

Arboretum BULLETIN

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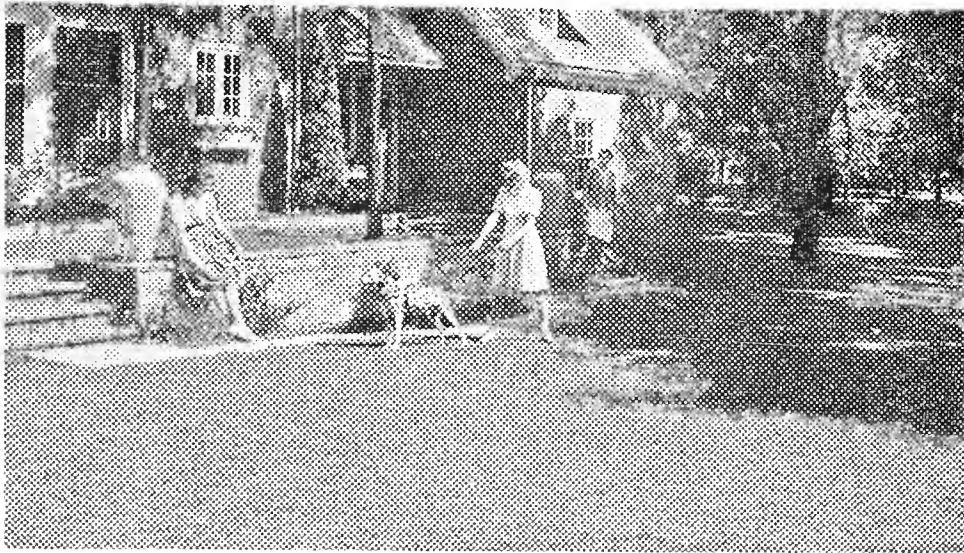
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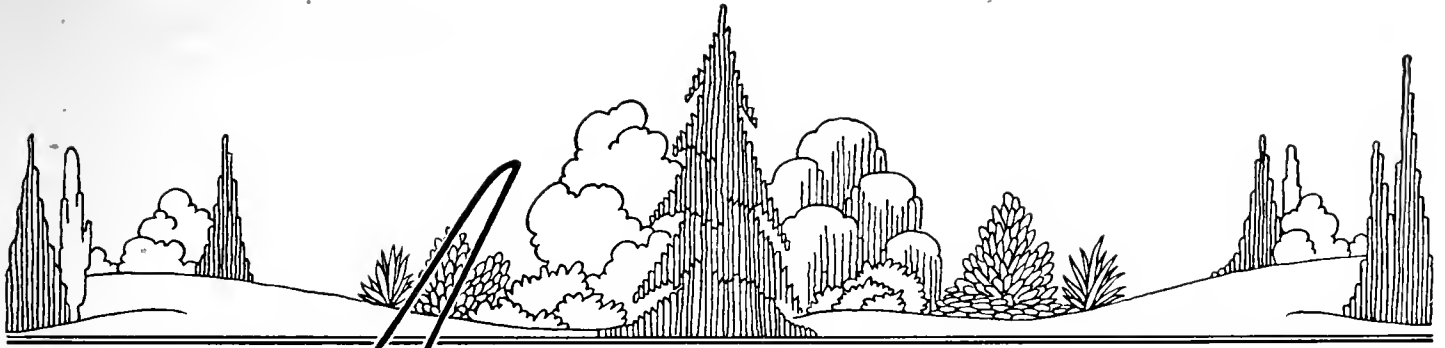
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The Arboretum Bulletin

Arboretum Report—Summer, 1948

BRIAN O. MULLIGAN

THE three months of May, June and July this year have been conspicuously marked for us by the long continued cool, cloudy and showery, not to say at times wet weather. The actual rainfall figures for the city of Seattle, compared with the normal, demonstrate part of the reason for this, and show an excess for the three months of 4.65 inches of rain.

	May	June	July	Totals
Actual	4.67	2.02	1.81	8.50
Normal	1.89	1.35	0.63	3.85

The May rainfall was the heaviest for that month ever recorded in Seattle, since records began in 1878.

The percentage of sunshine was also much below normal, as the following figures show.

	May	June	July	Mean.
Actual	38	48	45	40
Normal	53	53	64	57

June, however, was notably warmer than usual, and in fact the second warmest June on record here, with an average temperature of 63.8° F. compared with a normal of 61.4°.

Weed Control and Spraying

The most obvious result in the Arboretum of these abnormal weather conditions has been a rapid and continuous growth of weeds through the late spring and early summer months, with which it has been impossible for the small staff to fully cope. By concentrating on particular planted areas, at the expense of others yet to be developed, and by applying a thick mulch of sawdust after cleaning the ground, we have been able to get and keep these sections in a state of reasonable cleanli-

ness. They include the entire rectangle and surroundings of the parking lot by the E. Lynn Street bridge, now largely planted with varieties of *Hydrangea macrophylla* (*Hortensia*) and some fuchsias for the summer months, the beds of azaleas on both sides of the north end of Azalea Way, the large bed of several hundred young rhododendrons, planted in spring 1947, to the south of the Magnolia collection near the Upper Road (see illustration, p. 2), some parts of the nursery, and the *Cistus* mound east of the Upper Road. Most of these areas have received a covering of western cedar (*Thuja plicata*) sawdust, made available for our use by several sources, especially the Stimson Mill Co., to whom we are particularly indebted; the Seattle Service Co., West Coast Shingle Co., the North End Milling Co., and the Day & Night Fuel Co.

A limited quantity of hickory shavings has also been received from the Anderson and Thompson Ski Co., and this, a promising material for mulching, has been applied to the new *Pieris-Kalmia* bed, to a small bed of hydrangeas by the Upper Road, and in one small section of the nursery. In each place this sawdust mulch has been accompanied by a dressing of fertilizer, sometimes on the soil, sometimes on the sawdust and watered in.

Another means of weed-control in the larger grass areas, especially along Azalea Way, at the Montlake section, and on both sides of the Upper Road from Woodland Garden to Rho-



dodendron Glen, has been by spraying with the synthetic plant growth regulator, 2-4-D. This was accomplished through a 12-foot wide spray boom fitted to the rear of the Hardie sprayer, in late June and again (in part) in mid-July, and has given very good results especially where two applications were made. Plantains, cat's-ear, and some of the dandelions have all been either eliminated or greatly reduced, much improving the appearance of the grass. In future summers this will become a routine operation.

The sprayer was used for the first time in April and May against the usual spring outbreak of tent caterpillars on the alders at the north end of the Arboretum and on Foster's Island, on the Japanese cherries at Montlake and along Azalea Way, and on some other trees. Both D.D.T. and lead arsenate were employed, with apparently equal success and immediate benefit to the trees infested.

A third use for the spraying equipment was found in dealing with a dense growth of weeds in an otherwise empty section of the nursery in late June; by spraying with a solution of "Ammate" (1 lb. to 1 gallon of water) a complete kill was obtained in a few days, although some difficulty was experienced with particles of the material frequently clogging the spray nozzles.

Other Operations

An endeavor has been made to keep several areas cultivated so that planting can be begun on them next winter or early spring. These include the section for Leguminosae on the east side of the Upper Road north of Rhododendron Glen, and the adjacent part for *Berberidaceae*, two areas on either side of the same road south of the Glen, one for hollies, the other for Hypericums and Hebes (New Zealand shrubby Veronicas). Shortage of man-power as well as equipment has unfortunately prevented any continuation of the good work done on the former dump area during the winter and early spring, but it is hoped

to return to this as soon as conditions allow us, probably in the early fall.

Most of the staff's time during these months has been occupied in weed-removing and in grass-cutting, both of which are essential tasks at this season and take priority over all else. The foreman has had to spend a considerable part of his valuable time in repair and servicing work on the smaller, older mowers, and in fact at one time or another during the past three months in some such urgent work on most of our mechanical aids in order to keep them running. Until late July, however, little watering has been required, in distinction to 1947 when much time was occupied in that way from spring onwards.

The drinking fountain by the picnic tables was repaired in May and a new drain laid to carry off the surplus water. Recently the gate at the south end of the Upper Road has had to be replaced, due to wanton damage. New signs have been placed at either end of the Upper Road. A start has been made on putting and repainting the greenhouses, a long-overdue task.

In the nursery the sections planted during the past two seasons are being regularly hoed and kept as clean as possible; some parts, after such cleaning, have been covered by a sawdust mulch, and in time this process will be extended to cover all nursery stocks.

Plantings

Due to the continued showery weather planting extended several weeks longer than in 1947, and the young plants set out benefited by the rains and received a helpful start in their new sites. At the end of May, 20 varieties of *Hydrangea macrophylla*, one plant of each, were moved from the nursery to a temporary site opposite the magnolia collection; in mid-June 46 rhododendron plants, of five distinct species, were similarly shifted to more permanent places, and in the first week of that month over 50 plants of *Ledum groenlandicum* and *L. columbianum* were removed from flats or lath-house to the margin of the Kalmia-Pieris bed. Planting from pots has, however, continued much longer. Thirty-six *Cistus* (three species) to the *Cistus* collection



Bed of rhododendrons south of Magnolia area, mulched with sawdust. Planted spring 1947. Trees chiefly *Thuja plicata*.

on June 17th; 46 plants (five species) of the closely related genus *Halimium* to the same area on July 27th, and 68 *Helianthemums* as edging plants there on July 9th. On July 8th five species of California Lupins were planted near the Cistus, represented by 22 plants, and between June 3rd and July 27th four more species (10 plants) of *Ceanothus* were added to the growing collection on the east bank of Azalea Way. These are some examples of planting in the Arboretum proper.

A variety of unusual or interesting plants has been added to the borders along the south side of the greenhouses, and on the top of the stone wall opposite. Some of these are *Hypericum balearicum*, *Teucrium fruticans*, received from the Strybing Arboretum, Golden Gate Park, San Francisco; *Penstemon corymbosus*, *P. fruticosus*, *P. Adamsianus*, and seedlings of Mr. Carl English's hybrid *P. Edithae*; *Ceratostigma Willmottianum*, also from Golden Gate Park, and a species collected under No. 13350 by Ludlow and Sherriff in S.E. Tibet. Five more species (13 plants) of South African Proteas have been placed against the greenhouse wall, since others planted there experimentally in 1947 came through the winter with the overhead protection of a framelight plus some dry bracken round their stems. Young plants of the striking Mexican *Beschorneria yuccoides* have likewise been placed here as well as on a well-drained bank near the foreman's house facing west.

In the Pinetum small experimental plantings have been made of three species of the S. African conifers *Widdringtonia*, raised from seeds obtained from the National Botanic Gardens at Kirstenbosch, S. Africa, in 1945, but it is unlikely that these will prove hardy in the Arboretum.

Acquisitions

The most important piece of equipment received this summer is a new Ford tractor, to replace the former one which was 2½ years old and had been in constant daily use throughout that period, with very few mechanical breakdowns or other troubles. Next year we hope to be in a position to buy a second tractor, since with only one it is quite im-

possible to do all the necessary work, especially in summer, for which a small tractor of this type is the key tool.

Donations of plants have included 11 plants of choice English rhododendron hybrids, from Henny & Brydon, Brooks, Oregon; three plants of *Rhododendron exquisetum* from Mr. Lester Brandt of Puyallup, seedlings of *R. camschaticum* from Mrs. A. C. U. Berry of Portland, Oregon, and plants of six of Mr. B. Y. Morrison's latest azalea hybrids from the Plant Introduction Station at Beltsville, Maryland. Of seeds, collections have been received in exchange from botanic gardens at Pallanza, Italy; Kew, England; Wageningen, Holland; Lisbon, Portugal, and Nikko, Japan. From the Pacific N.W. Forest Experiment Station at Portland came an unusually interesting collection of S. American tree and shrub seeds, and from the Dept. of Scientific and Industrial Research, Wellington, New Zealand, seeds of one of the evergreen southern beeches, *Nothofagus Menziesii*. Various plants have also been purchased to add to our collections, including the Californian Matilija Poppy, *Romneya Coulteri*; white and pink forms of the dwarf *Penstemon rupicola*; the silver-leaved *Convolvulus Cneorum*; *Azalea Bakeri*, native of the state of Georgia, and others, as well as seeds of a few Chinese trees and shrubs from a Shanghai source.

The library has also increased in size and usefulness during the period under review. Some of the principal additions have been: Parey's "Blumengartnerei," an excellent two-volume German encyclopaedia by C. Bonstedt and others (Berlin, 1931-32), Robinson's "English Flower Garden" (14th edition, 1926), "Los Juniperos Mexicanos," M. Martinez (Mexico, 1946); three volumes of C. S. Sargent's "Garden and Forest" (1892, 1894, 1895), Rehder's "Synopsis of the Genus *Lonicera*" (1903), Beijerinck's "Calluna, a Monograph on the Scotch Heather" (Amsterdam, 1940); Hulten's "Flora of the Aleutian Islands" (Stockholm, 1937), ten volumes of the Royal Horticultural Society's "Journal" between 1902 and 1923, L. H. Bailey's "Nursery Manual" (22nd edition, 1947), and

"Knowing Your Trees," by G. H. Collingwood and W. D. Brush (Washington, D. C., 1943).

Photographs, Radio Talks

Since May 20th a series of both colored and black-and-white photographs have been taken approximately every two weeks, chiefly of shrubs in flower, but also of various views in different parts of the Arboretum. The former number 75 in this period, and are being mounted as slides for showing to group meetings; the latter 35, for recording development of areas as well as plants, and for illustrations in this BULLETIN and elsewhere.

Weekly 15-minute radio conversations (station KOMO) between the Director and Mr. Milo Ryan were continued every Saturday until the end of June. Some of the subjects covered in May and June were: the Rhododendron Show, Azalea Way, June shrubs, and summer work in the Arboretum. It is hoped to recommence this series again about the end of September.

Final planting plans of the three beds of Japanese Quinces planted in the past two winters have been completed by Mr. Hansen, who is now working on a similar plan of the

area just north of the bridge over the Boulevard, planted chiefly with hydrangeas but with some other shrubs for spring and early summer flowering. In the course of time we intend to make such plans to form permanent records of all areas planted; where no planting has yet taken place they will be drawn up in advance and used as the work proceeds.

Visitors

During June and July we had the pleasure of visits from several notable personalities in various branches of horticulture, amongst them Mr. and Mrs. Anson Blake, of Adelante, Berkeley, California; Mr. T. T. Munger, formerly Director of the Pacific N.W. Forest and Range Experiment Station, who writes in this issue; Mr. Harry Wood, head gardener at Swarthmore College, Philadelphia, and Prof. and Mrs. Irving L. Peterson, of the University of Illinois, Champaign. Many parties of Garden Club members have also visited the Arboretum this summer, especially when the rhododendrons and azaleas were in flower; from July onwards out-of-state visitors have been frequent.

The Morris Arboretum

MARGARET LANCASTER*

TWELVE MILES from the busy center of Philadelphia, against the north side of Chestnut Hill, is a 158-acre tract of rolling land, half of it in intensive plantings and rolling lawns, half in pastureland. Formerly the estate of John T. Morris and his sister, Lydia T. Morris, of a well-known Philadelphia family, it is now the Morris Arboretum. Through their interest and searching, and with the help of Dr. C. S. Sargent of the Arnold Arboretum, the Morrises, starting in 1889, gathered together here many unusual and beautiful trees and shrubs from over the world.

Miss Morris survived her brother by 17 years. At her death in 1932 the Chestnut Hill

estate became, under the terms of her will, the Morris Arboretum of the University of Pennsylvania, to be directed by the Department of Botany of the University.

