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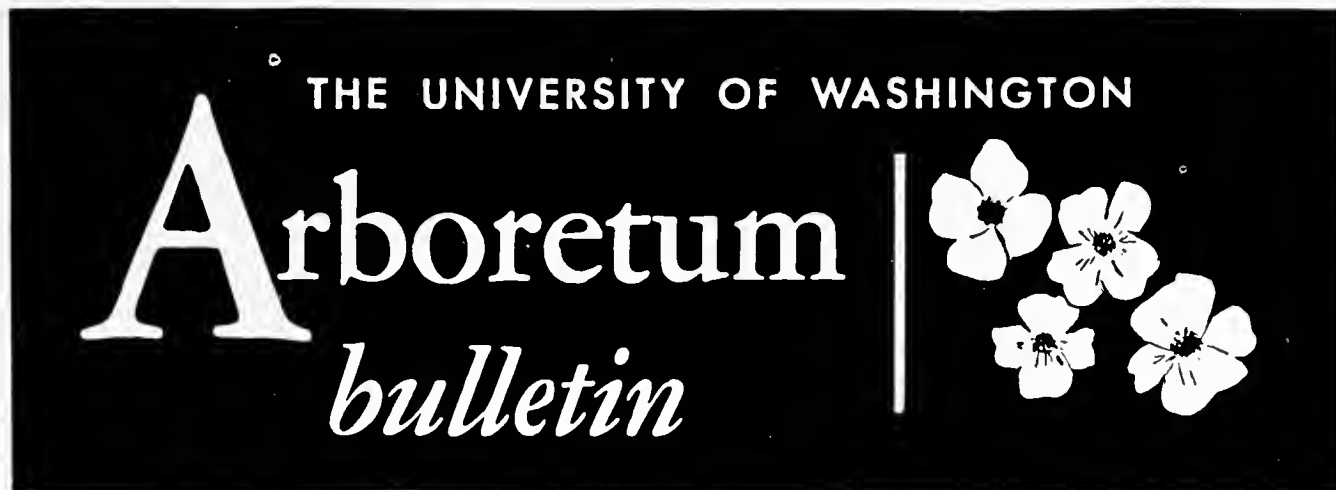


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COVER PHOTO:

Viburnum Tinus

PHOTO BY: E. F. MARTEN

Arboretum Progress, Fall-Winter, 1963-1964

B. O. MULLIGAN

Operations

A CONSIDERABLE amount of time and effort was expended in the late summer and early fall of 1963 in laying new drains in several areas to remove surface water and improve local soil conditions. The largest operation was on the hillside above the south end of Azalea Way, where some 500 ft. of 6-inch and 4-inch drain tiles were laid down to Azalea Way, thence into the ditch draining out of the Japanese garden. In January a large volume of water was noted pouring out of the exit pipe, indicating the success of the work.

Another was dug, 260 ft. in length on the east bank of the lagoon outside our north entrance. Although less water resulted here, the ground in the area appears appreciably drier. However, in February a much larger excavation became necessary in the same area when it was found that there was no drain beneath the parking lot from the catch basin on the east side of the road. A crew and equipment from the University had to be called in to construct a drain and another catch basin, to remove the surplus water to the lake.

A third site was dealt with at the north end of Azalea Way, where the soil is clay and natural drainage almost non-existent. We hope that improvement has been effected in this case, but it is a more difficult problem to solve.

Also in August and September last a new water line was laid westward across the south bank of the lagoon—940 ft. in all, the major portion being 2-inch galvanized pipe—to bring a supply to that peninsula just east of the new lake bridge approaches where planting has been done in recent years, especially for the benefit of the large rhododendrons (*R. sutchuenense*) placed there in Dec. 1962.

Finally, in November a fourth new drain—but a smaller one this time—was required

immediately outside the entrance to the cottage and across the lawn to the north of it. In this instance a short steel pipe had to be placed beneath the heavy stone pillar, and again we had to call for assistance from the University. A new lawn has to be sown here this spring as a consequence.

