossing the European *P. coronarius* and the Rocky Mountain *P. microphyllus*. This plant is intermediate between its parents in size and in the size of the flowers. The flowers are pure white, very fragrant and produced in the greatest profusion. Lemoine then crossed his *P. Lemoinei* with other species and obtained remarkable results. By using *P. pubescens* or some related species as the other parent he obtained a race to which the name *P. cymosus* has been given. The plant named "Conquête" may be considered the type of this race. It is a vigorous, hardy plant with flowers from two to two and a half inches in diameter, and only surpassed in size by those of "Rosace" of this race, and a beautiful and desirable garden ornament. There is a good specimen in the Shrub Collection. Other plants of this race are "Mer de Glace," "Norma," "Nuée Blanche," "Rosace," "Voie Lacté" and "Perle Blanche." By crossing *P. Lemoinei* with the hybrid *P. insignis* Lemoine obtained the race to which the general name of *P. polyanthus* has been given. Well known forms of this race are "Gerbe de Neige" and "Pavillon Blanc." Another of these hybrid races created by Lemoine is called "*P. virginalis*;" of doubtful origin it is distinguished by double racemose flowers. The type of this group is "Virginal," and other varieties referred to it are "Argentina," "Glacier," and "Bouquet Blanc."

Crataegus Phaenopyrum, the Washington Thorn, better known perhaps as *C. cordata*, is a member of the small group of Macrocarpae, distinguished by the principal veins extending to the sinuses of the leaves as well as to the points of the lobes, flowers with twenty stamens, rose-colored or yellow anthers and red fruit not more than a quarter of an inch long. To this group belong in addition to the three species of the southern United States the two common species of western Europe, *C. oxycantha* and *C. monogyna*, now often cultivated in this country in many forms. *Crataegus Phaenopyrum* is a tree up to thirty feet in height with a trunk a foot in diameter, and erect branches

forming a comparatively narrow or round-topped head. The leaves are broad-ovate to nearly triangular, long-pointed, more or less incisedly or three-lobed, dark green and very lustrous above, and pale below up to two inches in length, turning late in the autumn bright scarlet and orange. The flowers open here early in June after the leaves are fully grown and are about half an inch in diameter, creamy white with rose-colored anthers, and are arranged in compact, many-flowered corymbs. The fruit is scarlet and lustrous, and ripening late in September or in October retains its color and remains on the branches until the spring of the following year. The Washington Thorn is the last of the American species to flower in the Arboretum. The flowers are less beautiful than those of most Hawthorns, but the plant is valuable for the remarkable coloring of the leaves in autumn and for the brilliant and persistent fruit. Nowhere very common, this tree grows naturally in a few isolated stations from western North Carolina, through Tennessee and Kentucky to southern Illinois and southern Missouri, and is now often naturalized in the middle and Ohio valley states.

Late Flowering Magnolias. The Sweet Bay, *Magnolia virginiana*, or as it is more often called, *M. glauca*, opened its fragrant cup-shaped flowers ten days ago and will continue to open them until midsummer. The leaves, which are dark green above and silvery white below, and more beautiful than those of almost any other plant which is hardy in this climate, remain on the branches without change of color until the beginning of winter; and the perfume of the flowers is more penetrating and delightful than that of any of our native trees and shrubs. A plant for every garden, great or small, how often is the Sweet Bay found in those of modern construction? *Magnolia macrophylla* flowers a few days later than *M. virginiana*, and is the last of the genus to open its flowers here. It is a wonderful 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 great leaves are often torn by wind unless a sheltered position is selected for it. *Magnolia macrophylla* is a distinct and beautiful tree, and is interesting in the fact that its leaves and flowers are larger than those of any other which grows in extra tropical regions.

Eleagnus angustifolius. A tree with silvery white foliage can sometimes be mixed with advantage with dark-leaved trees to produce contrast in the landscape, and for this purpose no tree which is hardy here at the north is so well suited as the Oleaster, as *Eleagnus angustifolia* is sometimes called. A native of southern Europe and western Asia, it is a tree sometimes thirty feet high, or a large arborescent shrub, with erect and spreading, sometimes spiny branches, and narrow lanceolate leaves up to three or four inches in length. The fragrant flowers are produced in few-flowered clusters in the axils of the young shoots and are nearly half an inch in length with a bell-shaped tube and four spreading lobes. The fruit is oval, half an inch long, yellowish and covered with silvery scales; the flesh is sweet and mealy. The large plants of the Oleaster on the left hand side of the Bussey Hill Road are now covered with flowers.

ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JUNE 23, 1922

Summer Flowering Shrubs. After the middle of June the number of trees and shrubs that bloom in the Arboretum rapidly decreases, but there are still the Lindens to flower, and the flowers of several shrubs make the Arboretum interesting in the last days of this month. The following are a few of the conspicuous plants at this season of the year:

Rhododendron maximum, the only evergreen Rhododendron which grows in the northeastern states, with an extensive Appalachian range southward to Georgia, is one of the handsomest of the broad-leaved evergreen plants which can be grown in this climate. The flowers are pink and white or nearly white and, like those of some other late-flowering Rhododendrons, are more or less hidden by the branches of the year which usually make a considerable part of their growth before the flowers open. *R. maximum* grows well in any soil not impregnated with lime and flourishes in shade and when fully exposed to the sun, but when growing in open positions it is often seriously injured by the lace-wing fly which was first brought to New England on plants of this Rhododendron collected in the south. Hybrids of *R. maximum* and *R. catawbiense* hybrids have been raised. One of the earliest and best known of these hybrids, *R. delicatissimum*, has lustrous foliage and white flowers tinged with pink which open two or three weeks before those of *R. maximum* and are not hidden by young branches. This hybrid is one of the hardiest, handsomest and most desirable of the large growing Rhododendron which can be planted in Massachusetts.

Rhododendron minus, better known perhaps as *R. punctatum*, is still little known in American gardens. It is a plant of the southern Appalachian Piedmont region, and ascends on the Blue Ridge of the Carolinas to an altitude of at least three thousand feet. The small, pale rose-colored flowers are produced in small clusters which, like those of *R. maximum*, are overtopped by the shoots of the year which begin to grow before the flower-buds open. This *Rhododendron* varies greatly in size, the largest plants growing at nearly the highest altitudes where individuals seven or eight feet high, and often forming thickets, are not uncommon. Less attractive perhaps than *R. carolinianum*, with which it grows on the southern mountains, *R. minus* is well worth a place in the gardens of a region in which so few species of *Rhododendron* can be successfully grown as in Massachusetts. In northern Georgia there is a form of this plant (var. *Harbisonii*) with larger leaves and larger flowers in larger clusters which may be expected to make a handsome garden plant. It is not yet in cultivation. Two good dwarf garden plants are believed to have been obtained from *Rhododendron minus*. The first, *R. arbutifolium*, is a dense shrub spreading into broad masses, with branches occasionally four feet high, small, acute leaves, and small rose-purple flowers in small compact clusters. Its other parent is believed to be *R. ferrugineum* of the European Alps. *R. arbutifolium* is better known in gardens as *R. Wilsonii*, a name which belongs to a hybrid between two Himalayan *Rhododendrons*. It is sometimes also cultivated under the names of *R. daphnoides*, *R. Hammondii*, and *R. oleaefolium*. The second of these plants, *R. myrtifolium*, is believed to be a hybrid between the other European alpine species, *R. hirsutum* and *R. minus*. It is a smaller and more upright growing plant than *R. arbutifolium* and has smaller and broader leaves and much handsomer rose-pink flowers also in compact clusters.

