ARNOLD ARBORETUM
HARVARD UNIVERSITY

BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

APRIL 18, 1912
It might have been expected that the last year with its exceptionally dry summer and remarkably cold winter would have damaged many plants in the Arboretum, but on the whole the collections are in unusually good condition and as yet show little effect of the severe climatic changes of the winter. The conifers are all uninjured with the exception of one or two small plants of the Hemlock of the northwest coast, *Tsuga heterophylla*, planted near the top of Hemlock Hill. This is a tree of very doubtful hardiness here and it is satisfactory that the second specimen is untouched. The broad-leaved evergreens are in unusually good condition for this season of the year when they too often look brown and shabby. A few small Rhododendrons on trial for their hardiness have suffered, but generally the Rhododendrons are in good condition and promise abundant bloom. The Laurels (*Kalmia latifolia*), are uninjured by heat, drought or cold and give promise of such masses of flowers as have not before been seen on these plants in the Arboretum.

The influence of the weather on the plants raised from seeds collected in western China has been watched with interest as a number of them were planted last year in exposed positions that their hardiness here might be tested. The winter has shown that a large number of Chinese trees and shrubs new to our plantations can probably be successfully cultivated in Massachusetts, and of course in all the regions south of Massachusetts. The following are some of the most important of these trees: *Davidia involucrata* should perhaps be mentioned first. It is a medium sized tree related to our Flowering Dogwood, but with one large floral bract in place of the four smaller bracts of the American tree. *Davidia* is described as one of the most beautiful of all the flowering trees of temperate regions and its introduction a few years ago into cultivation through French missionaries was a matter of great horticultural interest. It has lived for several years in the Arboretum and has flowered twice in Europe. Of especial interest is *Cladrastis sinensis*, introduced by Wilson, as it adds another to the list of genera represented in the eastern United States and China. The American Cladrastis, better known as *Virgilia*, is one of the rarest and most beautiful of the trees of the United States. Unfortunately the Chinese species promises to be of less value as an ornamental tree. The flowers, which are sometimes faintly tinged with pink, are smaller than those of its American relative and are borne in erect not drooping clusters. The leaflets are smaller and the bark is of a darker color. The two new Catalpas from western China, *C. Fargessii* and *C. Duclouxii*, are both uninjured. In *Phellodendron chinense* there is an important addition to the eastern Asiatic genus *Phellodendron*, represented before in the Arboretum by three species. It is good news that *Staphylea holocarpa* has come through the winter in good condition. This is a tree twenty to twenty-five feet tall, producing in May before the leaves appear pendulous racemes of fragrant flowers varying in color from white to rosy lilac. Mr. Wilson speaks of it as the handsomest of
its genus, and one of the most beautiful of the small flowering trees of western China. The different forms of the so-called European Walnut (*Juglans regia*), introduced by Wilson, and the distinct *J. cathayensis*, a tree with splendid foliage and nuts resembling those of the American Butternut, are uninjured by the cold. *Populus lasiocarpa*, which has lived in the Arboretum uninjured during the past two years, adds a very remarkable and handsome species to the large group of these trees which can be cultivated here. A still more beautiful species brought back by Wilson on his last journey and still unnamed has passed the winter without injury. Even the Liquidambar of central China, *L. formosana*, is uninjured and may prove hardier here than the native species which suffers in eastern Massachusetts except in favorable positions.

The greatest of all the Hazels, *Corylus chinensis*, judging by the plants at this time, gives promise of becoming an important addition to the ornamental trees which can be cultivated here. With an average height of from sixty to eighty feet and a girth of trunk of from eight to ten feet, in favorable situations on the mountains of Hupeh it attains a height of more than a hundred feet with a trunk five feet in diameter. There is much interest in the various forms of Cherry raised from seeds sent home by Mr. Wilson, who found an unexpectedly large number of species in several of the groups of the genus *Prunus* to which the Cherries belong. They are nearly all quite new to science and of course have not been found before in gardens. Thirty of these new species or varieties have passed through the winter uninjured, and only two species, which will probably not live here, have suffered. Among these species are a number of great beauty and this group perhaps is the most interesting of the deciduous-leaved trees obtained by Mr. Wilson during his first journey. The Hemlock of western China, *Tsuga yunnanensis*, has now lived for two years in the Arboretum. This is one of the largest and most widely distributed of the conifers of China. The fact that it grows with the Spruces and Firs which cover the mountains of the Tibetan frontier indicates that these trees may also be hardy in this climate. The introduction of these conifers was the object of Mr. Wilson's last journey to China, and they are now growing in the Arboretum and in many public and private collections.

It can be said that generally the new Chinese species of Oak, Beech, Birch, Willow, Poplar, Pear, Maple and Ash, besides some of the less well-known genera like *Idesia*, *Euptelea*, *Poliothyrsus* and *Eucommia*, judging by the experience of the past year, are likely to succeed here and it is probably reasonable to hope that not less than seventy-five new species of trees will be added to our plantations by Mr. Wilson's first journey to China. In another issue something will be said of the condition of some of the new Chinese shrubs.

There are already many flowers to be seen in the Arboretum. The Elms, and the Red Maple, the Poplars and some of the Hazels are in flower. The flowers of the Silver Maple are already falling. Many of the Alders are now covered with their delicate flowers. One of the most interesting of these is the Japanese *Alnus tinctoria*. This is a medium sized shapely tree with smooth pale bark and large dark green leaves. Two specimens can be seen on the right-hand side of the Meadow Road close to the walk and in front of the Linden Group. They were raised
from seeds brought from Japan by Professor Sargent in 1892 and have
grown more rapidly and to a larger size than any of the plants of that
collection. This is a good time, too, to examine the Willows as many of
the shrubby species are in flower on the walk which starts from a path
opposite the Administration Building and follows along the eastern
boundary of the North Meadow.

The first plant to bloom in the Shrub Collection is *Daphne Mezereum*
where the white flowered form has been flowering for more than a week.
This small shrub, of which there are several forms in cultivation, is a
native of the mountains of Europe and Western Asia. It is valuable for
its very early fragrant flowers, appearing with or before the leaves, and
for its showy scarlet fruits.

On the right-hand side of the Bussey Hill Road, opposite the end of the
Lilac Group, are large masses of two native shrubs. The first, the Spice
Bush (*Benzoin aestivale*), is a common inhabitant of northern swamp
borders. It is a tall shrub with slender branches on which the small
yellow flowers are now opening. The male and female flowers are found
on different individuals, so that only some of the plants bear the small,
bright scarlet, shining fruits which are so attractive in the autumn.
The leaves, which are fragrant like those of its relative the Sassafras,
are uninjured by insects and turn bright yellow before falling. This is
one of the common shrubs which should be better known by gardeners.
Just above the Spice Bushes is a group of the Leatherwood (*Dirca Palus-
tris*), which in the perfection of its specimens is one of the most success-
ful groups in the Arboretum. The Leatherwood is valuable for its small
but very early and abundant yellow flowers which appear before the
leaves and will soon be fully open. It owes its common name to the
toughness of the bark of the branches. The geographical distribution of
the genus is unusual, as of its two species one is widely distributed in the
eastern United States and the other is found only in California.

An illustrated guide to the Arboretum containing a map showing the
position of the different groups of plants has recently been published. It
will be found useful to persons unfamiliar with the position of the differ-
ent groups of plants. Copies of this guide can be obtained at the Admin-
istration Building in the Arboretum, from the Secretary of the Massa-
chusetts Horticultural Society, 300 Massachusetts Avenue, Boston, from
The Houghton, Mifflin Company, 4 Park Street, Boston, and at the Old
Corner Bookstore, Bromfield Street, Boston.

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given these Bulletins.
In the last issue of these bulletins something was said of the effects of the winter on a few of the new Chinese trees in the Arboretum. The number of new Chinese shrubs which promise to be hardy in this climate is naturally much larger than the number of trees. We can speak, however, only of a few of these now. Of Lilacs Wilson found eleven species in China. Nearly all of these were discovered by him and most of them are now growing in the Arboretum where three species have been sufficiently tested to show that they will be hardy here. These are Syringa pinnatifolia, S. Komarovii and S. Wilsonii. The flowers and flower-clusters of the first are small and not conspicuous, but the deeply divided leaves are unusual among Lilacs and form the chief interest in this plant. The others are large shrubs related to S. villosa with handsome foliage and flowers. More interesting, although not yet fully tested for hardiness, are S. reflexa, with long pendulous flower-clusters, thus differing from all the other known Lilacs, and S. Sargentiana with long acuminate leaves and shorter nodding not pendulous flower-clusters.

The genus Cotoneaster, which is valued chiefly for its black or red, often long-persistent fruits, has been poorly represented in our gardens as few of the species previously known have proved hardy here. Wilson, however, found an unexpectedly large number of new species of Cotoneaster in western China and at least a dozen of these have passed through the winter without injury and promise to become valuable garden plants here. Among these may be mentioned C. Dielsiana, with weeping whip-like branches and small red fruits persistent late into the winter, C. divaricata with dark red fruits, C. foveolata with large leaves which turn in the autumn to brilliant shades of orange and crimson and black fruit, C. moupinensis also with black fruit, a plant remarkable in the brilliant colors the leaves assume here in the autumn, and C. hupehensis, a strong-growing, shrubby black-fruited species with graceful spreading branches, ornamental white flowers and crimson globose fruit.

Among the new Spiraeas introduced by Wilson are three species which are now known to be perfectly hardy and to be among the most ornamental of all the numerous species and hybrids of this genus. These are S. Henryi, S. Wilsonii, and S. Veitchii.

The Chinese Witch Hazel, Hamamelis mollis, a common shrub of the central provinces, has now lived unhurt in the Arboretum for two years. It is one of the late winter or early spring-flowering species and its flowers are said to be more beautiful than those of the other Witch Hazels. Several of the Chinese Hydrangeas are uninjured by the winter. Among these may be mentioned H. xanthourea and its several varieties, all handsome shrubs with large corymbs of flowers. In Exochorda Giraldii New England gardens have a new and perfectly hardy plant of first-rate importance. It grows to a height of twelve feet or more and produces larger and handsomer flowers than the well-known Pearl Bush of gardens, Exochorda grandiflora.

Of the beautiful genus Abelia we have before been able to cultivate only the hybrid A. grandiflora, so it is particularly gratifying that the large-flowered, strong-growing A. Engleriana proves to be hardy here. It is of interest, too, that the new monotypic genus Kolkwitzia flourishes here. It is a shrub from four to six feet high with large terminal pan-
icles of flowers followed by crimson hairy fruits, and is related to Abelia and Lonicera. Another beautiful plant of this family, *Dipelta floribunda*, of a genus new to cultivation, with large and showy Weigelia-like flowers, can also be numbered among the hardy Chinese plants.

Of Wilson's numerous Honeysuckles which are flourishing in the Arboretum we can only mention now *Lonicera prostrata*, which promises to be a useful plant for covering rocky slopes and banks. It is very hardy and free-growing, with prostrate stems, small oval bluish-green leaves, small white flowers turning yellow when fading, and orange-red fruits; *L. Henryi*, a vigorous climbing plant which has preserved its large dark green leaves through the winter, and *L. tragophylla*, which in habit and general appearance resembles the Woodbine of Europe although the flowers are golden yellow. An important addition to very early-flowering shrubs is *Corylopsis Veitchiana*, with short pendulous racemes of primrose-yellow fragrant flowers produced before the leaves unfold. A majority of the large collection of Chinese Brambles are uninjured, especially those showy species with nearly white stems, like *Rubus lasiostylus* and *R. coreanus*.

Of the Grape Family at least six new species have come through the winter without injury. Of these perhaps the most interesting is *Ampelopsis megalophylla* with canes from twenty to thirty feet long and large divided leaves often more than three feet in diameter. The Barberries have probably suffered more from the winter than any of the other deciduous-leaved shrubs planted in exposed situations, but many species and varieties of Roses, Deutzia, Philadelphus, Viburnum and Ligustrum are in excellent condition and promise to make important additions to these groups in northern gardens.

Near the Administration Building the Asiatic Magnolias, which flower before the appearance of the leaves, are beginning to open their flowers; indeed the fragrant flowers of the shrubby *Magnolia stellata* and its pink-flowered form have been in bloom for a week. This is a perfectly hardy, usually free-flowering and very desirable shrub. The small flowers of *Magnolia kobus* from central Japan and its larger-flowered northern variety (var. borealis) are open. This northern variety is a large, hardy, fast-growing tree of good habit and handsome foliage, but it has never flowered freely here and the petals hang down in an unattractive way soon after the flowers open. It is a much less valuable ornamental plant than the Chinese *M. conspicua*, often called the Yulan Magnolia, which is one of the most beautiful of all early-flowering trees, although unfortunately the flowers are frequently touched by late frost or injured by storms. That the flowers may be seen to the greatest advantage the tree should be planted in front of evergreens which would also protect the flowers from frost. The hybrids, which have been mostly raised in France by crossing *M. conspicua* with the shrubby, purple-flowered *M. denudata* (or *purpurea*), flower rather later than the species and are therefore less liable to suffer from frost. These hybrids have flowers more or less tinged or striped with purple or rose color and the best known are *M. Soulangeana*, *M. Alexandrina*, *M. Lennei*, *M. Norbertiana* and *M. speciosa*.

The Forsythias are fast opening their flowers. This genus has given to gardens some of the most beautiful and most generally satisfactory of all hardy shrubs. The species are all Chinese with the exception of *F. europea* which was discovered in Albania a few years ago. As we are learning every year, hybrids are often more desirable garden plants.
than the species from which they originate, and certainly the handsom-
est of the Forsythias in flower is a hybrid between *F. suspensa*, var. *Fortunei* and *F. viridissima*, called *F. intermedia*. Of this hybrid there
are a number of forms differing in habit and in the color of the flowers,
showing opportunity for still further variation and improvement. Of the
species and varieties var. *Fortunei* is now the most generally used and
the most vigorous and desirable garden plant, although *F. suspensa*, with
its long slender drooping branches is best suited for draping high walls
or steep banks. The European species is of much less value as a garden
plant, and *F. viridissima* the first species cultivated in Europe and Amer-
ica and the latest of all to flower, is of comparatively little ornamental
value.

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

The earliest of the Peaches, *Prunus (Persica) Davidiana*, is in flower,
although the plants in the Arboretum are blooming sparingly this year.
This is a native of the mountains of northern China, and some writers
have considered it the wild type of the cultivated Peach. There are
pink and white-flowered varieties. This tree flowers, however, so early
that the flowers are too often destroyed by frost and therefore it is not
of great importance as a garden plant here.

The earliest of the Cherries to flower, *Prunus tomentosa*, is also from
northern China, and will be in bloom within a week. This is a broad
vigorous shrub of excellent habit which every spring is covered with
large flowers, the white petals more or less tinged with red toward the
base. The small, bright red, slightly hairy fruits are of good flavor.
This interesting shrub was raised from seeds sent to the Arboretum from
Peking in 1882 and is now somewhat cultivated for its fruit in Alberta,
Dakota and in other cold dry interior regions of the continent where
other Cherries are not hardy. It should be much better known than it
is in northern gardens. Very large specimens can be seen along the
Boston Parkway between Perkins Street in Jamaica Plain and Forest
Hills, and there are small plants on the right-hand side of Forest Hills
Road, entering from the Forest Hills Gate. A number of interesting
forms of this plant discovered by Wilson in northern China have recently
been described.

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MAY 1, 1912
BULLETIN NO. 20.

The most interesting event, perhaps, in the Arboretum this week is the flowering of several Japanese Cherries, which may be seen on the left hand side of Forest Hill Road from its junction with the Meadow Road to the Forest Hill gate. The first of the Japanese Cherries to flower is Prunus Sargentii. This is a tall tree in the native forests of the Northern Island where it is valued as a timber tree. There are six specimens of different sizes on the Forest Hill Road, and they are now covered with clusters of large pink or rose-colored single flowers, for the color of the flowers of this tree vary considerably on different individuals. The small black fruits which ripen in June are almost hidden by the large dark green leaves which in the autumn turn to shades of orange and red; the smooth, shining, reddish bark adds to the beauty of this tree. Travellers who have seen Cherry blossoms in many lands declare that Prunus Sargentii as it now appears in the Arboretum surpasses in beauty all other Cherry-trees. Whether this is an exaggeration or not it is certainly a tree of first rate importance for New England; and its hardiness, rapid growth, large size, the abundance of its flowers even on small plants, and its handsome foliage make it the most valuable deciduous leaved tree we have yet obtained from Japan. The trees in the Arboretum produce large crops of seeds and these germinate readily so that there is no reason why Prunus Sargentii should not become a common tree if nurserymen will recognize its value and make a business of making it known to the public.

The better known Prunus pendula flowers a few days later. This tree is remarkable for its long, slender, pendulous branches which before the leaves expand are covered with small pink flowers. P. pendula, which does not appear to be common in a wild state in Japan, is often planted in Japanese gardens in which it sometimes grows to a large size. It was brought to the United States many years ago, and specimens from twenty to thirty feet high can be seen in the neighborhood of Boston. By nurserymen it has usually been propagated by grafting on tall stems of the common Cherry, with the result that the trees look unnatural and are rarely long-lived. Plants produced by grafting at the ground level grow to a larger size, live longer, and when in flower look like fountains of pink mist. It has been shown at the Arboretum that the drooping habit of the branches is reproduced in seedlings, and as this Cherry bears seeds freely, seedling plants will, it is to be hoped, become more common.

A plant with even more beautiful and more abundant flowers than Prunus pendula is Prunus subhirtella, or as it is now labelled in the Arboretum, P. pendula ascendens, a small tree, or as it has grown here a large shrub, from central Japan, and now known through Wilson’s collections to occur also in western China. It is perfectly hardy and flowers freely every year. Introduced into the Arboretum twenty years ago, and from here sent to Europe, it is surprising that this handsome plant has remained so little known in gardens.

Prunus triloba can be seen in flower near P. tomentosa just below the entrance to the Shrub Collection at the Forest Hill gate. It is a shrub with bright clear pink flowers which are about an inch in diameter and appear before the leaves. The double flowered form of this shrub (var. multiplex) is a favorite garden plant in China whence forty or fifty years ago it was introduced into Europe and the United States where it is often
cultivated. The much more beautiful single-flowered plant grows on the mountains near Peking and appears to have been cultivated for the first time in the Arboretum to which seeds were sent from China in 1882. Although perfectly hardy P. triloba is not a particularly vigorous plant. It well deserves a place, however, in every garden for the charming color of the flowers.

The Plum-trees in the group next to the Cherries and at the principal entrance to the Shrub Collection from the Meadow Road are beginning to open their flower-buds. The earliest is the Canada Plum (Prunus nigra). This is the most northern of the American Plums, being distributed from Newfoundland to the shores of the Strait of Mackinaw and southward to the northern borders of the United States. It is a small tree with rough dark bark, rather erect, ridged, spiny branches, and flowers slightly tinged with pink and becoming rose-colored in fading. This is not one of the handsomest of the American Plum-trees, but it is valuable on account of its hardiness, the early appearance of the flowers, and the early ripening of the fruit. Several selected forms are grown by pomologists. The flowers of P. nigra will soon be followed by those of the Chinese P. triflora. This is a common fruit tree in China and Japan, and from it or from some of its varieties the so-called Japanese plums, now so popular in the United States, have been derived. The plants in the Arboretum were obtained from seed brought in 1892 by Professor Sargent from Japan. With P. triflora will probably flower one of the Siberian Apricots, P. dasycarpa. In the Arboretum it has grown into a large shrub with spreading branches. This plant is chiefly interesting on account of the dark purple or black color of the fruits which, however, have little value in comparison with those of the common Apricot.

