


The Arboretum Bulletin



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Outstanding Annuals in the Trial Grounds

GO TO the trial grounds at the Arboretum nursery right now if you want to see some of the new varieties at their best. To be sure, the recent rains have beaten down the petunias, but there are many other types, both named and unnamed, that are quite striking. Pay particular attention to the new Cleome, the new, rich, rose-purple zinnia and the blue variant of Nierembergia hippomanica in the All-American group at the west end. Also don't fail to observe the scarlet Flower of the Incas (Tithonia) in the center of the south row.

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Clematis Varieties for Late Summer and Fall Bloom

By JOHN H. HANLEY

WE HAVE BEEN attempting to gather together a complete list of the better clematis species and varieties for the past two years and, although our collection is by no means complete, we are, nevertheless, able to report that certain of the little-known forms have already given an excellent account of themselves.

Probably most of you are familiar with the more common, large-flowered types. Clematis Jackmani has been used for years by gardeners throughout the country and has been found very satisfactory. It blooms profusely and grows with great vigor. In contrast with it, many of newer named hybrids are deficient because of their weak growth and in spite of the fact that they materially expand the range of color and size of the flowers. There are some beautiful, large-flowered whites, lavenders, purples, and rich reds, to be sure, and many of them produce their flowers much later than Jackmani, too. But their value is materially reduced by lack of vigor or by their one-stemmed, spindly growth.

In view of these things it is a pleasure to report on three varieties which have demonstrated their vigor and floriferousness for the past two years. The first is a variety called Duchess of Albany. It is one of the large-flowered forms which reaches the peak of its bloom in late August and September. One observer recently described its flower as resembling a beautiful, medium pink, lily-flowered tulip. The flower is quite large and urn-shaped and one gets the impression that it might be a hybrid between the broad, flat flower type such as Jackmani presents and the extreme urn-shaped form that the scarlet Texas clematis produces. It is certainly an excellent form and one that will lift the pride of any gardener.

The second good variety that blooms very late is called "Huldine." The flowers are moderate in size, white with a pinkish or slightly lavender cast, and are produced in great abundance. It is a vigorous grower, too, and the flowers have the very desirable character of facing outward and upward away from the foliage. Huldine may be considered

the late-blooming counterpart of clematis montana and will find its most satisfactory use where it can be viewed at a distance. In other words, the mass effect is better than that of the individual flowers.

The third variety produces very large, pure white, up-facing blooms of the broad, flat type. It is called "Henryi" and will give the best effects if planted so that it can be seen from above.

All three of these varieties are excellent and, although they may not be available locally, can be purchased from the better eastern nurseries. Like most clematis varieties, they enjoy a deep-worked soil into which well-rotted barnyard manure has been incorporated. You should also use a bit of lime on them each year and they apparently prefer being placed so that the lower part of the stem will receive shade from a low wall, a frame or from nearby plants.

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Notes from the American Nurseryman

FOR a lawn in shady places, Chewing's or New Zealand fescue or Poa trivialis should be used, with some light application of fertilizer through the summer, as well as watering, to enable the grass to meet the competition of the feeding roots of the trees producing the shade. The fertilizer now generally recommended is 10-6-4, and the rate of application for a lawn in autumn or early spring is ten pounds per thousand square feet, well watered in—the water being most essential.

Chewing's fescue should be sought for grass in the shade, as the price of Poa trivialis has risen sharply since imports from Europe have been affected by the war.

Red spider is well controlled by a spray of one pound of one per cent rotenone to 100 gallons of water with the addition of two and two-thirds pints of sulphonated castor oil. The spray also kills thrips.

Garden chrysanthemums do better if divided every year or two. Bad drainage of the soil is responsible for many cases of winterkilling.

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Rhododendron Mucronulatum

By A. P. FREDRICKSON

RHODODENDRON mucronulatum's chief claim to attention is in its early blooming period—January. The high rating given to it by the Rhododendron Association is primarily for this reason as well as its general all-around hardiness, for if it bloomed in April or May we would hardly give it recognition. It is deciduous.