Rhododendron (Azalea) arborescens. As the flowers of the yellow-flowered Appalachian Azalea (*R. calendulaceum*) begin to fade the first of those of *Rhododendron arborescens* open. This is a handsome plant, and the beauty of the pure white fragrant flowers is increased by the bright red color of the long filaments and style. This is also an Appalachian plant, and sometimes at an altitude of about five thousand feet covers with dense thickets only a few feet high and sometimes an acre in extent the treeless summits of the Blue Ridge Mountains, and in their sheltered valleys sometimes grows into great arborescent bushes twenty feet tall and so justifies its name. There are growing in Mr. H. H. Richardson's garden in Brookline plants of this Azalea obtained from the highlands of North Carolina with pale rose-colored flowers of extraordinary beauty. Probably this variety will not reproduce itself from seeds and must therefore remain rare in gardens, for the propagation of Azaleas on a large scale by grafting is in this country a slow and expensive operation.

Sambucus canadensis, the black-fruited Elderberry of northeastern North America, is the last of the Massachusetts shrubs to make a conspicuous display of flowers. Few native shrubs make a greater show of flowers and fruits, and the numerous Elders sown by birds on the banks of the Bussey Brook in the valley north of Hemlock Hill, and by the

little ponds near the junction of the Meadow and Bussey Hill Roads add much to the beauty of the Arboretum in July. Growing with *Sambucus canadensis* in the Shrub Collection is a form with leaflets deeply divided into narrow segments (var. *acutiloba*) and more curious than beautiful. There are in the collection also a form with yellow fruit (var. *chlorocarpa*), and var. *maxima*, which originated a few years ago in a European nursery and which has flower-clusters three times as large as those of the wild plant and such large and heavy bunches of fruit that the branches can hardly support them. A variety with yellow leaves (var. *aurea*) is also in the collection. More objectionable than many yellow-leaved shrubs because it is hardier and grows more rapidly to a larger size than many of them, this plant now disfigures many European gardens and is too often seen in those of this country.

Cytisus nigricans. Of the small yellow-flowered shrubs of the Pea Family, which are such a feature of the flora of southern and south-eastern Europe, and are so important and highly valued in the gardens of western Europe, the best known in Massachusetts is the Woad Wax, *Genista tinctoria*. Brought early from England as a garden plant, it long ago escaped from a Salem garden and has spread over and ruined for agriculture hundreds of acres in Essex County. Planted in the Arboretum it has spread among the native plants like dwarf Roses and Goldenrods which form a considerable part of the ground cover among the groups of Hickories and Oaks, and now enlivens the valley through which the Valley Road extends from Centre to South Street. There is a taller variety of the Woad Wax (var. *elatior*) with larger flowers growing in the Arboretum. More beautiful and the handsomest of these plants which an experience of many years has shown to be suited to New England gardens is *Cytisus nigricans*. This native of northern Italy, Austria and Hungary is now in bloom in the Shrub Collection, and no plant now flowering there is more distinct and beautiful. As it grows in the Arboretum it is a compact, round-topped bush from two to three feet tall and broad. It differs from most of the related plants in the arrangement of the flowers which are borne in long erect racemes terminal on branches of the year. They are bright yellow and produced in great profusion.

Early flowering Summer Hydrangeas. The handsomest and most valuable of these eastern Asiatic plants here is the so-called Climbing Hydrangea (*Hydrangea petiolaris*) of Japan. This plant was first raised at the Arboretum in 1878 and is now seen in a few American gardens. A plant now growing here on the Administration Building is one of the great sights of the Arboretum, for it has grown with unusual vigor and is clothed with leaves and covered with its broad heads of flowers from the ground to the eaves of the building. The leaves of few plants unfold here so early in the spring, and there is but one other vine, *Schizophragma*, with deciduous leaves and showy flowers able in this climate to attach itself firmly to a brick or stone wall, or to the trunk of a tree. The flower-clusters, surrounded by a circle of sterile flowers, are from eight to ten inches in diameter and terminal on short lateral branches which stand out from the body of the plant and give it an irregular surface which adds to its interest and beauty.

The best known of the shrubby Hydrangeas and the first to flower is *H. Bretschneideri*, a native of northern China and first raised at the Arboretum in 1883. It is a large, vigorous and hardy shrub with dark green leaves and every year is covered with its flat heads of flowers surrounded as in the other species with sterile white ray flowers. Several of the Hydrangeas discovered by Wilson in western China also flower in June and can be seen on the southern slope of Bussey Hill and on Hickory Path near Centre Street. *H. Rosthornii* is now the tallest and probably the most vigorous here of these plants. *H. xanthoneurea* and its varieties *Wilsonii* and *setchuenensis*, although closely resembling in their general appearance *H. Bretschneideri*, are interesting additions to the June flowering shrubs.

Rosa Virginiana (often called *R. lucida*), the seashore rose of New England, has been largely planted by the roadsides here and adds much to the beauty of the Arboretum in June. A plant which came here years ago from the island of Mt. Desert on the coast of Maine and now distinguished as var. *lamprophylla* is a handsomer plant than the typical form of *R. virginiana*, of denser habit and with darker green lustrous leaves. The large pink flowers and the showy red hips are similar to those of the common form.

Late Roses. Some of the Roses still to flower are the Japanese *Rosa Wichuriana*, which in this climate blooms best when the long trailing stems are allowed to lay flat on the ground, the Korean *Rosa Jackii*, a plant with semiprostrate stems much like *Rosa multiflora* in general appearance but with larger and later flowers, the Chinese *R. caudata*, a large, strong growing shrub with broad clusters of flowers two inches in diameter, their pink petals marked with white near the base; and the American Prairie Rose (*R. setigera*) which is the last of the American Roses to open its flowers with the exception of the New Mexican *Rosa stellata* which, already in bloom, will continue to open its large rose-colored flowers through the summer. There is also a Rose here brought recently from Sand Point, Idaho, probably *R. pyrifera*, which flowers in June and again in September.

Viburnum Canbyi is now in flower. This is the largest, handsomest and latest of the blue-fruited Viburnums of eastern North America, and has grown to a large size in the Arboretum. Compact, round-topped specimens ten to fifteen feet high and broad can be seen near the Administration Building and by the Meadow and other Roads. This shrub is a native of eastern Pennsylvania and northern Delaware, and has been found in central Indiana. It is often considered a variety of *V. venosum*, now called *V. pubescens*, but it is a much larger plant than that species with larger flower-clusters and fruit. It blooms, too, two or three weeks later. As it grows in the Arboretum this Viburnum is one of the splendid shrubs of eastern North America.

Tripterygium Regelii. Climbing plants with handsome foliage and a conspicuous inflorescence easy to grow and hardy in New England are not too numerous, and Professor Jack's introduction several years ago from Korea of *Tripterygium Regelii* made an important addition to the number. It is in bloom in the Shrub Collection.

ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JUNE 30, 1922

English Elms. There is still apparently much confusion in popular understanding in this country in regard to the trees known here as "English Elms," and it does not seem to be generally understood that there are four distinct species of Elm-trees now growing naturally in England, and that among the trees sometimes cultivated are hybrids of these species which also in the popular mind pass as English Elm-trees.

Ulmus procera. This is the name now adopted for the tree which is generally known as English Elm in Boston where it has proved one of the best foreign trees ever planted in Massachusetts. It has been growing here for more than a century, and nearly one hundred years ago Major Paddock had a nursery at Milton for the propagation and sale of this tree. Probably no tree, native or foreign, which has been planted in the neighborhood of Boston has grown to such a large size. The Paddock Elms, which stood on Tremont Street in front of the Granary Burying Ground, were of this species, as were the great Elms on the Tremont Street Mall of the Common which were killed by the Subway. The Elm-trees on each side of the Shaw Monument opposite the State House are of this species, and there are still large specimens in the suburbs of the city. This is the common Elm-tree of southern England where it grows usually in hedge-rows, although it has been largely planted in parks. It often grows one hundred feet tall with a massive stem covered with dark deeply furrowed bark, spreading or ascending branches which form a comparatively narrow oval head, and slender branchlets thickly covered during their first year with down.