The Shad-bushes (Amelanchier) are just opening their flower-buds and it is a delightful time in the Arboretum when they are in bloom for they have been planted freely in the borders and along the margins of the woods, and some of these plants have grown to a large size. Two species are native in the Arboretum, A. canadensis, which grows in woodlands and often becomes a tree of considerable size; this species can always be recognized in early spring by the purple color of the unfolding leaves; and A. obovalis, which is an inhabitant of low moist soil and more shrubby in habit, with gray unfolding leaves covered with a thick felt. There are good sized trees of the former at the base of the wooded slope on the right hand side of the Forest Hill Road and in the rear of the Apple Group, and there is a large plant of A. obovalis on the border of the North Meadow. It is this species which has been generally planted in the Arboretum.

Few of the forest trees of Europe really succeed in eastern North America, but in the half dozen exceptions to this rule the Norway Maple (Acer platanoides) must certainly be included. Just now this handsome tree is conspicuous from the clusters of bright yellow flowers which cover the leafless branches. More showy than the flowers of the native Sugar Maple they are less delicate in color, while the flower clusters lack the grace of the slender drooping racemes of the American tree, which make the flowering term of the Sugar Maple a term of peculiar charm.

In the last issue of these Bulletins something was said of the value of the hybrid Forsythia intermedia as a garden plant. Another hybrid of the same origin, which was raised in Germany and is called F. intermedia spectabilis, is flowering in the Arboretum for the first time. The flowers are larger and of a deeper color than those of the parents with narrower but longer corolla lobes. This new hybrid promises to be a garden plant
of exceptional value. It may be seen among the other species and hy-
broids in the rear of the bank of Forsythias on the left hand side and at
the lower end of the Bussey Hill Road.

Many of the species of Ribes (Currants and Gooseberries) in the Shrub
Collection are already covered with nearly full grown leaves; and a few
of them, including the Rocky Mountain R. cereum, are in flower.

In the Rhododendron collection at the base of Hemlock Hill a number
of plants of R. praecox, Little Gem, are covered with clusters of pale
lilac colored flowers. This plant was raised several years ago in the
Vietchian Nursery in England by crossing the Siberian R. dahunicum
with R. praecox, R. praecox being a hybrid between R. dahunicum and
the Himalayan R. ciliatum. The Little Gem Rhododendron is a
dwarf and perfectly hardy plant, and the earliest of the evergreen Rhod-
odendrons in the collection to flower. It blooms, however, so early that
unless an exceptionally favorable place can be secured for it the flowers
are too often ruined by frost.

Two American shrubs which have been used largely in the Arboretum
for ground cover are now in flower and may be seen along the borders of
several of the drives. They are the Fragrant Sumach (Rhus canadensis
or aromatic) and the Yellow Root (Zanthorhiza apiifolia). The former
is rather a straggling plant with slender stems sometimes three or four
feet high, although in one of its forms this plant grows much more
compactly. The flowers are bright yellow in small axillary clusters
which appear before the three-lobed leaves. This has been found a use-
ful plant in the Arboretum, although as a ground cover it has not proved
as successful as the Yellow Root. This does not grow so tall, and spread-
ing rapidly by underground shoots soon thickly covers the ground with
its erect stems. The small purple flowers are produced on terminal erect
or spreading racemes and open before or with the unfolding of the pin-
nate leaves, which become clear bright yellow in the autumn. On the
whole this is the most satisfactory shrub, for covering the ground among
trees and larger shrubs, which has been tried in the Arboretum.

The careful examination of the opening buds and unfolding leaves of
trees and shrubs can give much pleasure and greatly help to an accurate
knowledge of these plants. Nearly every species differs in the color of
the very young leaves and in the nature and amount of the hairs which
protect them in the bud. At this time the young leaves of the Horse-
chestnuts or Buckeyes, of the Shadbushes, of several Maples, and especi-
ally of the Moosewood (Acer pennsylvanicum), of the Viburnums, and of
many other plants in the Arboretum, are, if carefully examined, objects
of great beauty; and in the young leaves are often found important char-
acteristics for distinguishing species. All the American Oaks, for exam-
ple, differ in their very young leaves, and some of them, like the Black
and Scarlet Oaks, which are often difficult to recognize by their fully
grown leaves, are easily distinguished by their very young leaves. All
the American Oaks which are hardy in New England can be seen in the
valley between the upper end of the Bussey Hill Road and the Valley
Road, and in a few days their young leaves will be in condition to study.

The flowers of the Chinese Magnolias, Forsythias, Asiatic Cherries,
and early Plum-trees and the expanding buds of a large number of trees
and shrubs make this a good time for an early spring visit to the Arboretum.

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given these Bulletins.
BULLETIN NO. 21.

Although seldom cultivated and little known in this country, several of the wild Pear-trees are plants of ornamental value as their large white flowers, which open before or with the leaves, and the silvery foliage of several of the species are handsome in the spring. The genus *Pyrus* (the Pears), is now considered distinct from *Malus* (the Apples), and *Cydonia* (the Quinces); it is distributed with a dozen or fifteen species from southern Europe to the Caucasus, through Persia to the Himalayas, and northward to northern China, the largest number of species being found in southeastern Europe and the Caucasus. The genus is widely distributed and much cultivated in China where more species certainly occur than are now recognized by botanists. There is no native Pear-tree in northern Asia or in Japan, and the genus has no New World representative. This comparatively restricted range of the Pears is remarkable, for wild Apples occur in nearly all the countries of the north temperate zone. The Pears do not show such a tendency to hybridize as the Apples, although some of the wild European forms are sometimes considered on slight evidence natural hybrids; and in the United States undoubted hybrids between some of the cultivated varieties of the common Pear (*P. communis*), and cultivated plants of one of the Chinese species have appeared, and these hybrids have been largely planted for their fruit in different parts of the United States. The best known of these are the Keifer and the Leconte.

The Arboretum collection of wild Pear-trees is planted on the left-hand side of the road entering from the Forest Hill Gate, above the collection of Apples. Some of the species will be in flower during the week and others will be interesting from the beauty of their unfolding leaves. The earliest Pear to flower is from northern China and is now called *P. Simmonii*. It is one of the green-leaved species and, unlike those of all other Pear-trees, the leaves turn bright scarlet in the autumn. The fruit is small, light yellow, juicy, of good flavor, broadest at the base and gradually narrowed toward the apex. The handsome flowers and the brilliancy of the autumn leaves make this a valuable ornamental tree. A number of species with more or less silvery white leaves from southern Europe and the Caucasus will soon be in flower. Among them are *P. malifolia*, *P. amygdaliformis*, *P. elaeagnifolia*, *P. Michauxii*, *P. salicifolia*, *P. parvifolia*, etc. One of the handsomest plants in the collection is *P. betulifolia* from northern China, with crowded clusters of rather small flowers which are followed by globose fruits not much larger than peas. This is a very hardy, vigorous, tall, fast-growing tree. Among the plants grown in the Arboretum as *P. sinensis* are two very distinct forms raised from seeds sent here from Peking thirty years ago. They are both tall, shapely trees with large flowers and large, thick, lustrous leaves. One of these Pear-trees produces globose, yellow, juicy fruit, and is perhaps the wild type or one of the forms of the excellent yellow Pear which is brought in different sizes and great quantities to the Peking markets in September and October. The other form produces brown, hard fruits not more than half an inch in diameter; and on some trees the fruit is globose and on others pear-shaped. The Japanese Sand Pear, with its hard, brown, round fruits may perhaps have been derived from this Chinese plant.
The White Willow (*Salix alba*) is now covered with its bright yellow catkins and makes a charming picture in the landscape. This is the largest and the most common Willow tree of New England where it has often grown to a noble size and assumed a picturesque habit. It is a European tree, and it is of interest that it is the only exotic tree that has really become widely naturalized in New England. There are many forms of this Willow and the one which has most often established itself here is the variety *coerulea*. There is no record of the introduction of this tree into America, but it was probably soon after the settlement of the country, for very old trees can be found here, and it must have taken a long time for it to have spread as generally as it has done. Occasionally plants of the Brittle Willow (*S. fragilis*) may be seen in this part of the country, but in some of the middle states it is now completely naturalized, having been brought there many years ago to provide charcoal for the powder works in Delaware.

The most interesting plants now in flower in the Shrub Collection will be found among the Currants and Gooseberries (*Ribes*). The two yellow-flowered American Currants are already in bloom. The better known of these, the so-called Missouri Currant (*Ribes odoratum*) was for many years a favorite garden plant in the United States and is still found in many old gardens. It is a large, broad, very hardy, fast-growing shrub with drooping clusters of bright yellow fragrant flowers and lustrous black fruits. It owes its popular name to the fact that it was first found on the upper Missouri River, and it is now known to occur on the great plains from South Dakota to Texas. In many books this plant appears as *R. aureum*, but this name properly belongs to a smaller plant from the northwest and the northern Rocky Mountains with more slender branches, smaller flowers, and black or orange-colored fruits. This species appears to be extremely rare in cultivation. The two plants are growing together in the Shrub Collection and the differences in their general appearance and in the structure of the flowers can be readily seen. Among the Gooseberries already in flower the most interesting perhaps are *R. pinetorum* from the mountains of New Mexico and Arizona, with bright, orange-red flowers; *R. niveum* from northwestern North America with pure white flowers; *R. cynosbati* from eastern North America, and its spineless variety, *R. curvatum* from Stone Mountain, Georgia, with white flowers gracefully drooping on long stalks; *R. stenocarpum* from western China with white flowers, and *R. robustum*, a vigorous white-flowered plant of unknown origin but supposed to be a hybrid between *R. niveum* and *R. oxyacanthoides*.

The first of the Honeysuckles to bloom this year is *Lonicera coerulea*, a plant with small yellow-white flowers and early ripening bright blue fruit. It is one of the most widely distributed of the shrubs of the northern hemisphere, being found in numerous forms and varieties in the northern part of North America, Europe and Asia. There are several distinct forms of this plant now flowering in the Shrub Collection. The pink flowered *Lonicera gracilipes* from Japan and the Fly Honeysuckle of northeastern North America, (*L. canadensis*) are also in flower in the collection where Honeysuckles will continue to blossom for several weeks.

The earliest Barberry in the Arboretum to flower this year is *Berberis dictyophylla* which, although it comes from the warm province of Yunan in China, has proved perfectly hardy here. The flowers are solitary or
occasionally in pairs in the axils of the leaves, rather less than half an inch in diameter and pale primrose yellow in color. They are produced this year in profusion, but the greatest beauty of this plant is in the leaves which, although not large, are silvery white on the lower surface and in the autumn turn brilliant scarlet on the upper surface while the lower surface retains its spring and summer color. This Barberry was sent to Europe a dozen years ago and soon reached the Arboretum where it is one of the handsomest shrubs of comparatively recent introduction. It can be seen in the Shrub Collection and among the Barberries on Hickory Path near Centre Street.

The Hobble Bush or Moosewood (Viburnum alnifolium or lantanoides) is the first of the genus to flower here and one of the handsomest shrubs of northeastern North America where it grows in cold moist woods. In cultivation it is occasionally seen in good condition, growing to a large size, flowering freely, and spreading by the rooting of its inclining branches, but it has never done well in the Arboretum where the right place for it has probably not yet been found. The Hobble Bush is one of the species with broad flat flower-clusters surrounded by greatly enlarged neutral white flowers, the flowers opening with the unfolding of the leaves. A plant just coming into flower can be seen among the dwarf Birches on the left-hand side of the Bussey Hill Road and just below the point where it turns abruptly to the left in ascending the hill.

In Prinsepia sinensis, a member of the Rose Family and a native of northern China, the Arboretum has an interesting addition of recent introduction to its list of hardy shrubs. Prinsepia sinensis has small, axillary, bright yellow flowers, which are produced in profusion, and it is one of the earliest shrubs in the Arboretum to expand its bright green leaves which are nearly fully grown when the flower-buds open. It is now in bloom on the right-hand side of Hickory Path, going from the Valley Road, close to Centre Street.

The hybrid Spiraea arguta (multiflora x Thunbergii), which is one of the handsomest of the early flowering Spiraeas, is a more desirable plant here than S. Thunbergii which flowers at the same time, but is never vigorous and is often injured by cold. This hybrid is in the Shrub Collection and large plants in flower can be seen in the supplementary Spiraea Collection on the short path between the two branches of Hickory Path near the middle of the Hickory Group.

The Hickories are rapidly expanding their leaf-buds and these as they open are beautiful and interesting because the inner bud-scales rapidly enlarge before falling, and on some trees are bright red and on others yellow or green, appearing like the petals of some great flower. The beauty of these scales lasts for only a few days, but as the buds of the different species open during a period of at least two weeks, an observer who is able to visit the Arboretum several times at this season can see all of the Hickories which are hardy here at an interesting period of their development.

The Arboretum will be grateful for any publicity given these Bulletins.
Some of the earliest flowering Apple-trees are already in full bloom and during the next two or three weeks flowers can be seen on some of the species and varieties. Much attention has been paid to these plants at the Arboretum where they are arranged in two groups. The original group is on the right-hand side of the Forest Hills Road going towards the gate. The situation is not a good one, the space is very limited, and a few years ago a second collection was established at the eastern base of Peter's Hill. The plants here are smaller than those in the original group but the number of individuals and of species and varieties is much greater, and here will be found specimens of all the Crabapples that the Arboretum has been able to obtain. The study and proper comprehension of these plants are full of difficulties, for many of the species hybridize so freely that seedlings raised from seeds of cultivated plants rarely produce the original type, and wild plants or seeds from isolated wild plants of the Old World species are almost impossible to obtain. The common Apple-tree of orchards even is now generally believed to be a hybrid between the two European species; the so-called Siberian Crabs of American pomologists are supposed to be hybrids between the Common Apple and the Siberian *Malus baccata*, and the number of other varieties supposed to be hybrids is large, including two which have already appeared in the Arboretum.

One of the handsomest of all Crabapples, *Malus floribunda*, is one of the earliest to flower. As it grows in this country it is a broad shrub, with a trunk dividing at the base into several large branches. The pink flowers, which are deep rose color in the bud, turn white before the petals fall and are produced in the greatest profusion. The dark green foliage is abundant but the yellow or orange-colored fruits, which are not much larger than peas, make little show. The origin of this plant is uncertain; it was first sent to Europe from Japan but it is not a native of that country where it was probably introduced from China, although it does not appear to be known in China now in a wild state. By some authors it is considered a hybrid between two of the species of northern China, although it bears but little resemblance to its supposed parents. The largest specimens of this Crabapple will be found in the neighborhood of the Administration Building. A plant which is evidently a hybrid of *M. floribunda* appeared spontaneously in the Arboretum several years ago and has been named *Malus Arnoldiana*. It has much larger pink flowers and larger fruit than *M. floribunda*, and in flower is one of the most beautiful of all Crabapples.

The Crabapple of eastern Siberia, *Malus baccata*, is a tall narrow tree with white flowers on long, drooping stems and very small yellow fruits from which the calyx falls before the fruit ripens. There is a fine old specimen of this tree in front of the gardener's house in the Harvard Botanic Garden at Cambridge. In the Arboretum a number of forms of this species have been raised. They are distinguished from the Siberian tree by larger pure white flowers and larger fruits than those of *M. baccata*. Some of these forms are among the most beautiful of the early flowering Crabapples.
*Malus spectabilis* from northern China is a tall shrub or small tree with erect, slightly spreading stems, large pink flowers which in the cultivated plants are more or less double, and medium-sized yellow fruits. This is an old inhabitant of gardens where several forms have appeared. The handsomest of these is known as the Rivers Crab (*M. spectabilis Riversii*) from the English nurseryman by whom it was raised or distributed. The Parkman Crab (*M. Halliana*) owes its name to the fact that it was first cultivated outside of Japan by Francis Parkman, the historian, who received it from there in 1860. It is a small and not very vigorous tree with dark bark and bright, clear pink, semidouble flowers drooping on long, slender stalks. This is a Chinese plant now only known in gardens and long cultivated in those of Japan. It should be in a list of the four or five most beautiful Crabapples. Another handsome plant in this group is *Malus Scheideckeri* which is supposed to be a hybrid between *M. floribunda* and *M. prunifolia*. It is vigorous and fast-growing, with erect stems which form a narrow head, pink and white flowers and light yellow fruits.

Interesting species now well established at the Arboretum are *Malus zumi* from Japan, with pink and white flowers, *M. toringo* from northern China and Japan, and *M. Sargentii* from Japan. The two last flower late, have small flowers in crowded clusters and are distinguished by the three-lobed leaves on the shoots of the year. Unlike all other Crabapples, *M. Sargentii* is a low shrub growing naturally on the borders of salt marshes.

The so-called Siberian Crabapples of pomologists are trees of much ornamental value and are well worth cultivating for the beauty of their flowers and fruits; they are fast-growing trees with straight stems and pyramidal heads, large white flowers, and brilliant, often translucent, red or yellow, long-hanging fruits. The fruit is used in preserves and jellies, and for their fruits these trees are much grown in regions too cold for the successful cultivation of the common Apple. One of the most curious Apple-trees in the collection, *M. Niedzwetzkyana*, has deep purplish red flowers and fruit, even the flesh being purple, purple leaves at least early in the season and dark bark. It comes from central Asia and is probably a form of *M. pumila*, one of the parents of the common Apple-tree, as seedlings raised in the Arboretum have sometimes purple but more often green leaves.

The Apple of the northwest coast (*M. fusca* or *rivularis*), with its distinct oblong fruits, can be seen in the group on the Forest Hills Road and with it a hybrid of this species and the common Apple, which has been named *M. Dawsoniana*. The Crabapples of eastern North America bloom later than the Old World species. They all have large, pink, fragrant flowers, and fragrant, green or yellowish fruit characterized by the sticky exudation with which it is covered. There are large plants of *M. coronaria* and *M. ioensis*, the two common eastern species, in the Forest Hills group opposite the end of the Meadow Road. There are large plants of the southern *M. angustifolia* on Hickory Path opposite the large group of Pterocaryas; and in the Peter's Hill group can be seen flowering plants of *M. glaucescens*, a species recently distinguished in western New York and now known to range along the Appalachian Mountains to North Carolina. The last of the Crabapples to flower is the
double-flowered form of *M. ioensis*, known as the Bechtel Crab. This tree has double pale pink flowers which look like small clustered Roses, and attract so much attention that the ground around the trees is trodden hard every day by visitors who wish to examine them at close range. There are two trees of the Bechtel Crab opposite the end of the Meadow Road.

The earliest of the American Hawthorns to flower in the Arboretum this year is *Crataegus Arnoldiana*. This is one of the large-leaved, large-flowered, and large-fruited species, and even in winter is easily recognized by its numerous thorns and by the zigzag manner in which its erect branches grow. The flowers open as the leaves expand and the brilliant scarlet fruit ripens toward the end of August and then soon falls. The early ripening of the fruit makes this tree valuable because showy fruits are not common here in summer. *C. Arnoldiana* grows naturally on a wooded bank in the Arboretum and on the Mystic River in West Medford, Massachusetts. When botanists called all American Thorns with red fruits *C. coccinea* or varieties of that species *C. Arnoldiana* was included. There are a number of large plants in the shrubbery on the right-hand side of the Meadow Road, between its junction with the Bussey Hill Road and the Centre Street Gate. There is a plant, too, in the collection of *Crataegus* between the Shrub Collection and the Parkway, and there are a number of others on the right-hand side of the Meadow Road in front of the group of White Oaks. These trees will be in flower next week.