The Morris mansion has remained in use as the administrative headquarters and contains the library, a lecture room, the herbarium, a laboratory and the staff offices. The three remaining greenhouses of the estate have been supplemented by a greenhouse for propagation and research. A stone head house of early Pennsylvania architecture has been built to house the potting shed, equipment, men's locker-rooms, small offices and laboratories. A new shade house of cypress and shipmast locust is under construction for two- and three-year-old ericaceous plants. Near the greenhouses are small nursery sections; but most

*Miss Margaret Lancaster studied horticulture at Cornell University and is associate of design and planting at the Morris Arboretum.

of the one and a half acres of nursery are located at Bloomfield Farm, the more northerly portion of the grounds, and outside the city limits. Here are grown the plants for the development of the Arboretum.

One section along the Wissahickon in this farm area has particular historic interest with its old stone grist mill and miller's house dating from Revolutionary days. There are also two bog iron holes that were worked in colonial times. This historic section is suitable for a contemplated development honoring early American botanists and horticulturists.

Plantings

Present plantings are largely concentrated around the beautiful grass slopes along the valley near Hillcrest Avenue and up over the hill to Meadowbrook Avenue. This area has an acid soil derived largely from the quartzite rock of the region, whereas the soil of the farmland stretching into the Whitemarsh Valley is evolved from underlying limestone—a happy combination for an arboretum.

A few acres of native woodland (oak, hemlock, beech and tulip trees) were fortunately preserved on the rocky shoulder of the hill that drops precipitously to the Wissahickon and these remain as a sanctuary for wildlings—birds and plants—as well as providing a foretaste of the beauty of the steep, rocky, hemlock-wooded ridges farther down the Wissahickon in Fairmount Park. On the southern edge of these woods are several of the largest Tupelos, or Sour Gum trees (*Nyssa sylvatica*) in this region.

As a fitting although never used entrance to their estate, the Morrises planted a 700-foot avenue of scarlet oaks along the secluded eastern boundary from Hillcrest Avenue. Today the high Gothic arches formed by the branches and the long enclosed quiet vista give one the feeling of a cathedral. The ivy collection numbering approximately 42 hardy species and varieties, is planted along this avenue.

The Morrises developed three Japanese gardens, all different. One, shouldering a pool, is now a tangle of large *amoena* and *poukhanensis* azaleas; one, around an overlook and criss-crossing paths, is dark with spreading yews,

Japanese red pine and Oriental maples. The third one grows increasingly charming. On an open slope between the Swan Pond and a sheltering tall blue Atlas cedar rise little hills with an oriental rhyme and reason. Dwarf spruce and procumbent junipers partially clothe them. The orange trunks and low-spreading canopy of Tanyosho Pines (*Pinus densiflora umbra-culifera*) build the illusion of an isolated high mountain forest. Large specimens of Umbrella Pine (*Sciadopitys verticillata*), *Torreya*, *Cephalotaxus*, *Taxus*, and finely cut Japanese maples add richness and interest. In this garden four other pines are noteworthy. *Pinus thunbergi*, the Japanese black pine; its variety *oculusdraconis*, the dragon's eye; *P. parviflora*, the Japanese white, and *P. cembra*, the Swiss stone pine.

Southwest of this Japanese garden, on the edge of the swan pond and behind the marble sun temple, is probably one of the handsomest specimens in this country of the true Chinese Elm, *Ulmus parvifolia*.

Close by are two tall narrow spires of southern Bald Cypress, *Taxodium distichum*. They tower about seventy feet above the pond across from their slender cousin of October gold, *Taxodium ascendens*, the Pond Cypress.

Above the pond is growing a forty-year-old specimen of Himalayan Pine, *Pinus Griffithii*. It is one of the Arboretum's most beautiful trees. Philadelphia is close to the northern limit of its range (a companion tree was killed in the cold winter of 1934-35).

Situated on a flat plateau or terrace below the administration building is the rose garden. Covering seven-tenths of an acre with almost 2000 roses of both well-proved and newer varieties, it is the center of attraction from June through September. It is overhung by the big tupelos, tulip trees and black walnuts, and the Arboretum's large collections of boxwood and *Taxus* center around it.

The dry wall around three sides of the rose garden is a garden in itself, alive with yellow, white and lavender in May (*Alyssum*, *Iberis*, *Aubrieta*), pricked with color through the summer, a harmony of grays in winter. As a springtime lure to photographers, the dry wall

has been perhaps the most oft-remembered feature of the entire Arboretum.

On the balustrade around the lower part of the rose garden are many varieties of clematis, large-flowered and small. Two outstanding forms are the large-flowered, lavender-blue, "The President," and the little, open-faced yellow species with such lovely grace and an oriental air, *Clematis pseudoflammula*. To date the clematis collection numbers approximately fifty-two different species, varieties and hybrids.

Just below the rose garden is the fernery, a low circular conservatory where, in a world all its own, one may wind under fern trees and along banks of ferns and Selaginellas. A moist sunken grotto is covered with one of the finest growths anywhere in cultivation of *Trichomanes radicans*, the Killarney Filmy Fern.

At the east entrance of the rose garden is a thirty-foot specimen of the Lace-bark Pine, *Pinus Bungeana*, with sycamore-like, green-white, purple-lighted bark and soft, airy open foliage. Its low-branched trunks build into a rounded mass unusual for a pine and so of particular landscape interest.

East of the rose garden are two 40 to 45-foot Silverbell trees, *Halesia diptera* and *H. monticola*, natives of our southern mountains. They are indeed a lovely sight in the spring, covered with thousands of white bells. The two-winged Silverbell is noteworthy for its large leaves, more upright habit and later season of bloom.

The Arboretum has all three species of *Cedrus*. The youngest one, whose hardiness is yet to be proved, is the Deodar. Now about 18 feet high, it has been growing very rapidly for the past few years. The 60-foot Cedar of Lebanon, a specimen of the hardy strain presented by Professor C. S. Sargent in 1913, as yet has not developed the wide-spreading horizontal branches so characteristic of the species. There are four varieties of the Atlas Cedar: a silver one, a golden one, the very blue (previously mentioned in the Japanese garden) and the type, a thick, horizontally branched, graceful specimen east of the rose garden. Cedars are frequently seen in English gardens and

seem to be characteristic of them. Perhaps after seeing the beautiful trees here at the Arboretum more people will use cedars in their own gardens.

Fine beech trees are well represented; the American, and European in its purple, weeping and cut-leaved forms. The large, semi-pendulous tree by the administration building is probably the rarest and certainly the most graceful of them all, particularly in winter.

Other beautiful specimens of fine trees are: the yellow-flecked Sycamore Maple, *Acer pseudoplatanus flavo-variegatum*; the Golden Ash, *Fraxinus excelsior aurea*; a good number of oaks, among them *Quercus cerris* and *Q. conferta*; the Katsura-tree, *Cercidiphyllum japonicum*; *Phellodendron japonicum*, the Cork-tree; *Sophora japonica*; the Oriental Spruce, *Picea orientalis*, and three firs, *Abies cephalonica*, *A. c. apollonis* and *A. nordmanniana*.

Unplanted pastureland, covering approximately 80 acres, is used for cattle until such time as it can be developed. The cattle solve the problem of grass-cutting while producing manure and beef.

Functions

The activities of the Arboretum may be divided into maintenance, development, education, publications and research. Of these, maintenance consumes the greatest number of man-hours. Pruning, cultivating, spraying, fertilizing and, most of all, grass-cutting, require time and labor but are essential for the fullest development, enjoyment and appreciation of the plants.

This year almost 300 new trees and shrubs have been moved from the Arboretum nurseries to supplement and develop existing plantings. The present feeling of spaciousness and informality will be kept as the keynote in improving hitherto dull and uninteresting areas.

Informal instruction in nature study and conservation has been given to several hundred school children and their teachers within the past year. A formal course with university credit is given on all phases of propagation. Lecture tours and discussion groups are conducted for university classes, garden clubs and

various civic groups, some coming from quite a distance.

The Arboretum is fortunate in having a group of interested associates whose support makes possible the publication of a quarterly bulletin containing articles of horticultural and botanical interest, including the activities of the Arboretum. The Arboretum is publishing also a series of monographs devoted to botanical subjects.

The research carried on at the Arboretum is varied, as would be expected in the broad field of horticulture. Included are investigations on the accumulated black wastes of anthracite mining in central Pennsylvania with a view to their permanent colonization with plants; studies in forest genetics and tree breeding for the production of improved tree types by the Northeastern Forest Experiment Station of the U. S. Forest Service; control of insect pests; a special project on the control of shade tree diseases in cooperation with the University of Delaware Department of Plant Pathology; durable labels; plant propagation; aspects of tree fertilization, and the breeding of ornamentals, particularly rhododendrons and azaleas.

Purposes

Basically the purposes of an arboretum are to display for study as many as possible of the woody plants hardy in the area. English and European botanic gardens quite often developed from estates, where plants are arranged according to botanic families and their evolution. The Morris Arboretum plans to break away from this tradition for three reasons: the possibility of a more pleasing and decorative layout; more leeway in choosing the situation best filling the plants' needs, and, most important, it is felt that plant exhibits can mean more to a greater number of people when arranged on a functional basis. Inquiry and study should be stimulated if plants are grouped according to the obvious characteristics and the possible uses which tie the plant immediately into everyday life and common experience and needs. Toward this end plants would be arranged in demonstration plantings each showing a variety of the best plants for

a designated use, as hedges, groundcovers, bank plants; city tolerant plants, aromatic or fragrant plants, plants for birds, drought-resistant plants, dwarf plants, honey-producing plants, plants with decorative fruits, medicinal plants, nut crops, poisonous plants, plants for the seashore, winter-flowering plants, etc. There will be demonstration plantings also where trees and shrubs will be grouped together according to some decorative characteristic such as fall color, colored foliage (grey, blue, bronze, various shades of green), plant form and habit (fastigate, pendulous, horizontal, etc.) and plant texture. These plantings will try to show also some of the more appropriate uses for types frequently misused and thus often disliked and misjudged.

Erosion demonstration plots are contemplated to show suburban people (many of them future landowners) the best solutions to the problems of controlling and improving the land.

In addition, it is hoped to set aside areas of the arboretum for groups of plants which have undergone extensive horticultural development or have special soil and maintenance requirements, such as rhododendrons, azaleas, heath plants, evergreens, flowering cherries and crab-apples, ferns, hollies and lilacs.

The general layout and location of each of these areas has been worked out on a master plan. Fulfillment depends on public interest and support.

The Director of the Arboretum is attending the 50th annual convention of the American Institute of Park Executives, and the affiliated American Association of Botanic Gardens and Arboretum, in Boston, Mass., October 3-6, and will subsequently visit botanic gardens in New York, Philadelphia and Washington, D. C.

/ / /

Miss Eleanor Rohde called the Mermaid rose "The Queen of yellow roses." She said it was introduced by William Paul in 1917 and awarded a Gold Medal from the National Rose Society of England. One of its parents is the Chinese *Rosa bracteata*.

Rose Species

II.

BRIAN O. MULLIGAN*

Cultivation

THE chief requirements for growing most of these wild roses are: (1) a situation which is not waterlogged during the winter months, (2) plenty of sunshine, and (3) a soil which is not too acid or composed chiefly of leaf-mold or other humus. So long as drainage is satisfactory and the plants, with a few tolerant exceptions such as the Western American *R. gymnocarpa*, are not over shaded, rose species will grow in many and varied soils and situations, on the lightest sands or the heaviest clays, either with or without natural lime, and with the least possible amount of attention or care. However, it is probable that most prefer a soil heavy rather than light, containing a small amount of calcium; certainly the majority appreciate and benefit by pruning when necessary and a regular application of fertilizer every spring, with compost or some other form of humus spread over their root area in May if the soil is light and the site becomes very dry in summer.

The best planting time in the Seattle area is from late October until approximately mid-December, with February-March as an alternative period, though less recommended owing to the risk of subsequent dry weather. Pruning does not usually become necessary, except for removal of any dead branches, until the plants have grown to some size; then some of the oldest branches which have borne flowers may, if the bush needs thinning, be cut out during the winter months after the hips (fruits) have lost their beauty, although sufficient young wood must, of course, always remain to provide flowers for next season. Unusually long and vigorous young shoots may either be tipped during growth to induce branching, or pulled down and tied to a stake, with the same result.

The distance to be allowed between plants

must necessarily depend upon the size to which each will eventually attain. Where space permits, it is desirable to set the larger bush-forming species such as *R. Moyesii*, *multibracteata*, *omeiensis* and *setipoda* ten feet apart, which will give them room to show their natural form and habit of growth, and allow space to walk between them, at least for some years. Where groups of three or more are to be planted, if placed seven or eight feet apart they will eventually form one large and effective mass. As informal hedges, three to four feet between plants will be adequate, and for the most suitable kinds, such as *R. virginiana*, *altaica* and *nutkana*, the lesser distance is sufficient. For varieties of *R. spinosissima*, plant eighteen inches apart.

The smaller, more compact and less invasive species, including *R. Forrestiana*, *R. glutinosa*, *R. sicula*, *R. arkansana* and *R. gymnocarpa*, should be planted more closely together—about three feet apart—in groups of three, five or more plants, and allowed to merge into one another. Many of the American and some other species sucker freely, including *R. nitida*, *R. nutkana*, *R. carolina*, *R. rugosa* and *R. spinosissima*, and consequently should not be given the opportunity to extend into choicer plants.

If climbing species are to be planted against a wall or fence, allow fifteen or twenty feet length for each, training the young shoots out carefully to cover the area as fully as possible on each side of the plant. Some of the most vigorous climbers such as *R. Banksiae*, *R. moschata* and *R. Brunonii* will require more than this, and hence, if possible, should be so placed as to climb into a tall tree, preferably an evergreen to provide a better background for the flowers in summer.

Propagation

Rose species are propagated on a commercial scale by budding in summer or by grafting in early spring, the latter often under glass.

*This is the second and concluding part of the Rose Species study prepared by Mr. Mulligan, director of the Arboretum. The first installment appeared in our Spring, 1948, issue.

Many of them are not easy to root from cuttings, although with care, and by choosing the right period and type of growth in summer—usually in July—some success may be achieved with certain kinds. Cuttings taken at that season will be of partly-mature short lateral shoots, usually four to six inches long, inserted firmly in a shaded frame or under a glass cover of some kind, in a mixture of sand (two-thirds) and peat (one-third), or sand (one-third), peat (one-third) and vermiculite (one-third), kept constantly moist but not saturated. Some cuttings may also be rooted if taken at the end of the growing season (October) and planted firmly in a sheltered and well-drained situation to about half their depth, adding plenty of sand at the base if the soil is chiefly of clay. The former (July) type should produce roots within a few weeks and be fit to transplant outdoors by fall; the latter will require twelve months in the same site before moving.

Another vegetative method of propagation is by layering—pegging down and covering a convenient branch with soil and a stone, notching or partly breaking it at the covered part to induce root formation. This again will require at least a year to form a new plant; the work may be done in September or October.

Propagation by seeds has at least two disadvantages.

(1) Many rose species intercross very easily through the activities of pollinating insects; hence seedlings raised from any plant in a garden, or even in their native habitat where other species are growing nearby, are liable to be hybrids and not identical with the parent. C. C. Hurst however found (1929) a group of true-breeding *Rosa* species from Europe and western Asia which normally always produce seedlings similar to the mother parent; among these are *R. canina*, the dog rose; *R. pomifera*, the apple rose; *R. rubiginosa*, the sweet-briar, and *R. rubrifolia*. Other rose species may be and frequently are raised from seeds, but unless these are from plants isolated from other species, the risk of obtaining a mixed and varied progeny is considerable. In addition, many rose species are partially self-sterile,

and few fertile seeds may be formed unless cross-pollination occurs.