The leaves are broadly oval or ovate, oblique at base, dark green and rough on the upper surface and covered below with soft down; they are from two to three inches long with about twelve pairs of veins, and their stalks are only about one-fifth of an inch in length. This tree very rarely ripens fertile seeds in England or in this country, but it produces suckers in great numbers and is propagated entirely by means of these. As this tree so rarely produces seeds few varieties are known, but a small-leaved Elm (var. *viminalis*) is believed to be a seedling of it. Of this little Elm there are forms on which the leaves are blotched with white and with yellow.

Ulmus foliacea, or **nitens**. This is another English Elm which differs from the last in its paler bark, in its smooth or nearly smooth branchlets, that is without a covering of down and in its leaves which are smooth and shining on the upper surface, only slightly downy below early in the season and from two to three and a half inches long. This tree produces fertile seeds in abundance and seedlings are raised in European nurseries. It is widely distributed over central and southern Europe and grows also in northern Africa and eastern Asia. Several geographical forms are recognized; the most distinct of these are the Cornish and the Guernsey Elms which are trees of medium size with erect growing branches which form a narrow pyramidal head. Plants of these two forms are not always hardy in Massachusetts. Another form, common in Hertfordshire, is a large tree with wide-spreading and pendulous branches and at its best, although not so tall is almost as handsome as our American White Elm (*U. americana*). Another form (var. *umbraculifera*) from Persia and Armenia is interesting from its compact globose head. This tree might perhaps be made useful in formal gardens. On many trees of *Ulmus foliacea* the branches are furnished with corky wings (var. *suberosa*), and the so-called English Elms with such branchlets occasionally seen in this country are usually of this variety. The seedling trees of this Elm which have been imported from European nurseries vary in habit, in the size of their leaves and in their hardiness; and the unhealthy and generally unsatisfactory Elm-trees which have been planted in considerable numbers in eastern Massachusetts during the last twenty years are in nine cases out of ten seedling forms of *U. foliacea*.

Ulmus glabra. This is another widely distributed European Elm which is often called Scotch Elm or Wych Elm by English-speaking people. This is a tree with a trunk and branches which remain smooth for many years. It can always be recognized, too, by the large obtuse buds covered by pale brown hairs and by its dark dull green leaves abruptly pointed or three-lobed at the apex, oblique and unsymmetrical at the base, rough above, downy below, and from four to six inches long with stalks shorter than those of other Elm-trees. This tree does not sucker but produces fertile seeds in great quantities, and more abnormal seedling forms of this tree have been raised than of any other Elm. The well-known Camperdown Elm is a form of this tree with regularly pendulous branches which is often planted in suburban gardens to make natural arbors; another form (var. *pendula*) has horizontally spreading pendulous branches which form an unsymmetrical, flat-topped head.

There is a form with erect branches forming a narrow pyramidal head and others with leaves more coarsely toothed than those of the ordinary form, and with purple and other abnormal leaves. This is perhaps the least beautiful of all the species of Elms. The abundant seeds are blown great distances and germinate so readily that seedlings are often troublesome weeds which if neglected for a few years become difficult to eradicate. For several years the leaves of this tree in the neighborhood of Boston have been turned brown and often killed by a leaf-mining insect which attacks this species but no other Elm-tree.

Ulmus minor, sometimes called *U. sativa*, is a small-leaved Elm-tree of large size which is rather closely related to *U. foliacea*. Although common in the eastern counties of England, it is possible that this tree cannot be seen in the United States outside of the Arboretum.

Ulmus hollandica. This general name has been given to a race of natural hybrids between *U. foliacea* and *U. glabra*, among which are some of the handsomest and most valuable of the European Elms. To the best known in this country of these hybrids the name *Ulmus hollandica vegeta* has been given. This tree was raised in a nursery at Huntingdon about the middle of the eighteenth century and is usually called the Huntingdon Elm. This tree often grows one hundred feet high with a massive trunk and spreading and ascending branches which make a vase-shaped head which readily distinguishes this tree from other Elms. It can be seen to good advantage in Cambridgeshire, England, especially in Cambridge, where there is a noble avenue of the Huntingdon Elm. A tree of this hybrid which grew in the grounds of Magdalen College at Oxford was believed to be the largest tree in Great Britain. In this country this tree grows more rapidly than other Elm-trees, and as it produces suckers it can be easily multiplied. It is not common here, however, although in the neighborhood of Boston specimens not more than sixty years old have already grown to a large size. The var. *belgica* of this hybrid is the Elm which has been most often planted as a street and roadside tree in Belgium and Holland. It is a tall tree with a straight, rough-barked trunk, a broad head of rather erect branches, and dark green leaves slightly roughened above and covered below with soft down. As this tree grows in Holland it is one of the handsomest and most desirable trees for shading city streets. This Elm appears to be little known in the United States; it is growing well in the Arboretum, but it has not been here long enough yet to show if it will be of permanent value in New England. The so-called Dutch Elm, *Ulmus major* of many English dendrologists and a common tree in English parks, is probably another hybrid of the same parentage (*U. hollandica* var. *major*). This is a large tree with a short trunk covered with rough bark, wide-spreading branches furnished with corky wings, and dark green leaves lustrous and nearly smooth on the upper surface and slightly downy below. As this tree produces many suckers it can be easily multiplied.

The Arboretum collection now contains sixty-six different Elms and includes all the known species with the exception of the four Himalayan Elms and the Mexican Elm which are not in cultivation, and two spe-

cies from the southern United States which are not hardy here. With few exceptions the important and interesting varieties and hybrids are represented in the collection. Many of the plants are still too small to produce fruit or to show the habit of mature trees, but as a whole the collection offers a good opportunity for the study of the leaves and branchlets of Elm-trees.

Hydrangea paniculata. Three forms of this Japanese shrub or small tree are in the Arboretum collection. The flowers of the three forms are borne in large terminal oblong pointed clusters and the long acuminate dark green leaves make the plants attractive before the flowers open and after they fade, although like those of other Hydrangeas they fall in the autumn without change of color. The clusters of fertile flowers on what is considered the typical form are surrounded by the ring of white sterile flowers to which Hydrangeas owe the beauty of their inflorescence. This form, which is a handsome and valuable garden plant, will not be in bloom for another month. There is, however, an early-flowering form (var. *praecox*) which is now just opening its flowers, and which is very similar, except in its time of flowering, to the type. This form has, however, rather larger and whiter ray flowers, and is a more ornamental plant. Indeed when in flower in early July it is one of the handsomest shrubs in the Arboretum. This early flowering form appears to be exceedingly rare in American gardens. This unfortunately cannot be said of the third form of *Hydrangea paniculata* (var. *grandiflora*) on which the entire inflorescence is composed of sterile flowers which form a great cone-like white mass of abortives which as they fade turn to a dirty red. This plant has been propagated and sold by American nurserymen during the last fifty years by hundreds of thousands, possibly by millions, so that it is now perhaps more generally cultivated throughout the country than any other garden shrub, and certainly no other shrub has done so much to disfigure the surroundings of the homes of the people of the northern United States. A few years ago the only plant within the fence which surrounds Jefferson's Grove at Monticello was *Hydrangea paniculata grandiflora*. And Thomas Jefferson published in 1784 in his "Notes on the State of Virginia," the first comprehensive list of the plants of his native State, among which are some of the most beautiful trees and shrubs in the world.