As a native of Korea and Japan, it has long been acclimated to early frosts and sharp changes in temperature during its blooming period. Frosts injure the flowers only and the unopened buds follow with the first warmth.

It should be given a green background with sun exposure and protection from winter's cutting winds, so that the rosy-

purple flowers are set off to the best advantage when all else in the garden is still in its winter blanket. The shade of color ranges from a light pink to a rosy-purple. The darker forms are the best.

R. mucronulatum is comparatively easy to start from seed and eventually attains a height of about seven feet. Some of the plants in the Arboretum nursery are about four to five feet. Commercial growers will doubtless pay more attention to this species rhododendron so in due time more ample supply may be had.

R. dauricum and *R. mucronulatum* alone form the *dauricum* series with their variations *sempervirens* and *acuminatum* respectively, and are botanically placed as a small group intermediate between the typical rhododendron and azalea.

Everybody can flower this rhododendron and for the returns in winter flowering, every garden could make a place for it, and it should be within reach of every gardener's pocketbook.

As its name implies, the leaves of *R. mucronulatum* are pointed; and the flowers are about $1\frac{3}{4}$ inches long, in widely funnel-shaped terminals, clustered at the ends of the shoots. The leaves of *R. dauricum* are more rounded and the flowers about $\frac{3}{4}$ of an inch long.

With *R. mucronulatum*'s variation *acuminatum* flowering about a fortnight later than the type and with *R. dauricum* (semi-deciduous) and its variation *sempervirens* (evergreen) following along with blooms a fortnight and a month later, a very slight display of color is in due time planned in the lower southerly knoll of Rhododendron Glen of the Arboretum adjoining Azalea Way, where it may be easily seen from cars passing by on the boulevard.

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Combating the Diseases of Madrona and Dogwood

By JOHN H. HANLEY

THE madronas and dogwoods of the Seattle area are being killed in large numbers by what appear to be three distinct fungus diseases. Two of them are extremely important pests; the third, a form of die-back on madrona, is less so because it apparently is not present in epidemic condition and can be more readily controlled. By far the more serious situation, insofar as the madrona is concerned, is created by a fungus which attacks the trunk of the tree at or near the ground line, penetrating the outer bark and inner bark layers at this point and killing these tissues as far in as the cambium layer. The disease which affects the dogwood acts in an almost identical way and, in both tree species, after the original penetration has been made, there is a gradual extension of the fungus in two directions, (1) up the trunk and (2) around the base of the stem. Complete killing of the trees is never accomplished until the second movement (around the stem) has been achieved. Thus the final effect is one of girdling, or gradual strangulation.

Continued observations on affected trees have made possible the following tabulation of facts concerning the diseases and their effects and the second list of remedial principles which can be employed as counter measures.

I. The pertinent facts concerning the trunk diseases of madrona and dogwood:

- (a) The diseases enter at or near the ground line.
- (b) They destroy the outer bark, inner bark and cambium tissues as far in as the xylem or true wood.
- (c) They gradually extend in two directions, (1) around the stem and, (2) up the trunk and oftentimes out along the main branches. As is the usual case, the

upward movement is the more rapid and it apparently requires several years for complete encirclement.