The earliest flowering plants of *Rhododendron (Azalea) Kaempferi* are beginning to show the color of their flowers. There are two large groups of these plants in the Arboretum, one on the left-hand side of Azalea Path and the other on Hemlock Hill Road where they are planted in a long narrow belt between the Hemlocks and the Laurels. The plants on Azalea Path being exposed to the sun flower earlier and fade quickly as the delicate flowers are unable long to resist our sun. This handsome plant is a native of the high mountains of Japan and was first cultivated in the Arboretum where it was raised from seeds collected in 1902 by Professor Sargent. On Azalea Path many of the plants will soon be in full flower, but those in the shade of the Hemlocks will not be at their best probably for a couple of weeks, but when their flowers do open here they will furnish one of the great sights of the Arboretum year.

*Viburnum Carlesii*, a native of Korea, is flowering in the Arboretum for the first time. It appears to be very hardy and promises to be a first-rate ornamental plant here. The flowers are produced in compact clusters and are very fragrant. The open flower is pure white but the bud is pink, and as all the flowers do not open at the same time the contrast between the pink buds and the white flowers adds to the beauty of the cluster. There are small plants of this species in the *Viburnum* group on the right-hand side of the Bussey Hill Road near the nursery.

The Arboretum will be grateful for any publicity given these Bulletins.
Many of the Lilacs are now in flower and persons interested in these plants should visit the Arboretum during the next few days, although the flowers of several of the species will continue to open until the end of June.

The plant with which the popular idea of Lilac is associated, and which for New England and other regions with cold winters and hot summers, is one of the most beautiful and successful of all shrubs is Syringa vulgaris. It is a plant for the north, for in southern New England and southward the leaves in summer are often temporarily disfigured by a white mildew. This plant was sent from Constantinople to Vienna about 1560 and soon reached western Europe, as the purple and white varieties were cultivated by Gerard in England in 1597. The Lilac was long believed to be a native of Persia, and it is only in comparatively recent years that its home has been found to be among the mountains of Bulgaria. A few years ago the Arboretum succeeded in obtaining seeds from wild Bulgarian plants and the seedlings raised from these seeds will bloom here this year for the first time. For more than two centuries only the purple and white varieties were cultivated; then a few selected seedlings appeared in gardens, and in the last thirty or forty years a great deal of attention has been paid in France and Germany to improving the Lilac. In the Arboretum collection there are now one hundred and twenty of these named varieties and there are others for which room cannot be found. Further improvement in these plants by selection can hardly be expected; indeed some of the oldest varieties are still the best, and many of the seedlings of recent years are so much alike that many of them are not worth cultivating. Indeed, in a dozen selected varieties nearly all the good qualities and the greatest beauty of modern garden Lilacs can be found. If there is not much now to be expected from new seedlings of Syringa vulgaris, the making of hybrids between the species promises interesting and valuable garden plants if we can judge by the excellence of a few hybrid Lilacs, which have already been raised. The first of these hybrids, the Rouen Lilac, was raised in 1785 in France and is the result of crossing Syringa vulgaris with the small, late-flowered Syringa persica. The oldest name for this plant is unfortunately Syringa chinensis, given to it through a misunderstanding of its origin; it is also known as S. rothomagensis. It is very vigorous and is intermediate in character between its parents. The flowers are reddish purple, fragrant, and produced in long comparatively narrow clusters which weigh down the slender branches; there is a variety with nearly white flowers. This hybrid is among the best of all garden Lilacs.

A hybrid between S. vulgaris and S. oblata with small, semi-double, very fragrant, purple flowers, known as S. hyacinthiflora, is one of the earliest of all Lilacs to flower and is a vigorous, large-growing and very hardy plant. S. oblata, one of the parents of this hybrid, is a native of northern China and has been in flower for several days. The large pale lilac flowers are very fragrant and are produced in more or less irregular
clusters. The leaves are thick and leathery in texture, and, unlike those of all other Lilacs, turn in the autumn to a deep bronze red color. In gardens this plant becomes a tall, broad shrub, but the brittleness of the branches, which are often broken down by snow or ice, reduces its value.

Two other Chinese Lilacs bloom as early or earlier than *S. oblata*. These are the white-flowered *S. affinis* and the lilac-flowered form of this species, called var. *Giraldii*. *S. affinis* is the common and perhaps the only Lilac cultivated in the gardens of Peking in which great masses of it are sometimes seen. The variety comes from the province of Shensi. The flowers of these two Lilacs are fragrant and beautiful, but the open irregular habit of growth assumed by these plants in the Arboretum is not attractive. If they become more shapely with greater age, they will be garden plants of real value. *S. pubescens* is just opening its very fragrant, long-tubed, rather small flowers; this is a native of northern China, and is hardy, free-flowering, and one of the most beautiful of all Lilacs. It is still little known in gardens. The Persian Lilacs (*S. persica*) bloom rather later than the common Lilacs. This beautiful plant has been known in gardens for two centuries and a half, and there are purple and white-flowered varieties and a form with deeply-divided leaves (var. *laciniata*) which is less vigorous than the others. One of the least beautiful of Lilacs is the Hungarian *S. Josikaea*, a tall, slender shrub with narrow elongated clusters of small purple flowers which open later than those of the Persian Lilac. By crossing this plant with the Chinese *S. villosa* a remarkable race of hybrids was produced in Paris a few years ago. This hybrid race has the vigor, good habit, and large flowers of *S. villosa*, and the purple flowers of *S. Josikaea*. The general name for this race of hybrids is *S. Henryi*, from the horticulturist who produced it, and the best known and most beautiful of these hybrids is called *Lutece*. This is a plant which should be in general cultivation. *S. villosa* blooms later than the other Lilacs and is therefore more valuable. It is a large, vigorous, and very hardy shrub with good foliage and numerous clusters of pale pink or rose-colored flowers which, unlike those of the other true Lilacs, have a disagreeable odor. A hybrid between *S. affinis*, var. *Giraldii*, and the common Lilac has been produced in France and is highly spoken of. It has not yet flowered in the Arboretum.

On the right-hand side of the South Street entrance are large plants of *Crataegus mollis* and on the left-hand side there is a plant of *C. arkansana*, and next to it and nearer the gate a plant of *C. submollis*. These trees, which are now in full flower, belong to the section Molles of the genus which has large leaves, large flowers and large, usually scarlet fruit. *C. mollis* is one of the common Hawthorns of the middle and western states where on bottom-lands it grows to a large size. Its fruit ripens and falls in September. *C. arkansana*, a native of central Arkansas, is a handsomer tree distinguished by its long, wide-spreading, more or less horizontal branches; the fruit ripens late and remains on the branches until the end of November. *C. submollis* is a native of eastern Massachusetts, with pear-shaped fruit which ripens and falls in September. These trees and a number of other Hawthorns were raised at the Arboretum from seeds planted about 1880. When fifteen or twenty years later they began to flower it was seen that many of them were un-
like any of the described species. This fact led to the general study of American Hawthorns which has been carried on at the Arboretum during the last twelve years. During these years three thousand lots of seeds collected from wild plants in different parts of the country have been planted and thousands of seedlings have been raised and distributed. A set of these seedlings has been planted on the eastern slope of Peter's Hill where the oldest of them are already beginning to flower.

On the left-hand side of the South Street entrance may also be seen the largest plant in the Arboretum of the Ohio Buckeye (Aesculus glabra) now in full flower. The earliest blooming of the American Magnolias, M. Fraseri, is unfolding the pale-yellow petals of its large flowers which open as the leaves begin to expand. This native of the forest of the southern Appalachian Mountains is a comparatively small tree; it does well at the Arboretum where it flowers freely every year. It can be seen in several specimens with the other American Magnolias on the right of the Jamaica Plain entrance and between the gate and the Administration Building.

In the Shrub Collection the red-fruited Elders are in full flower and are handsome shrubs, especially in early summer when their brilliant fruit ripens. In the collection can be seen the North American Sambucus pubens, the European and Siberian S. racemosa and their varieties, and the Japanese S. racemosa var. Sieboldiana. This is a very vigorous large shrub, and although the flower and fruit clusters are smaller than those of the other forms of this group, the bronze color of the finely divided leaves makes it particularly attractive at this season.

The large plant of Fothergilla major with its attractive heads of white flowers is now in full bloom in the Witch Hazel Group near the pond at the end of the Meadow Road; it is also in the Shrub Collection. Many of the Bush Honeysuckles are beginning to flower. One of the most conspicuous of the early-flowered species of this group is Lonicera chrysantha from eastern Siberia. A large plant of this can be seen on the right-hand side of the Bussey Hill Road opposite the Lilacs, and here, too, are several large plants of some of the hybrids of the Tartarian Honeysuckle.

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

The Arboretum will be grateful for any publicity given these Bulletins.
BULLETIN NO. 24.

Next to the Lilacs the most conspicuous shrubs now in the Arboretum will be found in the group of Bush Honeysuckles. Among these are some of the hardiest and generally most successful shrubs for northern gardens. They not only produce countless beautiful and fragrant flowers but their fruits, which usually ripen in summer, are equally beautiful and abundant. The best known of these plants, the Tartarian Honeysuckle (*Lonicera tatarica*), a native of the region from southern Russia to the Altai and Ural Mountains, is an old inhabitant of gardens where formerly it was more often seen than it is at present. This is a vigorous plant, growing ten feet high or more and equally broad, and there are varieties with white, pale yellow, pink and rose-colored flowers, and with yellow and red fruits. Interesting and valuable hybrids of this plant have appeared in European gardens. One of the handsomest of these, *L. notha*, with pale pink flowers, is believed to be the result of a cross with *L. Ruprechtiana* from northeastern Asia. There are two large specimens of this plant on the right-hand side of the Bussey Hill Road opposite the Lilac Group. There is here also a large plant of *L. bella*, with pale yellow flowers, the result of a cross between *L. tatarica* and *L. Morrowii*. *L. xylosteoides*, with white flowers, a hybrid between the Tartarian Honeysuckle and *L. Xylosteum*, and *L. muendeniensis* with pale yellow flowers, a hybrid of the Tartarian Honeysuckle with *L. Morrowii* from northeastern Asia, are also handsome and desirable plants.

Other interesting plants now in flower are *L. muscaviensis*, with pale yellow flowers, a hybrid between two species of northeastern Asia, *L. Morrowii* and *L. Ruprechtiana*, *L. Segrezensis*, with white flowers, a hybrid between *L. quinquelocularis* and *L. Xylosteum*, *L. multiflora*, with white flowers, a hybrid between *L. micrantha* and *L. Morrowii*. The translucent fruit of this plant is perhaps the most beautiful of all the Honeysuckle fruits produced in the Arboretum. *Lonicera Korolkowii* is a vigorous plant from Turkestan with pale bluish foliage and small rose-colored flowers; equally beautiful are the var. *floribunda* of this species and a hybrid of the species with *L. tatarica* which appeared in the Arboretum and is known as *L. amoena Arnoldiana*. These three plants are of exceptional value from the beauty of their delicate flowers and foliage.

Attention is also called to three Honeysuckles from northeastern Asia, *L. Ruprechtiana* with narrow leaves and large yellow flowers, *L. Maackii* with pure white flowers, and *L. Morrowii* with white and yellow flowers. The flowers of *L. Maackii* are large and make a handsome contrast with the dark green leaves. The form of this species from western China, var. *podocarpa*, is in every way a less desirable garden plant. *L. Morrowii* is a large, round-headed shrub with pale, gray-green foliage and wide-spreading branches, the lowest clinging close to the ground. This plant is well suited for the formation of dense thickets or to border drives and walks where abundant space can be given to it, as can be seen at several points in the Boston Park System. A hybrid between *L. Morrowii* and *L. tatarica* is often sold in American nurseries as *L. Morrowii* itself, but it is a very inferior plant to either of its parents.
Outside the Boston parks, where a few of the strong-growing Bush Honeysuckles have been planted, they are rarely seen in American collections in spite of their great beauty and value. They need good soil and plenty of space in which to develop naturally or much of their beauty is lost. The habit these plants assume as they attain their full size can be seen on the right-hand side of the Bussey Hill Road and along the Arborway between Jamaica Pond and the entrance to the Arboretum.

Some of the small-growing Bush Honeysuckles from central and western China now in flower in the Shrub Collection deserve careful examination. Some of the most interesting species are L. syringantha and L. syringantha, var. Wolfii, with purple flowers, from western China, L. tibetica and L. tangutica from the same region, and L. coerulea gracilipes, with pale yellow drooping flowers, from Turkestan.

To many people the word Horsechestnut stands only for the great tree from the mountains of Greece with large clusters of white flowers blotched with red which has been planted for at least a hundred years in the United States where it is one of the most satisfactory of all exotic trees. But there are many other Horsechestnuts, both trees and shrubs, as may be seen by the examination of a group of these plants on the right-hand side of the Meadow Road and just beyond the Linden Group.

Some of the hybrids are of much interest and of these the best known now is the so-called red-flowered Horsechestnut, Aesculus carnea, a hybrid probably between the Grecian tree (Ae. Hippocastanum) and the red-flowered Aesculus Pavia from the southeastern United States, although the history of the origin of this tree is unknown. A form or variety of this hybrid, known as Ae. carnea Briotii, appeared about forty years ago in a French nursery and is a tree with handsomer and much darker-colored flowers than the ordinary red-flowered Horsechestnut. The beauty of these flowers can be seen on two small plants now flowering in the collection. Ae. glabra, the Ohio Buckeye, and some of its varieties, Ae. octandra and hybrids between the last and Ae. Pavia, known under the general name of Ae. versicolor, are also in flower. These hybrids and varieties of the American Horsechestnut were popular garden plants in France in the first half of the last century but they have now largely disappeared from cultivation and are difficult to obtain. One of the oldest and largest collections to be found now anywhere is in the Mt. Hope nurseries at Rochester, N. Y.

The large and abundant flowers of Magnolia Fraseri, mentioned in the last number of these bulletins, are now fully open. Two other American Magnolias in the same group are also in flower, M. acuminata and M. cordata. M. acuminata, the Cucumber-tree, is a large tree with small, yellow-green, not very conspicuous flowers. This is the most northern in its range of the American Magnolias and is a hardy, fast-growing tree of rather formal pyramidal habit while young; it is a distinct and desirable tree for northern plantations in which in good soil it can grow to a large size. M. cordata is a smaller, round-headed tree with thicker and darker-colored leaves and small, bright canary yellow flowers. This beautiful tree is supposed to have been carried to France from the mountain forests of northern Georgia or of the Carolinas at the beginning of the last century. It has not been rediscovered, however, or a tree exactly like it has not been rediscovered in the south, and it is now only known as a cultivated tree. The plants in the Arboretum were obtained by
grafts taken from the old trees in the Harvard Botanic Garden at Cambridge where they were probably planted soon after the establishment of the Garden. This tree usually bears a second crop of flowers during the summer but does not produce fruit, so that it can be propagated only by grafts and therefore remains extremely rare in cultivation.

*Viburnum prunifolium* is in flower and can be seen on the right-hand side of the Bussey Hill Road opposite the Lilacs and at several points on the Valley Road. It is one of the three arborescent Viburnums of the United States and is a small tree with spreading branches and compact clusters of pure white flowers which are followed by blue-black fruit. It is one of the handsomest of the American Viburnums and is too rarely found in gardens.

On the right-hand side of the Meadow Road there is a fine group of the northern pink-flowered *Rhododendron (Azalea) canescens* in flower and this plant can be seen on Azalea Path and in some of the other plantations. It is one of the earliest of the eastern American Azaleas to flower and during the next six weeks other species will bloom in the Arboretum where they are much harder and in every way more satisfactory than the so-called Ghent Azaleas which are hybrids too often weakened by crosses with the tender yellow Azalea of the Caucasus or with the short-lived Japanese *A. mollis*. For American gardens American Azaleas, though not often cultivated, have proved themselves more satisfactory than any of the hybrids in part raised from them.

The pale pink buds of the opening flowers of the hybrid *Spiraea nudiflora* in the Shrub Collection make this plant conspicuous at this time among the large number of species and hybrids of this genus.

Of the immense tropical and subtropical genus *Symplocos* only one species is hardy in New England. This is the Japanese *S. crataegoides*, a large shrub with clusters of small white flowers just now opening and bright blue fruits which make this plant particularly attractive in the autumn. It is in the Shrub Collection and there are large specimens in the grass border between the drive and the walk on the left-hand side of the Bussey Hill Road above the Lilacs.

*Vaccinium corymbosum*, the High-bush Blueberry of New England swamps, has been largely planted in different parts of the Arboretum and is now covered with its white bell-shaped flowers. This is one of the most beautiful shrubs of eastern North America. The habit is good, the flowers and fruit are beautiful, and no other plant has more splendid autumn color.

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

The Arboretum will be grateful for any publicity given these Bulletins.
BULLETIN NO. 25.

Viburnums have been largely planted in the Arboretum and the abundant and conspicuous flowers now open on several of the species show the value of these plants for the decoration of parks and gardens. Viburnums are found in all the temperate parts of the northern hemisphere, the largest number of species growing in eastern Asia and in the eastern United States. The eastern American species, all things considered, are more valuable garden plants than those from other parts of the world, although there are a few Old World species which must be counted among the best of all hardy shrubs. Among these Old World species which cannot be spared from our collections are the European Wayfaring-tree, *Viburnum Lantana*, the Japanese and Chinese *V. tomentosum*, and the Japanese *V. dilatatum*. The first of these plants is a large shrub or small tree with blue-green foliage, large convex clusters of flowers which are followed by fruits, which when fully grown are at first bright red and then become black, fruits of the two colors being found together in the same cluster. This is a very hardy and vigorous plant and flowers here early in May. *Viburnum tomentosum* is a large flat-topped shrub with wide-spreading horizontal branches, and in Japan sometimes becomes treelike in habit. It is one of the species in which the clusters of small perfect flowers are surrounded by a ring of abortive flowers with much enlarged pure white corollas. The flower clusters of *Viburnum tomentosum* are arranged along the upper side of the branches and are produced in great profusion, making it one of the most beautiful of all the shrubs now flowering in the Arboretum. The fruit is small, at first bright red and finally nearly black; the leaves turn orange and red in the autumn. A variety of this plant with very narrow leaves (*var. lanceolatum*) discovered by Professor Sargent in Japan is flowering in the recently arranged Viburnum Group on the right-hand side of the Bussey Hill Road near its junction with the Valley Road. The Japanese Snowball, known usually in gardens as *Viburnum plicatum*, is a form of *Viburnum tomentosum* (*var. dilatatum*). This must not be confounded, however, with the true *Viburnum dilatatum*, which will not be in flower probably for a couple of weeks. This is a large shrub with numerous clusters of creamy white flowers but is most interesting in the autumn when it is covered with small, bright red, lustrous fruits which remain in good condition for a long time.