(2) Difficulties in germinating rose seeds. Seeds of many *Rosa* species are notoriously slow and erratic in germination. In 1935 M. A. H. Tincker in England found, after trial of more than a dozen different methods, that the most satisfactory system was stratification of the seeds in moist sand throughout the winter, in pots sunk in ashes outdoors from early November to early March. Even in this case the average germination after fifteen months was only 26 per cent, although *R. rugosa* gave 63 per cent and *R. mollis*, 44 per cent; on the other hand, *R. gymnocarpa* and *R. multibracteata* produced only 4 per cent. Dr. Tincker concludes that “some acceleration of the germination of rose seeds can be caused by storing the seeds in moist sand or other medium at a cool temperature of -2° C. to 2° C., or at 5° C., or in the soil in autumn and winter.”

Species for Garden Decoration

A. Climbing

- **Rosa filipes*, *R. Helenae*. Both introduced by E. H. Wilson from central and western China, 1907-8. The latter, named for Mrs. Wilson, has flowers $1\frac{1}{2}$ inches wide, in large corymbs. Those of the former are smaller but more numerous.
- **R. moschata*. Musk Rose. Cultivated in England since the late 16th century, earlier in Italy. Flowers $1\frac{1}{2}$ inches wide in large corymbs, very fragrant. A double-flowered form is also known, and was illustrated in 1629.
- **R. Soulieana*. Introduced to France by R. P. Soulie from western China, 1896. Enjoys a dry climate. Stems very thorny. Flowers $1\frac{1}{2}$ inches wide; stamens conspicuous. Hips Marigold orange. Sept.-Dec.
- R. Sinowilsonii*, *R. cerasocarpa*. Two similar Chinese species; the former, introduced by Wilson in 1905, is semi-evergreen, and has reddish young shoots.
- R. multiflora* var. *cathayensis*. A larger, pink-flowered Chinese variety of the Japanese *R. multiflora*. The form *carnea* has attractive double pink blossoms. All the preceding (except the last) have corymbs of fragrant white flowers in June or July, and orange or reddish hips in fall and early winter.
- R. Wichuraiana*. An evergreen, trailing species from Japan, Korea and Formosa, with glossy leaves and white flowers in July. Excellent as a cover for banks.
- **R. Banksiae* var. *lutea*. The pale yellow, double-flowered variety of the Banksian rose, flowering in May and June. Usually thorn-

*Indicates those most recommended.

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The Wind River Arboretum From 1912 to 1947

THORNTON T. MUNGER*

History, Location and Purpose of Arboretum

IN 1909 the Forest Service began its program of artificially reforesting the denuded burns on the national forests by establishing a 10-acre nursery on recently logged land in the Wind River Valley of southern Washington. The nursery has since been greatly expanded and has been the source of all the trees used by the Forest Service in planting west of the Cascades. It is located about 10 miles north of the hamlet of Carson which is near the Columbia River in Skamania County.

Soon after the nursery got into production forest research activities were centered at this point by the creation of the Wind River Experiment Station, primarily, at first, to study nursery and reforestation problems. To have on display large specimens of the various species which were then being grown in the Wind River Nursery, a few trees of each were planted on some idle stump land alongside the nursery and its residence buildings.

This was the beginning in 1912 of the first publicly maintained arboretum in Oregon or Washington, though some notable private collections of trees antedated it. From this small beginning the Wind River Arboretum has gradually expanded to cover 11½ acres rather closely planted with from 5 to 25 specimens each of 135 species of conifers and fewer specimens of 33 species of broadleaf trees; this is exclusive of many lots which have not survived.

The arboretum was located here primarily to test in a climate and soil representative of a considerable area of forest land, species that might prove of value for reforestation. Secondly, this being an important and much-visited forest research center, it was desired to create here an outdoor museum of trees which would have interest to travelers and some dendrological value to students and research workers. It has been the intention from

the start to grow the trees under natural forest land conditions, with only a minimum of culture. No consideration has been given to landscaping or aesthetic effects.

At first the planting was somewhat promiscuous but in the mid-1920s a plan was adopted by which the trees of each genus were grouped together, so far as space permitted. In most of the plantings since then the purpose has been to plant about 20 of each species, spacing them somewhat irregularly in a block about 12 to 15 feet apart. Trails, rough gravelled in CCC days, and kept mowed of weeds, enable the visitor to walk along the borders of many of the block plantings.

Site, Soil and Climate

The Wind River Arboretum, like the adjoining large nursery, lies on a bench that slopes about 6 per cent to the east on the western edge of this hanging north-south valley which is here about three-quarters of a mile wide. Its altitude is 1,150 feet, but high hills surround it. The soil is a fairly deep, coarse, porous, "shot" sandy loam derived from the disintegration of the prevailing basaltic rock. After removal of the forest cover its fertility seems to leach rapidly in this rainy climate, and during the summer drought it becomes very dry. In the classification of five forest sites adapted to Douglas Fir this rates site III, or medium, in the scale of growth.

The climate may be summarized by the following items from the records of the Wind River cooperative weather station for the period 1911 to 1940:

Yearly precipitation—av. 86.49 ins.; max. 135.92, min. 54.15.

Temperature—av. annual 48.3° F.; mean max. 59.9°, mean min. 36.6°.

Temperature—max. of record 107°, min. of record —13.

In about half the winters the temperature does not fall below +10°. The average length of season with no frost is 133 days; shortest

*Mr. Thornton T. Munger, former director of the Wind River Arboretum from 1924 to 1946, is now collaborator with non-resident supervision.

75 days. The summer drought is acute and the nights are cool even in summer.

The climate is fairly characteristic of the western foothills of the Cascade Range except, that being almost on the axis of the Cascade Range and hence toward the eastern edge of the humid belt, it has a sunnier, hotter, and drier summer than points of like annual rainfall to the west.

Sources of Seed or Stock

At the outset, seed of some species was bought from commercial dealers but later nearly all the seed, and in some cases young trees, have been obtained from other arboreta or forest experiment stations, assuring positive identification. The arboretum stock has been grown in a corner of the Wind River Nursery until large enough to set in its permanent location.

Records, Reports, and Nomenclature

Each lot of seed or stock was given an acquisition number and had a 5 by 8-inch card prepared upon which to record its history. Altogether there have been 539 acquisitions; but since duplicate lots of certain species have been acquired the number of different species is only about 200. Each tree carries its lot number on a metal tag; each species group has a sign bearing the scientific and common names.

It was the hope to establish in this arboretum all the tree species of the world likely to survive at this location, but the broadleaf trees did so poorly that for the last 20 years or so new acquisitions have been confined almost entirely to conifers. The collection has been directed entirely at natural species, and no effort made to get hybrids, horticultural varieties, regional races, or trees grown by vegetative propagation.

At periodic intervals all trees in the arboretum have been measured and a progress report prepared summarizing the results.¹

The nomenclature has been a problem, as it always is. The scientific and common names

1. Munger, Thornton T. and Kolbe, Ernest L. The Wind River Arboretum from 1912 to 1932. Mimeo. 1932.

Munger, Thornton T. and Kolbe, Ernest L. The Wind River Arboretum from 1932 to 1937. Mimeo. 1937.

Munger, Thornton T. The Wind River Arboretum from 1937 to 1946. Multilithed. 1947.

of the Forest Service's 1927 Check List (as amended), but not including the changes in the still unapproved mimeographed edition of April 15, 1944, were used for the North American species. For species of other countries the names in Dallimore & Jackson's "A Handbook of Coniferae" have been used with few exceptions.

Injuries, Disease, and Enemies

An arboretum, like orchards and gardens, is subject to many vicissitudes. It is most disheartening to the arboriculturist after getting seed of a rare species and watching the little trees for years to have them succumb to some enemy from without. Here, since it was the object to grow these trees under conditions simulating the forest, intensive preventive or remedial measures have not been applied. They have been given water only at time of planting. Besides death of some lots because of obvious unsuitability to the climate or soil, losses have been from a variety of causes.

Red-bellied sapsuckers have mortally girdled several trees, notably *Pinus sylvestris*.

Gophers have gnawed off the roots of trees five feet high and undoubtedly impaired the health of others.

Snow and ice have bent over and broken many heavy foliated trees, such as *Pinus apachea* (*P. latifolia*). Splints and guy lines have remedied some of the injuries.

Adelges galls have disfigured certain species of spruce, *P. sitchensis* perhaps being the worst sufferer.

White pine blister rust has invaded the arboretum in spite of repeated efforts to keep the nursery and its environs safe; many cankers have been removed to prolong the life of infected trees.

Spring frosts have recurrently caught the new foliage of some species whose phenology does not fit the local climate, sometimes with fatal results, particularly certain *Abies*.

Needle blights have been serious on several species especially the Rocky Mountain form of Douglas fir and the native *Larix occidentalis*.

Growth and Survival of Various Conifers

Among the 135 species of conifers growing in the arboretum are species which would

hardly be expected to survive in a climate so different from their native haunts, like *Pinus coulteri*, *Pseudotsuga macrocarpa*, and *Cupressus macnabiana* (and *C. bakeri*). Others which should survive here, like some of the cedar tribe, have failed perhaps because of unfavorable soil. The southern pines have failed for obvious climatic reasons. The growth has not been rapid but many of the older lots now average over 45 feet in height. It is interesting that on the nearby watered lawn, specimen trees are making much faster growth than in the unwatered arboretum.

A resume of the status of some of the genera may be of interest:

The Pines

Forty-seven species and subspecies of *Pinus* are now growing in the arboretum. A large proportion of these have made excellent development. Species from a considerably different environment, *P. sabiniana*, *coulteri*, and *muricata* for example, have survived and done fairly well. Others from fully as rigorous a climate, like *rigida*, have been inferior in form. The southern pines are a failure except *echinata* and it is of poor form and thrift. The nut pines of a much drier and sunnier climate

have survived well, but made their customary slow growth. Some species that suffered winter-killing of the foliage when they were small, like *coulteri* and *attenuata*, have not shown damage in recent years as they grew taller. The cone production of several species has been abnormally early and heavy; *sinensis* is a striking example of excessive cone production with poor thrift and form.

The Larches

There is a very thrifty planting of 10 species of *Larix*, some dating back to 1913. *Sibirica* is outstanding and the tallest is 57 feet. It is somewhat ironical that one of the native species of Washington, *lyallii*, has failed entirely after years of nursing a lot of wild stock.

The Spruces

All species tried have apparently succeeded in one test or another with the possible exception of *P. jezoensis*. There was some difficulty in establishing *breweriana* but a group from two different lots is flourishing now. Many lots bore cones profusely from the time they were four or five feet high, *bicolor*, *koyami*, *likiangensis*, and *rubra* being conspicuous in this regard.



Site of the Wind River Nursery and Arboretum 10 miles north of the Columbia River and Carson, Washington. The arboretum occupies the 11½ acres in the foreground between the nursery and the road that skirts the hill. (Photo by U. S. Forest Service in 1935.)



Among the 22 species of *Abies* (balsam firs) now growing in the Wind River Arboretum, the local species, as well as several exotics, make a fine showing. Here is the local noble fir (formerly *A. nobilis*, now *A. procera*) which in 33 years has attained a maximum height of 27 feet. (Photo by U. S. Forest Service.)

The Hemlocks

The eastern hemlock grows well alongside the western, but no species makes a handsomer appearance than the native *T. mertensiana*. The Japanese *sieboldii* is suffering from freezes and is hardly surviving; *caroliniana* is young, but promises well.

The Douglas Firs

The Rocky Mountain Douglas Firs (blue form) have grown notably slower than their native cousins 50 feet away outside the fence. *Pseudotsuga macrocarpa* seemed to be on the way out nine years ago with gradual mortality, but the four survivors now look very well, though the tallest is only 7 feet in 20 years.

The Balsam Firs

A large proportion of the species of the world have been tried here and specimens of 22 species are now living. Many of the lots are strikingly successful; beside all the six native Oregon species, *A. pectinata*, *arizonica*, *fraseri*, and *balsamea* are flourishing. Other species have done less well or actually failed and it is not clear whether this is due to the climate or to the difficulties of establishing these shade-loving species in the exposed hot site of the arboretum. Certain species have suffered greatly from spring freezes, notably *brachyphylla*, *holophylla*, *koreana*, *nephrolepis*, *sachalinensis*, *sibirica*, and *veitchii*.

Cedrus

Of the three species of *Cedrus*, *atlantica* and *libani* seem perfectly at home, though slow-growing. The *deodara* has not done well.

Cupressus

One of the most thrifty lots in the arboretum is the *bakeri* variety of *C. macnabiana*. It seems perfectly at home here, but growing slowly as in its native haunts. It is the erect, compact, dense-crowned form. The sprawling-branched type of *macnabiana*, whose crown width is as great as its height, has also prospered here. Some specimens of *arizonica* on a nearby watered lawn have done phenomenally well, though the arboretum trees of that lot were lost. Of the other *Cupressus* species, none tried has succeeded, although a few specimens of *goveniana* and *macrocarpa* are still alive.

The Sequoias

Sempervirens has survived out planting for several years, but it is freezing back constantly and making only a sickly sprawling plant. *Gigantea* has done excellently.

The Incense Cedars

Only *L. decurrens* has been planted here and it has made excellent development; *chilensis* was started in the nursery and suffered winter damage so was out planted to the more equable climate of the Cascade Head Experimental Forest.

Thuja

This site is a poor place for most trees of this genus, though *T. plicata* is native here. It is interesting that this species has been browsed badly by deer while other trees of the cedar tribe have been untouched; *dolabrata* has thriven on the watered lawn; *occidentalis* and *orientalis* average only five or six feet high in over 20 years and apparently need a moister, cooler soil.

Chamaecyparis

Port Orford white-cedar (*C. lawsoniana*), though far from its native southwestern Oregon, has thriven here, as has also the other native of the high mountains of the state—Alaska cedar (*C. nootkatensis*). The Japanese species, *C. pisifera* and *obtusa*, have been failures. The swamp-loving eastern *thyoides* has done poorly on this loose, coarse soil.

The Junipers

Of the many lots of juniper seed acquired, many did not germinate, probably because of failure to give specialized treatment. Of the species established in the arboretum, none looks perfectly at home. *Virginiana* is perhaps the most successful, though *chinensis* and the two species of this state, *occidentalis* and *sco-pulorum*, are both surviving.

The Taxaceae

Both *Taxus baccata* and *brevifolia* are doing very poorly, obviously a poor environment for them. *Cephalotaxus drupacea* must be classed as a failure though sprouting after winter-killing. *Araucaria imbricata* on a sheltered part of the lawn look healthy now, but only four feet tall in 33 years.

The Broadleaf Trees (Hardwoods)

As stated earlier, acquisition of broadleaf trees (so-called hardwoods) was discontinued about 20 years ago because, for the most part, they had been so unsuccessful in this soil and climate.

The major eastern species have done very poorly; the proportion of trees that have survived is not bad, but their form and height is far below normal. Some, like basswood, have periodically died back and sprouts replaced the original main stem. Box elder is 9.3 feet high in 35 years, yellow poplar 13.5 feet in the same time. Black cherries are all alive but average only 8.2 feet in 33 years. Chestnut is 16.3 feet in 22 years. Of the oaks, *Q. borealis*, red oak, is definitely the best of any species tried. A couple of trees in this lot are 42 feet tall at age 34. Most of the American elms planted are alive but average only 11.4 feet in 34 years; they are broken by storms and distorted in form. Of the ashes, *F. pennsylvanica lanceolata* has done the best of any, but averages only 16.7 feet in 34 years.

Quercus chrysolepis and *Lithocarpus densiflora* of southern Oregon are practically failures. But golden chinquapin (*Castanopsis chrysophylo*), which is native only a few miles away, has done well.

The poor success here of the broadleaf trees must be attributed largely to the dry, hot

summers, not to winter cold. The cold nights during the growing season are probably unfavorable to some species. The porous acid soil is disadvantageous. The failure of the broadleaf trees to do well here under untended forest land conditions does not mean that on cultivated or watered ground they would not succeed in this climate. Several broadleaf trees on the lawns are doing much better than those in the arboretum.