On Foster's Island a connection was made from our former road to the underpass beneath the approach to the new bridge, through which we can drive a small truck or a tractor. In one week of December we hauled 60 truckloads of stable manure from the north end of Seattle to our compost heaps on the island, and thanks to the generosity of the owners of the stables have been fetching a regular supply ever since then, now totalling about 700 yards. As usual a large quantity of leaves was brought to the Arboretum by City of Seattle trucks and these have been spread on many beds of shrubs along Arboretum Drive and Azalea Way. Lime was applied to grass on the clay soil areas and to our lilac collection in December, the latter by the kindness of Mrs. F. A. Bunge.

In the old nursery the disused uprights for the overhead sprinkler system were removed, as was a large mass of ivy on the east bank, where space was required for a new woodpile.

A certain amount of clearance work was accomplished during January and February; first, in the Pinetum south of E. Lynn St., where native nut bushes and vine maples were reduced in size to allow more room for our planted conifers. Second, and more noticeable, on the east side of Foster's Island, where wild cherry seedlings and a number of decrepit big-leaved maples and some alders were removed, thus providing more open spaces and a general improvement in appearance. By hiring a chipper for ten days the branches cut in this operation were later turned into chips and added to the compost pile, through a donation for this purpose from the Arbore-

tum Unit Council, for which we are sincerely grateful. This saved us hauling many loads of brush to the city dump, since we are not now permitted to burn it.

During the same period one man of our crew spent part of his time in pruning certain areas or groups of plants which particularly needed this attention; the crab apples between the cottage and Madison Street, hawthorns and crab apples along the Boulevard between the Japanese garden and Boyer Avenue, the Viburnum collection north of the latter, which had not been touched for many years and is now greatly opened up and improved, the Japanese cherries and eastern dogwoods along Azalea Way, and the various trees and shrubs beside the parking lot south of the Japanese garden. This is a policy which we shall hope to continue in the future, perhaps supplemented by some summer pruning in July and August.

The windstorm of January 16 brought down about a dozen native trees, but none of any particular value. One landmark which we removed in February on account of its rotten condition was the large old western red cedar which stood on the grass beside Arboretum Drive, just south of Woodland Garden. Unfortunately, it fell on our largest (12 ft. tall) specimen of the uncommon Japanese evergreen shrub *Trochodendron aralioides*, which was sliced in half as a result, but will probably recover in a few years' time.

Preparations were made for the new memorial drinking fountain to the late William F. Paddock, across the road from our offices, by laying a tile drain and connecting the site to the existing water supply. It is anticipated that this fountain designed by Noble Hoggson, will soon be constructed.

Acquisitions (Plant Material)

662 items were recorded for 1963, compared with 726 for the previous year; 155 of these arrived during the last three months of the year. They included plants or cuttings of rhododendrons from the Strybing Arboretum, San Francisco; dwarf conifers from the Morton Arboretum, Lisle, Illinois; various young shrubs from the U. S. Dept. of Agriculture,

Glenn Dale, Md., raised from seeds collected in Nepal; additional *Arctostaphylos* and *Ceanothus*, purchased from a California nursery; and a gift of 170 lily bulbs, of five kinds, from Mr. W. Switzer of Woodinville, Wash. Amongst seeds, *Cedrus libani*, from Mrs. H. S. Behr of Seattle, collected in Lebanon, and a variety of Australian tree and shrub seeds from the Botanic Garden at Adelaide, were most notable.

Up to the end of February 197 acquisitions had been noted this year. They included seeds from thirteen botanical gardens or arboreta, the majority in Europe, and consignments from the American, English and Scottish Rock Garden Societies. Thirteen packets of native tree and shrub seeds collected by Mr. Carl S. English of Seattle, chiefly in Arizona and California and sixteen from the Arboretum des Barres in France must be particularly mentioned.