Hydrangea radiata. With the exception of *Hydrangea quercifolia* of the southern states, which is not really hardy in New England, *H. radiata* is the handsomest of the four American species and their varieties. It is a broad round-topped shrub of excellent habit, with leaves of ample size dark green above and silvery white below, and broad heads of fertile flowers surrounded by a ring of white neutral flowers. This shrub is a native of mountain slopes in North and South Carolina, and many years ago a favorite garden plant is now rarely cultivated, being replaced by *H. paniculata grandiflora* and the forms with all sterile flowers of the American *H. arborescens* and *H. cinera*.

ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JULY 7, 1922

Rhododendron maximum superbum. A plant under this name came to the Arboretum a few years ago from a Connecticut nursery. It has leaves shaped like those of *R. maximum* but only six inches long and flowers two inches across the expanded corolla; this is deep rose color on the margin of the lobes shading to white toward their base and marked on the upper lobe by many orange colored spots. This plant blooms a few days earlier than *R. maximum*, and beginning to grow usually after the flowers open they are not partly hidden by the young branches of the year as are those of *R. maximum*. It is probably a hybrid of *R. maximum* with one of the hybrids of *R. catawbiense*. The plants raised from this cross by Charles Sander at Holm Lea in Brookline are of the general appearance of *R. maximum superbum*, but they have longer and more lustrous leaves pale on the lower surface, and on some of the plants much larger clusters of handsomer flowers. There is an old plant, evidently the same hybrid, in what was the garden of Mr. Francis Parkman on the western shore of Jamaica Pond and now included in Olmsted Park. This plant has even longer leaves than the Sander plant and rather paler-colored flowers. This and one or two of the Sander plants are as handsome as any Rhododendron with pink or rose-colored flowers which can be grown in this climate. They bloom at the same time as the white-flowered hybrid of the same parentage which was raised many years ago by Anthony Waterer at Knaphill and named by him Wellesleyanum for Mr. Hunnewell's estate at Wellesley. This plant has not always proved entirely hardy in Massachusetts but has now flowered well for several years at Holm Lea. These maximum-catawbiense hybrids seem des-

tined to play an important part in the decoration of parks and gardens in the northeastern United States where few Rhododendrons or other broad-leaved evergreen plants can be grown. They are as hardy as the hardest of the catawbiense hybrids, and flowering two or three weeks later than these prolong the flowering time of hybrid Rhododendrons into July, that is to the time when the conspicuous flowering of trees and shrubs is not abundant.

Schizophragma hydrangeoides, now that it has at last, after forty years of failure, found a place that suits it on the east side of the Administration Building, is growing rapidly and promises to cover as much space as the great plant of the Japanese Climbing Hydrangea which is its neighbor. It is already half way to the top of the building, and its value as a flowering plant in July is now shown by its conspicuous flower-clusters. The Japanese *Schizophragma* now grows as rapidly as the Climbing Hydrangea and clings as firmly to a brick wall. The leaves are smaller, more circular in shape, more coarsely toothed and darker and duller in color. The inflorescence, which is terminal on short lateral branchlets, which stand out from the stems, is interesting but not perhaps as showy as that of the Hydrangea, for instead of the surrounding ring of neutral flowers there are only two neutral flowers to each of the divisions to the large compound cluster of perfect flowers; these neutral flowers are snow white, ovate, often an inch or more long, and hang on long slender stems an inch in length. *Schizophragma hydrangeoides* seems to be a rare plant in American and European gardens, and in this country *Hydrangea petiolaris* is often sold for it. The Chinese species, *S. integrifolia* introduced by Wilson, has not yet found a place in the Arboretum which suits it, and has not proved hardy here. It is a handsomer plant than the Japanese species with much larger sterile flowers.

Decumaria barbara is another climbing plant of the Saxifrage Family which is now flowering in the Arboretum Nursery. It grows naturally by the banks of streams and in swamps from southeastern Virginia to central and western Florida, western Louisiana, and western Tennessee, often climbing up the trunks of trees by its aerial roots to the height of thirty feet. This handsome and interesting plant has dark green and lustrous leaves, small, white, fragrant flowers in large, terminal, compound clusters, and capsular, urn-shaped fruit with a persistent style and stigma. It is rare in gardens, certainly in those of the northeastern United States, but there is an old and well established plant in that of Mr. N. T. Kidder in Milton, Massachusetts, which flowers every year. It is now growing well and promises to become established in the Arboretum. The Chinese species introduced by Wilson is growing well in a cold pit here but has not yet flowered.

Itea virginica, another plant of the Saxifrage Family, was in flower last week in the Shrub Collection. It is a shrub two or three feet high, with simple, alternate, minutely serrate, deciduous leaves and small white flowers in terminal erect racemes. This interesting little plant is widely distributed from New Jersey to Florida and Louisiana, and northward to Missouri and southern Illinois, ascending on the Car-

olina Mountains to altitudes of from two thousand to two thousand five hundred feet. It grows usually in swamps. The beautiful species introduced by Wilson from central China with persistent leaves, *I. ilicifolia*, is not hardy here.

Ceanothus pallidus plenus is the only one of the hybrid Ceanothus tried in the Arboretum which has proved hardy. It has been growing here since 1889 and is an attractive shrub of dwarf compact habit which every year late in June covers itself with clusters of pale pink double flowers. It is believed to be a hybrid of *C. ovatus* and *C. Delilianus* which is a hybrid of *C. americanus* and *C. coeruleus*, a Mexican species often called *azureus*. Hybrid Ceanothus are popular plants in Europe, especially in France and Germany, but are not often seen in this country although south of New England many of them would probably flourish. Ceanothus is an American genus with three species in the eastern United States; it is represented by a few species in the Rocky Mountain region and is most abundant in California where several beautiful plants of this genus occur, and in Mexico. The two species of the northeastern states, *C. americanus* and *C. ovatus* with its variety *pubescens*, and the Colorado *C. Fendleri*, are the only species which are hardy in the Arboretum. The northeastern species are attractive small shrubs with white flowers and are good plants to naturalize on the borders of woods and by the side of roads. *Ceanothus Gloire de Versailles*, a form of *C. coeruleus* with bright blue flowers is one of the popular garden plants in temperate Europe and might well be grown in the gardens of the middle states.

Two Japanese Hollies with deciduous leaves and red fruit, *Ilex serrata* and *I. geniculata*, are in flower on Hickory Path near Centre Street. The berries of the former are smaller than those of our native Black Alder, *I. verticellata*, but they are of a brighter color and remain on the branches although changed in color by severe cold until the leaves of the following year are fully grown, and in the autumn the leafless branches covered with fruit are sold in great quantities in the streets of Tokyo and other Japanese cities. *Ilex geniculata* is a delightful little plant with small bright scarlet fruit gracefully hanging on long slender stems. Little known, it is a plant for any garden.