In Conclusion

The Wind River Arboretum has taught foresters a great deal about the adaptability of foreign species to Cascade Range conditions; it has stimulated interest of the visiting public in forestry, for zeal in forest conservation often begins with interest in the individual tree; it has given several generations of forest school students their first-hand view of many of the notable trees of the world; it has furnished cones and foliage for educational exhibits; it has even furnished pollen for hybridization experiments elsewhere. In short, an arboretum such as this in the heart of the timber-growing region is a valuable adjunct to forest research and to public education.

It is hoped to add to the collection some of the rarer trees and recently recognized species, so that students of dendrology from near or far may have a complete assortment of Temperate Zone conifers to study. A regional arboretum such as this may thus become a valuable scientific outpost to the great centralized arboreta, with whom interchange of results and of materials are much to be desired.

Most trees and shrubs flowered from 2-3 weeks later this year than in 1947, spring-flowering species being more delayed than the summer types.

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Let's Talk About Herbaceous Peonies

ROY S. LEIGHTON*

NOW that the spring season has once again come and gone, it is easy for us to reminisce. If we are good gardeners we have made some notes, visited a few other gardens or nurseries and charged ourselves with enthusiasm to add new plant members to our garden collection.

If you have a spot that is sunny, has good drainage and if you desire to use plants that require only normal care and may grow for years without changing, one must of course explore the peony field. American hybridizers have made tremendous strides in recent years. It is no longer necessary to import varieties from Europe, the Orient, or any other foreign country, for American peony hybridization now far surpasses that of most all other countries. (Thanks to the fine work of the American Peony Society).

We now are able to secure dwarf peony varieties for bedding purposes that do not grow over twelve to eighteen inches high and with miniature flowers in proportion to the size of the plant, thanks to the peony hybridizers who are specializing for this feature. Incidentally, this will open up a new field for the use of the peony in smaller flower arrangements. Several noteworthy varieties include "Ariel," a full double, light rose pink that comes into bloom very early. Fragrance is of cinnamon scent. This is an extraordinary variety for its season. "Rosalie," a semi-double, looks like a rose and close to the true American Beauty shade. A dwarf plant, very strong grower and bloomer, "Parry" is of the anemone type; small bloom, dwarf plant with an unusual shade of pink, which is near to a salmon shade. "Peggy" is an early stiff-stemmed dwarf, the blooms are a warm bright silvery pink, petals notched and crinkled. "Flower Girl" is a true dwarf plant to twenty inches tall, opens flesh fading to white. Rose

fragrance, blooms on stiff stems. "Smouthii," a purplish red single with leaves gracefully cut.

Other recent introductions have produced varieties with such stout stems that they are able to support their large flower bloom without the necessity of staking, which is a fine addition for the perennial border or specimen planting. Several outstanding varieties would include "Dr. J. H. Neeley," double, midseason white with a blush tint, fragrant, with strong stems and a strong grower. "Elsa Sass," a gold medal variety very worthy of the distinction. Full double, rather dwarf growing but stems stiff and strong, holding the beautiful large bloom erect under most all conditions. A true rose form with large petals. "Ellen Foster," rose type blooms of good size, large, broad, deep petals of almost uniform light flesh pink flushed delicate lavender. A newer variety. "Minuet," very large, full rose type. Color a most pleasing light pink. Stiff stems reaching fifty inches in height, with foliage to the ground. "Blanche King," a deep, dark pink that holds its color well. Very late bloomer. Tall and handsome. "Kansas," early bright red that has a full double flower held high on one of the strongest of stems. Recently was the American Home Medal Winner. "Mischievous," a most satisfactory dark red-pink. Good size and color which holds well in the sun. A good landscape variety. "President Lincoln," a tall single red with flowers large for a single and held straight up. Two rows of brilliant red petals with striking center of rich yellow stamens.

Another very important phase of the newer herbaceous peony hybridizing has been the introduction of varieties that bloom very early, or as much as a month before the regular *albiflora* types come into bloom. Most of these come in singles, or semi-doubles on extremely sturdy stems and with very large, imposing looking heavy leaves. Still very difficult varieties to obtain yet but worth noting for the future are: "Chalice," huge pure white blooms

*Mr. Roy S. Leighton, a member of our Foundation's Board of Directors, has been an experienced peony grower for many years. The Leightons' lilac gardens in Edmonds, Washington, are well known to many of our readers.

eight to ten inches across, with long silky stamens, erect on heavy stems about three feet tall. "Birthday," a medium-sized pale pink Shirley poppy in color and form. Slightly fringed at the edge.

Then there is that group of true hybrid introductions with entirely new breaks in the peony color field as a result of species crosses. Unfortunately, very few gardeners are familiar with this latter group because they are still too new, somewhat expensive and generally bloom before the larger peony show of flowers begin. To mention but a few: "Victoria Lincoln," clear pink, large, full double when established. This is an *albiflora* x "Otto Froebel" cross. "Red Cockade," frilled and crinkled like a big fringed tulip. This is an *albiflora* x *lobata* species cross. "Burgundy," blackish purple petals of heavy substance, lustreless and crinkled. Brilliant yellow stamens. This is a triple hybrid of *albiflora* x (*macrophylla* x *officinalis*).

Those who love to cut peony blooms for the home or office will marvel at the newer introductions with fine stiff cutting stems, easily growing to thirty-six or forty inches. This would include such varieties as "Marietta Sisson," midseason, light pink double. A very loosely built flower that is very attractive. Stems good and flower held rigidly erect. Another of the good Sass originations. "Mrs. Franklin D. Roosevelt," the flower is artistically formed, with extremely long, loose petals of soft pink. A splendid grower with excellent blooming habit. "Nic Shaylor," double, late, blush or light pink with occasional red markings. Some years these markings are more prominent than others, indicating weather conditions influencing this characteristic. Very fine form, good plant growth. "Ella Christianesen;" no matter how many peonies you have already planted, you will find this a worthy addition. The color is a pleasing dark pink. Petals are long, narrow, and heavily serrated on the edges. "Matilda Lewis," a very dark maroon red that is well formed and fully double. This variety is pleasantly fragrant. "Nimbus," double, full, deep flowers of palest rose fading to white. Late bloomer.

Those who enjoy the foliage of the plant as well as the blooms should consider several of the species and hybrids of these species crossed with the regular *albiflora* types. Outstanding for interesting foliage are such species as *Willmottiae*, which is a very beautiful white flowered species from Western China. It is one of the earliest of all peonies, coming into bloom in early May. The foliage is large and carries color shadings of green, rust and gray. The stems are quite red. Unfortunately, it is still very rare, but much worth seeking out. Fortunately, many of its crosses come with the same beautiful foliage and early blooming characteristic. Another desirable species is *cmodi*, the Himalayan peony. It is very tall, with nodding white single flowers that are quite like a single polyanthus rose. If not disbudded it will bloom for a very long time. The extremely handsome foliage is light green on tall wiry stems. *Mlokozewitschii* is the only truly yellow herbaceous peony and one of the most beautiful of hardy plants. A very early and abundant bloomer. The plant is quite dwarf in growth habit with odd grayish green foliage. Although not always certain to succeed, it should at least be tried. *Macrophylla (tomentosa)* is a very large leaved species from the Caucasus region. Flowers are white, cup-shaped; one of the first of all peonies to bloom. *Officinalis lobata*, dwarf in its growth habit with light green finely cut leaf foliage. Flowers are a brilliant vermilion color, the brightest light red shade that one can imagine. *Triterinata*, also comes into bloom very early. Flowers a light mauve pink. The foliage is wavy. It is a plant worth having. *Cretica* is another very beautiful early species. *Tenni-folia* and its hybrids in some seasons are the first of all peonies to bloom. The plants have finely cut foliage and a great abundance of bright crimson flowers. Dwarf grower.

It would be unfair if I did not caution all growers of peonies in this great Puget Sound area to apply a spray of micronized copper, applied once a week from the time that the peony first starts appearing through the ground until the leaves are well formed, in order to

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Sickly Foliage

O. B. HOWELL*

PRACTICALLY all plants are subject to the yellowing of their foliage which is due to one of two common causes. These are (1) Lack of nitrogen in which the entire plant turns yellow and (2) chlorosis, wherein the leaves turn to a light green and finally to a creamy-white while the leaf veins still maintain their green color. The presence or absence of the green veins is the identifying characteristic by which the trouble can be diagnosed.

Nitrogen deficiency can readily be cured by applying some form of fertilizer, either as barnyard manure or as a commercial fertilizer which contains this element. If manure is used, apply about a half peck around the plant (but not touching the stems) dug or worked into the soil and well watered down. If a straight nitrogen fertilizer such as nitrate of soda or sulphate of ammonia is used, scratch in a tablespoonful around each affected plant—being careful again not to get any fertilizer on the leaves or against the stem. Water this in well. Commercial brands of fertilizer may also be used the same way with amounts up to a cupful, depending on the size of the plant. A teaspoonful for a snapdragon, two table-spoonsful for a peony, a cupful for a shrub. If the plant does not respond readily, repeat the treatment two or three weeks later.

The second one, chlorosis, is a deficiency disease commonly occurring where flowers or shrubs have been planted where lime in the form of plaster or cement has been worked into the soil in the process of building the house and walks. Chlorosis may also be caused by the lack of iron or manganese (usually the former) in the soil, or by the presence of the lime which makes the iron unavailable to the plant. It should be said also that many people unfamiliar to the Inland Empire soils have added lime to their yards and flowers because it was the custom to do so in those soils which are very acid, as are found on the

West Coast. Inland Empire soils, with very few exceptions, do not need lime. It is noted also that certain hybrid tea varieties of roses, particularly those containing the yellow blood of the Australian Copper rose are very susceptible to this yellowing leaf condition.

The function of the green leaves of plants is to take the various elements received from the roots in solution form and, with the aid of the green chlorophyll, manufacture these raw products into starch and sugars. These are the energy and wood-building foods of the plants. When the plant cannot obtain these food materials because they are lacking, or are prevented from being absorbed by the lime, the chlorophyll is inactivated or destroyed and the leaves become yellow. Then, when the leaves are in this inactive condition, diseases and insects finally kill the whole plant.

The cure for chlorosis is very easy. Simply add the unavailable elements in a soluble form. For example, 2 to 4 pounds of copperas (iron sulphate) may be added to each 100 square feet of garden area. Copperas, being very soluble, will clear up the condition within a week's time. If the soil is very alkaline (a condition opposite to an acid soil) it may be necessary to repeat the copperas treatment every 10 to 20 days.

Inland Empire soils usually have plenty of iron. As lime ties up this iron and makes it inaccessible to plants, it is necessary to acidify the soil to release the iron into a soluble form. This is done by adding to the soil either aluminum sulphate, sulphur, tannic acid, or peat moss. Aluminum sulphate is the fastest acting of the group, but it also causes clay soils to become sticky and hard to work. Aluminum also may become harmful to plants by accumulating in the soil after two or three years applications. For this reason sulphur is commonly used (its cheapness also recommends it). When 12 to 15 pounds of sulphur is used to each 100 square feet of garden space the results are noted in three to six weeks. Sulphur oxidizes slowly so this amount

*Mr. O. B. Howell is extension specialist in ornamental horticulture at the State College of Washington, Pullman, Washington.

will last for a year or longer. For quick results a mixture of this amount of sulphur plus two pounds of aluminum sulphate will acidify the soil properly until some of the sulphur dissolves. The total amount of sulphur necessary to neutralize the lime in a soil depends on the amount of lime present.

While not accurate, a fairly simple test to determine the amount of sulphur needed is to take a teaspoonful of soil sample and put a few drops of muriatic acid on it. If it doesn't bubble, only 5 to 8 pounds of sulphur is

needed to each 100 square feet of soil. If small particles of lime are visible in the soil and vigorous bubbling takes place, 20 or more pounds of sulphur are needed. The method of application recommended for small amounts of sulphur is to rake it into the soil and water it gently. For large amounts, holes are dug around the plants and about 10 per cent sulphur is mixed with the taken out soil which is then returned to the hole. Sulphur may also be placed in holes punched in the ground around plants.

The John A. Finch Memorial Arboretum

HAROLD T. ABBOTT*

THE people of Spokane have been benefited by the gift of a new arboretum as a memorial to the late John A. Finch, pioneer mining leader and lover of nature. In January, 1948, the sum of \$250,000 was made available to the city from the remainder of the Finch estate. Preliminary work of clearing and maintenance has been underway this year.

Under the provisions of the grant, it was stipulated that approximately \$50,000 should be used for an administration building and arboretum library, and that \$50,000 should be set aside, the income from it to be used towards maintenance. The rest of the grant was to be used for development.

The desire for an arboretum in Spokane was expressed for many years by the late John W. Duncan, superintendent of parks for 30 years. Because of the unique climatic conditions of Eastern Washington, Mr. Duncan felt that an arboretum would serve a useful purpose not only for its recreational value, but as a laboratory for the schools, colleges and the timber interests of this region. Fortunately for Spokane, the appropriateness of an arboretum as a memorial to Mr. Finch was fully appreciated by Mr. William A. Corey, the only surviving trustee of the Finch estate.

During his lifetime, Mr. Finch had deeded to the city many large and valuable tracts of

land for park purposes and among them were portions of the attractive Garden Springs property, the site of the present development. As the name implies, this area is favored by having a plentiful supply of underground moisture and a stream flowing the entire year. In a semi-arid country such as that of Spokane, a creek or spring is a treasured feature.

The Finch Arboretum will be a small one of not more than 40 acres to begin with. An additional tract of about 15 acres for future expansion is under consideration at this time.

The purpose of this arboretum is to provide a collection of the most satisfactory woody plants for ornamental, forestation and timber crop plantings. No attempt will be made to include every species hardy in Eastern Washington. As a park arboretum it will be used by the recreation department for a program of nature lore, by the bird club as a favorable spot in which to observe bird life, and by the amateur gardener as a place to become better acquainted with plant materials for his use.

Situated as the arboretum is along the Sunset Highway, its proximity to the center of the city makes it readily accessible to everyone. In driving from the west, visitors are impressed by the beauty of the arboretum's ponderosa pines, and the native *Amelanchier*, *Philadelphus*, *Ceanothus* and *Physocarpus* displays which provide an unusual foreground to the view of the city's western entrance.

*Also the author of *Trees of Proven Worth in Eastern Washington*, on page 30, this issue.

The Arboretum Bulletin

VOL. XI, No. 3 SEATTLE, WASH. FALL, 1948

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9 a. m. to 4:30 p. m.
Monday through Friday
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Special Notice

To keep memberships in the Arboretum Foundation in good standing, dues should be paid during the month payable. Active memberships more than three months in arrears and previously established \$2 memberships more than thirty days in arrears will be dropped and THE BULLETIN will be discontinued.

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Notes and Comment

New Board of Directors

The following directors of the Arboretum Foundation were elected at the annual membership meeting August 4, to serve a one-year term:

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Olympia—Mrs. Thad Pierce.

Pullman—A. T. Merrill.

Puyallup—Fred W. Griffiths.

(Continued on Page Thirty-three)

President's Report

MAURICE JACKSON*

DURING the year closing the Foundation has worked toward organizing for a more efficient and substantial assistance to the University in its management of the Arboretum. While we must increasingly intensify our effort to fully accomplish this objective, I believe it reasonable to say that substantial progress has been made.

In last year's report it was stated that the net contribution to the University should in time be increased to \$1,000 per month. You will note from the Treasurer's report that cash allotments and expenditures during the fiscal year amounted to \$4,308. This, together with cash awaiting allocation, would bring the average monthly figure to about \$500, a considerable improvement over prior years, about half of our goal.

The office has been moved to the Arboretum proper, adjacent to and in communication with the staff office of the Director. This has improved our efficiency even more than was expected. It has made it more convenient and interesting for all members to visit our own office and the Arboretum office, and to meet the active staff.