Of the three species cultivated in the Arboretum of the Opulus Group of Viburnums, with palmately lobed and veined leaves and showy sterile flowers surrounding the flower clusters, two are from the Old World and are perhaps handsomer garden plants than the American representative of this group. The three species are *V. opulus*, from central and northern Europe, *V. Sargentii*, from northeastern Asia, and *V. americanum*, from northeastern America. The first is the largest plant of the three, with thicker darker green leaves late persistent in the autumn, and dark red fruit. The old-fashioned Snowball of gardens is a form of this species with all the flowers sterile; there is a very dwarf form which rarely flowers, and there is a form with yellow fruit. The flowers of *Viburnum Sargentii* are more showy than those of the other species, but the fruit is small and inconspicuous. The habit of *V. americanum*, the so-called High-bush Cranberry, is less compact than that of the other species. The flowers, however, are beautiful, and the fruit, which is translucent and very lustrous, remains on the branches through the win-
ter; in the autumn the leaves turn bright orange-red before falling. The three species are all very hardy. *Viburnum americanum* and *V. Sargentii* have been generally planted in the Arboretum, and very large plants of *V. opulus* can be seen on the Parkway and in some of the other Boston parks.

Among the other American species *Viburnum alnifolium*, the Hobble-bush, and *V. prunifolium* have been mentioned in recent issues of this bulletin, and their flowers have already gone. The species which is now so conspicuous in many parts of the Arboretum is the Nanny-berry, *V. Lentago*. This common New England roadside plant is a large shrub or small tree with large, thick, lustrous leaves, large, rounded clusters of creamy white flowers which are followed by drooping blue-black fruits. There is no better or hardier plant for large shrubberies or the borders of woods, and much of the early June beauty of the Arboretum is due to its general use here. It is one of the three American arborescent species, the others being *V. prunifolium* and *V. rufidulum*. This last is a southern plant distinguished by its thick and shining leaves and by the thick red-brown, felt-like covering of the winter-buds and leaf-stalks. *V. rufidulum* is still rare in cultivation but fortunately it is hardy in the Arboretum. Young plants are now in flower in the Viburnum Group on the Bussey Hill Road.

On the right-hand side of the Bussey Hill Road, opposite the Lilacs, a large mass of *Viburnum pubescens* completely covered with small clusters of white flowers is now one of the most conspicuous objects in the Arboretum. This shrub grows from western New York westward and southward, and, although hardly known in gardens, is a first-rate garden plant. The eastern American species with bright blue fruits, *V. dentatum*, *V. venosum*, and *V. Canbyi*, will flower later in the order in which they are mentioned here. They are common wild plants in the regions they inhabit and are all greatly improved by good cultivation. They have been freely used in different parts of the Arboretum and their value for the decoration of American parks is at last beginning to be appreciated.

The Arrowwood, *Viburnum acerifolium*, will soon be in flower. This inhabitant of northern forests is a small, shade-enduring shrub with neat foliage, small flower-heads and black fruit. It can be seen in large masses on the right-hand side of Bussey Hill Road where in going up the hill it is the last of the small collection of Viburnums planted in the grass border between the drive and walk. *Viburnum affine*, considered a variety of *V. pubescens*, a rare plant from southern Missouri, is now flowering in the Viburnum Group where in the next two weeks flowers may be seen of the still rarer *V. molle* from the southern states. Persons interested in the cultivation of shrubs should study carefully at different seasons of the year the Viburnums which have been assembled in the Arboretum.

Enkianthus is an eastern Asiatic and Himalayan genus, with drooping clusters of small, bell-shaped flowers, and dry capsular fruits, and is related to Andromeda. Three Japanese species are well established in the Arboretum and can be seen in the Shrub Collection and in a large group on the right-hand side of Azalea Path. The handsomest of the three species, *E. campanulatus*, is a tall shrub with slender erect stems and branches, and light yellow or rose-colored flowers. It is found in every Japanese garden where it is valued for the bright scarlet color the leaves assume in autumn, and where it is often cut into balls and other fantastic shapes. This Enkianthus is a garden plant here of real value. The
other species, *E. japonicus* and *E. subsessilis*, are smaller plants with smaller yellow flowers and are less valuable ornaments of the garden.

Some of the most valuable shrubs now found in gardens are natural hybrids of related species or have been produced by skilful hybridizers. One of the most beautiful of Lilacs, *Syringa chinensis*, described in a recent issue, is a natural hybrid which appeared one hundred years ago in the Botanic Garden at Rouen. Several of the most attractive Honeysuckles are hybrids, and in recent years the crossing of different species in several genera has produced new races of garden plants which have vigor, hardiness and beauty not possessed by their parents. A good example of the value of such hybrids is found in *Deutzia Lemoinei*, obtained by a French nurseryman by crossing the Japanese *D. gracilis* with *D. parviflora* of northern China, and now in flower in the Shrub Collection. Although it resembles *D. gracilis* in habit, it grows into a taller and broader shrub; the flowers are larger and it is much hardier. It is certainly one of the best garden plants of recent introduction. The systematic crossing of shrubs with the object of creating new forms, except perhaps in the case of Roses, is a comparatively new industry, but it has already produced startling results in such genera as Magnolia, Deutzia, Philadelphus, Ceanothus, Rhododendron, and Diervilla; and with the great number of new shrubs discovered in recent years in eastern Asia and eastern North America at his disposal the hybridizer will now have new and abundant opportunity to show his judgment and skill in producing new races of plants. Hybrid trees are naturally less common than hybrid shrubs and, except in the case of fruit trees, comparatively few attempts to cross different species of trees have been made. Trees which are believed to be natural hybrids, however, are not rare. There are several American Oaks which are probably hybrids and these, so far as they have been tested in the Arboretum, grow more rapidly than their supposed parents. For example *Ulmus vegeta*, which is believed to be a hybrid between two European species, grows more rapidly than any other Elm-tree, and the so-called Carolina Poplar, which is not an American tree but probably a hybrid between the American Cottonwood and the European Black Poplar, outgrows, at least while young, all other Poplar trees.

Several of the Rhododendrons in the collection at the base of Hemlock Hill are in flower and the flower-buds of many others are fast opening. The end of this week and the beginning of next week will probably be the best time to visit this collection which is most easily reached from the South Street entrance where automobiles should be left.

This is one of the most interesting times of the year to visit the Pinetum, for many conifers are now in their greatest beauty, as the young shoots, of various shades of green or blue, are now growing rapidly on many of these trees and often afford good characters for distinguishing the Firs, Spruces and Pines. Particularly handsome just now are the Carolina Hemlock (*Tsuga caroliniana*), the Colorado White Fir (*Abies concolor*), the two Rocky Mountain Spruces (*Picea pungens* and *P. Engelmannii*), now bluer than they will be later in the season, and the Douglas Spruce, (*Pseudotsuga mucronata*). An entrance to the Pinetum is close to the Walter Street gate.

The Arboretum will be grateful for any publicity given these Bulletins.
The Laurels (*Kalmia latifolia*) will be in full bloom at the end of the week. They are planted along the base of Hemlock Hill, and here the plants remain in flower for a long time, for they are protected from the full effects of the sun by the hill behind them and the soil is moist and cool. The beauty of the flowers, too, is heightened by the dark background of Hemlocks, and none of the flower displays in the Arboretum surpass the flowering of the Laurels which this year promise greater beauty than ever as the plants never before have been so covered with flowers-buds.

*Kalmia* is a genus which is found only in North America and, with the exception of one small species, is confined to the eastern part of the country. *Kalmia latifolia* is the largest and most important species of the genus and in favorable situations on the southern Appalachian Mountains sometimes grows to the size of a small tree. It is one of the most beautiful of hardy flowering shrubs and for the northern states the most valuable of the broad-leaved evergreens which can be successfully grown here in the open ground. It would be astonishing that it has been so neglected in this country as a garden plant were it not for the fact that it has never been greatly appreciated or largely planted in England, and until recent years England has set the fashion in plants for us; and so because Rhododendrons flourish in many parts of England we have tried to grow them in a climate not really suited to them and have neglected our native Laurel which, less showy perhaps than some of the Rhododendrons, has beauties of its own which no Rhododendron can surpass.

No hybrids or varieties of *Kalmia latifolia* have been developed in cultivation probably because little attention has thus far been paid to the cultivation of these plants, and the few varieties which are known have appeared naturally in the woods. There is a form with pure white flowers (var. *alba*), and there is another with deep pink, nearly red flowers and darker green leaves (var. *rubra*). These extreme forms are connected by others with flowers of all shades of pink. There is a distinct form with small leaves and small heads of small flowers (var. *myrtifolia*). This form is a low compact bush and flowers only sparingly. A form with broad obtuse leaves like those of a Rhododendron (var. *obtusata*) was discovered near Pomfret, Connecticut, a few years ago; this is also a shy bloomer. In another form (var. *polypetala*), first found near South Deerfield, Massachusetts, the corolla is deeply divided into narrow lobes. These varieties are all well established in the Arboretum. The Laurels can be easily and quickly reached from the South Street and Walter Street entrances.

The Sheepkill, *Kalmia angustifolia*, is a handsome dwarf shrub with small dark red flowers and, although rarely seen in gardens, well deserves cultivation. Another dwarf species recently discovered on the southern Appalachian Mountains, *K. caroliniana*, promises to be hardy in the Arboretum, but is still growing in the nursery where seeds of it were planted in 1906. Of the other dwarf species those from the north are difficult to cultivate and require special treatment, and the others are not hardy here.

The blooming of the Syringas (*Philadelphus*) is also an interesting event in the Arboretum where a large collection of these beautiful plants has been assembled. They can be seen in the Shrub Collection and in a large supplementary group on the right-hand side of the Bussey Hill Road,
opposite the Lilac Group. The first of these plants to flower is a new addition to the collection, *P. Schrenkii*, var. *Jackii*, a rather dwarf plant with slender stems and medium-sized flowers discovered in Corea a few years ago by Mr. Jack who brought seeds to the Arboretum. The flowers have already nearly all fallen. The next to open are the flowers of the southern Appalachian *P. hirsutus*. *P. coronarius* is also one of the early-flowering species; this is a native of southeastern Europe and the Caucasus, with extremely fragrant creamy white flowers. It is the Mock Orange of all old-fashioned gardens and the only European species of this genus. There are several varieties of this plant in the collection but none of them are as valuable as the common form, which is still one of the best garden plants in the genus, and are of little interest except as curiosities. Many other species will soon open their flower-buds; among some of the most interesting are *P. inodorus*, with large, solitary, pure white flowers, and one of the most distinct and beautiful plants in the genus although it is little known in gardens; *P. Falconerii*, of unknown origin but probably a native of Japan or China, and *P. maximus*, a probable hybrid between two American species, and the largest of all the Mock Oranges.

In no other genus of woody plants have more astonishing and unexpected results been obtained by the hybridizer. A few years ago the Rocky Mountain *Philadelphus microphyllus* was sent by the Arboretum to Lemoine, the famous French hybridizer; this is a small-growing species, with small leaves, and small, very fragrant flowers. Lemoine crossed it with *P. coronarius* and produced a new race of plants to which the general name of *Philadelphus Lemoinei* has been given. These hybrids are dwarf and compact shrubs with pure white fragrant flowers, usually not as large as those of *P. coronarius*, and small foliage. There are now many named varieties of this race in the Arboretum and some of the most distinct and beautiful of them are Avalanche, Boule d'Argent, Bouquet Blanc, Candélabre, Conquête, Fantasie, Gerbe de Neige, Manteau d'Hermine, Mont Blanc, Nuee Blanche, Pavillon Blanc, etc. These and several others are beginning to open their flowers, and no more charming group of dwarf hardy shrubs can be seen. *Philadelphus microphyllus* itself blooms later; none of the other species surpasses it in the fragrance of its flowers. With the exception of *P. coronarius*, all the species are found in the southeastern United States, the southern Rocky Mountain region, the northeastern United States, and in eastern Asia. The largest plants are found among the American species which generally produce larger and handsomer flowers, and are better garden plants than the Asiatic species which usually have smaller and less fragrant flowers.

Some of the Cornels or Dogwoods are now conspicuous. The principal group of these plants is at the junction of the Meadow and Bussey Hill Roads, and several species have been freely planted in border shrubberies in different parts of the Arboretum. The most interesting species now in flower are *Cornus rugosa* or *circinata* and *C. sanguinea*. The first, which is a common native shrub, is one of the handsomest of the genus; it has green branchlets, broad, rounded pale green leaves paler and hairy on their lower surface, and conspicuous clusters of creamy white flowers which are followed by beautiful light blue fruits. Like a few other Dogwoods, it is difficult to transplant but once established soon spreads into large masses. There are several individuals in the Cornel collection, and large shapely plants can be seen on the bank just above the group of Sassafras trees on the right-hand side of the Bussey Hill Road, and
below the Benzoin Group. Among the Hickories on the right-hand side of the Valley Road there are also large groups of this plant. *Cornus sanguinea* is a native of southern Europe and southeastern Asia, and is a large shrub with dark red branches, small flat flower clusters and black fruit; it has wide-spreading lower branches clinging close to the ground, and is well suited to grow as a single specimen or to plant on the margins of woods or of a large shrubbery. The habit of this plant can be seen in the large specimen in the Cornel group.

*Magnolia glauca*, the Sweet Bay of the Atlantic coast swamps, planted on the right-hand side of the Jamaica Plain entrance, is beginning to fill the air with the aromatic fragrance of its creamy white flowers. This is a shrub or small tree, with handsome leaves bright green and very lustrous above but silvery white below, which remain on the branches until the beginning of winter, and small cup-shaped flowers; it is the last of the Magnolias to flower, and the flowers open during several weeks. *Magnolia glauca* is perfectly hardy; it is easily cultivated and it is one of the most beautiful of the small trees which can be successfully grown in this part of the United States. It is astonishing therefore that it is so little known by the present generation and that good plants in quantity cannot be found in any American nursery.

Two plants of a rare Apple-tree (*Malus florentina* or *crataegifolia*) of the northern Apennines are just passing out of flower in the Apple Group at the eastern base of Peter's Hill where they have flowered more profusely this year than they have before in the Arboretum. It is a small tree with much-lobed leaves like those of the European Hawthorn, small white flowers, and small bright red fruits. Of all the Apples planted in the Arboretum it is the last to flower.

The different forms of the climbing *Evonymus radicans* are flowering very freely this year and can be seen in the Evonymus Group on the right-hand side of the Meadow Road. The hardiest, handsomest and most desirable of all the forms of this useful plant which have been tried in the Arboretum is the broad-leaved variety from northern Japan (var. *vegetus*) which, although it has been cultivated in the Arboretum for the last twenty-five years, is still little known and difficult to find in nurseries.

Opposite the Evonymus Group the Smoke-tree (Cotinus) of old-fashioned gardens is in bloom. The flowers are not conspicuous, and it is the clusters of the lengthening hairy colored stems of the flowers which make the "smoke" and the conspicuous feature of this plant which is a native of southern and southeastern Europe, the Himalayas, and western China. Near it is a large plant of the American Cotinus which is also in flower. The clusters of hairy flower-stems are less conspicuous than those of its Old World relative, but the foliage is larger, lighter-colored, and in autumn turns brilliantly to orange and scarlet shades. The American Smoke-tree, although it is a native of northern Alabama and south-western Missouri, is perfectly hardy in New England in the most exposed positions, and is as much at home in western Europe as it is in New England, although usually the trees and shrubs of the southeastern United States do not flourish in Great Britain where they miss the summer and autumn heat necessary to properly ripen their wood.

**The Arboretum will be grateful for any publicity given these Bulletins.**
BULLETIN NO. 27.

In Bulletin No. 23 something was said of the Chinese Syringa villosa and of the hybrids of this plant with the Hungarian S. Josikaea, represented by the variety called Lutèce. This variety is just passing out of flower and this year has sustained its reputation of being the handsomest of the late-flowering Lilacs. It is interesting that among the plants of S. villosa recently raised at the Arboretum there is one with nearly pure white flowers.

There is a group of Lilacs which bloom even later than Lutèce and its parents; they are not true Lilacs, however, and belong to the section Ligustrina of the genus which differs from the true Lilacs in the short tube of the corolla from which the stamens protrude. There are three species of this group, all natives of northeastern Asia; they are shrubs or small trees, and they produce white, bad-smelling flowers in large clusters. Two of the species are in bloom in the Lilac Group on the left-hand side of the Bussey Hill Road. The earliest of these plants, S. amurensis, is not flowering this year; it is a native of eastern Siberia, as its name indicates, and is a small tree with flat, spreading or slightly drooping clusters of white flowers. The second species to flower, S. pekinensis, a native of northern China, is a shrub rather than a tree, although it sometimes reaches the height of thirty feet, with numerous stout stems pendant at the ends and covered with bark peeling off in thin layers like that of some of the Birch trees. The long, narrow leaves hang gracefully, and the half-drooping flower-clusters, which are flat and unsymmetrical, are smaller than those of the other species but are produced in great quantities. S. japonica, a native of the forests of Japan, is the last of the Tree Lilacs to flower and is a tree often thirty or forty feet high, with a tall, stout trunk covered with lustrous bark like that of a Cherry tree, and a wide, round-topped head. The leaves are large, thick and dark green, and the flowers are produced in large, erect, symmetrical clusters. Like the other species of this group, S. japonica loses its leaves early in the autumn without change of color. S. amurensis and S. pekinensis have not become common in gardens, but S. japonica has been quite generally planted in those of the eastern states. It is one of the most valuable plants introduced by the Arboretum where it was first raised from seeds sent in 1876 by the late William S. Clark, the first President of the Massachusetts Agricultural College, and later the first President of the Agricultural College at Sapporo in Japan where this tree is common. One of the first seedlings raised at the Arboretum can be seen in the Apple Group on the right-hand side of the Forest Hills Road going toward the Forest Hills Gate, the site of the first Arboretum Nursery in which this Lilac was planted.

It is unfortunate that it is almost impossible to keep the Locust tree (Robinia Pseudoacacia) alive in eastern Massachusetts for any length of time owing to the borer which riddles the trunk and branches of this beautiful and valuable tree. There is now living in the Arboretum only one of the ornamental seedling forms of this tree which are so highly prized and so often planted in Europe, especially in Germany, but it is interesting that this is one of the most abnormal of these forms (var. monophylla) in which the compound leaves are reduced to a single leaflet. This variety is spreading rapidly on the bank on the right-hand side of
the Meadow Road beyond the Horsechestnut Group where it is flowering profusely this year and seems able to resist the borer. One of the most interesting Locusts in the collection is a hybrid (Robinia Holdtii) between *R. Pseudoacacia* and the Rocky Mountain *R. neo-mexicana* which appeared in a Colorado nursery a few years ago. This is a vigorous tree with pale pink flowers and seems better able to resist the borer than either of its parents. The shrubby Rose Acacia (*R. hispida*) is less often attacked by borers and when in flower it is a beautiful and conspicuous plant. It is, however, sometimes troublesome as it spreads rapidly by underground shoots and so may occupy too much space. Another shrubby Robinia, *R. Kelseryi*, from the southern Appalachian Mountain Region where it was discovered a few years ago, flowers well in the Arboretum and is a desirable and handsome plant. The other arborescent species, *R. viscosa*, the Clammy Locust, and *R. neo-mexicana* suffer badly from the attacks of the borer.

The first of the shrubby Hydrangeas to bloom, *Hydrangea Bretschneideri*, is now in flower. It is a large and very hardy shrub from Manchuria and northern China, and in this climate is one of the most satisfactory plants in the genus. It can be seen in the Shrub Collection, and with it is now flowering for the first time in the Arboretum a variety of the species (var. setchuenensis) discovered by Wilson in western China.