The ripening of fruits has already begun and the varied and beautiful fruit of many trees and shrubs will make the Arboretum an interesting place to visit for several months, and one of the best places in America to supply birds with food. Although not yet ripe, the bright red "keys" of the Tartarian Maple are now the showiest fruits in the Arboretum. They are the chief ornament of this hardy little tree of southeastern Europe and western Asia (*Acer tataricum*), many years ago much more often seen in American gardens than it is now. The fruit on several Bush Honeysuckles is ripe or nearly ripe. A few of the most conspicuous of these plants now are those of the hybrids of the Tartarian Honeysuckle (*Lonicera tatarica*), called *L. bella*, *L. muendeniensis*, and *L. notha*. There are varieties, too, of *L. tatarica* with red and with yellow fruit which are attractive at this season of the year and the bright yellow flowers of *Lonicera Ruprechtiana* var. *canthocarpa*

make a great show in early July. These and many of the other Bush Honeysuckles which can be seen in the Arboretum, where there is a large collection of these plants, are excellent shrubs for cold countries like the extreme northern states and Canada. They are very hardy and grow rapidly; their flowers are abundant and handsome and no other shrubs have such brilliant fruit in early summer. These plants like rich well drained soil, and the fact can not be too often repeated that the large growing kinds like *L. tatarica* and most of its hybrids, *L. Morrowii* and *L. Maackii*, must have room in which to grow. A plot of ground twenty to twenty-five feet across is needed for one of these plants if it is to show all its beauty. There are a few good specimens of the large growing hybrids by the Bussey Hill Drive opposite the Lilacs where they have had room to grow, but it has been found necessary to move all the large growing Honeysuckles from the Shrub Collection and make a new planting of them on the slope between the Meadow and the Bussey Hill Roads where most of them will have room enough to grow to a large size. This has been necessary because when these plants are crowded together or their branches are trimmed they are ugly objects and give no idea of their real beauty and value. The red fruit covered with hairs of *Rhus canadensis*, often called *R. aromatica*, are also ripe. This is a shrub two or three feet high as it grows in the Arboretum with spreading and ascending branches, clusters of small yellow flowers which cover the naked branches in early spring, and leaves composed of three leaflets. The leaves of only a few plants turn here in the autumn to a more brilliant scarlet color. This *Rhus* has been largely used in the Arboretum for planting in front of taller shrubs along the borders of the roads.

Stewartia pseudo-camellia is beginning to flower this year two or three weeks earlier than usual. The pure white cup-shaped flowers of this small Japanese tree resemble those of a single-flowered *Camellia*. In the autumn the leaves turn dark bronze purple an autumn color not seen on the leaves of any other plant in the Arboretum. The smooth pale gray bark not unlike that of a Hornbeam adds to the interest of this tree. The flowers are, however, smaller than those of the two species of eastern North America, *Stewartia pentagyna* and *S. Malachodendron*, and less beautiful than those of the variety *grandiflora* of the former in which the stamens are not yellow but purple. Two specimens of the Japanese tree have been growing for many years on the upper side of Azalea Path.

Koelreuteria paniculata. This Chinese tree which will be in full bloom in a few days, is when in flower the most conspicuous of all 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 great erect clusters of golden yellow flowers which are followed by large bladder-like pale 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. The *Koelreuteria* often appears in American nursery catalogues under the name of "Japanese Lacquer Tree," although it is not a native of Japan and has not lacquer-producing sap.

ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JULY 14, 1922

Linden Trees. At midsummer the Lindens scent the air with their fragrant flowers from which bees gather their richest harvest. *Tilia*, the name of the Linden, is one of the widely and generally distributed genera of the trees of the northern hemisphere; it is absent, however, from western North America, and no Linden has yet been found in the forests which cover the Himalayas. Eastern North America with fifteen species is richer in Lindens than all the rest of the world, and in eastern 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; 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 Lindens grow by the scanty streams, and under the bluffs of the Edwards Plateau, a region in which Lindens could hardly be expected to flourish.

The ability of the southern species to grow in New England has still to be demonstrated in the Arboretum, and only three northern and one southern Appalachian species are established here. These are *Tilia glabra*, more often called *Tilia americana*, *T. neglecta*, *T. heterophylla* var. *Michauxii*, and *T. monticola*. Of these *Tilia glabra*, which was once abundant in northern woods where it grew to a great size, is the only American species which has been often planted as a shade tree in

New England. Generally, however, it has not proved a good tree beyond the limits of the cool damp woods which are its home, for in less favorable situations the leaves are disfigured by the red spider which often kills them. The other American species are still little known in parks and gardens.

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 or Asiatic species. This is unusual, for of other European trees only the Beech and White Willow grow better here than their American relatives, and except Lindens all eastern Asiatic trees are more at home in eastern North America than the trees of Europe. The five European species, *Tilia platyphyllos*, *T. cordata*, *T. vulgaris*, *T. tomentosa* and *T. petiolaris*, and several varieties of the first, are growing here in a satisfactory manner. The first of these trees is easily distinguished by the hairs which cover the lower surface of the yellow-green leaves and the young branches. This tree is the first of the European species to flower. It has long been cultivated in the eastern states; indeed it appears to be the common European Linden sold by American nurserymen, although as an ornamental tree it is the less desirable of the European Lindens. *Tilia cordata*, distinguished by its small cordate leaves pale and glaucous on the lower surface, is the last of the Lindens to flower. It is a beautiful tree which also in Europe grows to a large size, but is not very often seen in this country. A better tree here than either *T. platyphyllos* or *T. cordata*, *T. vulgaris* is now generally believed to be a natural hybrid of these species. The leaves are dull green on the upper surface, paler on the lower surface, and without hairs with the exception of those in the tufts in the axils of the veins below. This tree, which has been often planted 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, *T. tomentosa* and *T. petiolaris*, are distinct and handsome trees with leaves silvery white on the lower surface, which can be easily and successfully grown in southern New England. *T. tomentosa*, which is common in the forests of Hungary, in this country forms a broad, compact, round-topped head with erect branches and large leaves erect on short stalks. *T. petiolaris* is a more beautiful tree with pendulous branches which form a narrow head and 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 occasionally seen in the neighborhood of Boston, but it is more common southward, especially in Newport, Rhode Island, where there are a number of noble specimens.

It is too soon to speak with authority on the value of the Asiatic species. Only *T. japonica* has been long enough in this country to give any real indication of its value. It is a graceful and handsome little tree which is the first of the Lindens in the Arboretum collection to flower, but as yet shows no indication of growing to the great size

this tree attains in Japan. Some of the most valuable of the Lindens are hybrids. Attention has already been called in this Bulletin to *Tilia vulgaris*. The Crimean *Tilia euchlora* is believed to be a natural hybrid between *T. caucasica* and *T. caudata*. One of the handsomest of the Linden-trees in the Arboretum, *T. spectabilis*, is supposed to be a hybrid of *T. glabra* and *T. petiolaris*. It is a fast growing tree with leaves as large or larger than those of *T. glabra* but silvery white like those of its other parent. A variety of this hybrid called "Moltkei" originated many years ago in a German nursery. It is a tree of denser habit and darker leaves than *T. spectabilis* and grows well in the Arboretum. The Arboretum collection of Lindens has been arranged in the meadow on the right hand side of the Meadow Road. It now contains forty-five species, hybrids and varieties, and offers a good opportunity for the study of these trees, although they are of course too young to show their habit at maturity. Many of them, however, have produced flowers and ripened fruit for several years, and every year information of their permanent value in this region is accumulating.

The Sorrel Tree, *Oxydendrum arboreum*, is already covered with flowers which will open before the end of the month. This tree is a native of the southern Appalachian forests. It has deciduous bright green, shining leaves which have a pleasant acidulous flavor and in the autumn turn bright scarlet, Andromeda-like flowers erect on the branches of spreading or slightly drooping terminal clusters, and pale capsular fruits which in the autumn are conspicuous among the brilliant leaves. In its native forests the Sorrel-tree sometimes grows to a height of sixty feet, but as it grows slowly and begins to flower at the north when only a few feet high it will probably never attain a great size here. It is one of the handsomest, nevertheless, of summer-flowering trees which can be grown in New England. There is a group of these plants among the Laurels at the northern base of Hemlock Hill.