Our paid membership roster is improved in number, in total receipts, in prompt payment, and in expected permanence. While we have not and do not intend to raise the dues of our many loyal \$2.00 members, a number of them voluntarily increased to a higher classification. The minimum charge for a new membership from any source is \$5.00. We are especially pleased with the number of subscriptions in the amount of \$25.00 and more. Your most effective response to the increasing interest in the Arboretum is by the obtaining of new memberships, and as well by raising your own to a higher classification if you can reasonably do so.

An ever increasing and important source of

assistance is from memorial funds. As the physical appearance of the Arboretum improves, in direct relation will it be more highly appreciated as an appropriate recipient of gifts to be expressed as living and permanently-cared-for memorials. During the past year donations in a substantial amount have been received, as well as special memorial plantings by the Seattle Garden Club and the Mercer Island Garden Club.

I believe that operating expenses have been reduced to a minimum for efficiency. We will have some increase in cost for the ARBORETUM BULLETIN unless made up by additional advertising.

Every dollar that comes in to the Foundation, in excess of operating expense, is available for direct expenditure by the University Arboretum management, or for specific allocation at its request or with its approval.

The above is with the exception of gifts or bequests to the Endowment Trust Fund, the principal of which remains intact for distribution to the University of Washington in 1994, specifically allocated for operation and maintenance of the Arboretum. The income from the principal is made available for operations. I urge that an increasing interest be taken to implement this endowment fund.

It will be suggested tonight that you name an additional officer in the capacity of Historian, whose duty it will be to compile a permanent review of the organization and development of the Arboretum to date; this would record the names of individuals and organizations who have been active in its behalf.

I wish to thank all committee members for their diligent attention to Arboretum business. In particular I want to commend: Mrs. Carl Ballard for her continuing work with the Arboretum Units.

Mr. Donald Graham and Mrs. Stanley Sayres, and their subchairmen and committee personnel, for the outstanding success of the Rhododendron Show. Mr. Charles May of the

*Mr. Maurice Jackson, retiring president of the foundation for the year ending May 31, 1948, gave this report of the activities during the year at the annual membership meeting held August 4 in Anderson Hall on the University of Washington campus.

University gave considerable time and effort to the project.

Mrs. Eva Scott Simms for initiating and carrying through to completion the first Lilac show, in the name of the Foundation. I am sure this could be developed into an unusual and prominent annual event.

The ARBORETUM BULLETIN editorial board, whose names appear in each issue. It would be difficult for me to express the appreciation of all members of the Foundation for the faithful and highly competent work of these individuals. THE BULLETIN has increased in

stature both locally and nationally, as a semi-professional publication. A major factor in the especially high percentage maintenance of our membership is due to the general reader interest in THE BULLETIN.

Mrs. W. A. Fisher, chairman, and Mrs. Kenneth L. Mead, for their faithful and competent work on THE BULLETIN mailing committee.

The nominating committee, composed of Mr. Clinton S. Harley, chairman; Mrs. Carl Ballard, Mrs. Philip Macbride, Mr. R. B. Harris, Mr. Donald Graham, Mr. Roy S. Leighton, and Mr. Darwin Meisnest.

Mr. Brian Mulligan and Mr. Milo Ryan for the highly successful series of Saturday afternoon radio programs, presented through the University's Radio Division. I regret to announce the resignation of Mr. Milo Ryan as editor of THE BULLETIN and director of public information. He will devote full time to a position in the University of Washington School of Journalism.

Miss Gene Webb, our executive secretary, and Mrs. Mary Flanders, accountant, both of whom have been unsparing of their time and effort in our behalf.

It has indeed been a pleasure to be associated with you as president of the Foundation. In the years since the Arboretum was founded, many enthusiastic supporters have contributed far more towards its support, yet I hope that I may be counted as one who has added something to the development of a project which, as it approaches maturity, will surely be one of the most colorful and important cultural assets of the whole state.

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Symposium . . . Trees for Town Gardens

Little has been written upon trees suitable for town gardens, a subject in which considerable interest is now being shown. Appropriately, therefore, we present these articles from various sections of the Northwest.

Street Trees in Seattle

ROBERT J. HANSEN*

SEATTLE has been no exception to the rule that cities just grow. As a pioneering town vast areas were not cleared of tree growth. Their removal was a gradual process of necessity. Assuming the status of a city, fewer trees remained in the center of commercial activity. They were a detriment to progressive expansion, it seemed, always in the way; too tall or taking too much of the limited atmosphere.

Mother Nature was too thoughtless in her planting . . . man was too careless. Couldn't they have known the city was to be here, needing surrounding territory? Man lived for the present time only. Tomorrow was far away. Planning was not in his consciousness. His streets, built to accommodate the horse and buggy, were narrow and planted with young trees which, in many cases, have now matured to form stately avenues. The coming of the automobile opened a new era in transportation and man found these narrow streets could not meet the expanding needs of the times.

Two recent examples of expansion this way, where block after block of mature trees have been wiped out, are the widening of Boren Avenue and of 15th Avenue N.E. The physical needs of city traffic justified the sacrifice of trees in the name of progress. How sad that our fathers had not looked ahead. Simple planning would have alleviated these conditions. The financial burden to rectify these mistakes now is excessive.

Following the same pattern of other cities there are remaining many misfit trees along Seattle's streets. These are the so-called "weed-trees" such as Oregon maple, willow and poplar. Those trees which are short lived also are included. Many clog the sewer lines with rampant roots, or heave and break the

sidewalk. Some grow too tall, interfering with the overhead utility wires which mark Seattle's landscape. Others are brittle, being hazardous with falling branches. A few are dangerous because of fruits which make streets and walks slippery. One can see all phases of street tree planting or lack of it—from streets with no trees* to those with too many, and, of course, all variations of tree species.

Upon seeing good examples of planned street tree plantings, a spirit of hope is revived. We ask, why can't the whole of Seattle be planned in this manner, making it one of the outstanding coastal cities. To illustrate, I quote from the report of the Mayor's Committee on Parking Strip Care and Beautification:

"Few cities in the world have the great natural advantages of varied terrain, impressive water and mountain outlooks, and a favorable climate that are offered to the City of Seattle. It remains only for advancing maturity to bring with it an increasing awareness on the part of our citizenry that these great natural advantages are, in truth, advantages without parallel which will be used for the utmost benefit to all, resident and non-resident alike. That they have not thus far been used and developed to the full is no criticism of anyone; it is more the normal lack of appreciation of such a need that one finds in every young metropolis. Further, it is a simple evidence of another perfectly normal condition namely that, in a young community, the financial situation and the financial psychology are definitely opposed to anything which cannot be immediately translated into dollars and measured in them. Ordinarily, there are just too few dollars to support everything that needs to be developed."

Take such fine examples of boulevard planting as the Ravenna Boulevard, with very spacious grass panels and a consistent planting of trees; or in Laurelhurst Boulevard where there are several blocks of fine tree planting with

*Mr. Robert J. Hansen is assistant to Mr. Mulligan at the Arboretum.

Deodar Cedar in the center and English Hawthorn in each parking strip, or by the Montlake Bridge, where linden trees make pleasing the approach.

If Seattle can have these few excellent examples why can't there be many more? Why don't we do something about it now? Why isn't there a city regulation concerning street trees? Why are we so behind the times when such ordinances have been in effect in many cities for over a quarter of a century?

Strangely enough there are two little known city ordinances, No. 38045, Section 87, which prohibits planting of Lombardy poplar, cottonwood or gum or any other tree the roots of which cause injury to sewers, sidewalks or pavements.

And amended ordinance No. 68866, Section 90, of 1938 states that no trees, shrubs or flowers over two feet in height shall be planted in that portion of any parking strip lying within thirty feet of the intersection of said parking strip with the marginal line of any intersecting street.

"No trees shall be planted or maintained within twenty-five feet of any street light except that those existing trees, shrubs and flowers may be maintained under special permit if the Board of Public Works determines they do not constitute a traffic hazard."

Seattle obviously needs leadership in achieving a street tree beautification program.

Mayor Devin appointed a committee last spring under the chairmanship of Dr. John H. Hanley to study and formulate a suggested parking strip improvement program. There were representatives from various civic groups as well as the city council, engineering department and the Washington Society of Landscape Architects. The committee concentrated on proposals and recommendations as to control, operation and financing of the program.

One of the first recommendations was the removal of all shrubs or plant growth from the parking strip areas except the boulevard plantings. This approach is based on two very practical considerations—traffic and pedestrian safety as well as crime prevention. It designates all those which cannot be pruned to

maintain a clean trunk, free of limbs to a minimum of six feet.

The major part of the study is the proposed policy program regulating parking strip development sponsored by the Washington Society of Landscape Architects. This comprehensive code of regulations compiled by Mr. Cash Beardsley covers: (1) *Types of Plantings*: (a) Highway approaches to the city center; (b) Arterials and Parkways, and (c) Residential. (2) *Types of Trees*: (a) Highway Approaches and Arterials, (b) Residential. (3) *Tree Spacing and Special Cases*.

It seems appropriate to quote directly from the report the portion covering trees for residential areas as it will give examples of the many smaller suitable trees: "The selection of trees for residential areas would be made from the following list of suitable trees recommended for different conditions, the selection to include three sub-dominant species in addition to the dominant tree type. Fastigate tree forms may be used.

"1. Plantings for streets having overhead clearance of utilities 35 feet or under shall be selected from the following species: Striped Maple, *Acer pensylvanicum*; Paperbark Maple, *Acer griseum*; Japanese Maple, *Acer palmatum*; Tatarian Maple, *Acer tataricum*; Allegheny Serviceberry, *Amelanchier laevis*; American Hornbeam, *Carpinus caroliniana*; Katsura Tree, *Cercidiphyllum japonicum*; Red Bud, *Cercis canadensis*; Flowering Dogwood, *Cornus florida*; Washington Hawthorn, *Crataegus phaenopyrum (cordata)*; English Hawthorn, *Crataegus oxyacantha*; Carolina Silverbell, *Halesia carolina*; flowering *Malus* species and varieties; flowering Peach, Plum, Cherry, *Prunus* species and varieties; Snowbell Tree, *Styrax japonica*.

"2. Plantings for streets having overhead clearance of utilities over 35 feet in height, but under 50 feet in height may be selected from the following: David Maple, *Acer davidi*; Shadblow Serviceberry, *Amelanchier canadensis*; Hedge Maple, *Acer campestre*; Red Horsechestnut, *Aesculus carnea*; Pacific Madrone, *Arbutus menziesii*; Yulan Magnolia, *Magnolia denudata*; Kobus Magnolia, *Mag-*

nolia kobus; American Hophornbeam, *Ostrya virginiana*; Chinese Pagoda tree, *Sophora japonica*.

“3. Plantings for streets having no overhead utilities may be selected from the following: Norway Maple, *Acer platanoides*; Sugar Maple, *Acer saccharum*; Sycamore Maple, *Acer pseudoplatanus*; Horsechestnut, *Aesculus hippocastanum*; White Ash, *Fraxinus americana*; Maidenhair Tree, *Ginkgo biloba*; Sweet Gum, *Liquidambar styraciflua*; Mountain Silverbell, *Halesia monticola*; London Plane, *Platanus acerifolia*; Oriental Plane, *Platanus orientalis*; White Oak, *Quercus alba*; Scarlet Oak, *Quercus coccinea*; Red Oak, *Quercus borealis*; Pin Oak, *Quercus palustris*; English Oak, *Quercus robur*; American Linden, *Tilia americana*; Silver Linden, *Tilia tomentosa*; Littleleaf European Linden, *Tilia cordata*; European Linden, *Tilia europaea*.”

Finally, the Washington Society of Landscape Architects recommends appointment of a city landscape engineer, in the Park Department, to head this program. There is no doubt that this would be a full-time job which could keep many assistants busy.

As another part of the landscape architects' study, a survey was made of several major cities to learn of their regulations covering parking strip plantings. Included were Detroit, Michigan; Madison and Milwaukee, Wisconsin, and Kansas City, Kansas.

Many of these cities have had regulations for over twenty years, which have been amended and brought up to date to meet present conditions. Unworkable methods have been discarded. One outstanding fact was the recognition that street trees, their planting and maintenance are as much a city function as street cleaning or street lighting.

The majority of the cities cover the maintenance expense in their regular city budget as part of operating costs. Some assess the property owner for cost of trees and planting.

We should consider ourselves fortunate in benefiting by the trial and error method of other cities. Accordingly we should plunge ahead, basing our own ordinances or regulations on their tried efforts.

It is not enough to incorporate district by district in a piecemeal plan of street tree beautification. It is worthy of whole-hearted support by all Seattle districts. It should be recognized as a city-wide project financially supported by the city budget with a general departmental appropriation.

Seattle cannot rest on its laurels and consider itself a pioneer in street tree planning, for we are quite a few years behind the times. It can and must take long sweeping strides to catch up and become The City of the Pacific Northwest.

1 1 1

Trees for Town Gardens—Victoria

W. H. WARREN*

IN SELECTING trees for a town or city garden it is not only very useful to know what trees will play the most effective role so far as beauty and utility are concerned, but it is equally important to know what not to plant in the garden. Under this heading might be classified trees which grow too large and too rank, trees whose roots cause trouble to sewers and surface drains, trees which habitually harbor insect pests or are very susceptible to disease, trees with an unsatisfactory habit, and trees which do not thrive well because of some climatic or soil condition. Most of the mistakes in the use of trees around the home occur because of the owner's desire for quick results without giving serious consideration to the habit of trees, particularly the amount of annual growth they make and their ultimate size. It is usually the rule rather than the exception that when trees get too large the owner is reluctant to have them removed, but does not mind cutting them back to a reasonable size, even if it involves a brutal tree butchery program every year or so. If there is one point to be emphasized in this article it is the folly of planting a tree which will ultimately be too large for its intended position and then having to butcher it back regularly to keep it under control. There is only one thing to do under such conditions and that is to remove such trees and

*Mr. W. H. Warren is park administrator of the Department of Parks, Victoria, B. C.

plant smaller and slower growing types, trees of nice habit which have attractive flowers, fruit and foliage. No tree should be planted unless one possesses a reasonable knowledge both of its virtues and its sins. Some trees are very susceptible to annual infestations of aphids, leaf hoppers and other insects. Such facts should be known before planting.

In the rose family are to be found most of the useful smaller types of ornamental deciduous trees. One must bear in mind that they are all susceptible to the same diseases and pests which plague the apple, plum and cherry orchards. Amongst the flowering cherries "Yoshino," single white; "Mt. Fuji," double white; "Shirofugen," double pink fading to white, and "Kwanzan," double pink, are amongst the best, roughly listed in order of size and vigor. Smaller types usually lack vigor, are more susceptible to troubles and are short-lived. The double white Mazzard or Gean (*Prunus avium* var. *plena*) is also a good cherry seldom seen here. Amongst the Higan cherries (*Prunus subhirtella*), or Rosebud cherries as they are called in Great Britain, there are some good forms and also some poor ones, both upright growing and weeping. The fall blooming type, Jugatsuzakura, is a very interesting tree to grow in protected positions, where it will usually bloom sparingly during mild spells throughout the winter. Two double forms of the Higan cherry deserve to be better known, the double red Momi-jigari, and the double pink Atsumori. Both are excellent spring blooming trees.

Amongst the flowering crabs there are many new sorts. The pick amongst them are *Malus*

Lemoinei, *M. Eleyi*, *M. floribunda*, "Peach-blow, similar to *M. floribunda*, *M. Arnoldiana*, and Bechtel's crab, *M. ioensis plena*. Crabs are held in higher regard in the east where they probably hold their fruit longer. *Malus zumi* var. *calocarpa* is one of the best with red fruit and "Matthew" an excellent one with yellow fruit.