- (d) Parts of the crown, such as large side branches, may die before the diseases have worked entirely around the trunk but after encirclement is complete the whole tree gradually succumbs.
- (e) The primary effect of the diseases is to cut off the flow of elaborated foods that pass downward through the inner bark to the roots. The roots gradually die from this starvation and their normal function of taking up water and essential minerals from the soil is gradually lessened until, by their ultimate death, it ceases completely. While this development is taking place, the secondary effect upon the branches and leaves also becomes apparent. They gradually wither, turn brown and die.
- (f) The appearance of the disease on the madrona may be likened to a severe fire scar, much blackened, usually shrunken and with deep fissures well into the true wood. At the edge of the scar the still-living tissues form a ridge, the result of the tree's efforts to grow over the dead tissue. It is conceivable that, if the disease is recognized soon enough and if the diseased tissues are removed by a tree surgeon and the wound cauterized, the tree could accomplish complete healing by the production of new, healthy tissue growing over the wound from the sides.
- (g) The appearance of the disease on the dogwood, at least in the later stages, may be likened to a severe sun-scald such as often occurs on thin-barked trees if they are brought from a shady woodland and planted in full sun. The bark falls entirely away, indicating that here, too, the disease has killed outer bark, inner bark and cambium. At this stage it is the xylem or true wood which lies exposed. In the early stages the presence of the disease is made known by small, irregular, vertical cracks out of which may exude a blackish, shiny liquid.

II. What should be done to counteract the effects of the diseases?

- (a) Since, in practically every instance, these two diseases of madrona and dogwood have entered the trees through breaks in the bark near the ground line or through the exposed ends of roots that have been cut or otherwise injured, the gardener should do everything possible to avoid injuring the trunk and roots. Here are the principal sources of injury—avoid them!
 - (1) Striking the trunk with the lawnmower.
 - (2) Cutting off the side roots in order to construct a walk or drive.
 - (3) Cultivating around the tree with spade or hoe.
- (b) Since water and warm temperatures are required for the most rapid development of fungi it is wise to avoid sprinkling against the immediate base of the trunk when watering the other shrubs, flowers and grass during the summer.
- (c) If madronas and dogwoods are too severely infected they should be cut down and the infected parts destroyed, preferably by burning.
- (d) If the diseases are just starting the trees can probably be saved by a skillful tree surgeon.
- (e) An immediate replanting program should be started and the sites for placing the new trees should be selected carefully so as to avoid all possibility of subsequent injury to the roots by the causes mentioned above. Madronas and dogwood are difficult to transplant, hence it is better to get them from a nurseryman than to pull them out of the woodlands. Nursery grown plants have a bigger, more concen-

trated, mass of roots and can therefore become established easier in their new site.

The cooperation of Puget Sound nurserymen should be enlisted for the replanting program. There is a dearth of these two tree species in nurseries now. They (the nurserymen) should be encouraged to grow more of them and, if possible, to handle them in gallon cans rather than to place them out in the nursery row. In the can the entire root system is thoroughly confined and there is less injury to it in the final planting.

National, state and municipal organizations which have park lands and the like at their disposal should be enlisted to lead the way in this program.

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A Brief History of Gardening

(Continued from August)

Gardens of Greece

ALTHOUGH the people of Greece had a great love for natural beauty they did not excel in the development of fine gardens for a number of reasons. First of all was their relative poverty, a factor which directly bears upon garden art. They were more particularly exponents of action in politics and athletics; and lastly, theirs was a civic life that did not lend itself to the growth of suburban and country estates. Early in their history it is recorded that they did have sacred groves around their temples. Even in these the artistic impulses were derived from the Persians. We learn that Cimon was the first to adorn Athens with gardens. In the Fifth Century, B.C., under the Persian influence, he created ornamental places for exercises. Later he put plane trees around the market place and set out a grove near the academy where the philosophers and students were wont to walk. It was surrounded with a wall, had marble fountains, long alleys of plane trees and narrower ones lined with shrubs. Intermingled with these were sculptured and architectural forms such as temples, altars, statues and seats. In the age of Pericles we first read of the pleasure garden in the modern sense. At this time a line of villas gradually stretched out of the city of Athens as far as Eleusis and by the time of Alexander the Greeks had as keen a love of gardens as did the Persians.

During the period from 500-200 B.C., domestic gardens flourished. Here again, formality was essential, but gracefulness was added which had been unknown before. The features of the garden were not stiff, and although trees were still used in rows, others were found in groups. The trees and shrubs were never cut into formal shapes.