The summer-flowering Buckeye, *Aesculus parviflora*, is already covered with its tall narrow spikes of small, slender, white flowers with long exerted stamens, and is perhaps the most conspicuous of the summer-flowering shrubs, with the exception of Hydrangeas, which are hardy in the Arboretum. It is a native of the southeastern states from South Carolina to Florida and Alabama, and nowhere abundant it appears to be most common in northern Alabama. It has long, however, 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.

Cornus amomum, the Silky Cornel, is the last of the American Dogwoods to bloom and flowers can still be found on many of the plants in the Arboretum where they have been largely used. In cultivation it is not a satisfactory plant unless it can be given sufficient room for its wide-spreading branches to extend freely over the ground. When crowded by other plants the branches become erect and it loses its real beauty and value. To be seen at its best this Cornel should have a clear space with a diameter of not less than twenty feet in which to spread. It is well suited for the front of groups of trees and shrubs,

and there is no better shrub to plant by the margins of ponds and streams where its long branches can hang gracefully over the water. Its purple stems are attractive in winter, and the bright blue fruits which ripen in the autumn add to the value of this native shrub. Its value and beauty as a water-side plant can be seen at two of the small ponds near the end of the Meadow Road.

Cornus paucinervis, introduced by Wilson from China, is the last of the Dogwoods to flower in the Arboretum. It is a shrub now six or seven feet tall with erect stems and short spreading branches, small, narrow pointed leaves with only two or three pairs of prominent veins, small clusters of white flowers and black fruit. This shrub grew and flowered well for several years in the Arboretum but was badly injured by the exceptional cold of the winter of 1917-18; it has partly recovered and the plant in the Chinese collection on the southern slope of Bussey Hill is now covered with flowers. A native of low level lands in central China where the Orange flourishes and rarely ascending to altitudes of three thousand feet, it is not surprising that the New England climate is too severe for it. Further south *Cornus paucinervis* should be a valuable summer-flowering shrub.

Calluna. There is a good collection of the varieties of the Scotch Heather (*Calluna vulgaris*) in the Arboretum and the bright crimson flowers of the first of them to bloom here (var. *rubra*) are already open. The flowers of some of the white-flowered varieties are beginning to open and for several weeks now the different Heathers will be an interesting feature of the Shrub Collection. It does not appear to be very generally known in this country that the European Calluna is hardy in northeastern North America, where it has become naturalized near the northern border of Massachusetts and in Nova Scotia. On one Massachusetts estate where it was planted only a few years ago it has spread over several acres, and in late July or early August makes a great show. Calluna should be planted in not too rich, thoroughly drained soil and in full exposure to the sun. The ends of branches are sometimes killed in winter but this does not do the plants permanent harm; and the advantage of the severe pruning of the old wood the plants receive in early spring before they begin to grow is seen in the compact habit and abundant bloom of the plants in the Arboretum collection. Unless they are so pruned the plants become thin and bare of leaves, and are often short-lived.

Philadelphus argyocalyx. This handsome plant has flowered this year for the first time in the Arboretum where it is established in the Shrub Collection. A native of the southwest, the Arboretum plants were gathered in 1916 by Mr. Alfred Rehder on the Sacramento Mountains, New Mexico, at altitudes of eight thousand five hundred feet. It is a small shrub with small elliptic leaves. The flowers are solitary, an inch across, and the calyx, like the lower surface of the leaves, is covered with a thick mat of snow white hairs. It flowers late, at the same time or only a little earlier than the hybrid *Philadelphus insignis* which blooms later than any other *Philadelphus* in the Arboretum collection.

These Bulletins will now be discontinued until the Autumn.

ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

OCTOBER 23, 1922

Memorial Trees. The use of trees as memorials for soldiers who lost their lives in the Great War is now popular in this country, judging by the number of letters which come to the Arboretum on the subject. The planting, too, of trees to commemorate the visit of an Association or of a distinguished individual to a spot of historical interest has long been practiced in the United States and has often interfered, with disfiguring results, with well considered planting plans. Even the plans of George Washington, a master planter of trees, have suffered by the zeal of his admirers who have too often in efforts for self-aggrandizement sacrificed the simple beauty of Mount Vernon by insisting on planting among Washington's native trees Japanese Maples, European Oaks, Chinese Mulberries and other trees which fortunately have usually proved short-lived in the valley of the Potomac.

Clearly the essential thing in a memorial tree is its ability to live long. The tree selected therefore should be the native tree which grows to the greatest age in the particular locality and in the kind of soil in which it is proposed to establish the memorial. A native tree should be used for the trees native to any locality have become, through thousands of years of cross-breeding and natural selection, better able to live long and flourish in that locality than any foreign tree or any tree brought from a distant part of this country. All sorts of trees are being used as soldiers' memorials. In a western city a long memorial avenue of Japanese Cherry-trees has been planted. The kind selected is a handsome tree, but its seeds first reached the United States in 1892. Japanese trees are well known to be short-lived in this country, and who can foresee the future of this tree in

North America? In another city an avenue of the Chinese Pagoda-tree (*Sophora*) is suggested as a memorial. This is a handsome tree interesting in the fact that its abundant pea-like white flowers do not open until midsummer. In some of the open places in Peking are specimens of this tree which from a distance look like great Oak-trees. They may be two or three hundred years old. In this country this tree has probably not been growing for more than seventy or eighty years and its growth here has not been rapid. There seems to be no good reason why the Chinese *Sophora* should be used as a memorial for an American soldier. But the most unfortunate selection for a soldier's memorial is that made by a patriotic Connecticut community which has planted a group of Colorado Blue Spruces for this purpose. This Spruce by its unusual color probably has taken the popular fancy; it is easily raised; it grows rapidly, and is hardy even in the extreme north. More of these Blue Spruces are sold every year in the northeastern states perhaps than of all other conifers combined. Millions of dollars have been expended on it, and in fifty years from now it is pretty safe to predict that not one per cent. of the trees planted this year will be alive. The Blue Spruce was discovered in 1862, and it was first raised in that year in the Harvard Botanic Garden by Dr. Asa Gray. In Colorado, where it grows near the banks of streams in colonies of scattered plants it loses many of its branches and becomes unsightly by the time it is fifty years old. In cultivation it gradually loses branches long before it has reached that age, and it usually becomes unsightly and only fit for the brush pile.

There are objections to using even the longest lived trees as memorials. Even Elms and White Oaks in New England, Laurel Oaks in Florida and Live Oaks in South Carolina and Louisiana, Black Walnuts in Illinois and Burr Oaks in Wisconsin may suffer from bad treatment. Unexpected calamities are liable to happen to trees; they are often injured by fire or killed by lightning, and neglect is often the fate of trees in this country. Twenty years ago no nobler tree for a Pennsylvania memorial could have been found than the Chestnut and now every Chestnut-tree in the state has been killed by a disease for which no remedy can be found. In the northern part of the eastern states there is not a more appropriate tree than the White Pine to mark the grave of a soldier, but the White Pine is menaced by a deadly disease and no one should now plant it for any purpose with the expectation that it will live through its natural life of one or two centuries.

Trees as memorials appeal to the imagination of many persons. Theoretically they have much to recommend them for this purpose. There are few men who would not be happy in thinking that their memory was to be kept green by one of the great New England Elm-trees, or by such a Live Oak as grows in Audubon Park, New Orleans, but in recent years the best Elm-tree in Massachusetts was first mutilated and then destroyed by storms long before it reached maturity, and the large New Orleans Live Oaks may at any time succumb to one of the West Indian hurricanes which every year destroy buildings and trees on the Gulf Coast.