Prunus Mume, the flowering apricot, comes in a wide range of colors and is attractive because of its early sweet scented blossoms. The purple leafed flowering plums are a sombre lot, so far as their foliage is concerned, but they have attractive bloom. The double pink *P. blireiana* is the pick of the lot and the tree is the smallest. *P. cerasifera* var. *Pissardi* is well known with white or palest pink flowers. Variety *nigra* is equally lovely with clear pink, slightly smaller blossoms.

Valuable also are the hawthorns, the double white, pink and rose forms of *Crataegus oxyacantha* being preferred. Besides the common mountain ash there are some fine new species from the Orient which deserve to be better known such as *Sorbus discolor*, *S. Wilsoniana*, and *S. Conradinae*, good in fruit and foliage.

One should not forget the natives, the flowering dogwood and vine maple which are amongst the finest of all ornamental trees. The pink horse chestnut is a nice tree, not so large as its white counterpart. There are also many kinds of magnolias and all of them seem to respond well to good treatment. Despite previous remarks about large trees, there are three which I particularly like if room is available—the white birch, *Liquidambar*, and tulip tree.

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Trees for Town Gardens in the Portland Area

ERNEST E. FISCHER*

TOWN gardeners in Portland and vicinity are unusually fortunate in regard to the large number of trees which thrive in their gardens and which are suited to their particular needs. Portland gardeners can be "choosey" in their selection of trees adapted to varying conditions of growth and habit, and no matter how small the space, among the hundreds of suitable trees there can be found just the right tree for the right place. Due to our copious amount of rainfall (average 39.43 ins.) and mild climate, many of the ornamental trees become too huge in a short period of time to make them worthy of a place in the average town garden. Examples of such trees are the broadleaf maple, the ailanthus, the kaki, the true cedars, and most of the true species of hemlocks, firs, pines and spruces. Therefore, the town garden should support only those trees which are slow growing and which eventually do not become overwhelmingly large.

The list of trees given here (most of which have been tested at the Bureau of Parks' Hoyt Arboretum) fulfill these two requirements. Naturally the choice depends on the individual's taste, whether it be used as a specimen or background tree, if it is planted for its blooms, or possibly for its fall foliage; again for the shade it casts; maybe for its nuts or fruits, maybe to use as a screen or hedge,

*Mr. Ernest E. Fischer is curator of the Hoyt Park Arboretum, Portland, Oregon.

or more than likely a combination of several of those uses.

Trees for the town garden fall naturally into three classifications—the deciduous trees, the needle-bearing trees and the broadleaved evergreens.

In the deciduous group more members of the pea or legume family are suited for the town garden than any similar family of trees. The Siberian pea tree attains a height of about twenty feet and makes a very attractive showing with its yellow blooms in the early spring. The angelica tree supports stout spines and, with its colorful flowers, large leaves and umbrella shaped crown, makes a good tree for the town garden. The various species of red-buds are picturesque because of the rosy purple flowers which appear before the leaves. Its European relative is known as the Judas tree. The various species and varieties of laburnum or golden-chain are highly desirable as a town tree because of their long racemes of yellow flowers. The yellow-wood is a drought-resistant tree of medium height on which appear white flowers at a time when nearly all other trees are through blooming. Another member of the pea family suitable for the Portland area, where protection from winter winds is available, is the Persian silk tree or pink siris, whose dainty acacia-like leaves and pink flowers maturing in mid-summer make it well worth planting as a specimen tree. The spineless variety of honey locust is quite attractive with its long strap-like pods and dainty compound leaves.

Although our native broadleaf maple grows entirely too fast for use as a garden tree, there

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are other species, such as the Amur maple, the English hedge maple, our native vine maple, the striped maple and several varieties of the Norway maple, especially *schwedleri*, which show signs of fast becoming popular garden subjects.

Birches are highly recommended as garden trees. The weeping cutleaf variety is used extensively as a street tree in the Portland area. Its dainty foliage, pendulous branching, and columnar habit make it ideal also for the very small town garden.

While most of the true chestnuts grow too large for the average garden, several species, including the Chinese, the Spanish and the Japanese, are quite suitable. The Japanese species produces unusually large nuts. No evidence of the chestnut bark disease has been noted in the Portland area.

There is no finer picture in a town garden than when the dogwood trees are in bloom; especially if a background of coniferous trees is provided. Our own Pacific dogwood is "tops" insofar as size of bloom is concerned, but the Japanese species, which blooms sev-

eral weeks later, is highly desirable for this region. The blooms on this tree remain for a long period of time, and each flower stands upright on a slender stalk—making this dogwood a show in itself during the flowering period. The eastern flowering dogwood is not as showy as either the native or the Japanese species, but its pink variety is outstanding as a specimen tree. The Cornelian cherry, a true dogwood, has small yellow flowers in early spring, followed by showy scarlet fruits.

The sweet gum grows rather slowly in the Portland area, but restriction to the larger gardens is desirable since it eventually reaches rather large proportions. Its autumn display of brilliant foliage is quite spectacular. The sour gum or tupelo, no relative to the sweet gum, demands a great deal of moisture and the banks of a stream or pond is an excellent location for this tree. The town gardener planting this tree is well rewarded in the fall by a dazzling display of bright red leaves.

The sour-wood or sorrel tree is a lover of acid soil and is noted both for its panicles of white, waxy flowers and its scarlet leaves in autumn. Another small, acid-loving tree is the *Franklinia*, which bears large, camellia-shaped, white flowers when all other trees have long since bloomed out.

Although all the hawthorns thrive in the Portland area, few of them are recommended for the garden because of the thorny branches. Their showy flowers and attractive berries somewhat offset this bad feature. Nurserymen's varieties are planted quite extensively, especially where the gardener wishes to attract the birds.

While very few dove trees are to be found in this area, tests at the arboretum show that this unique tree with its excellent foliage and distinct bloom really flourishes. Although somewhat scarce at nurseries, the dove tree is highly suited for the town garden.

The silverbell trees, with their drooping, bell-shaped flowers, are ideal garden subjects. There are three species from which to choose, and all appear to be on a par in this vicinity.

The various magnolias, including numerous varieties, are excellent for the local gardener to plant, although the umbrella magnolia

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needs protection from high winds to keep its huge leaves from shredding. The cucumber tree, the starry magnolia, and the saucer magnolia are other magnolias suitable for the Portland area. The tulip tree, while eventually attaining large proportions, is a good specimen tree for the larger gardens. Its freedom from pests, its odd shaped leaves, plus its tulip-shaped flowers, make it a good subject where space is not at a premium.

The Empress tree, or royal *Paulownia*, with its panicles of violet-colored flowers appearing before the leaves, and its huge catalpa-like foliage, is an outstanding tree in any town garden. Its cousin, the catalpa, is seen commonly in Portland yards but gets too large for the majority of gardens. The Japanese and Manchurian species are better suited in this region.

The many varieties of flowering prunes, cherries, almonds and peaches lend a cheerful outlook to the town garden in early spring, and some are being used as street trees. The *Styrax* or snowdrop tree is very dainty, with showy, white, bell-shaped flowers, but it needs protection and partial shade for best results. Of the two species, the Japanese *Styrax* is the more spectacular.

Other trees suitable for the town garden in the Portland area are the mountain ash and its European cousin, the rowan tree; the witch hazels; the various mulberries; the Caucasian wing nut; the Amur cork tree; the staghorn sumac; the spindle tree, and some of the lindens and sycamores.

Unusual deciduous trees which do well in this area include the Chinese and Jugoslavian date tree, the Japanese persimmon, the raisin tree, the paw-paw, the *Maackia*, the scholar tree, the smoke tree and the golden-rain tree.

Among the coniferous trees, the majority of the genera, with the possible exception of the yews and cypresses, are not suited to the town

garden because of their tendency to become oversized in a short time. Thus most of the conifers adaptable to the home garden are limited to nurserymen's varieties. Exceptions are the plum yews with their white flowers and large red berries scattered among the sword-like needles. The Japanese, Chinese and English yews do exceptionally well, as do their numerous varieties. The Japanese *Cryptomeria* is a good subject for the average yard and the Chinese fir with its strikingly long needles is unique in appearance if you want something different. Junipers are widely used in landscaping in the Portland area and many varieties besides the Irish, the Chinese and the Formosan are thriving in many local gardens. Among the spruces, the tiger-tail and Koster's blue spruce make ideal specimen trees, while the Himalayan and Brewer's spruces are very desirable for gardeners wanting a weeping type of needle-bearing tree. Most pines get too large for the average town garden, but the *mugho* types are widely used in place of the distinct species. The so-called umbrella pine makes a distinct showing while young, but

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eventually gets too huge. The California nutmeg is recommended for its yew-like foliage and nutmeg-looking seeds. A large number of varieties of the Oriental arborvitae and Lawson cypress are also good garden subjects and widely planted in this region.

The *Ginkgo* or Chinese maidenhair tree is one of the most picturesque of all trees and is highly suited for local planting in gardens due to its slow growth. The unusual fan shaped leaves are its chief attraction aside from the fact it is referred to as a "living fossil."

Our native broadleaf evergreen trees, the madrona and the chinquapin, are both suited for the home garden. The golden-leaved chinquapin with its spikes of creamy white flowers, followed by burrs resembling those of the chestnut, may be trimmed either as a shrub or a tree. It requires perfect drainage and is difficult to transplant from the wild. The madrona is quite picturesque with tan-colored bark, bell-shaped waxy flowers, and bright orange-red fruits.

Other broadleaved evergreens suited to this region include the bull bay or evergreen magnolia with its huge white blooms emitting a citrus-like smell; the Japanese loquat with its leathery leaves and pear-shaped edible fruit; the strawberry tree from Europe, a cousin of our madrona; the various species and varieties of hollies too numerous to list; the canyon live oak with its holly-like leaves; the tan bark oak; the South American fire-bush tree; the Holm oak; the sweet bay, a species of magnolia. No garden in the Portland area is complete unless it supports at least one specimen of our own Oregon myrtle. Its white flowers in clusters, the pungent odor of its leaves and the value of its wood make this last tree on our list outstanding among all other trees suitable for the town garden in the Portland area.

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Trees of Proven Worth in Eastern Washington

HAROLD T. ABBOTT*

Spokane pioneers who built the first homes and laid out the grounds around them generally gave little thought to the selection of particularly refined trees for the plantings on these grounds. They were interested first in the creation of pleasant shade as a relief from the oppressive sun which so quickly dried out the soil under the scattered ponderosa pines. Water was exceedingly scarce and gardens as well as extensive lawns with trees were the exception. In a semi-arid country only the most rugged trees were planted in order that shade could be enjoyed as rapidly as possible. Poplars, box elders, black locusts and silver maples, therefore, soon took possession of the city streets; they thrived well on a minimum of moisture and provided the much-needed shade for the pedestrians who were numerous in the days of few automobiles.

As the city expanded, an occasional new tree such as the Norway maple or the widely advertised London plane was introduced; in fact, whole streets in new additions were planted to a single species. On the lawns of the few large residences appeared horse chestnuts, American chestnuts, European white birches and evergreens such as Norway spruce, Colorado blue spruce, concolor fir, European larch and western white pine. Fortunate indeed was the owner of property along the north slope of the "South Hill" where moisture could be retained more easily and where Douglas fir grew luxuriantly to serve as a protection and background for young new species being introduced to Spokane.

Within a few years there grew up in Spokane a great enthusiasm for gardening. Led by such men as the late Superintendent of Parks John W. Duncan, considerable activity in the way of tree introduction took place. Aubrey L. White, the city's first Park Board president, had already instituted the first important civic

*Mr. Harold T. Abbott, superintendent of parks, Spokane, Washington, is again welcomed to the columns of *The Bulletin*. Many will remember with pleasure his article appearing in the Summer, 1947, issue: "Consider a Few Shrubs of Refinement."

movement and formed the City Beautiful Committee as a forerunner of the Park Board itself. Other well-known Spokane men such as Louis M. Davenport, the late F. Lewis Clark and the late Frank Graves, spared no expense in order to bring into the city for planting on their grounds, choice trees for use as decorative specimens, for use in mass effects and for street parking plantings. For the most part, the parks proved to be the test areas for all types of trees. The success or failure of a species in a public park influenced the average homeowner in his demands upon the nurserymen who were attempting to build up their stocks of plant materials. And for many years it has been a problem for the nurserymen to introduce new things in the way of trees and shrubs which have not already been planted in one of the public parks. Alex Lowe, city horticulturist, has devoted many years to the propagation of new species for planting in Spokane.

Spokane is a city of small homes with small adjacent properties. The demands upon the spare time of the average homeowner are such that he now desires the minimum of responsibility in the maintenance of his home grounds. He now requests that the least amount of planting be his care; at the same time he wants privacy and an attractive surrounding area for recreation. Except for an occasional street planting and a specimen on the lawn, the large forest type tree is losing ground in popularity. Problems of root damage to sidewalks, curbs and sewers are having their effect in the removal of old street tree specimens and in the replacement of them with smaller flowering trees which are not difficult to maintain and which ultimately can be replanted.

To select the best trees for planting in the vicinity of Spokane is not an easy assignment. Because of the wide variation in site characteristics, from the soil pockets on basaltic rock of the "South Hill" to the sand and gravel prairies of the northern additions, the relative success of a tree will depend upon which portion of the city receives it. The following list, then, is given merely as an indication of the wide possibilities for planting if reasonable

attention is paid to providing moisture, fertilization, and protection from severe injury.

LARGE TREES FOR STREET OR LAWN AREAS

BOTANICAL NAME	COMMON NAME
<i>Acer campestre</i>	Hedge Maple
<i>Acer platanoides</i>	Norway Maple (also var. <i>schwedleri</i>)
<i>Acer pseudoplatanus</i>	Sycamore Maple
<i>Acer rubrum</i>	Red Maple
<i>Acer saccharum</i>	Sugar Maple
<i>Aesculus hippocastanum</i>	Horsechestnut (also var. <i>rubicunda</i>)
<i>Ailanthus glandulosa</i>	Tree-of-heaven
<i>Betula alba</i>	European White Birch (also var. <i>pendula</i>)
<i>Catalpa bignonioides</i>	Common Catalpa
<i>Catalpa speciosa</i>	Western Catalpa
<i>Celtis occidentalis</i>	Hackberry
<i>Cladrastis lutea</i>	Yellow-wood
<i>Fagus americana</i>	American Beech
<i>Fagus sylvatica</i>	European Beech (also var. <i>purpurea</i>)
<i>Fraxinus quadrangulata</i>	Blue Ash (not recommended)
<i>Gleditsia triacanthos</i>	Common Honey Locust (also var. <i>inermis</i>)
<i>Ginkgo biloba</i>	Maidenhair-tree
<i>Juglans nigra</i>	Black Walnut
<i>Liquidambar styraciflua</i>	Sweet gum
<i>Liriodendron tulipifera</i>	Tulip tree
<i>Platanus acerifolia</i>	London Plane tree
<i>Platanus occidentalis</i>	American Plane tree
<i>Quercus coccinea</i>	Scarlet Oak
<i>Quercus macrocarpa</i>	Mossycup Oak
<i>Quercus palustris</i>	Pin Oak
<i>Quercus prinus</i>	Chestnut Oak
<i>Quercus robur</i>	English Oak (also var. <i>fastigiata</i>)
<i>Quercus rubra</i> (<i>Quercus</i> is subject to chlorosis in Spokane area)	Common Red Oak
<i>Robina pseudoacacia</i>	Black Locust
<i>Sophora japonica</i>	Chinese Scholar tree
<i>Tilia cordata</i>	Littleleaf European Linden
<i>Tilia platyphyllos</i>	Bigleaf European Linden
<i>Tilia tomentosa</i>	Silver Linden
<i>Ulmus americana</i>	American Elm (not recommended)
<i>Ulmus pumila</i>	"Chinese" Elm
<i>Ulmus racemosa</i>	Rock Elm

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<i>Cercis canadensis</i>	American Redbud
<i>Cornus florida</i>	Virginia Dogwood (also var. <i>rubra</i>)
<i>Crataegus cordata</i>	Washington Hawthorn
<i>Crataegus crusgalli</i>	Cockspur Thorn
<i>Crataegus oxyacantha</i>	English Hawthorn (also var. <i>pauli</i>)
<i>Koelreuteria paniculata</i>	Golden Rain-tree
<i>Magnolia soulangeana</i>	Saucer Magnolia
<i>Magnolia stellata</i>	Star Magnolia
<i>Malus arnoldiana</i>	Arnold Crab
<i>Malus eleyi</i>	Eley Crab
<i>Malus floribunda</i>	Japanese Flowering Crab
<i>Malus halliana</i>	Hall Crab
<i>Malus ioensis plena</i>	Bechtel Crab
<i>Malus niedzwetzkyana</i>	Redvein Crab
<i>Malus nied. x baccata</i>	Hopa Crab
<i>Malus sargentii</i>	Sargent Crab
<i>Malus scheideckeri</i>	Scheidecker Crab
<i>Prunus blireiana fl. pl.</i>	Purple-leaf Plum
<i>Prunus pissardi</i>	Blireiana Plum
<i>Prunus subhirtella pendula</i>	Weeping Japanese Cherry
<i>Prunus triloba</i>	Flowering Plum
<i>Sorbus americana</i>	American Mountain Ash
<i>Sorbus aucuparia</i>	European Mountain Ash
<i>Syringa japonica</i>	Japanese Tree Lilac
<i>Syringa pekinensis</i>	Peking Lilac

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<i>Juniperus scopulorum</i>	Colorado Juniper
<i>Juniperus virginiana</i>	Red Cedar
<i>Picea excelsa</i>	Norway Spruce
<i>Picea pungens</i>	Colorado Spruce (also var. <i>glauca</i>)
<i>Pinus monticola</i>	Western White Pine
<i>Pinus ponderosa</i>	Western Yellow Pine
<i>Pseudotsuga taxifolia</i>	Douglas Fir
<i>Tsuga canadensis</i>	Canada Hemlock
<i>Thuja occidentalis</i>	American Arborvitae
<i>Thuja orientalis</i>	Oriental Arborvitae
<i>Thuja plicata</i>	Giant Arborvitae

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Notes and Comment

(Continued from Page Twenty)

Shelton—Mrs. George Cropper.