Amongst plants, new azalea introductions from the U.S.D.A. Plant Introduction Station, Glenn Dale, Md., and the U. S. National Arboretum at Washington, D.C., together with four recently introduced manzanita selections (*Arctostaphylos*) from the Saratoga Horticultural Foundation in California are especially noteworthy. Likewise four uncommon and attractive climbing roses from Will Tillotson's Roses, Watsonville, California.

Some Books Acquired

Garden Shrubs & their Histories, by Alice M. Coats; (London, 1963).

Bonsai-Seikai, by T. Kawamoto & J. Y. Kurihara (Tokyo, 1963). Sent for review.

Poisonous Plants of the United States, W. C. Muenscher, rev. edn. (New York, 1962).

A Garden Century, The Christchurch Botanic Gardens, 1863-1963: published by Christchurch City Council, N.Z. (1963). Gift.

The Botany of Cook's Voyages, by E. D. Merrill (Waltham, Mass., 1954). Donated by Mr. and Mrs. Page Ballard, with other volumes, in memory of Prof. E. G. Cox.

Illustrations of Himalayan Plants, by J. D. Hooker (London, 1855). Donated by Mr. P. Bloedel.

The Last Redwoods, by P. Hyde and F. Leydet (Sierra Club, 1963). Gift of Unit No. 8.
Botany of the Antarctic Voyage of—Ships Erebus & Terror, by J. D. Hooker (1844-60; reprint 1961, London). Three volumes and plates.

Curtis' Botanical Magazine, vols. 41-42 (London, 1815). Given by Unit No. 8.

Plants Distributed

Eighteen consignments have been sent to other institutions since 10/1/63; two overseas. They included plants of our two magnolia selections and scions of *Acer palmatum* forms, as well as a variety of other items, most of them uncommon.

New Plantings

Since the removal of the overhead water line supports in the old nursery, and of ivy on the east bank, we have been able to make more use of this area for planting, since it is no longer used for nursery purposes. A representative collection of twenty kinds of young crab apples, 24 plants in all, was set out in December to form a short avenue from east to west beside an old service road, extending also along the west side of our main nursery road. These will provide an opportunity to judge the behavior of some of the newer forms here, as well as supplying a nucleus for propagation in the future, if so desired.

As a background, additional young pines of various kinds were planted on the sandy east bank (including for the first time, *P. taiwanensis*, from Taiwan), and a group of four Mexican species on the south slope in front of the bee hives, one of the warmest locations in the Arboretum.

On Foster's Island new groups were made adjacent to the bridge approach, on very peaty soil, of pin oaks, birches, and the native red-stemmed dogwood. At the north end, two more groups of pines and some young serviceberries (*Amelanchier* species), while near the tip of the island two examples of the interesting hybrid between the red and silver maples have been placed. Several other kinds of pines were added to the collection south of the bridge.

Additions were also made to the linden (*Tilia*) collection on the bank of the lagoon outside our north entrance (three species), to the viburnums on the east side of Lake Washington Boulevard north of Boyer Avenue (seven kinds), and to the birches located just south of the latter group (four species). Three young trees of the Chinese *Catalpa Fargesii* were also planted in this area, the first in this Arboretum.

An extensive planting of azaleas was undertaken on the west slope below Rhododendron Glen, since this area was thoroughly drained in the summer of 1962 and can now be expected to provide better growing conditions than formerly. Some forty large plants of various species were used, including *Rhodn. calendulaceum*, *R. occidentale* and *R. luteum*, which should supply both color and often fragrance between the end of April or early May and mid to late June, plus some fall color in October. These were supplemented by four large old *Enkianthus* bushes, and two plants each of *Acer cissifolium*, from Japan, and *A. Hersii* from W. China. Four more of the same sized *Enkianthus* were placed near the south entrance to the Japanese garden, where additional large specimens of rhododendrons and camellias are now being planted in the strip between the sidewalk and the garden fence. In all, 385 plants have been set out between October 1, 1963 and February 29, 1964.