*Indigofera Kirilowii*, a low shrub from Manchuria and Korea, with racemes of pea-shaped pink flowers, is blooming in the Shrub Collection and on Hickory Path, near Centre Street, and is a hardy and handsome garden plant although little known in the United States. Another charming plant of the Pea Family, *Sophora viciifolia*, has been flowering also on Hemlock Path. This is a shrub two to four feet high with small pinnate leaves and showy blue and white flowers. It is a native of central and western China and appears to be perfectly at home in the Arboretum.

*Clematis tangutica*, which can be found on one of the trellises on the east side of the Shrub Collection, is beginning to open its flowers and will continue to open them for several weeks; they are vase-shaped and bright clear yellow, and as they fade are succeeded by heads of fruits with long glistening hairy tails. As the flowers open gradually during several weeks flowers and fruits appear on the plant at the same time. This Clematis is a native of the extreme western part of China and is one of the best of the hardy vines of recent introduction.

The flame-colored Azalea (*Rhododendron calendulaceum*) has been largely planted on the long slope below Azalea Path and in many of the Arboretum shrubberies, and, although it usually flowers abundantly, this year it has been exceptionally beautiful. Among the seedlings raised at the Arboretum there are plants with flowers of many shades of yellow and orange. Flowering rather later is another Rhododendron of the same region *R. arborescens*; the flowers of this shrub are pure white with bright red filaments and, if they are not so showy as those of the flame-colored Azalea, they are equally beautiful and much more fragrant. There are masses of this Azalea on each side of the Valley Road. The flowers of *R. arborescens* will be followed early in July by those of the Clammy Azalea (*R. viscosum*), a common plant in New England swamps, especially in those near the coast, which at midsummer are made fragrant by its pure white flowers. For three months the different Azaleas of the eastern United States flower in succession.
in the Arboretum, and among them are plants as beautiful when in flower as any of the hybrid Azaleas produced in Europe. They are hardier and longer-lived than any of the European hybrids or the species of eastern Asia, and among the many shrubs which eastern North America has contributed to gardens none are more beautiful than these six Azaleas, or Rhododendrons as botanists now call them, which are named in the order of their flowering: Vaseyi, canescens, nudiflorum, calendulaceum, arborescens, and viscosum.

Much of the June beauty of the Arboretum is due to the general use in its plantations of several common native shrubs with handsome flowers and fruits. Thirty years ago most of our native shrubs were unknown to gardeners, but the Arboretum has lost no opportunity to teach the lesson that the best trees and shrubs for the permanent decoration of American parks and gardens are to be found in American fields and forests. Now, therefore, it is a satisfaction to know that the appreciation of the beauty and value of many of our native shrubs is gradually spreading from the Arboretum over the country and that it is now possible to find many of the best American trees and shrubs of eastern America in large quantities in several American nurseries.

One of the best of the native plants which have proved satisfactory in the Arboretum is Cornus racemosa or, as it is often called, paniculata or candidissima; this is a common inhabitant of roadsides and wood borders in this part of the country, and in cultivation it is one of the most free-flowering of all the Dogwoods. It is a round-headed shrub with slender erect gray stems which spread into dense broad thickets, and creamy white flowers produced in compound oblong clusters. The plant moreover is as beautiful in October as it is in June for the flowers are followed by translucent white berries borne on bright red stalks, making this one of the most interesting of the shrubs which ripen their fruit in mid-autumn.

A hybrid of this species with another native Dogwood, Cornus obliqua, appeared naturally in the Arboretum several years ago and is known as Cornus Arnoldiana. The oldest plants are now ten feet high and nearly as broad, with erect stems, and bear flower-clusters which are larger and handsomer than those of either of its parents. The flowers, however, of this hybrid are its chief beauty for it bears little fruit and therefore in the autumn is less interesting and ornamental than Cornus racemosa. The Silky Cornel, Cornus Amomum, flowers a little later. It has been much used in the Arboretum but in cultivation is not a satisfactory plant unless it can be given sufficient room for its wide-spreading branches to extend out freely and spread over the ground or over water; for this reason it should be planted as a specimen or on the borders of ponds and streams, for which it is admirably adapted. The purple stems are interesting in winter and the bright blue fruits, which ripen in the autumn, add materially to the attractions of this vigorous native shrub.

The Arboretum will be grateful for any publicity given these Bulletins.
Among the other American Magnolias in the group on the right hand side of the Jamaica Plain entrance Magnolia macrophylla is now in flower. This is a medium-sized tree of the southern states where it is found in sheltered valleys and, although nowhere common, is widely distributed from western North Carolina to Kentucky, Florida, Alabama and Arkansas. No other tree of the northern hemisphere beyond the tropics bears larger leaves or larger flowers, for the former are from twenty to thirty inches long and from nine to ten inches wide, while the creamy white petals of the flower, which are marked with a dark red spot at the base of the inner surface and become reflexed above the middle when the flower opens, are from six to seven inches long and from three to four inches wide, the expanded flower being often a foot in diameter. The beauty of this tree is increased by the silvery white color of the lower surface of the leaves and by its symmetrical habit, with wide-spreading branches forming a broad, round-topped head. *Magnolia macrophylla* is perfectly hardy but it is well to plant it in sheltered positions for the leaves are easily torn by the wind. It is one of the most beautiful of all the Magnolias and one of the most remarkable and interesting trees of eastern North America; it is less commonly seen, however, in northern collections than formerly although its value and beauty appear to be more appreciated in some of the middle states than they are here.

One of the most attractive objects in the Shrub Collection this year is a large plant of *Halimodendron argenteum*, called Salt-tree because it inhabits the saline steppes near the river Irtish in Siberia. The pale rose-colored, pea-shaped, fragrant flowers, which are produced in great abundance, are borne in short clusters and their delicate beauty is heightened by the light color of the leaves which are clothed with a pale silky down. The plant remains in flower during several weeks. The Salt-tree was introduced into England as early as 1779, but it does not seem to be much known in the United States, for among the rare plants sent to the Arboretum for determination it has come only once. It produces abundant crops of seeds in the Arboretum and it can be raised from cuttings, so there is no reason that it should remain so rare in American gardens.

In the Shrub Collection, near *Halimodendron*, another plant of the Pea Family is in flower; this is *Cytisus nigricans*, a low, slender, hardy shrub from central and southern Europe, with long erect racemes of beautiful yellow flowers, and for this climate one of the best plants of its class. With it are blooming *Genista elata* and the well known *Genista tinctoria* which has destroyed with its fatal gift of beauty so many of the fields of Essex County in this state.

Of the Privets, or Ligustrums, none of the introductions from eastern Asia are more valuable garden plants than the European *Ligustrum vulgare* which is becoming naturalized in the eastern states; it is a tall, broad, shapely shrub with bluish green leaves and is now covered with its small, erect, terminal clusters of white, bad-smelling flowers. The great value of this plant is not in the flowers but in the lustrous black fruits which decorate it in the late autumn, and in the fact that it retains its leaves in good condition almost until the beginning of winter, making
it one of the most desirable of all the shrubs which are hardy here for
the decoration of parks and gardens. This Privet has been much used as
a hedge plant for which it is well suited. There are varieties with green-
ish yellow fruit, with yellow leaves, and with erect branches. Of the
Asiatic species *Ligustrum ibota* is perhaps now the best known of the
hardy species here; it is a broad shrub sometimes ten feet high, with
spreading slightly recurved branches, small, dark green leaves which
turn purplish in the autumn, and short, nodding clusters of white flowers
which are produced on short lateral branches and which are followed by
clusters of small, purplish black fruit covered with a pale bloom and
often persistent on the branches until spring. This is a handsome shrub
but it has sometimes suffered from the cold of exceptionally severe win-
ters. Equally handsome but of very different habit is its variety *Regeli-
anum*; this is a much lower and denser shrub, with horizontally spread-
ing branches which form a broad, flat-topped head, and larger leaves.
As the two plants grow side by side in the Shrub Collection they appear
very distinct, but seedlings of the variety are often identical with *L.
ibota*. Another species, *L. amurense* from eastern Siberia, has also
fruit covered with a bloom like that of *L. ibota*, but the branches termi-
nate with larger flower-clusters, while the lateral flower-bearing
branches are often longer than those of *L. ibota*. It is best distinguished,
however, by its pyramidal habit, for it is a tall shrub with erect stems
which form a narrow head. The Japanese *L. acuminatum* is a broad
shrub with the largest flower-clusters near the ends of the stems and
lustrous black fruit like that of *L. vulgare*. These Asiatic species are
much confused in American nurseries and a number of plants are sold
under the name of *L. amurense* which, on account of its hardiness, rapid
growth, and erect stems, has been recommended as a hedge plant for
regions which are too cold for the so-called California Privet; this is *L.
ovalifolium* and is not a Californian but a Chinese plant. It has been
much planted for hedges which in severe winters are often killed to the
ground even in southern New England.

The earliest of the Hawthorns, the European *Crataegus nigra*, and the
New England *C. Arnoldiana*, were in bloom on the 10th of May, and the
flowers of the latest blooming species in the collection, *C. cordata*, the
so-called Washington Thorn, are not yet fully expanded. This native of
the southern Appalachian region and of southern Missouri is a slender
narrow tree sometimes thirty feet high, with small, shining, nearly tri-
gle leaves, and small, dull white flowers; its greatest beauty is in
the autumn when the leaves, which do not fall until late, are bright
orange and scarlet, and contrast beautifully with the small, bright
scarlet, globose fruits which remain in good condition on the branches
until spring. The only objection to this tree is the brittleness of the
branches which are often split or broken by storms.

Among the fifty species or forms of Viburnum found to be hardy in
the Arboretum the first to flower, *Viburnum alnifolium*, the Hobble
Bush or Moosewood, was in bloom during the first week in May, and
the flowers of the latest in the collection to open, *Viburnum Canbyi*,
will not be fully out for several days, so that the flowering time of the
Viburnums here extends through two months. *V. Canbyi* is a broad,
tall, round-topped shrub with large lustrous leaves, large flat clus-
ters of flowers and bright blue fruit. It is a native of eastern Penn-
sylvania and northern Delaware, and is nowhere common. It is one of
the native species which is greatly improved by cultivation and splendid large plants can be seen on the right-hand side of the entrance to the Administration Building and on the Meadow Road.

Some of the wild roses have been largely planted along several of the drives and their flowers add much to the interest and beauty of the Arboretum at this time. The flowers of the earliest of the five New England species, *Rosa blanda*, have already gone and the latest to flower, *R. caroliniana*, is not yet in bloom, but the others *R. virginiana* or *lucida*, *R. humilis*, and *R. nitida*, are at their best. The most beautiful of these three roses is perhaps *R. nitida* with its rather dark-colored flowers and short stems covered with bright red prickles. It is always dwarf in habit and is found from Massachusetts to Newfoundland. *R. virginiana*, which is the common rose of the New England seacoast, is a taller plant with thick very lustrous leaves, and flowers which range in color from dark red to pink. There is also a white-flowered form of this plant found in Maine a few years ago. In the Arboretum there are forms with thinner and duller leaves which may be natural hybrids with *R. humilis* which is the common Wild Rose of the interior, that is of regions beyond the immediate influence of the sea. This is a low plant with dull leaves, and the least ornamental of the native Roses. This Rose or some of its numerous hybrids are generally sold in nurseries for *R. virginiana*. The wild roses flower at the same time as *Cornus rugosa* mentioned in the last issue of these bulletins, and when this Cornus and these Roses are planted together a beautiful combination of color is obtained.

The first species to flower in the collection, and one of the gems of the genus, *Hypericum Buckleyi*, is just opening its bright yellow flowers in the Shrub Collection where it is now well established. It is a dwarf plant growing here only a few inches high, but spreading into a broad mat which becomes covered with flowers, and these remain in good condition for a long time. *H. Buckleyi* is very rare in cultivation, although it is well suited for a sunny position in the rock garden. Naturally it grows on rocky cliffs in the southern Appalachian region where it is nowhere very abundant.

A few of the fruits of early summer are beginning to be conspicuous in the Arboretum. The most beautiful, perhaps, are the bright keys of *Acer tataricum*, a small Maple tree from southeastern Europe and the adjacent parts of Asia. This is an early flowering, very hardy tree well worth cultivating for the brilliancy of its fruit alone. It is a very old inhabitant of the gardens of western Europe and the United States, but since the introduction of the Japanese Maples it has been rather lost sight of. Plants can be seen in the Maple collection. In the Shrub Collection the bright red fruits of a North American Elder, *Sambucus pubens*, are now beautiful and conspicuous, as are those of the rare variety of this plant with orange-colored fruits (var. *leucocarpa*). The fruits of the Old World plants of this group are still green or only just beginning to turn red.

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The black-fruited Elder, *Sambucus canadensis*, which is the last of the New England shrubs making a conspicuous show of flowers, now adds much beauty to the Arboretum where it is common in the neighborhood of the small ponds near the junction of the Meadow and the Forest Hills Roads and in the valley of the Bussey Brook. In the Shrub Collection are some interesting forms of this beautiful plant. The most conspicuous perhaps is the variety with finely divided leaflets, var. *acutiloba*; another variety, var. *chlorocarpa*, with yellow-green fruit, was found recently in southern New Hampshire. The variety *maxima*, which originated in a European garden, produces flower-clusters at least three times as large as those found on the wild plants, and these are followed by such large and heavy bunches of fruit that the branches are hardly able to support them. The European *Sambucus nigra* and its variety with yellow leaves is also in flower. As a foliage plant one of the most beautiful of all the Elders is the Japanese form of the red-fruited *Sambucus racemosa* (var. *Sieboldii*) which is well established in the Shrub Collection. The flower and fruit clusters are smaller, however, than those of the European and Siberian forms of this plant and the fruit ripens rather later.

The Chinquapin, *Castanea pumila*, is in flower about a week before the flowers of the northern Chestnut-tree appear. The Chinquapin is a native of the coast region of the Atlantic States from New Jersey to Florida. It is found also in the Gulf States and in the region west of the Mississippi River from southern Missouri to Texas. In the Atlantic States it is usually rather a low shrub spreading into thickets, but west of the Mississippi, especially in southern Arkansas and Texas, it grows into a large, round-headed tree, although it never becomes as large as the northern Chestnut-tree. A tree of this western form, and a large group of the dwarf form originally from Virginia are established in the Arboretum and can be seen with the other Chestnuts on the right-hand side of the Valley Road just beyond the Hickory Group. The nuts of the Chinquapin are produced freely in the Arboretum every year and, unlike those of the northern Chestnut-tree, they are cylindrical, not flattened, as only one nut is produced in a burr, and are bright and shining and of even better flavor than those of the common Chestnut. The silvery under surface of the leaves, which is covered with fine hairs, also distinguishes the Chinquapin from the Chestnut-tree.

Attention was called in a recent issue of these bulletins to the value of the eastern Siberian *Hydrangea Bretschneideri* as a garden plant. It is the first of the genus to flower here. More conspicuous is *Hydrangea paniculata* of Japan and western China. The most generally planted of the forms of this plant is one in which all the flowers are sterile, known as *Hydrangea paniculata grandiflora*. This plant produces large clusters of white sterile flowers which turn rose color in fading, and it will not be in bloom for several weeks. There are two other forms in which some of the flowers only are sterile and are called ray flowers because they surround the clusters of fertile flowers. These are the wild plants from which the form *grandiflora*, with all the flowers sterile, has been developed. There are two forms of this Hydrangea with perfect flowers and one of these (var. *praecox*) will be in flower in a few days.
while the other form, the type of the species, will not be in flower for several weeks. In the Shrub Collection are three plants of var. praecox, differing in the size of the flower-clusters and in the size and shape of the ray flowers. The handsomest of these was raised from seeds collected by Professor Sargent in Hokkaido where it grows into a small tree sometimes twenty or thirty feet tall. A variety of the American Hydrangea arborescens, known as grandiflora, is in bloom. This plant was found a few years ago growing wild in one of the western states and has been largely distributed in this country and Europe. It is a hardy, shapely shrub and produces large clusters of sterile white flowers in profusion. It blooms a few days before Hydrangea arborescens itself which is growing with it. Two other American species of Hydrangea, H. cinerea and H. radiata, will soon be in bloom; as a foliage plant the latter is the most beautiful of the American species for the leaves, which are dark blue-green on the upper surface, are silvery white below.

Zenobia is a genus of the Heath Family, by some botanists treated as a section of Andromeda, composed of a single species which inhabits pine barrens from North Carolina to Florida, and is a deciduous-leaved shrub from two to four feet in height. The flowers, which are pure white and from one-third to one-half an inch long and broad, are produced in compact clusters arranged along leafless branches of the previous year and are perhaps more beautiful than those of any of the Andromeda-like plants. There are two forms, the type, Zenobia pulverulenta, with chalky white leaves covered with a dense white bloom, and the variety nitida with green leaves. Although natives of a region which produces few plants able to survive the cold of New England, these Zenobias are perfectly hardy in the Arboretum and can now be seen in flower in the Shrub Collection and on the right-hand side of Hemlock Hill Road where there is a large group of them in which the green-leaved form is the most numerous. Another deciduous-leaved plant of the same family, Pieris or Andromeda mariana, also produces its flowers on leafless branches of the previous year, but the flowers are smaller and the plant is less attractive in habit than the Zenobias. It is a native of the coast region from Rhode Island southward, and is very abundant on some parts of Long Island. There is a large group of this shrub now in flower on the right-hand side of the Meadow Road in front of the Horsechestnuts.

The common Thyme (Thymus vulgaris), one of the old-fashioned fragrant pot herbs and a native of southern Europe, is now not often seen in American gardens; it is a dwarf shrub growing in the Arboretum only a few inches high but spreading rapidly into broad mats which are now completely covered with short clusters of purplish blue two-lipped flowers. Masses of this plant can be seen in the Shrub Collection and on Azalea Path.

Among the climbing Honeysuckles on the north trellis of the Shrub Collection Lonicera Heckrottii is exceptionally beautiful this year. This is believed to be a hybrid, probably of American origin, although its history cannot be traced, between the scarlet-flowered American Lonicera sempervirens and L. italicca supposed to be itself a natural hybrid between L. Caprifolium and L. etrusca, which, though growing naturally only near Lyons in France and near Trieste in Austria, is common in cultivation. The flowers of L. Heckrottii, although not fragrant, are very beautiful; the outer surface of the corolla is deep rose color and the inner surface is pale yellow, closed buds and open flowers occurring together in the same cluster and making a beautiful contrast of color.
The leaves of many of the climbing Honeysuckles are often disfigured by attacks of an aphid and can only be kept in good condition by careful spraying early in the season and just as the leaves are unfolding.