Spokane—Joel E. Ferris, Dean Chas. E. McAllister, R. L. Rutter, Aubrey L. White.

Tacoma—Mrs. A. S. Black, Mrs. Metcalf Foff, Mrs. Corydon Wagner.

Walla Walla—Mrs. Henry J. Copeland.

Wenatchee—Mrs. E. T. Adams.

Yakima—Mrs. O. R. Schumann.

✓ ✓ ✓

The *Winter* issue of the ARBORETUM BULLETIN will be devoted almost entirely to the Camellia. Contributions are welcomed—particularly to the Arboretum Notebook.

✓ ✓ ✓

At a meeting of the Arboreta Committee of the Western Chapter of the National Shade Tree Conference held recently in Alameda Park, Santa Barbara, California, Brian O. Mulligan, director of our Arboretum, was elected vice-chairman.

✓ ✓ ✓

The newly created office of Historian of the Arboretum Foundation, proposed at the annual membership meeting, was filled by unanimous vote in the selection of Mrs. Arthur J. Krauss. Now that the Arboretum is "13 years young" its historical events become increasingly important and when compiled will be a valuable record of interest to all. The happy selection of Mrs. Krauss to undertake this important work is a climax to her own long, faithful and arduous devotion to the Arboretum's cause. Those who have any information concerning the Arboretum's early

years are urged to get in touch with Mrs. Krauss.

✓ ✓ ✓

Mrs. Else Frye and Mr. Earl Hubbard having resigned from the Editorial Board of THE BULLETIN for personal and health reasons, the following have accepted invitations to serve in their places: Mr. Clarence Prentice of the Prentice Nursery & Decorating Co., Seattle, and Mr. Bryan Taylor, manager of Campus Nursery Inc., Seattle.

While sincerely regretting the loss of two valuable and trusted advisers, we welcome our new members in the belief that our relationship with the nursery trade and our expression of its views will be thereby strengthened.

As technical consultant we are happy to have the skilled advice of Mrs. Lucile R. Davis, of the Western Printing Company, who has been responsible for the make-up of THE BULLETIN for a number of years.

✓ ✓ ✓

The Metasequoia plants, now about 9-12 inches tall, are growing well in pots.

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Rose Species

(Continued from Page Ten)

less. Cultivated in Japan, but originating in China.

- R. bracteata*. Macartney Rose. Flowers July-August, white.
- **R. laevigata*. Cherokee Rose. Leaves evergreen, like the three preceding species. Flowers in May, white, 3 inches wide.
- R. setigera*. Prairie Rose. The single American representative of this group. Wild from Ontario to Nebraska, south to Texas and Florida. Flowers rose to white, July-August. Leaves deciduous.

B. Tall shrubs, usually 6-10 feet high

- Rosa Davidii*. Corymbs of pink flowers in June-July; long-necked red hips in fall. Intro. by E. H. Wilson from W. China in 1908.
- R. Farreri*. Very bristly stems, small pink flowers, followed by orange-red fruits. Introduced from Kansu, N.W. China by R. Farrer, 1915.
- **R. Hugonis*. Introduced to England from W. China by Father Hugh Scallan in 1899. Flowers May to early June, Empire yellow, 1½ inches wide; hips dark red. July-Sept.
- R. macrophylla*. Native of the Himalaya mountains; named in 1820. Flowers up to 3 inches wide, rose-pink, in June-July. Hips Poppy red, up to 2 inches long, Sept.-Nov. Erect bush to 12 feet, with dark wood.
- **R. Moyesii*. Introduced from W. China by Wilson, 1903. Flowers solitary, blood-red, in June. Hips flask-shaped, Signal red, up to 1½ inches long. Habit stiff, upright, with few branches.
- **R. multibracteata*. From W. China; found and introduced by E. H. Wilson, 1910. Habit open, spreading. Small leaves; flowers small, pink in early July; fruits orange-red to scarlet, Oct.-Nov.
- R. omeiensis*. Bushy habit, 10-12 feet tall. Native of Mt. Omei, W. China. Introduced 1901. Attractive foliage; flowers 4-petalled, white or pale yellow, May; hips scarlet or yellow on a fleshy stalk, July-Aug. Several different varieties.
- R. oxyodon*. (*R. pendulina* var. *oxyodon*). Upright, 10 feet, few branches, young wood reddish. From W. Caucasus Mts. Introduced to France by 1904. Flowers in clusters, Fuchsine Pink, 2½ inches wide, June; hips flask shaped, 1 inch long, red, Sept.-Oct.
- R. Roxburghii* (*R. microphylla*). Wide-spreading, stiff branches, few thorns. Flowers pale pink, 3 inches wide, May-June; fruits Chestnut-like, July-Aug., soon falling. Found in W. China; the double form cultivated in England since 1824. Var. *hirtula* from Japan.
- **R. setipoda*. Upright, vigorous, few stems. Sent to France from C. China, 1895; by Wilson to England, 1901. Flowers in corymbs, pink, each 2½ inches wide, in June; hips 1 inch long, red, Sept.-Oct.
- **R. Sweginzowii*. Bushy, 8-12 feet tall; from N. W. China, 1910. Stems thorny and bristly. Flowers few in clusters, each 2 inches wide, pink; fruits bristly, flask-shaped, Signal to Turkey Red, Aug.-Sept.
- **R. xanthina forma spontanea*. Upright to spreading; young branches, dark brown, N. China, Mongolia, Korea. Wild form intro-

duced to U. S. A. by F. Meyer, 1907. Flowers Empire yellow, 2-2½ inches wide, late May; fruits ½ inch long, red. Double form first known in Europe.

C. Medium-sized shrubs

- R. blanda*. Eastern Canada and U. S. A., south to Missouri. Stems often reddish, bristly or without thorns. Flowers pink, 2 inches wide, May-June. Hips variable in shape, red, sepals persistent.
- **R. Eglanteria*. Sweet Briar. Native of Europe. Foliage glandular and fragrant. Flowers bright pink, June. Hips usually ovoid, scarlet, Oct.-Nov.
- **R. nutkana*. Upright, bushy, spreading by suckers. W. N. America, from Alaska to N. California, east to Wyoming. Flowers large, 2½ inches wide, solitary, rose-pink, June. Fruits ovate to globose, ½ to ¾ inch wide, Sept.-Dec.
- R. palustris*. Swamp Rose. Upright habit. Nova Scotia to Minnesota, south to Florida. Leaflets narrow, finely toothed. Flowers in corymbs, pink, 2 inches wide, July-Aug.; fruit small, red, Oct.-Dec.
- R. pendulina* var. *alpina*. Usually stiff and upright, without thorns. Young wood reddish. Mountains of C. Europe. Cultivated in England in 17th century. Flowers purplish-rose, one or few, 2 inches wide, late May-June. Fruits variable in shape, ovoid or oblong, bright red, Sept.-Oct.
- **R. pimpinellifolia (spinosissima) var. altaica*. Upright, compact, dense habit, 5-6 feet tall, native of Siberia and Altai region; introduced to England 1818. Flowers 2½ inches wide, white, solitary but numerous, late May-early June; hips flattened, purple-black, Aug.-Sept.
- **R. pomifera*. Apple Rose. Stiff and upright. Europe and W. Asia. Leaves large, grey-green. Flowers few in clusters, 2 inches wide, pink, June. Hips nearly globular, dark red, bristly; Sept.-Oct. Also double form, var. *duplex*, known in 1775.
- **R. Primula*. Native of Turkestan; introduced to U. S. A. 1911. Densely branching. Young wood red-brown. Leaves glandular below, fragrant. Flowers pale yellow, solitary, late May; fruit maroon red, nearly globose.
- R. rubrifolia*. Habit upright, few branches, purple when young. Central and S. E. Europe. Introduced 1814. Foliage grey-green tinged purple. Flowers small, rose-red with pale center, June-July. Hips round, red.
- R. rugosa*. Bushy, compact, suckering. Native of Japan and N.E. Asia. Stems bristly and thorny; leaves large and glossy, turning yellow in fall. Flowers rose-purple or white, fragrant; June-Aug. Hips flattened-globular, tomato-red, Aug.-Oct. Varieties with double flowers.
- R. virginiana*. Dense and much-branched, few suckers. E. North America from Newfoundland to Alabama. Leaves shining. Flowers few in cluster, bright rose, June-July; fruit red, usually subglobose.
- R. Webbiana*. Open, spreading habit, slender branches. W. Himalaya, Turkestan, Tibet. Small rounded leaflets. Flowers 2 inches wide, pale pink, June. Hips usually ovoid or flask-shaped, red.

**R. Willmottiae*. Upright to spreading, many-branched. N.W. China, E. Tibet. Introduced by Wilson, 1904. Leaflets small, greyish beneath. Flowers late May-June, rose-purple, 1½-2 inches wide, fruit shedding calyx, ⅜ inch long, red.

D. *Low-growing shrubs* (3 feet or less)

**R. carolina*. Slender stems, often bristly, suckering; E. Canada to Florida, west to Kansas. Flowers one or few, rose-pink, 2 inches wide, June-July; fruit often glandular, red, subglobose, Sept.-Oct.

R. foetida var. *persiana*. Persian Yellow; double form of Austrian Briar. Branches brown, spreading. From Persia, 1838. Flowers rich yellow, 2-2½ inches wide, June. Liable to black spot disease.

R. foliolosa. Low bush, usually thornless. So. U. S. A. plains. Leaflets shining, narrow-oblong. Flowers one or few, rose-pink, 2 inches wide, July-Aug. Fruit small, red, Sept.-Dec.

**R. Forrestiana*. Related to *R. multibracteata*. S.W. China, collected by G. Forrest; introduced 1922. Flowers pink, 1½ inches wide, late June-early July. Fruit ovoid, orange-red, Oct.-Nov.

**R. gallica*. French Rose. Upright habit, suckering. C. Europe to W. Asia. Flowers solitary, fragrant, 2½-3 inches wide, rose-red, June. Fruits globular or top-shaped, red.

R. glutinosa. Dwarf, compact, thorny. S.E. Europe to W. Asia. Leaves glandular, resin-scented. Flowers solitary, small, pink. June. Hips globose to ovoid, bristly, dark red, Aug.-Sept.

**R. nitida*. Low and bushy; stems densely prickly. Newfoundland to Connecticut. Leaflets narrow, shining, turning red in fall. Flowers one to few, pink, 2 inches wide, June. Hips red, globose, Sept.-Nov.

R. Richardii. Spreading, covering ground. Native of Abyssinia. Flowers pale pink, 2½-3 inches wide, in small corymbs, June. Related to *R. centifolia*, Cabbage Rose.

**R. Seraphinii*. Dense, prickly bush. Italy and adjacent islands. Introduced 1914 or earlier. Flowers solitary, bright rose, 1 inch wide, June. Fruits bright red, ovate to globose, Sept.-Oct.

R. sicula. Dwarf, thorny, compact; related to *R. glutinosa*. S. Europe, N.W. Africa. Flowers solitary, pink, 1 inch wide, June. Fruit bright red, ovate to globose, Sept.-Oct.

**R. spinosissima*. Burnet or Scots Rose. Europe, W. & C. Asia. Forming colonies by underground stems. Flowers solitary, white, pale yellow or pinkish, 1-2½ inches wide, May-early June. Hips usually globular, black, purple, or reddish brown. Aug. Var. *myriacantha*. Smaller, very spiny stems. S. Europe. Var. *hispida*. Taller, 3 to 4 feet. Flowers pale yellow. Cultivated 1781 in England; probably from Siberia.

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Let's Talk About Herbaceous Peonies

(Continued from Page Seventeen)

maintain clean, fungus-free leaves. Micronized copper does not leave a residue on the leaves as is the case when using bordeaux. It may be secured from most garden stores and should be applied at the rate of one-eighth pound to three gallons of water.

Another caution is to never fertilize with barnyard manure. Use raw bone meal instead, as it is safer and far better.

A final word to the wise would be to avoid planting peonies back in the same ground where peonies formerly grew. They resent it.

Otherwise peonies are not difficult to grow. May I suggest you try some of these newer hybridizations mentioned above and see their beauty for yourself.

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Book Reviews

Flora of Mt. Rainier National Park, by C. Frank Brockman. Published by U. S. Government Printing Office, Washington 25, D. C., 1947. Price, 75 cents, from Superintendent of Documents.

THIS paper-covered, 170-page handbook to the wild flowers of this great mountain region will form an admirable guide for summer visitors, especially those unfamiliar with the bountiful and varied flora to be found on the western side of the Cascade Range; it does not, however, pretend to supersede G. N. Jones' "Flowering Plants and Ferns of Mount Rainier," (1938), in the hands of more experienced botanists.

Simple keys in non-technical language are provided, first to discover the family to which any given plant may belong, then the genus, and sometimes the individual species, though these generally have to be selected from the plant descriptions which form the greater part of the work.

This text is supplemented by 104 photographic illustrations which will probably form the introductory means of plant identification to many purchasers and users of the book; while they vary in quality most are good representations of their subjects, covering all types from trees to high alpine plants. Most of the conifer material, and of some other trees, has been photographed against a background of one inch squares, a helpful practice in comparing size of foliage, cones, etc. The author, formerly Associate Park Naturalist and now Assistant Professor of Forestry at the University of Washington, is responsible for the greater number of these illustrations, and is well qualified by experience and temperament to write this account of the native flowers.