There are at least, however, two splendid memorials made by trees. The best known of them are rows of *Cryptomerias* which shade the road which leads to the Temples in Nikko, Japan. These trees

were planted between 1631 and 1651 and extend for a distance of twenty-four miles along the road. A few of the trees have been killed by fire but by the latest reports 18,308 trees are still standing and in good health. The story of their planting is interesting. When the Temple at Nikko, which is the burial place of Ieyasu, the founder of the Tokugawa Dynasty, was built, his successor in the Shogunate called upon the Daimyos of the Empire to send each a stone or a bronze lantern to decorate the ground about the mortuary Temple. All complied with the order but one man, Matsudaira Masatsuma, who, too poor to send a lantern, offered instead to plant trees by the roadside that visitors to the Temple might be shaded from the heat of the sun. He did his work so well that these trees promise to live for centuries longer, and this memorial to Ieyasu is one of the important sights of Japan. The second of the great tree memorials is in California where a block of Redwood-forest on Eel River has recently been dedicated to the memory of Colonel Royal Cawthorn Bolling of the American Aviator Service who was killed in France on March 26, 1918. If trees are selected as a memorial there can be nothing more splendid and more enduring than a part of the Redwood-forest, the most beautiful of all the forests of the world. The Redwood is the tallest of all trees and one of the largest in girth of stem. It grows in a region of humid atmosphere where forest fires rarely occur, and if the trees are cut, or killed by lightning they reproduce themselves by shoots which grow from the stump. The man who has secured this Redwood memorial for his friend has done patriotic service, too, for his country. For the Redwood-forest, which occupies only a narrow strip of territory along the coast of northern California contains the greatest stand of valuable timber per acre in the world, and in the hands of lumber-men must soon disappear if the movement now on foot to preserve at least parts of it is not successful. If memorials are to be erected for soldiers and other men in the form of trees the Redwood-forest offers the best opportunity in beauty and permanency which can be found anywhere in the world.

Fruits. The fruit of many shrubs and of several trees has been unusually abundant this year. That of many Crabapples, Cotoneasters and Hawthorns has been exceptionally fine. In the early autumn that of *Cornus obliqua* and *Evonymus planipes* were especially noticeable. This *Cornus* which has generally been confused with *C. Amomum*, the Silky Cornel, was first distinguished many years ago by Rafinesque and later was named in Germany *Cornus Purpusii*. *C. obliqua* and *C. Amomum* both grow in Massachusetts, but the latter is an Appalachian species while *C. obliqua* is most abundant in the Mississippi valley. *C. obliqua* is a more upright shrub, very distinct in its narrower leaves silvery white on their lower surface and rather larger sometimes paler blue fruit which ripens at least a month earlier than that of *C. Amomum*. In the Arboretum this year *C. obliqua* has been the handsomest of the Cornels in late summer and early autumn. *Evonymus planipes* is a native of northern Japan where it grows into a large shrub. It has not been many years in the Arboretum and its fruit becomes more abundant every year. It has the large broad leaves of the European *E. latifolia*, the inconspicuous flowers of the genus, and

crimson lustrous fruit which hangs gracefully on long slender stalks, and is larger and more beautiful than that of any other Burning Bush in the collection. Still rare and little known in gardens, it is an ornamental shrub of the first class in this climate.

Cotoneasters. The fruit of some of the species, like that of *C. racemosa soongarica*, was ripe in August. This is one of the handsomest of the new Chinese species when the long gracefully arching branches are covered with its erect clusters of white flowers, and when these are followed by the abundant showy orange-red fruit. All the forms of *C. horizontalis* are still covered with their small lustrous leaves and small bright red fruit. Of this group the var. *purpusilla* is proving the best garden plant here. Other red-flowered species which are now at their best are *C. adpressa* and *C. apiculata*, low growing species with spreading stems. Handsome, too, now are the large growing *C. davurica*, *C. Dielsiana*, and *C. Franchettii*, for they are also covered with green leaves and red fruit. *C. nitens*, a species with red flowers and small black fruit, is also a handsome autumn plant for none of the Chinese Cotoneasters have more lustrous leaves and more gracefully spreading and drooping branches.

Lonicera Maaekii var. **podocarpa.** Of the plants in the Arboretum conspicuous at this time for the beauty of their fruit none perhaps is more beautiful than this Honeysuckle which was introduced by Wilson from central China. It is a large, vigorous and hardy shrub with wide-spreading branches and open habit. The flowers are larger than those of most Honeysuckles and are white, and in one form white slightly tinged with rose color. The period of the greatest beauty of this plant, however, is late October, for now it is still covered with bright green leaves and the large scarlet, lustrous fruits are only just ripe. The best specimens of this Honeysuckle in the Arboretum can be seen in the collection of Chinese shrubs on the southern slope of Bussey Hill.

Some American Plum-trees. For the beauty of their fruit some of the Plum-trees from the region which extends from southern Illinois to Oklahoma and northern Texas are among the most important additions which in recent years have been made to gardens. The bright scarlet fruit of some of the species ripens in October when the leaves are still fresh, green and lustrous: and in October there is not a Crab-apple or a Hawthorn which equals them in beauty. Many of the Plum-trees are growing in the Arboretum which is responsible for their introduction into northern gardens, but to see them in their beauty it is necessary to visit the parks of Rochester, New York, for in the Arboretum it is now necessary to pick the fruit before it ripens, that the plants may not be broken down by boys who appear to be less lawless in Rochester than they are in Boston. The best of these plants for autumn decoration are *Prunus hortulana*, the handsomest and one of the largest of all Plum-trees (the largest Arboretum specimen was entirely ruined by boys a few years ago); *P. Reverchonii*, which grows on the prairies of northern Texas as a low shrub but in cultivation becomes a small tree, and some of the large Oklahoma forms of *P. angustifolia*. Lovers of plants will be repaid by an autumn journey to Rochester to see the Plum-collections.

ARNOLD ARBORETUM
HARVARD UNIVERSITYBULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

OCTOBER 31, 1922

Conifers. The value of institutions like the Arboretum appears in the fact that several cone-bearing plants which were first cultivated in this country at this Arboretum are now generally recognized as the best plants in their different classes which can be grown in the north-eastern United States. The most important of the conifers introduced by the Arboretum are *Tsuga caroliniana*, *Picea Engelmannii*, *Picea Omorika*, *Picea Glehnii*, the Colorado form of *Abies concolor*, the interior form of *Thuja plicata*, *Juniperus chinensis* var. *Sargentii* and *Picea glauca* var. *albertiana conica*.

Tsuga caroliniana, the Carolina Hemlock, as it grows in the Arboretum is generally considered the most graceful and beautiful cone-bearing tree in the 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 usually at elevations between two thousand five hundred and three thousand feet. It escaped the attention of the numerous botanists who explored the southern Appalachian Mountains during the last half of the eighteenth and the first half of the nineteenth century, and its distinct character was first noticed in 1850 by Dr. L. B. Gibbes of Charleston, S. C., although it was not until thirty-one years later that it was described by Dr. Engelman. This Hemlock was first raised at the Arboretum in 1880 and the tallest tree here is now nearly forty feet high. On the Blue Ridge the Carolina Hemlock is usually not more than forty or fifty feet high, although occasionally trees up to seventy feet in height occur, and the trunk

has rarely a greater diameter than two feet. It is a much smaller tree therefore than the northern Hemlock. The branches are more pendulous and the leaves are darker green and more lustrous than those of this tree. The leaves, too, are usually notched at the apex and slightly toothed, while those of the northern tree are usually rounded at the apex and are not toothed. The two trees are, however, best distinguished by their cones; those of the southern tree are not stalked and their scales are much longer than broad with obtusely pointed bracts; and those of the northern trees are stalked and the scales are about as long as wide with bracts broad and truncate at the apex. Many persons see and admire the Carolina Hemlock in the Arboretum every year, but it is still rare in cultivation, and probably ten thousand Colorado Blue Spruces (*Picea pungens*) are planted in this country every year for one Carolina Hemlock. It is not found in many American nurseries, and the price at which it is offered is excessive.