The Bush Honeysuckles are now the handsomest plants in the Arboretum with ripe fruits. They produce fruit in great quantities and it remains in good condition for several weeks, and as the different species ripen their fruit from now until October the second period of their beauty is a long one. On different species and hybrids there are blue, black, orange, yellow, crimson and scarlet fruits, and these beautiful and abundant fruits following beautiful flowers make some of the Bush Honeysuckles extremely desirable garden plants especially in the northern United States where they are very hardy and where they appear to fruit more freely than in other parts of the world. The orange-yellow translucent fruit of *Lonicera minutilflora* is one of the most beautiful perhaps in the collection. This plant is a hybrid between the Tartarian Honeysuckle from central Asia and a species from eastern Siberia, *L. Morrowii*. *L. muscaviensis*, another hybrid, is covered with large and translucent scarlet fruit. The fruit of the Tartarian Honeysuckles on some plants is red and on others bright yellow. Two hybrids of this species, *L. bella* and *L. notha*, bear crimson fruit. *L. xylosteum* bears large, dark crimson, lustrous fruit, and a hybrid of it, *L. xylosteoides*, large red fruit. All the numerous forms of *L. coerules*, a species which is found in all the colder parts of the northern hemisphere, have bright blue fruit, and that of *L. orientalis* is black and lustrous. No group of shrubs in the Arboretum is more worthy of the careful attention of persons who desire to form collections of large, fast-growing, hardy shrubs beautiful when covered in early spring with innumerable flowers or in early summer when their showy fruits are ripe.

The fruit of *Eleagnus longipes* is now ripe and will continue to remain on the plants for several weeks. This hardy Japanese shrub flowers and fruits here profusely. The fruit hangs gracefully on long slender stems and is oblong, nearly three-quarters of an inch in length, scarlet, lustrous and covered with small white dots. It has a tart and rather agreeable flavor, and is sometimes used in cooking. Specimens of this plant can be seen on the right-hand side of the Bussey Hill Road above the Lilacs in the Eleagnus Group.

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

The Arboretum will be grateful for any publicity given these Bulletins.
The largest genus of summer-flowering trees here is Tilia, the Lindens, which are now at the height of their flowering time although the flowers of a few of the species are already fading and those of some others are just opening. The genus is widely and generally distributed in all the temperate parts of the northern hemisphere with the exception of western North America and the Himalayas. Between forty and fifty species and several hybrids are recognized, for hybrids and supposed hybrids in Tilia are common, and among these hybrids are some of the handsomest and most rapid-growing of all Lindens. Although Lindens are much planted for the embellishment of parks and as street trees there is great confusion, especially in the United States, in regard to the different forms which are cultivated, and this confusion in so far as it relates to the European species was imported from Europe with the trees, for Linnaeus and many botanists after him believed that the Lindens of northern and western Europe were only forms of one tree, and so started the trouble.

In eastern North America there are seven species of Linden trees; four of these are from the extreme south and either are not hardy in the Arboretum or have been tried here during such a short time that they need not now be considered. The Linden of the north, *T. americana*, is a splendid great tree growing to its largest size on rich hillsides and moist bottom-lands, and showing its greatest beauty in the forests of New Brunswick, northern New England, and the valley of the St. Lawrence River. This tree may be easily distinguished from the other Lindens by the green and shining lower surface of the leaves which has no hairy covering with the exception of rather conspicuous tufts in the axils of the principal veins. This tree has been somewhat planted in eastern Massachusetts but less frequently than in the neighborhood of more northern cities. Here, especially in dry summers, the leaves are sometimes made brown by the red spider which, however, is easily controlled by spraying. *Tilia spectabilis*, which is believed to be a hybrid between this tree and *Tilia tomentosa* of eastern Europe, is a very vigorous and fast-growing tree of much promise. In some European nurseries it is sold under the name of *Tilia Moltki*. *Tilia flavescens*, usually found in nurseries under the name of *T. floribunda*, is a supposed hybrid between *T. americana* and the European *T. cordata*. This tree is remarkable in its rather small, thick and very lustrous leaves, and large flowers. Plants only a few feet high flower profusely.

The second North American Linden tree, *T. alba*, or, as it is often called, *T. Michauxii*, although it was first distinguished and made known nearly a century ago, was long overlooked or misunderstood by botanists; and it is only in recent years that this handsome tree has been found to be widely distributed from the valley of the St. Lawrence River to Georgia and Arkansas. It may be distinguished from *T. americana* by the pale lower surface of the leaves, which is more or less covered with star-shaped clusters of white hairs. This tree is now well established in the Arboretum, although the plants are not old enough to flower.

The third of our northern Lindens, *T. heterophylla*, is a species of the Appalachian Mountains and is distributed from western New York to northern Alabama, and through Kentucky to southern Indiana and Illinois, growing to its greatest beauty and to its largest size in the forests which cover the slopes of the mountains of North Carolina and Tennessee.
The leaves of this tree are larger than those of the other Lindens, and as they are silvery white on the lower surface and hang on long slender stalks the slightest breeze makes them turn first one surface and then the other to the eye. This hardy and beautiful tree appears to be rarely cultivated.

All the European Lindens succeed in the eastern states where they have been more generally planted than the American species and where there are large and old specimens of some of the species in the neighborhood of the seaside cities. There are five European Lindens and it is among these and their hybrids that exists the greatest confusion in the minds of the cultivators of these trees. Probably the most widely distributed of the European species, especially in the south, is *Tilia platyphyllos*. This tree may be recognized by the yellow tinge of the leaves and the thick covering of short hairs on their lower surface and on their stalks, and by the prominent ribs of the fruit. This is the earliest of all Linden trees to flower here, the flowers having been fading for the last ten days, and it is this tree which now appears to be most commonly sold in American nurseries as the European Linden. There are varieties with leaves larger than those of the type (var. *grandifolia*), with erect branches forming a broad pyramidal head (var. *pyramidata*), and with variously divided leaves (var. *lanceolata* and *vitifolia*).

A more beautiful tree is *Tilia cordata*, the common Linden of northern Europe where it sometimes grows to a very large size, the old historic Lindens of the northern and central parts of the continent being usually of this species. This tree is distinguished by its small, thin, more or less heart-shaped leaves which are pale on the lower surface and furnished with conspicuous tufts of rusty brown hairs in the axils of the principal veins. It appears to have been little planted in the United States, and in the neighborhood of Boston it is the rarest of the Lindens of western Europe. It is, however, a hardy and desirable tree especially valuable on account of its late flowers which supply the bees with food after those of all other Lindens have passed. There is a large-leaved form of this tree (var. *cordifolia*) from western Europe in the collection which is a handsome and vigorous plant of much promise. This is sometimes sold in European nurseries as *T. europaea* or *vulgaris*.

The third European Linden, called variously *T. vulgaris*, *T. europaea*, *T. intermedia* and *T. hybrida*, is considered by some of the best observers of European trees a natural hybrid between *T. platyphylllos* and *T. cordata*. Although widely distributed in Europe, it appears to be much less common than either of its supposed parents, and the variation in the size, shape and color of the leaves make its hybrid origin possible. On some individuals the lower surface of the leaves is quite green and on others it is bluish or even whitish, but leaves on different parts of the same branch differ in this respect and on shoots produced from the bases of old trees the large leaves are quite green. *T. vulgaris* is a fine round-headed tree with rather small somewhat pendulous branches, and it appears to have been more often planted in the neighborhood of Boston than any other Linden. There are a number of large specimens in front of an old house on Centre Street near Orchard Street, Jamaica Plain, and in Olmsted Park. The flowers of this tree are now fading, so in its flowering time it is intermediate between its two supposed parents. There is another supposed hybrid of the same parentage and a native of Hungary, known as *T. vulgaris* var. *pallida*. This tree has larger leaves pale on the lower surface, and in habit and general appearance resembles *T. platyphylllos* more than the commoner forms of.
T. vulgaris. It is propagated in some of the Dutch nurseries where it is sold as T. vulgaris or europaea, and in the Arboretum collection it is the most rapid growing and the most shapely of all the species and hybrids, giving promise of becoming an excellent street tree for this region.

Two Linden trees are found only in eastern Europe, the silver Linden, T. tomentosa or argentea, as it is sometimes called, and T. petiolaris. The Silver Linden is a tree with erect branches forming a broad, compact, round-topped formal head, and large erect leaves dark green and lustrous above and white and covered below with short thick felt. This distinct and handsome tree has not been much planted in eastern Massachusetts but it can be often seen in the neighborhood of New York and Philadelphia, and there are a number of good specimens in Central and Prospect Parks. T. petiolaris is a more beautiful tree; this also has leaves which are silvery white on the lower surface but they hang down on long slender stalks and flutter gracefully in the breeze. The branches, which are also pendulous, form a rather narrow but open head. This tree is not known in a wild state and all the plants in cultivation have been derived from a single individual found ninety years ago in a garden in Odessa. This beautiful tree appears to have been more often planted near Boston than the Silver Linden, but is still rare and little known here. A supposed hybrid of this tree with T. americana and sometimes sold in nurseries as T. alba spectabilis is one of the most rapid-growing of the Lindens and a very handsome tree with the leaves of the size and shape of its American parent but silvery white on their lower surface. Plants raised at the Arboretum from the seeds of a tree of T. petiolaris which was growing in the neighborhood of T. Americana, the two flowering at the same time, are identical with trees of this hybrid found in European nurseries. T. vestita is probably the proper name for it.

Much attention in late years has been paid in Europe to another supposed hybrid Linden, T. euchlora, or as it is more generally known, T. dasystyla. This is a pyramidal tree, with large dark green leaves lustrous on their upper surface. It grows rapidly; its habit is good, and it is now largely planted as a street tree in Germany and Holland. Its origin is uncertain although usually considered a hybrid of the little known T. rubra of the Caucasus. T. euchlora is perfectly hardy here and promises to be a useful tree in New England.

As a rule the trees of eastern Asia grow much better in the eastern United States than the related species of Europe, but this is not true of the Lindens. All the European Lindens flourish here but none of the Asiatic species give much promise yet of being handsome or valuable trees in this climate. Those which have been tried here are hardy but they suffer from various fungal diseases and are short-lived. It is too soon, of course, to form an opinion on the value of the Lindens recently discovered in western China, but of those of eastern Siberia, northern China and Japan only T. japonica has proved really satisfactory here. This is a small tree with pendulous branches, related to T. cordata, of which it has sometimes been considered a variety. It has no special ornamental value, although it is perfectly hardy and healthy and flowers and produces fruit in the Arboretum every year.

The Arboretum will be grateful for any publicity given these Bulletins.
No. 31

ARNOLD ARBORETUM
HARVARD UNIVERSITY

BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.
JULY 17, 1912
A few interesting trees flower in the Arboretum after the middle of summer. The first of these is already in bloom. This is the Chinese *Koelreuteria paniculata*, a small tree with large, handsome, pinnate leaves and large erect clusters of bright yellow flowers which are followed by conspicuous bladder-like fruits. No other tree has flowers of a more beautiful yellow color, and no other summer-blooming tree here is so conspicuous when it flowers. *Koelreuteria* is much cultivated in the gardens of Peking, and in western China it is common in hot dry valleys. It is therefore well suited to withstand heat and drought as well as cold. It can be seen on the right-hand side of the Meadow Road between the Evonymus and Horsechestnut groups, its relationship being with the Horsechestnuts and with the Maples.

Another Chinese tree will soon be in flower. This is *Sophora japonica*, a member of the Pea Family, with green branchlets, very dark green pinnate leaves and narrow erect clusters of creamy white flowers. The very large and old individuals of this tree with dark, deeply-furrowed bark which are growing in Peking look at a little distance like Oak trees. First known by Europeans in Japan it was called, like some other Chinese plants, *japonica*, although it was brought from China to Japan with many other plants cultivated by the Japanese and is not a native of the Island Empire. There is a form of this tree with weeping branches which rarely flowers. These trees can be seen on the right-hand side of the Bussey Hill Road opposite the head of the Lilac Group. There is also a fine specimen of *Sophora japonica* in the Public Garden of Boston.

Next to the Sophoras there is a group of the eastern Siberian *Maackia amurensis*, which is now in flower. This is a small tree and the only representative of its genus related to the eastern American and Chinese Cladrastis or Yellowwood. *Maackia*, however, has reddish bark, much smaller leaves, short erect spikes of creamy white inconspicuous flowers and scaly buds. Of much interest botanically, *Maackia* is of little ornamental value and probably will never be very often seen in this country outside of botanical collections.

Much more conspicuous and an object of great interest always to visitors to the Arboretum is *Acanthopanax ricinifolium*. This member of the Aralia Family is not an uncommon inhabitant of the forests of the northern island of Japan and grows also in Korea; it is a large tree with dark deeply furrowed bark, stout spreading branches which, however, are nearly erect on young trees and more or less armed like the trunk with short stout spines, and large, palmately lobed dark green leaves drooping on long stalks. In size and shape the leaves resemble those of the Castor-oil plant, *Ricinus*, a fact to which this tree owes its specific name. The small white flowers are produced in broad, flat, compound clusters and are followed in the autumn by shining black, berry-like fruits. *Acanthopanax ricinifolium* was raised at the Arboretum from seeds brought from Japan in 1892 by Professor Sargent; it has grown here rapidly and is perfectly hardy. There are two plants in the Aralia Group by the pond at the junction of the Meadow and Bussey Hill Roads, and there is a plant beyond the Platanus Group at the Centre Street entrance, and another in the mixed plantation on Peter's Hill.

Two other trees of the Aralia Family are also still to flower. These are the Hercules’ Club, *Aralia spinosa* of the southern states, and its
near relative from eastern Siberia, *Aralia mandshurica*, still sometimes found in nurseries under the name of Dimorphanthus. The Hercules' Club grows sometimes thirty feet high, with a slender stem armed like the branches with stout prickles. The leaves are twice pinnate, from three to four feet long, and two and a half feet wide, and the small white flowers are borne on long slender stems in many-flowered clusters arranged in broad twice compound panicles three or four feet in length, rising singly or in pairs above the spreading leaves. The flowers are followed by great clusters of small black fruits which ripen in the early autumn. No other tree of temperate North America has such a tropical aspect as this Aralia, which is not always entirely hardy in New England although it is now well established at the northern base of Hemlock Hill, just back of the Laurels, where it has spread by suckers from the roots. Its Manchurian relative, which greatly resembles the American tree, is hardier here and can be seen in the border between the drive and walk next to the Liquidambars and in the Aralia Group.

Another North American tree, the sorrel-tree or Sourwood, *Oxydendrum arboreum*, is now covered with flower-buds. This beautiful and interesting tree belongs to the Heath Family and is the only representative of its genus. On the rich slopes of the southern Appalachian Mountains it sometimes rises to a height of thirty feet or more, although in cultivation at the north it begins to flower when only a few feet high and will probably never become a large tree. The leaves are oblong, bright green and very lustrous, and have a pleasant acidulous flavor to which this tree owes its common names. The white flowers, which are shaped like those of the Andromedas, are erect on the branches of a terminal, spreading or slightly drooping, compound cluster seven or eight inches long; they retain their beauty for a long time and are followed by capsular fruits. The leaves of this tree turn in the autumn bright scarlet. The Sorrel-tree appears to be free from the attacks of all insects; it does not suffer from disease, and it is surprising that such a handsome, hardy and interesting tree should be so little known. There are a number of individuals among the Laurels at the northern base of Hemlock Hill.

With the early flowering Japanese forms of *Hydrangea paniculata* (var. *praecox*) mentioned in a recent Bulletin, *Aesculus parviflora* is now the most conspicuous shrub in flower in the Arboretum. This native of the southeastern United States is the last of the Horsechestnuts to flower. It is a shrub which in cultivation sometimes spreads to a diameter of twenty feet or more but rarely attains a greater height than six or eight feet. It is a good plant to use as a single specimen as it is perfectly symmetrical in habit, or, as has been done in the Arboretum, it can be planted in masses. The plants are now covered with long narrow spikes of small creamy white flowers which stand erect above the dark green foliage. A group of this Horsechestnut can be seen with the other Horsechestnuts on the right-hand side of the Meadow Road at the base of the woody hill which rises at the southwestern extremity of the north meadow.

The Pepperbush, *Clethra alnifolia*, will soon open its fragrant white flowers which are borne in erect, terminal, compound clusters. This is perhaps the most beautiful of the summer flowering shrubs of New England and is a common inhabitant of swamp borders and other wet places in the neighborhood of the coast from Maine to Florida. The Pepperbush can be seen along the Meadow Road where it has been largely planted, and in the Shrub Collection. A form with flowers faintly
tinged with rose was found near Fall River, Massachusetts, a few years ago and has been introduced into the Arboretum. Another species, a native of Florida, *C. tomentosa*, has proved hardy in the Arboretum, and is valuable as it flowers two or three weeks later than the northern Pepperbush from which it chiefly differs in the covering of white hairs on the lower surface of the leaves. The third American species, *C. acuminata*, an inhabitant of the forests of the southern Appalachian Mountains, has dull green leaves and drooping clusters of yellowish white flowers, and is a much less desirable garden plant. It can be seen with the others in the Shrub Collection and on the right-hand side of the Meadow Road near the Phellodendron Group. The Japanese species, *C. canescens*, lives in the Arboretum but has not proved very hardy here and has not flowered, although it has been more successful in other Massachusetts gardens where it produces freely its beautiful fragrant flowers.

Only a few forms of the large genus *Yucca*, which has its headquarters in the southwestern part of the United States, in Mexico and in Central America, are hardy in the Arboretum where they can be seen in the Shrub Collection. The common *Yucca* of American gardens is *Y. flaccida*, with thin reflexed leaves gradually narrowed from below the middle to the apex and separating on the margins into straight thin threads. In gardens, however, it generally appears under the name of *Y. filamentosa*, a species with thicker and more rigid leaves usually broadest above the middle, and separating on the margins into coarser curled threads. *Y. flaccida* is a native of the southern Appalachian foothill region and is probably the hardiest of all the Yuccas. It is now in full flower, as well as the form with leaves striped with yellow (var. *lineata*) which is usually found in gardens under the name of *Y. filamentosa variegata*. A fine and vigorous form of *Y. flaccida* from Stone Mountain, Georgia, (var. *patens*) is also in flower. There are also in the collection the true *Y. filamentosa* of the coast plains of the southeastern United States and its variety *concava*, found from the coast of Maryland southward, and *Yucca glauca*. This last is a plant with narrow leaves and is common and widely distributed over the high plains at the eastern base of the Rocky Mountains from Wyoming southward. This handsome plant is perfectly hardy here but has not flowered in the Arboretum.

*Indigofera Kirilowii* mentioned in a recent Bulletin has continued to grow and to produce its racemes of bright pink flowers in spite of the drought of June and early July which has been one of the most severe the Arboretum has experienced. This Korean shrub remains a long time in bloom. Its habit and foliage are excellent, and it gives every promise of being a valuable addition to the list of summer flowering shrubs. Two other species of this genus are now flowering on Azalea Path, *I. decora* from China and Japan, with pure white flowers, and *I. Gerardi-ana* with purple flowers, a native of the Himalayas. The low stems of these plants are killed to the ground every winter but new ones appear in the spring and growing rapidly flower freely at this time. *I. decora* is the more beautiful of the two and well worth a place on the margin of any shrubbery or in the herbaceous border.

These Bulletins will now be discontinued until the autumn.

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

BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

OCTOBER 17, 1912
BULLETIN NO. 32.