The one criticism which the reviewer feels compelled to make—apart from some minor typographical errors which can be corrected in any later edition—is the system, in accordance with "Standardized Plant Names," of providing a so-called common name for every herbaceous plant, and in frequently combining two or even three English words into one of unnecessary length and clumsiness. These practices result in such uncouth and unusable titles as "Lambstongue fawnlily" for the beautiful *Erythronium grandiflorum* var. *pallidum*, generally and appropriately called Glacier Lily; "Mount Washington Dryad" for *Dryas octopetala*, the Mountain Avens, and to take three examples from the Liliaceae, "Fat solomonplume," "Claspleaf twist-edstalk," and "Queencup beadlily." How many flower lovers will recognize the charming little *Clintonia uniflora* under that last appellation, and how many more, being introduced to it for the first time, would not prefer the simpler Latin to the more complicated, less euphonious English? Fortunately the trees have been more kindly handled.

The work, which is excellent value at the price, concludes with a short glossary of botanical terms, a bibliography of nineteen items, and an index containing both Latin and English names.

B. O. M.

Commonsense Rock Gardening, by F. Kingdon Ward. pp. 174, 12 illustration, 1948. Published by Jonathan Cape, London. Price \$2.10.

THIS new book from England contains much enjoyable reading and some new ideas, combining as it does a fairly unorthodox approach to problems of interest to rock gardeners with the highly specialized point of view of an alpinist of great renown.

The book, a sort of handbook for the advanced beginner—that is, one who wishes to go beyond, if only a few steps beyond (and this is devoutly to be wished, at least as far as the evidence of Seattle "rockeries" in general seems to show), the growing of the omnipresent "Snow-on-the-Mountain" and "Basket of Gold."

To this end Mr. Ward draws on his vast knowledge and love and understanding of plants and their mountain environs from European Alps to the frontiers of Burma and Tibet. He suggests ways of bringing true Alpine feelings into our gardens whether small or large scale. And while, to an extent, he is concerned with the aesthetics of rock gardening, he suggests methods of accomplishing this with much less than the usual "fuss and feathers." Nor is this book overburdened with elaborate varietal notes on Alpine species. There are other sources for this material, fascinating as it is upon occasion. (As, of course, Farrer's monumental "English Rock Garden".) Rather, Kingdon Ward gives us a discursive book ranging over the problems of building and maintaining, the pleasures, rewards, possible failures, and temptations to excess of one of the most fascinating departments of horticulture—the ever-challenging Rock Garden.

—GEORGE MANTOR

Knowing Your Trees, by G. H. Collingwood and Warren D. Brush. Third and enlarged edition. 1947. Published by The American Forestry Association. Price \$5.00.

THIS revised (third) edition of "Knowing Your Trees" is probably the most complete work on trees available today. Many will consider it the best book on the subject.

One hundred and fifty trees are discussed fully. Included are excellent photographs of tree form, both in winter and summer, of leaf, flower, fruit and bark. Accompanying this is a distribution map showing range of tree habitat.

The text in non-technical terms discusses the ecological association of each tree. It presents a graphic description of the tree personality; its height, growth habit, foliage, flowers, fruit and bark. In addition are notes of interest concerning the economic importance and ornamental value of trees as well as an explanation of the botanical names.

The reader will feel well equipped to go out and meet the trees. He will realize that they, like humans, have habits and mannerisms to make them individuals.

—ROBERT J. HANSEN

ARBORETUM NOTEBOOK

This department is published for correspondence and pertinent comments by experienced growers on interesting plants and their culture. We solicit your questions but space limitation necessitates the publishing of only such answers as we deem of general interest.

ROCK GARDEN RHODODENDRONS

Picking a favorite among rock garden rhododendrons is like picking a favorite from among the many Miss Americas. I can, however, mention several which, because of their beauty and general usefulness would, in my opinion, always rank among the top favorites.

R. Williamsianum, *R. leucaspis* and *R. moupinense*. *R. Williamsianum* is perhaps the most generally useful for it remains low, will follow the contour of the ground, and spreads out in a large mat (one of mine exceeds three feet in diameter). For an open ground cover or bank there are few plants which will equal it and when properly placed will flower profusely with beautiful open bells which are followed by new leaf growth of bronze shades. This new foliage alone would make it worth while but as this slowly changes to green the small heart-shaped leaves are in themselves delightful. It can also be used under other plants but when so planted does not flower very well.

R. leucaspis is a low-growing shrub quite compact when planted in the open. The flowers are white, almost flat with rich dark brown stamens.

R. moupinense is slightly taller but remains a small shrub. It flowers in February with white, pink and in some forms deep rose blooms. The small shiny leaves add to its garden value.

Having mentioned only three I find many others crowding for recognition and any one might well replace those I have selected. To mention only a few, there are *R. myrtilloides*, *R. pemakoense*, *R. aperantum*, *R. deleiense* and *R. tephropeplum*, *R. imperator*, *R. Keiskei* and *R. keleticum*.

I have purposely omitted any of the Lapponicum Series for while there are a number of splendid species in this group there are many mediocre ones and only selected forms should be chosen.

H. G. I.

✓ ✓ ✓

There were so few sunny days this summer that many of us who visited Mrs. Duffy's garden missed seeing one of the garden's greatest charms, the shadows that the tall trees cast over the great areas of brilliant color. However, that is only one of the many joys of the garden. In early August the plantings of hydrangeas reached on through almost endless spaces in every shade of blue, purple, pink, rose, creamy and snowy whites, billowing along the broad, grassy lanes. One picture, long to be remembered, was a giant cedar with brownish-red bark surrounded by a huge mass of astilbe covered with faded blooms that picked up the red of the cedar bark. Farther up the hill was a large group of *Prunus Pissardii* with their dark red leaves. The whole picture was like a painting in dark reds and greens, a quieting influence in the midst of such exciting color combinations.

X.

A sight to be remembered I saw this spring in the garden of a Japanese woman where I go to buy asparagus. It was a single plant of rhubarb (*Rheum palmatum*) with huge green leaves on brilliant red stalks and a giant spike of flowers rising ten feet in height. For sheer beauty it could compete with any so-called rare plants. Its color and style and striking gorgeousness left nothing to be desired. Used in a shrubby border this fine plant would make an accent worthy of any planting.

Another fine accent plant is *Saxifraga peltata*. The flowers appear in spring, before the leaves, on a stem ten to fifteen inches high, and form a clear pink cluster of blooms suggestive of costume jewelry. Later the leaves unfold, eventually becoming great cupped disks twelve to eighteen inches across with slashed and ruffled edges. It is sometimes called the Umbrella Plant. *S. peltata* belongs to the Peltiphyllum section of the Saxifrage family. Many growers think it does its best in a boggy location but it seems fairly happy in my shady garden at the edge of a bed of *Primula Sieboldii* and in front of tall rhododendrons.

A. B. C.

✓ ✓ ✓

Mr. Michael Haworth-Booth in his book "The Flowering Shrub Garden" says, "Had I but a small piece of woodland suitable for choice shrubs and could accommodate only half a dozen, these would be my choice: *Rhododendron Thomsoni*, *Acacia dealbata*, *Camellia reticulata*, *Eucryphia cordifolia*, *Magnolia sinensis* or *Campbellii*, and *Rhododendron bullatum*."

✓ ✓ ✓

The following are five of Mr. B. O. Mulligan's favorite books:

1. Rehder's "Manual of Trees and Shrubs."
2. Bean's "Trees and Shrubs Hardy in the British Isles."
3. Lester Rowntree's "Flowering Shrubs of California."
4. David Fairchild's "The World Was My Garden."
5. Francis Jekyll's "A Gardener's Testament."

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Azalea Gumpo is an amazing dwarf evergreen shrub growing not more than eight inches high. It has surprisingly small pointed leaves with flowers as large as the individual blooms of many hybrid rhododendrons. The blossoms grow singly or in pairs and measure three or more inches across. The pink *Gumpo* has delicious shades of pink and the white *Gumpo* is satiny in texture with pale green at the throat; both have trumpets with ruffled edges. They grow rapidly, soon making a mat of clear green that is pleasing the year around. Slugs prefer the blossoms to most diets and if your plants seem to have no blooms, bait for slugs; they will eat the bud before it has a chance to open.

1 1 1

There are several quite charming plants in my garden that, I am convinced, have decided my garden belongs to them and that I should have very little to say about it. Little *Veronica repens* I have ceased fighting; she has a much stronger personality than I. Now she has taken over all the paths and is fast taking possession of the lawn. She is a charming little creeper with a bright blue, saucy bloom in May and the rest of the year, in my shady garden, her foliage is bright, clear green. In a week's time she can

spread from the paths into all beds, eventually smothering those growths with a weaker constitution if she is not suppressed.

Omphalodes verna is another upstart. Blue-eyed Mary is her everyday name and while quite ravishing with her clear, bright blue color there is nothing modest about her. Each spring, in desperation, I pull out great areas where she travels with lightning speed.

Meconopsis cambrica, the Welsh Poppy, is another aggravating member of my family of plants. With pleasing foliage, with yellow and orange flowers of poppy form, it pushes its long tap root under every precious plant I own, and generally the precious plant has to be lifted before the poppy root can be extracted. It is interesting but sometimes exasperating to cope with the different personalities in one's garden.

G. T. D.

1 1 1

SOME FALL SHRUB COMBINATIONS

Caryopteris and *Abelia grandiflora*.

Euonymus alatus forming a mass of pink foliage near *Enkianthus japonicus*.

Cornus Kousa with brilliant shades of red lasting for a long time is beautiful by itself but associates nicely with *Berberis prunifolia*.

Many members of the *Rhus* family (*Sumach*) combine successfully with each other. They also make a fine background for the dark green of some rhododendrons, especially *R. campanulatum* with the cinnamon-brown linings to its leaves, so beautiful in the afternoon sun.

The leaves of *Rhododendron luteum*, the fragrant yellow azalea, turn to beautiful yellow shades in the fall and light up any planting of *Azalea mollis*.

The *Ginkgo* tree is one of the most beautiful of fall coloring trees. The leaves turn to pure yellow and then fall, keeping their color and making a pool of gold at the base of the tree.

1 1 1

Mr. Ihrig, in his review of "The Rhododendron Year Book," only mentions his own article among all the celebrated growers of rhododendrons in England. In it he tells of our problems with rhododendrons as well as the successes of growers here in the Northwest. A brochure of his article, if possible to obtain, would be most interesting as well as helpful to all growers who do not have the opportunity to own the 1947 Rhododendron Year Book of the Royal Horticultural Society.

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A LIST OF PLANT NAMES

(Continued from Summer Issue)

Actinopteris Greenhouse ferns from India.
 Actinostemma (ray and wreath) Climbing plants from China and Japan.
acutissimus very acute.
acutus acute, sharp-pointed
 Ada (a complimentary name) Orchids.
 Adamsii After Adams, a Russian botanist.
 Adansonia After M. Adanson, French botanist. Tropical shrubs and trees.
 Adenocalymma Tender climbing plants from Brazil.
 Adenanthera From the deciduous pedicellate gland on each anther. Tender trees.
 Adenocarpus Aden—gland, karpos—fruit, ornamental woody shrub.
adenogynum glandular ovary
 Adenophora Gland-bearing border perennials.
adenophyllus glandular leaved
adenopodium glandular pedicel
 Adenostoma Aden—gland, stoma—mouth, evergreen shrubs.
 Adhatoda Native name, Brazil. Evergreen shrubs.
 Adiantum (Gr. unwetted) Maiden-hair fern.
adiantoides Adiantum-like.
 Adlumia After John Adlum. Hardy biennial vine.
admirabilis admirable, noteworthy
adnatus adnate, joined to
adonidifolius Adonis leaved
 Adonis A favorite of Venus. Hardy annual and perennial herbs.
 Adoxa Gr. without glory. Inconspicuous herb.
adpressus pressed against
adroserum eglandular, destitute of glands
adscendens ascending
adsurgens ascending
aduncus hooked
advenus newly arrived
 Aechmea pointed
aechmophyllum with a pointed leaf
 Aegle L. Aegle, one of the Hesperides. A small spiny tree.
 Aeglopsis Aegle, opis, appearance.
 Aegopodium Aix—goat, podoin—a foot. Coarse perennial.
aegyptiacus Egyptian
aemulus imitating
aequinoctialis mid-tropical, pertaining to equinox
aequipetalus equal petaled
aequitrilobus equally three lobed
 Aerides Gr.—air plant. Tender orchids.
aerius aerial
 Aerua Arabic name. Tropical Asiatic and African herbs.
aeruginosum rusty, rust colored
 Aesculus Ancient name for some oak. Chestnut tree.
aestivalis of summer
 Aethionema Aitho—scorch, nema—filament
 Shrubby herbs.
aethiopicus Ethiopian
affinis related
afghanicum from Afghanistan

afra African
africanus African
aganniphum snowy
 Agapanthus Agape—love, anthos—flower, blue lily.
agapetum delightful
agavoides agave-like
 Agathis Agathis—glome; flowers in clusters. Tender Australian conifers.
 Agave Gr. agauos—admirable, important, decorative and economic plants from American deserts.
 Agdestis A mythical monster. Tender climbing shrub from Mexico.
ageratifolius ageratum leaved
ageratoides ageratum-like
 Ageratum Gr. not growing old. Garden annuals.
agetum wondrous
agglutinatum stuck together
aggregatus clustered
 Aglaonema Gr. bright thread. Greenhouse herbs.
agrarius of the fields
agrestis pertaining to the fields
agrifolius scabby leaved
 Agrimonia Old name. Perennial herbs.
 Agrostemma Gr. field garland. Garden herbs.
 Agrostis Ancient Gr. name for forage grass. Bent grass.
 Ailanthus Native name meaning Tree of Heaven. Trees.
aiolopeplum with a gleaming covering
 Aira Ancient Gr. name. Hair grass.
aischropeplum with an ugly covering
aizoides aizoon-like
 Ajuga Not yoked. Herbaceous perennials.
 Akebia Jap. name. Twining, woody plants.
alabamense from Alabama
alatus winged
 Albertsenianum After M. O. Albertsen of the Chinese Maritime Customs.
albescens whitish
albicans whitish
albicaulis white stemmed
albidus white
albiflorum white flowered
albifrons white froned
albispinus white spined
 Albizzia After Albizzi, an Italian naturalist. Woody plants.
 (To Be Continued)

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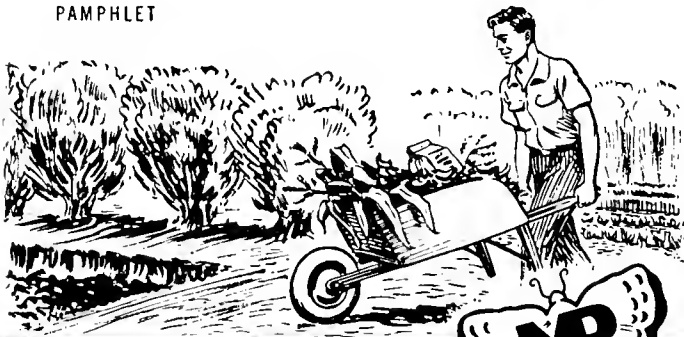
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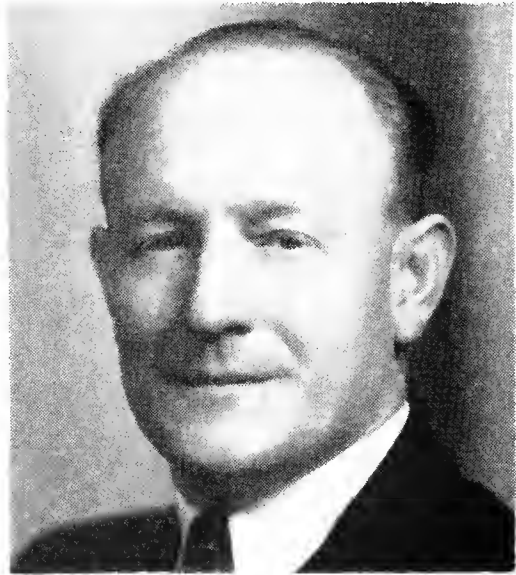


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