Among the materials used perhaps the plane tree was most favored. However, pine and cypress trees were planted along the avenues and oaks, poplars, olives and other fruit trees were commonly found. Myrtle and laurel were the favorite shrubs, and roses, violets, lilies, and hyacinths were used extensively.

It is interesting to note the different factors which influence the development of gardens and the way that they are expressed by different races. We consider the Egyptians to be the original users of plants for ornamental purposes, beginning about 4,000 B.C. Their gardens took on simple, geometric, formal designs and usually included a rectangular pool in the center of the walled space. Because of the need for providing shade in that hot Nile Valley they used a great many trees along their garden walks. Furthermore, the flat, uninteresting topography of the country did not inspire them to develop naturalistic scenes as did later peoples.

In Judea we found that the development of the garden arts was limited, to a material extent, by their laws and their religion. The Phoenicians, unhampered by these forces,

brought in new kinds of flowers from foreign lands and spent more time enhancing the beauty of their home surroundings. Wealth and the natural fertility of the soil in their country were also important considerations. They were influenced by both the Egyptians and the Persians, hence we find that simple formality marks their garden design. The Persians were relatively rich, had ample leisure time and a naturally fertile soil, too. The records place the development of gardening here at a much later date, 550 B.C. It is rather significant that all of these earlier races concentrated on formal outlines in their gardens. In no country have we as yet encountered naturalistic design.

The Greeks, because of their great love for natural beauty and because their land presented so many beautiful landscape views, might have been expected to have developed a naturalness in their garden plans. However, this was true only to a very limited extent largely because of the fact that the race laid such important stress upon the sculptural arts and athletics. Thus, even at the height of early gardening in Greece, 500-200 B.C., we find the use of sculptural and architectural works the predominant feature.

Gardens of Ancient Rome

The first record which we have of a Roman garden is that of Superbus, which was made in 534 B.C. It was not, however, until the last century of the Republic that the first great Roman gardens were made. During the first three centuries A.D., Rome gradually developed into a veritable city of gardens, for at this time the citizens were very luxurious and loved to have vast country places set amid a wealth of architectural and natural beauties.

In the latter days of Rome country seats became fashionable. There were many citizens at this time who had become wealthy. Through travel they had gained intelligence and a true taste for the finer things. As a result they sought retirement from the city, and the domination of the imperial rulers. The favorite situations for the retreats were upon the slopes of the Sabine and Alban Mountains at Tivoli, which is most famous because of its multitude of country seats, Frascati, Laurentium, Subiaco, Antium, Praeneste and on the shores of the Bay of Naples.

The larger villas often covered as much ground as one hundred acres. In these estates, the house was taken as the key, and the courts were arranged around it to conform with its architecture. The courts merged into the atrium, which was usually enclosed by a colonnade and adorned with statuary. The principal parts of the garden were separated by thick hedges or shady pergolas. Perhaps the most important feature of these estates was the hippodrome, "a place devoted to running and equestrian exercise, divided longitudinally by hedges of box ornamented with topiary work." The next most important feature was the xystos or flower garden. It consisted of a parterre composed of beds and paths. (In Greek xystos means covered gallery.) Rose gardens and a labyrinth were often adjoining the xystos, while fruit and vegetable gardens, with the trees arranged in rows were also part of the general scheme.

Although formality in design, coupled with the use of sculptural and architectural features, were characteristic of Italian gardens, there was also a tendency, especially in the larger estates, toward naturalness. This was best expressed in the use of water features. Moving water, because of its easy accessibility from the mountain streams, was much used. The Italians were also the first to adopt extreme forms of topiary work as garden adornments. They were used to a great extent and were an offspring of local taste rather than having been induced by previous races. Spherical and columnar shapes, hunting scenes, ships, climbing serpents and the like, were often depicted thus.

(To be continued)

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