The number of woody plants that produce flowers in New England after the middle of October is not large. The most important of them is, of course, the native Witch Hazel (*Hamamelis virginiana*) which is a true autumn bloomer, that is, it does not begin to flower until after the first of October. Its small clusters of flowers with their long pale yellow strap-shaped petals are now partly hidden by the leaves which are bright yellow and very conspicuous. As the leaves fall the flowers seem to cover the branches and form one of the most interesting features of the autumn flora of the northern United States. Occasionally a plant can be found in flower with leaves still retaining their summer color. and on such plants the beauty of the flowers is increased by the contrast between the bright green leaves and the yellow flowers. There is another species of Witch Hazel in southern Missouri and Arkansas which blooms in early spring, and the two Japanese species and the species of central and western China are also spring bloomers. The Witch Hazel Group, containing besides *Hamamelis*, the Sweet Gum, Liquidambar and Fothergilla, is on the south side of Meadow Road at its junction with the Bussey Hill Road. Large specimens of *Parrotia persica*, a shrub or small tree of this family, can be seen on Hickory Path near Centre Street. This plant grows in the Arboretum into a broad round-headed shrub with erect stems and, as the flowers and fruits are not conspicuous, is chiefly valuable for the orange and scarlet tints assumed in autumn by its ample leaves.

A plant still in flower is *Lonicera Heckrottii*. This is one of the climbing Honeysuckles and is of hybrid origin. It was described in Bulletin No. 29, issued on July 2nd last, when it had already been in flower two or three weeks. From the middle of June until the middle of October it has been covered with flowers. Although not fragrant, they are very beautiful; the outer surface of the corolla is deep rose color and the inner surface is pale yellow, and as closed buds and open flowers appear together in the same cluster beautiful contrasts of color are produced. This vine flowers more constantly and more persistently than any other plant in the Arboretum, and it might well find a place in every New England garden in which beautiful flowers are valued. A few belated flowers are still opening on the climbing semi-evergreen, Hall’s Japanese Honeysuckle (*Lonicera japonica Halliana*), and on the still more beautiful Chinese form of the same species, *L. japonica chinensis*, distinguished by the red color of the young stems and leaves. Two eastern American species of climbing Honeysuckles, *L. hirsuta* and *L. prolifera*, are interesting at this time as they are covered with compact clusters of bright red fruits surrounded by the cups formed by the union of the two upper leaves. These climbing Honeysuckles are on the trellis at the north end of the Shrub Collection. The leaves of many of the climbing Honeysuckles are often disfigured by the attacks of an aphis and can only be kept in good condition by careful spraying early in the season and just as the leaves are unfolding.

A few belated flowers are still to be found on the lovely *Daphne cneorum* of the mountains of central Europe. The prostrate stems of this little shrub are covered with light green leaves which persist during the winter and in early spring bear terminal compact clusters of delightfully
fragrant rose-colored flowers. In summer a nearly full second crop of flowers is sometimes produced, and flowers occasionally continue to appear until November. This Daphne is one of the most attractive of the evergreen shrubs which can be grown in this climate. It is usually perfectly hardy but sometimes suffers in winter, and as often in mild as in exceptionally severe winters. It is rather capricious, too, in matters of soil and situation, flourishing for years in some gardens and failing in others.

There are flowers, too, on some of the forms of the Heather (Calluna vulgaris) in the Shrub Collection, and the Cornish Heath, Erica vagans, which has been covered with flowers during the last two months, is still flowering abundantly. This is one of the few Heaths which can be grown in New England. Equally hardy is the red-flowered Erica carnea which blooms in early spring and only for a short time. This is a smaller plant than E. vagans and a native of the Alps of central Europe; while the Cornish Heath, of which there are both red and white-flowered forms, is rather widely distributed in western Europe.

There are still flowers on the plant of Vitex inceisa in the Shrub Collection. This is a member of the Verbena Family and a native of northern China and Mongolia. It is a large shrub of open graceful habit, with compound leaves and erect clusters of small bright blue flowers, and is valuable for its good habit, attractive leaves, and late flowers. It is not so showy, however, in flower as the Chaste Tree, Vitex Agnus-castus, a native of southern Europe and western Asia which, unfortunately, is not hardy in New England.

Abelia grandiflora is flowering on Hickory Path near Centre Street. Abelia is a genus related to the Honeysuckles, of some twenty-five species in eastern Asia and a single representative in Mexico. Several species have been recently introduced into the Arboretum by Wilson from western China and some of these lived through last winter in the open ground. It is too soon, however, to speak of their value here as garden plants; and the only plant of this interesting genus which can now be depended upon here is A. grandiflora. This is a hybrid between two Chinese species, A. chinensis and A. uniflora, and is found in gardens under a number of names. It seems, however, to be most often cultivated as A. rupestris. This is the Mexican species which is sometimes grown in greenhouses in this country and in the gardens of southern Europe. A. grandiflora is a shrub from two to three feet high with slender arching branches, small pointed leaves dark green and very lustrous on the upper surface and paler on the lower surface, and axillary clusters of small pale pink tubular flowers. The leaves do not fall until the beginning of winter; and their semi-persistent character, the autumnal flowers and excellent habit of this little plant make it a desirable subject for the rock garden or the margins of shrubberies.

It is not, however, the occasional flowers which can be found in the Arboretum in the middle of October which chiefly make it interesting at this time, but the Autumn condition of the trees and shrubs which flower in the spring or summer. Valuable lessons in decorative gardening can now be learnt here, for nowhere else are the colors assumed by the fading leaves of hardy trees and shrubs more varied and interesting; no other part of the world can equal the northeastern United States in the abundance of the fruits produced by these plants, and in New England the most beautiful of all autumn gardens can be made.
The difference between eastern North America and western Europe in the autumn coloring of the native plants of these two regions is now well shown in the Arboretum. The leaves of the plants of eastern North America are now for the most part brilliantly colored or have colored and fallen, while the leaves of the trees and shrubs of Europe are still green, and in the case of many of these plants the leaves fall and wither with little change of color. This interesting fact is seen in the American species of the genus Fagus. The American Beech now enlivens the forest with the yellow tints of its leaves, while the leaves of the European Beech are still almost as green as they were at midsummer. The leaves of the American Elm have already fallen except in the case of vigorous trees which still show the yellow tints of autumn, while the leaves of all forms of European and Asiatic Elms are still fresh and green. The leaves of Viburnum Lantana, the Wayfaring-tree of Europe, are still dark green or only slightly tinged with red along the margins, while the North American Viburnum Lentago, V. prunifolium and V. cassinoides are splendid in their autumn dress which is set off by their dark blue fruits. The contrast between old and new world plants in this respect is even more marked in the Viburnums of the Opulus group. Of these the leaves of the European Viburnum Opulus are still dark green and as fresh as in July; those of V. americanum, the native High-bush Cranberry, so-called, have turned to shades of yellow and red and are fast falling, while those of V. Sargentii of northeastern Asia, which were bright orange-red two weeks ago, have almost disappeared.

Many of the trees and shrubs of eastern Asia, however, are as brilliant in color in autumn as those of related American species. On a few Asiatic plants the autumn foliage is even more beautiful than that of the American plants in the same genus. The collection of grapes (Vitis) illustrates this fact. This collection, which is now well established on the trellis at the east end of the Shrub Collection, is one of the most successful groups in the Arboretum, and is particularly valuable in showing the decorative value of many of the grapevines of eastern America which have not before been often cultivated. The autumn leaves of American species turn yellow or remain green until touched by frost, to which they are very sensitive, but on the principal Japanese species, Vitis Coignetiae, a large and vigorous vine with immense semicoriaceous leaves, the leaves in the autumn turn brilliant scarlet. They are not always as brilliant here, however, as they are this season for Vitis Coignetiae is a plant from the far north and it is possible that the climate of eastern Massachusetts is not severe enough to bring out every year all its autumnal beauty. It is, however, one of the handsomest of the grapevines in the Arboretum collection, and for Canada and other cold regions it may be expected to become the most valuable of hardy vines.

The Arboretum will be grateful for any publicity given these Bulletins.
Attention is called in this Bulletin to a number of plants which are beautiful in the autumn from the brilliant color of their leaves and which are not generally cultivated in New England.

One of the most brilliant of all trees in autumn here is the Liquidamber or Sweet Gum (*Liquidambar Styraciflua*). This eastern American tree grows as far north as southern Connecticut and in the south, especially in the maritime region of the southern Atlantic states, and in the lower Mississippi valley it is one of the commonest of the trees of the forests on the bottom-lands of rivers where it sometimes grows to the height of more than one hundred and fifty feet. It is a tree with a tall straight trunk and short branches which form a narrow pyramidal head and are furnished for several years on their upper side with broad corky wings. The flowers and the fruit are not conspicuous, and the great beauty of this tree is found in its habit and in the leaves; these hang on long stalks and are generally rounded in outline with a square or slightly heart-shaped base and are deeply five- to seven-lobed, the lobes being acutely pointed. The leaves are thin and very lustrous on the upper surface and in autumn turn deep crimson. There is a species of Liquidamber in southwestern Asia which produces the Liquidamber of commerce, another in Central America, and two Chinese species. The two Chinese species are both growing in the Arboretum and there is a probability that one of these, *L. formosana*, will prove hardy here. This is the tree which produces much of the wood used for Chinese tea-boxes. There are several individuals of the American Liquidamber in the Arboretum, the two largest specimens being in the Witch Hazel group near the junction of the Meadow and Bussey Hill Roads.

The Sour-wood or Sorrel-tree, *Oxydendrum arboreum*, is another American tree which is too rarely found in cultivation. It is the only representative of the genus which belongs to the Heath Family, and in favorable surroundings on the Appalachian Mountains sometimes becomes fifty or sixty feet tall. It is, however, much smaller in cultivation at the north and begins to flower when only a few feet high. This tree owes its common name to the acid juices of the leaves which protect them from insects and this adds to its value. It is valuable, too, because the white flowers, erect on the drooping branches of large clusters terminal on axillary branches of the year, do not appear until midsummer when few woody plants are in flower and because the leaves in autumn turn bright scarlet in striking contrast to the clusters of white, dry, pointed, capsular fruits. This southern tree is perfectly hardy in New England where it should be more generally planted. There is a group of the Sour-wood among the Laurels at the base of Hemlock Hill.

Better known in this part of the country than the Liquidamber and the Sorrel-tree, the Flowering Dogwood (*Cornus florida*) might well be planted more generally than it has been, for there is no more beautiful inhabitant of the woods of eastern North America. The inflorescence, with its pure white floral bracts which appear before the leaves unfold, lights up the forests in early spring and in the autumn when
the clusters of shining scarlet fruits are ripe and the leaves have turned scarlet no other small tree is more beautiful here.

The leaves of the Scarlet Oak (Quercus coccinea) are still green, or are only just beginning to turn, but in a short time this tree will be the most brilliant in color of all the Oaks which can be grown in this region. The Scarlet Oak is comparatively rare in the immediate neighborhood of Boston, but in Plymouth County it is, perhaps, the most common Oak tree, and the autumn splendor of the woods in which this tree abounds will well repay a late October visit to the Old Colony.

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

Almost as brilliant here as the Highbush Blueberry are the Japanese species of Enkianthus which are established on the lower side of Azalea Path. The largest of these, Enkianthus campanulatus, is a tall narrow shrub with slender erect stems and drooping clusters of pale, Heath-like flowers. Like the other species its greatest beauty, however, is in the autumn when the leaves turn bright scarlet. This plant and Enkianthus japonicus, a much dwarfer species, are found in all Japanese gardens where they are grown for the colors of their autumn foliage. Although perfectly hardy and in every way satisfactory plants, the different species of Enkianthus are rarely found in American gardens.

One of the most interesting shrubs in the Arboretum in early autumn is the eastern Asiatic Evonymus alatus for, unlike those of any other plant in the collection, the leaves turn a clear rose color. This is a large, wide-screading, rather compact shrub with branches furnished with broad corky ridges and inconspicuous flowers and fruits. Its fine habit and the unusual color of the leaves in autumn are its chief claims for attention. Unfortunately the leaves fall early and their period of beauty is short. There is a large plant in the Evonymus group on the right-hand side of the Meadow Road and another on the left-hand side of the Bussey Hill Road above the Lilacs.

Of the shrubs with leaves which turn orange and scarlet in the autumn the most conspicuous now is Fothergilla major. Fothergilla is a genus related to the Witch Hazels and is found only in the southeastern United States where four species have been distinguished; they bear leaves which generally resemble those of the Witch Hazels and showy terminal heads of small white flowers which appear in spring before the leaves. The largest and the handsomest of the species, Fothergilla major, sometimes grows to be ten or twelve feet high, and it is the tallest of the species which is cultivated here. This and the related Fothergilla monticola are mountain species and very hardy here.
are smaller plants from the southern coast region and require especial
winter care.

Every one in New England interested in gardens knows the brilliant
autumn colors of the Japanese *Berberis Thunbergii* which has been
much planted here in recent years and is now an extremely popular
garden shrub. Some other Asiatic Barberries, although still little
known here, are equally beautiful at this season of the year. The
dwarf form of *Berberis Thunbergii* (var. *microphylla*), of dwarfer habit
and smaller leaves, which originated in the Arboretum several years
ago, is an attractive little plant, and a Japanese variety of the species
(var. *Maximowiczii*) is a larger plant than the type, with arching stems,
larger leaves and larger flowers and fruits. In the autumn the color of
the leaves is as beautiful as those of *Berberis Thunbergii*. But probably
the handsomest of all the Barberries which are hardy in this climate is
the Japanese *Berberis Regeliana*. This is a large shrub with the habit of
the common Barberry, but the leaves are larger and more lustrous, the
fragrant flowers are larger and of rather a paler shade of yellow, and
the fruit is more brilliant; in the autumn the leaves turn orange and
scarlet. This Barberry was among the first of the Japanese shrubs
brought into American gardens as it was cultivated at the Parsons’ Nur-
sery on Long Island fully fifty years ago and was then known and dis-
tributed as *Berberis Hakodate*. It appears, however, to be still very
rare in the United States and Europe. There is a large clump of this
species among the Barberries on Hickory Path near Centre Street.

Another Japanese Barberry, *Berberis Sieboldii*, is well worth a place
in every collection for the beauty of its deep dull red autumn foliage.
This is a smaller shrub with erect stems forming a round-topped head,
large flowers in few-flowered clusters, and large shining fruits.

There is now a large number of new Chinese species of Barberry in the
Arboretum but the value of many of these as garden plants here is not
known. Two Chinese species, *Berberis diaphana* and *B. dictyophylla*
which were discovered a few years ago by French Missionaries who sent
them to France whence they reached the Arboretum, are now known to
be plants of exceptional value. *Berberis diaphana* is a low round shrub
with solitary pale yellow flowers which are followed by large red fruits.
The habit of this plant is unusual among Barberries and make it valu-
able in small shrubberies. Its greatest beauty, however, is in the au-
tumn color of the leaves which is not surpassed in brilliancy by that
of any other Barberry. *Berberis dictyophylla* is a tall shrub with slen-
der erect stems which form an open irregular head, small spiny leaves
which are light green on the upper surface and silvery white below,
large pale yellow flowers solitary or in pairs and red fruit. This shrub
is attractive throughout the season and is particularly beautiful in the
late autumn when the upper side of the leaves turns scarlet and the
lower side retains its silver color, a condition which is found in a few
other plants and is always attractive. These Barberries are established
in the Shrub Collection and can be found in the supplementary Barberry
collection on Hickory Path.

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

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To the general rule that the leaves of European trees are not brilliantly colored in the autumn in comparison with those of eastern North American and eastern Asiatic trees of the same genera there are a few exceptions. The most conspicuous of these exceptions is perhaps found in the so-called Norway Maple (*Acer platanoides*), a large tree of northern and central Europe which has been much planted in the northern and middle states where it succeeds better than most European trees. This tree almost equals the native Sugar Maple in the bright clear yellow tints of its fading leaves which do not take on their greatest beauty until after those of the Sugar Maple have mostly fallen. This tree is very beautiful, too, in the early spring when the leafless branches are covered with dense clusters of bright yellow flowers. In cultivation a number of seedling forms of this tree have been developed and many of the most important of these are established in the Maple Group. The best known of these horticultural varieties is the form with purple leaves (var. *Schwedleri*) which has been often planted in this country. The leaves of this form are deep reddish purple early in spring, but their color is not persistent and nearly disappears before midsummer, leaving the leaves a dull shade of green. The var.* globosum* is a broad shrub only a few feet high and one of the most valuable of all the dwarf Maples. There is an unusually fine specimen of this form in the collection. The var.* columnare* is a pyramidal tree with erect branches, and the var.* nanum*, sometimes known in gardens as *Acer platanoides pyramidal* *nanum*, is dwarfer than the last mentioned variety and is an attractive and useful plant for small gardens. There are several forms of this tree with deeply divided or otherwise abnormal leaves. Some of these are var.* laciniatum*, the Eagle-Claw Maple, var.* eucullatum* and var.* palmatum*.

The American Horsechestnuts lose their leaves early and without much change of color, although occasionally those of the Ohio Buckeye (*Aesculus glabra*), when the tree is grown under exceedingly good conditions, turn bright red early in October. The tree from the south of Greece, however, the familiar and common Horsechestnut of parks and gardens and one of the most splendid of all hardy trees holds its leaves later than any of the American species, and on trees grown in damp moist soil they are only now beginning to fall after having turned bright yellow.

The American Lindens have now lost their leaves, but those of one species from western Europe, *Tilia petiolaris*, are only just falling, having first turned bright yellow. This is a handsome tree with rather pendulous branches and leaves which are silvery white on their lower surface and hang on long drooping stalks. This is not a very common tree in the neighborhood of Boston but it was largely planted on many estates in Newport, Rhode Island, from fifty to seventy years ago and some of these Newport trees have grown into beautiful specimens.

The three European Oaks which are usually cultivated in the eastern United States, *Quercus pedunculata*, *Q. sessiliflora*, and *Q. Cerris*, the
Turkey Oak, hold their leaves late and show no bright autumn colors. These three trees grow very rapidly here while they are young but are short-lived as the stems are usually cracked by the cold and, like the European Ash (*Fraxinus excelsior*) and the Sycamore Maple (*Acer Pseudoplatanus*), they are unsatisfactory to plant in New England. One of the Oaks of western Europe, *Quercus conferta*, or, as it is often called, *Q. pannonica*, promises to be a much more valuable tree here. This is a large and common forest tree in some parts of Hungary and is easily distinguished by the leaves which are deeply divided into numerous narrow lobes and which turn bright yellow at this season. It is a perfectly hardy, shapely, fast-growing tree which promises to succeed in this region as it has in western Europe, and it is surprising that it is still so little known and so seldom planted in the United States. The largest plant in this country which has been reported to the Arboretum is growing on what was formerly the estate of George W. Carpenter in Germantown, Pennsylvania, and is now about forty feet high. Mr. Carpenter, who was a lover of trees and had a large collection of them, was a friend of Thomas Nuttall, the distinguished botanist, who paid him frequent visits about 1880 and probably procured this then little known tree for him. There is a fine specimen, too, on the estate of Mr. John T. Morris at Chestnut Hill, Philadelphia, which produces acorns freely, but outside the Arboretum it does not appear to be growing in Massachusetts. The Hungarian Oak may be seen near Oak Path among the other exotic Oaks.

Five eastern Asiatic Oaks are well established in the Arboretum and nearly all of them produce fruit here; they are *Quercus crispula*, *Q. grosseserrata*, and *Q. glandulifera* from Japan, and *Q. dentata* and *Q. variabilis* from China and Japan. They are all interesting and attractive trees, and *Q. grosseserrata* will probably grow here, as it does in Japan, to a large size and become a valuable timber tree. The leaves of these Asiatic Oaks turn yellow or yellow and red in the autumn; they can be seen on Azalea and Oak Paths and on the left-hand side at the foot of Azalea Path where there is a large plantation of Asiatic Oaks. In this collection are the Oaks discovered by Wilson in western China; these are growing well and appear to be perfectly hardy, but it is too soon to speak of their value in this country.