Picea Engelmannii, which is the common and most widely distributed Spruce of the Rocky Mountains, was discovered in Colorado in 1862 by D. C. C. Parry. Seeds are said to have been sent by him in that year to the Harvard Botanic Garden, but there is no record that plants were raised there; and it is believed that this tree was first cultivated in 1879 when seeds were planted in this Arboretum. The Engelmann Spruce grows to its largest size on the mountains of Colorado where trees one hundred and fifty feet high with trunks up to five feet in diameter have been seen; further north and south the trees are smaller. As it grew in great forests which fifty years ago covered the slopes of the Colorado mountains up to altitudes of ten thousand feet it was with its light cinnamon red bark and narrow pyramidal crown of soft light gray-green leaves one of the handsomest, perhaps the handsomest of all Spruce-trees. The Engelmann Spruce has grown well in the Arboretum, and the tallest trees here are nearly forty feet high. For many years the stems were clothed with branches to the ground, but four or five years ago the lower branches began to die and the trunks of the largest trees are now naked for a distance of seven or eight feet from the ground. The narrow crowns are still perfectly healthy and the trees are growing rapidly. Engelmann's Spruce is a good ornamental tree to plant in New England, and its hardiness, the rapidity of its growth, and the value of the timber it produces may make it a valuable tree for forest planting in the northeastern states. In western Europe, where Engelmann's Spruce suffers from spring frosts, it is little known, which is perhaps the reason that it has been so little planted in the eastern states for Americans have been often too much governed in the selection of trees by what is known of them in England. From all points of view *Picea Engelmannii* is now the best Spruce which has been planted in the Arboretum.

Picea Omorika, the Servian Spruce which was not distinguished until 1875, was first raised at the Arboretum in 1880 from seeds presented to it by the late Dr. Bolle of Berlin. The Arboretum trees are now from thirty to forty feet high, with trunks clothed to the ground with short branches which form a narrow pyramid clothed with leaves dark green and lustrous on the ventral surface and pale on the other. This Spruce has proved perfectly hardy here and is one of the handsomest

conifers in the whole collection in which there are fortunately several individuals. The only objection to this tree is that it often loses its leader by the attacks of the borer which so often destroys that of the native White Pine. In southeastern Europe, where the Servian Spruce is widely distributed and forms great forests, it is an important timber tree, growing up to a height of one hundred and thirty feet, with a girth of trunk of not more than four feet.

Picea Glehnii is a native of northern Japan and Saghalin where it was discovered by a Russian botanist in 1861. Seeds of this tree are said to have reached Europe in 1871; those of the Japanese tree were planted in the Arboretum in 1892. It is of course too soon to speak with much authority about the value of this tree in eastern America. The Arboretum trees have grown rapidly, are perfectly hardy, and are certainly the most satisfactory here of the Japanese Spruces. Judging by the latitude of its native home, this Spruce should prove hardy far north in eastern America.

Abies concolor, the Rocky Mountain form of the White Fir of western America, was first raised in the Arboretum in 1874 from seeds collected by Dr. Engelmann on the Spanish Peaks of southern Colorado. It is said that a few seeds of this tree reached Europe from New Mexico two years earlier, but the statement needs confirmation. There are good specimens in the Arboretum raised from Dr. Engelmann's seeds nearly sixty feet high and with trunks still clothed with branches to the ground, and this Colorado tree must with our present knowledge be considered the best Fir-tree which can be grown in the northeastern states. Its only rival here is the Japanese *Abies homolepis* which was introduced into the United States in the early sixties through the Parsons Nursery, but has only recently been appreciated and is still rare in American collections. *Abies concolor* is now one of the most generally planted conifers in the eastern states.

Thuja plicata, the Red Cedar of the northwest, is one of the great trees of the world, often growing in western Oregon and Washington to a height of two hundred feet with a trunk fifteen feet in diameter. Plants raised from seeds gathered in the coast region have never proved hardy in the eastern states, but fortunately this tree — of less gigantic size — ranges eastward to the eastern slope of the continental divide in Montana, and in 1880 seeds collected near Fort Coeur d'Alene in Idaho by Dr. Sereno Watson were planted at the Arboretum. The plants raised from these seeds have grown rapidly and have proved perfectly hardy, and are now the handsomest trees of their class in the collection. Like other Arbor Vitae this tree is easily propagated by cuttings and a few American nurserymen are beginning to appreciate its beauty and value. One of the valuable timber trees of North America, this tree now promises to play its part in the decoration of eastern parks and gardens.

Juniperus chinensis var. **Sargentii** is generally considered the handsomest of the numerous Junipers with prostrate stems which are now known in gardens. It was first raised at the Arboretum in 1893 from

seeds collected the previous year by Professor Sargent in Japan. The original plants here are now dense mats of bright green foliage ten feet across and only a few inches high.

***Picea glauca* var. *albertiana conica*.** The original plant of this little Spruce was found in 1904 near Banff in Alberta by Professor Jack and the largest plants now in cultivation are only about three feet tall. No other dwarf Spruce is so pyramidal in habit and so dense in foliage, and Professor Jack's introduction proves to be one of the most interesting and distinct of all the dwarf conifers. Much attention has been paid to it in England during the last two or three years and it is now found in a few American nurseries.

***Callicarpa japonica*.** The so-called French Mulberry, *Callicarpa americana*, in late autumn and early winter when it is covered with its violet colored fruit is one of the handsomest shrubs of the southern states where it is common and attracts the attention and curiosity of northern travelers. The French Mulberry unfortunately is not hardy in New England, but it can be well replaced here by a Japanese and Korean member of the genus, *Callicarpa japonica*. This shrub was first cultivated in the Parsons' Nursery at Flushing, Long Island, sixty years ago. It soon disappeared from American gardens but was raised at the Arboretum in 1887 and has now been well established here for many years. It is a smaller shrub than the American species with smaller leaves and smaller, rather lighter-colored, lustrous violet fruit. The Korean form of this plant, which has been growing in the Arboretum since 1904, is a more vigorous plant with rather larger fruit. This autumn the fruit has been unusually abundant and the Korean *Callicarpa* has been one of the most beautiful objects in the Arboretum. The attention of lovers of hardy shrubs is again called to the beauty and value of this plant. Other Asiatic species in the collection are the Japanese and Korean *Callicarpa dichotoma* and the west China *C. Giraldii*. The latter is not very hardy and has not produced fruit here yet, and *C. dichotoma*, which is hardy, ripens its fruit very late and as an ornamental plant is inferior to *C. japonica*. These *Callicarpas* are arranged in a group on the upper side of Azalea Path close to its entrance from the Bussey Hill Road.

***Ilex serrata*.** The two so-called Black Alders of the United States, *Ilex verticillata* and *Ilex laevigata*, have not before in the Arboretum been more thickly covered with their bright red fruit which remains on the branches long after the leaves have fallen and makes them conspicuous objects during the last two months of the year. Although smaller than that of the American species, the fruit of the Japanese *Ilex serrata* is more lustrous and even more beautiful. This is a narrow and more slender shrub than the American Black Alders which in Japan is common and widely distributed, and grows to the height of twelve or fifteen feet. It is hardy in the Arboretum where it has been growing for many years by Hickory Path near Centre Street, and where the plants are now covered with fruit which will remain on the branches until the leaves unfold in the spring.

These Bulletins will now be discontinued until next spring.

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