The leaves of nearly all the Sumachs turn scarlet or red in the autumn. The last of them to lose its leaves is the native *Rhus copalina*. This plant at the north is a low shrub which spreads into thickets, but at the south, especially in southern Arkansas and in Texas, it sometimes becomes a slender tree thirty or forty feet high. The leaves are rather more lustrous than those of the other Sumachs, and this species can also be distinguished by the wings on the stalks between the leaflets. Few plants present a more brilliant appearance in the autumn when the leaves turn bright scarlet. In the Sumach group, which is on the east side of the Meadow Road, there is a plant which is of exceptional beauty in the autumn; this is the American Smoke-tree (*Cotinus americanus*). It is a rare tree found only in the south in a few isolated stations from northern Alabama to southwestern Missouri, eastern Oklahoma, and western Texas. In the Arboretum, where it grows
in the form of a large shrub rather than a tree, it is perfectly hardy in the most exposed positions. The flowers are small and the hairy stems of the fruit, which form the conspicuous "smoke" of the Old-World Smoke-tree, do not make much show; but the leaves are large and of a pleasing shade of green, and in the autumn turn orange and scarlet, making this one of the handsomest October plants in the Arboretum. This plant was introduced into cultivation by the Arboretum many years ago from northern Alabama and it is now often cultivated and much valued in Europe where it appears to be better known than in the United States. The bright orange-colored heartwood is very durable and yields an orange dye used in the south during the Civil War when most of the large trees were destroyed.

In the Shrub Collection the leaves of two currants are just turning scarlet. These are Ribes curvatum and the Chinese form of Ribes juss-ciculatum. Ribes curvatum is a little known plant found a few years ago in the neighborhood of Stone Mountain in central Georgia. It has long white flowers gracefully drooping on long stems and in cultivation has proved to be one of the attractive plants in the large collection of this genus. The beauty of the Chinese Currant at this season is increased by the bright red fruits which are still on the branches. It is the only representative of the genus in the collection with fruit which ripens in the autumn, and is well worth a place in every collection in which handsome autumn fruits are valued.

The Japanese and Chinese Wistaria, W. sinensis, is the species which is commonly cultivated in this country. The leaves are usually destroyed by frosts while they are still green, but the leaves of another Chinese species, W. multijuga usually turn a brilliant clear yellow before falling. This species, which is less commonly found in American gardens than W. sinensis, blooms later than that species and has longer flower clusters on which the flowers are set further apart and are more fragrant. It is a form of this species with abnormally long flower clusters which is so highly valued and so often cultivated by the Japanese. There are forms with pale blue, white and rose tinted flowers. This Chinese vine appears to be hardier than W. sinensis.

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

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

BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.
NOVEMBER 7, 1912
At this season one meets in Tokyo many vendors with bunches of leafless branches of a native Holly covered with small red berries, but in this country fruit-covered branches of hardy trees and shrubs are as yet little appreciated for the decoration of houses, although the branches of several of our plants are admirably suited to the purpose. The fruits of many of these retain their beauty for a long time and such decorations are much more economical than those made by the short-lived forced flowers of late autumn and early winter. The branches of the evergreen Holly of the southern states, *Ilex opaca*, however, are much used at Christmas, and occasionally branches of *Ilex verticillata* can be seen here in the windows of enterprising florists.

The Holly sold in the streets of Tokyo is *Ilex serrata*, and the fruit is smaller and less bright-colored than that of the American representatives of this plant, the so-called Black Alders of New England swamps. There are two of these, *Ilex verticillata* and *I. laevigata*; the former is the more common plant, but the latter is showier as the fruit is larger and brighter-colored. These plants are easily cultivated and grow rapidly in ordinary garden soil into round-headed shrubs sometimes eight or ten feet across. There are forms of them both with yellow fruit, a yellow-fruited form of *I. laevigata* (var. *Herveyi*) having been found a few years ago near New Bedford; it is not yet in cultivation. Two Hollies from the southern states with deciduous leaves and red fruits, *Ilex decidua* and *I. monticola*, are cultivated in the Arboretum; but although their fruit is larger, they are less decorative in this climate than the native species. *Ilex opaca* ought to be more generally cultivated here as the more beautiful English Holly, *I. Aquifolium*, is not hardy in New England. The American species is especially valuable as it is the only broad-leaved evergreen tree which is hardy in this latitude. This Holly grows naturally on the coast near Quincy in this state, and then ranges southward to Texas, in some parts of the country becoming a large and common tree. There is also a form of this tree with yellow fruit. The Ink Berry (*Ilex glabra*) a black-fruited Holly, is one of the handsomest of the broad-leaved evergreen shrubs which are hardy in New England. The branches of this plant are valuable for house decoration, for the leaves do not fall and the fruit retains its color and freshness for a long time after the branches are cut.

Another good plant for house decoration is the common European Privet, *Ligustrum vulgare*, which is a perfectly hardy shrub or small tree formerly much used in this country as a hedge plant and now occasionally naturalized in the eastern states; this is one of the European plants which retains its leaves late in the autumn without change of color, and these make a handsome contrast with the terminal clusters of shining black fruits. Many species of Privet have been introduced in recent years into our gardens from eastern Asia but none of them are as desirable garden plants in this climate as this old-fashioned European shrub which might well be grown for the value of its fruit-bearing branches in house decoration.
Nearly all the Mountain Ashes (Sorbus) produce handsome red or orange fruits which keep their color for a long time after the branches are cut. The species with the showiest fruit in the Arboretum is Sorbus americana, a common northern tree, several specimens of which can be seen on the right-hand side of the entrance to the Shrub Collection from the Forest Hills gate. These plants are now leafless, but the leaves before they dropped a few days ago had turned to bright shades of yellow and scarlet; but the fruits will remain on the branches in good condition until the flocks of northern robins arrive when they will eat every berry in preparation for their long flight southward. With these plants there is a tall specimen covered with fruit of Sorbus Matsunurana, one of the best growing of the numerous eastern Asiatic species in the collection. Several other species, including different forms of the European Mountain Ash (S. Aucuparia), are cultivated in different parts of the Arboretum and are usually short-lived.

Many of the Crabapples shed their fruits early in the autumn, but those of some of the forms or hybrids of the Chinese Malus floribunda retain them in good condition during the winter or until they are eaten by birds. There is a group of these trees near the eastern end of the Administration Building which do not lose their fruit until spring; these are now bright orange color and, although individually very small, are so numerous that the branches are weighed down by them, the beauty of the fruit being heightened by the color of the leaves which are just beginning to turn pale yellow. Too much cannot be said of the value of Malus floribunda as a garden plant in this climate, especially those forms with persistent fruit. No other large shrub or small tree is more beautiful in spring when it is covered with flowers which, rose color in the bud, become white as they develop; the habit is good; it is perfectly hardy, and it never fails to produce a full crop of flowers and fruits. Flower-covered and fruit-covered branches are admirable house decorations.

Fruit-covered branches of the American and Japanese Bittersweets are well suited for house decoration, the orange-colored pods being now open and displaying the seeds in their scarlet pulpy coats. The leaves, which turn yellow before falling, have now disappeared; the fruit, however, will persist for some weeks longer. The American species, Celastrus scandens, is usually considered the handsomer of the two species, the fruit being borne in raceme-like terminal clusters and therefore not hidden by the leaves, while in the Japanese species, C. articulatus, the smaller fruit is borne in axillary clusters so that until the leaves have fallen it is not very conspicuous. Another species in the collection, C. flagellaris, from northeastern Asia where it is widely distributed, has much smaller axillary fruits and, although perfectly hardy, is comparatively of little value as an ornamental vine.

The Snowberries (Symphoricarpos) generally retain their fruit late in the autumn, and on many of the plants the leaves are still green and fresh, increasing the beauty of the snowy white berries. There are several species and forms in the Shrub Collection but the handsomest is the common Snowberry of all old gardens, S. racemosus var. laevigatus, a plant now becoming naturalized in New England. The type of the
species is a much smaller plant with small fruits and therefore of less ornamental value.

The so-called French Mulberry, *Callicarpa americana*, with its axillary clusters of violet-colored fruits, is one of the handsome autumn shrubs of southern woodlands. Unfortunately it is not hardy here, and the only really satisfactory species of this genus which has yet been grown in the Arboretum is the Japanese *Callicarpa japonica*. This is a smaller plant than the American species but the fruit, although smaller, is of the same color and is now conspicuous on the branches from which the leaves have mostly disappeared. There are a number of plants of this small shrub on the left hand side of Azalea Path near its entrance from the Bussey Hill Road.

The silvery white tails of the fruit of a Japanese Clematis (*C. apiifolia*), now make a brilliant show on the right hand side of the Jamaica Plain entrance where this vine has rambled over a number of large shrubs; there is a plant, too, on the trellis at the east side of the Shrub Collection. It is one of the small flowered species, the white flowers appearing after those of the native *C. virginiana* and before those of the Japanese *C. paniculata*. It is hardy, fast-growing and blooms freely every year, and as a decorative plant its value is increased by the late persistence of the fruit, which now forms one of the handsome objects in the Arboretum.

The branches of many other trees and shrubs in the Arboretum are still covered with showy fruits and many of them have great decorative value in addition to their value as garden plants. The branches of the common Barberry, *Berberis vulgaris*, with its drooping clusters of red fruits are very ornamental in the house, as are those of its allies, *B. canadensis*, *B. amurensis*, and *B. Regeliana*. *Berberis canadensis*, which is a native of the southern Appalachian Mountains and southern Missouri, is a smaller plant than the European Barberry with smaller leaves and fruit and is still rare in cultivation. It retains its leaves later in the season than most of the Barberries of this group.

Showy fruits still cover the branches of several Hawthorns (*Crataegus*), especially those of *C. nitida*, one of the most ornamental species of the entire genus, and of *C. aprica*, a southern species which is perfectly hardy here. The best Hawthorn, however, for winter decoration is *Crataegus cordata*, the so-called Washington Thorn, a slender tree of the southern states which is still covered with its leaves now turning orange and scarlet and making a handsome contrast with the small bright red fruits which remain on the branches until spring without change of color.

Among the Cornels or Dogwoods the latest to hold its fruits is *Cornus racemosa*, sometimes called *C. paniculata* and *C. candidissima*, a common and widely distributed native shrub. The leaves have now fallen but the bushes are completely covered with clusters of dull white berries borne on bright red stalks. This Dogwood has been largely used in the Arboretum shrubberies where it is now one of the most conspicuous and interesting objects.

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

HARVARD UNIVERSITY

Jamaica Plain, Mass.

BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS.

NOVEMBER 14, 1912
The Arboretum is asked for information about dwarf conifers. In many genera of conifers dwarf individuals, which are seminal or rarely bud-variation forms, have appeared and have been multiplied by nurserymen and others interested in the cultivation of such plants, the largest number of such abnormal forms being found naturally among the seedlings of species which have been the most largely cultivated. The seedlings of no other conifer, perhaps, show so great variation as those of the Arborvitæ of the eastern United States, *Thuya occidentalis*. Some of these forms are very dwarf, forming round compact heads only a foot or two high; others grow into large globular masses; others are narrow pyramids, and some have pendulous branches. They vary, too, in the color of the foliage, that of some forms being of different shades of green, and that of others yellow. Like many other dwarf conifers, several of these forms are well suited for the decoration of the rock garden and for dwarf hedges or small beds. The collection of the forms of *Thuya occidentalis* in the Arboretum is probably one of the largest in existence and contains many interesting specimens. It is established on Yew Path leading from the Valley Road to the Hemlock Hill Road, and adjoining the Arborvitæ is the collection of Chamaecyparis or White Cedars. The species of this genus from the Pacific Coast are not hardy in New England, so it is not possible to grow here various dwarf forms of *C. Lawsoniana* which are common in European collections. Of the Japanese species, often called Retinosporas, there are several dwarf forms, the most beautiful of these perhaps being the variety *nana* of *C. obtusa*. For those who admire plants with colored foliage *C. pisifera argentea* is an attractive small plant. Of the White Cedar of the eastern United States (*C. thyoides*) there are a few interesting dwarf forms. The most conspicuous of these is probably the variety *ericoides*, of dwarf, compact, pyramidal habit, with leaves which as well as the branches, turn reddish brown with the first cold weather and retain this color until spring. Another interesting form is the variety *leptoclada*, also of dwarf habit and bluish green color.

One of the most valuable of all the dwarf evergreens is that variety of the Japanese Yew (*Taxus cuspidata*) which is now cultivated in American gardens as variety *brevifolia*, but is not to be confounded with *Taxus brevifolia*, which is a California tree. This variety of the Japanese Yew has very dark green leaves and wide-spreading, rather irregularly growing branches; it attains a height of only four or five feet but sometimes covers a space ten or fifteen feet in diameter. Seedlings raised from this plant often assume the upright growth of the typical species. In the collection of Yews on Yew Path there is also a small very compact plant of a form of *Taxus cuspidata* which is one of the most distinct and beautiful of all the dwarf evergreens in the Arboretum; this appears to be a unique plant and has not received a name. Nearly all the forms of the European Yew (*Taxus baccata*) suffer more or less severely here from cold and several of them are unable to survive a New England winter. There is, however, one form which is perfectly hardy; this is a broad, flat-topped, rather compact shrub not more than two feet high, with exceedingly dark green foliage. This variety is sometimes sold in American nurseries as *Taxus repandens*; this name has not been published, however, in any of the technical books on conifers and we know nothing here of its
origin. It has lived here entirely uninjured for several years on the edge of the group of Yews on Hemlock Hill Road at the entrance of Yew Path, one of the most exposed positions in the Arboretum. This is certainly a plant of great value for this part of the country.

Among the Junipers there are several dwarf forms of the arborescent species. Of our common Red Cedar, *Juniperus virginiana*, a form with branches spreading close to the ground grows at several places on the coast of Maine. The plants of this form in the collection are too young to show their habit; it has not yet received a name. The form *globosa* of the Red Cedar is a small, round, handsome shrub well worth a place in collections of these dwarfs. The var. *triptita*, which is not rare in European nurseries, is a low broad shrub with spreading and erect branches forming a wide open head. There are a number of large plants of this form on the left of the entrance to the path which leads from Yew Path to the knoll on which the Juniper collection is established.

Of *Juniperus chinensis* the best known dwarf form is the variety *procumbens*, with elongated branches spreading into wide mats. Of this species there are also in the collection plants of a dwarf form with erect stems forming small, round-topped shrubs. Of the European Savin (*J. Sabina*) the var. *tamariscifolia* is a vigorous prostrate shrub, and the variety *humilis*, which is the smallest of all the Junipers in the collection, is only a few inches high with small, spreading prostrate stems.

Of the conifers of the Pacific coast, with the exception of Lawson's Cypress and the Douglas Spruce (*Pseudotsuga mucronata*), no dwarfs have yet appeared, or, if they have appeared, they have not been multiplied in nurseries; and this seems to be true of the Firs, Spruces, Pines and Hemlocks of Asia with one exception; this is the dwarf form of the Japanese *Pinus densiflora* (var. *pumila*) which is much cultivated in Japanese gardens and is one of the handsomest of all dwarf conifers. This little Pine, which sometimes grows to the height of six or eight feet and forms a head of spreading branches ten or twelve feet through, is perfectly hardy here and is now well established with a number of other dwarf conifers on Conifer Path. Unlike other dwarf conifers, this plant flowers freely and occasionally bears cones. There are dwarf forms of the common White Pine of the eastern states, *Pinus Strobus*, which are decorative plants, and several dwarf forms of the so-called Scotch Pine (*P. silvestris*) which are more pyramidal in habit than forms of the White Pine. The most commonly cultivated dwarf Pine, however, is the Mugho Pine (*P. mughus* or *pumilio*). This is a shrub of the mountains of central and southern Europe and a form of *Pinus montana*, growing sometimes with that tree as on the Pyrenees, and sometimes, as on the Dolomites, by itself without other forms of the species. In cultivation it is a broad shrub with numerous erect stems occasionally reaching the height of fifteen feet and covered with dark green foliage. Plants in cultivation produce cones freely and the seedlings probably retain the habit of the parent. There are two quite distinct forms in the Arboretum collection, one with much coarser leaves than the other. This Pine is perfectly hardy and grows rapidly, but long before it reaches its full size it loses the lower branches and compact form which is the chief beauty of the young plants.

No other conifer, with the exception, perhaps of the eastern American Arborvitae, has shown so great seminal variation as the European or Norway Spruce (*Picea Abies*), and some of these forms are among the most
attractive of all the dwarf conifers. Some of the best of these are variety Clanbrasiliana, a low bush seldom more than six feet high, var. Gregoriana, usually not more than one to two feet high, and the varieties pumila and pygmaea both of exceedingly dwarf habit. Of our native Black Spruce (Picea Mariana) the var. Doumettii is a compact pyramidal plant which does not often grow more than ten or twelve feet tall and is of bluish color. An interesting dwarf form of the Rocky Mountain Blue Spruce. (P. pungens or Parryana, or as it should be called, P. Menziesiana) appeared several years ago in the Arboretum nurseries and promises to be valuable as a decorative plant; it has not yet received a name. There is in cultivation, too, a dwarf of the Spruce tree of the Caucasus (P. orientalis) which, however, is little known in collections, and in the Arboretum collection are two plants of a dwarf Douglas Spruce.

The genus Abies, the Firs, have as yet produced few dwarf forms. The best known is probably the dwarf of the Balsam Fir of northeastern North America (A. balsamifera), known in gardens as A. Hudsonica, a very dwarf and not particularly attractive plant. There is a dwarf pyramidal form of the Fir of central Europe (A. Picea) but this after a few years is apt to lose its dwarf habit and grow into a tall tree. A dwarf form of the Rocky Mountain A. lasiocarpa was raised several years ago in the Arboretum and is still a true dwarf in habit, although grafts taken from this plant are beginning to assume the narrow pyramidal habit of the species. The original plant can be seen in the bed of dwarfs on Conifer Path where there are three grafted plants of the dwarf Rocky Mountain Blue Spruce.

The common Hemlock of the eastern states (Tsuga canadensis) has a strong tendency to seminal variation, and dwarf and other abnormal forms of this tree often occur in the woods. The most distinct and interesting of these is a compact form with closely appressed pendulous branches forming a broad, low round-topped mass. Many years ago four or five plants of this form were found by the late Joseph Howland of Mattapan, New York, on one of the mountains back of Fishkill Landing on the Hudson River and were named by him Sargent's Hemlock for his friend and neighbor Henry Winthrop Sargent. Only one or perhaps two of these wild plants are now living, although the variety has been much propagated by nurserymen by grafting its branches on the common Hemlock. These grafted plants, as they grow more rapidly and are of more open habit, are less compact and less beautiful than the original seedlings. The plant in the Arboretum among the large collection of dwarf Hemlocks on Hemlock Hill Road is a grafted plant, but at Holm Lea in Brookline there is one of General Howland's original plants. The beautiful Carolina Hemlock (T. caroliniana) has not been very largely cultivated, but among the plants in the Arboretum Pinetum near the corner of Centre and Walter Streets are two plants which look as if they were true dwarfs as they are less than one-quarter of the size of the other trees of the same age growing with them and show no tendency to form an upright stem.

The Arboretum will be grateful for any publicity given these Bulletins.