Educational Activities

In October Mr. Witt conducted a series of four two-hour evening classes, for the Education Committee of the Arboretum Foundation, on *Trees & Shrubs for Winter Interest*. Twenty-three persons registered for this course.

Mr. L. J. Michaud, formerly propagator at the Arboretum, gave instruction on propagation by hardwood and evergreen cuttings and by seeds at six classes, held during December and January. Fifty-three students registered for these. These were also arranged by the Education Committee, as were two pruning demonstrations given by the Director

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Viburnums

MRS. MORITZ MILBURN*

FOR as long as I can remember having an interest in gardening I have been keenly interested in viburnums and consider them to be of great importance in landscape designing. The variations in their coloring, growth habits and requirements make them ideal companions to rhododendrons and azalea plantings. They are invaluable in breaking up the monotony of total evergreen plantings and are magnificently qualified for the finest of landscape work, having been used extensively in England and Europe. Their remarkable versatility can add brilliant color, unusual leaf texture, vari-colored fruit and lovely fragrance, while their enormous variety can supply something suitable for ground cover or small trees, something sprawling and graceful or something stiff and adaptable to hedges. Generally speaking, they are not easy to come by nor well known to our landscape architects who are most apt to use plant material that is readily available. But for the dedicated gardener the collection of fine plant material is a primary joy and there are good sources for their acquisition in England and our United States.

Let's first give a thought to their native habitat and place them botanically. Of more than two hundred known species the huge majority comes from Eastern Asia, from China, Korea and Japan. Some come from Europe and about a dozen are native to our United States, originating in New England or the hills of Tennessee and Georgia. As a group they are restricted to the northern temperate zone and can be successfully grown in almost every part of our country and Europe. Botanically, they are part of the family *Caprifoliaceae* which also includes *Weigela*, *Kolkwitzia*, *Abelia* and *Symphoricarpos*. Their oppositely arranged leaves vary greatly in size, veining, texture and shape—

from oval to pointed, serrated to waxy, to velvet. Generally, their flowers are white, pale pink or creamy, very small individually and set in clusters or cymes terminally. The individual blossom is quite insignificant but the cymes are conspicuously lovely. Fertile and non-fertile, or sterile, flowers appear together in some species. They are rarely dioecious yet they are not self-fertile. It is best to plant a species in number to guarantee fruiting. This does not follow the general rules of botany for, usually, plants that have perfect flowers are also self-fertile. The beautiful berries or drupes vary from oval to round, from $\frac{3}{8}$ to $\frac{3}{4}$ of an inch long and from red to yellow or metallic blue to black in color. The large majority of species and hybrids grows to a height of five to ten feet, but a few are procumbent and some produce single or multiple stemmed trees up to 30 feet.

Perhaps next it would be best to consider their requirements for cultivation. For all the glory they can add to a garden they ask little in return and they are particularly well suited to our own climate and are far from temperamental. On the whole, they like a slightly acid soil and don't require heavy feeding. Stay away from a predominantly nitrogen fertilizer—a good compost mulching is better. Choose a site with partial shade and good, deep loam with adequate drainage and they will be happy. It is wise to remember also that the semi-evergreen and evergreen varieties are inclined to be more tender and will appreciate shelter. My own experience has proven that they move much more successfully in the fall of the year and I would definitely advise using a wilt-proof spray, then mulching them well against frost.

They are both amenable and adaptable to pruning but it is seldom needed. Just remember to choose the proper variety for the proper location and be careful not to spoil the beautiful horizontal branching pattern of the species that grow that way.

*This was a talk given recently by Mrs. Milburn, long-time member of the Foundation's Board of Directors, to the Seattle Garden Club.

And, with a last word of saying that most need sun to flower and fruit profusely, I will give you a brief description of some better-known varieties—hoping that you will share in my enthusiasm of this group of plants.

acerifolium—American—will tolerate shade and dry conditions but is an exception to the general rule in liking moist, organic, acid soil. Important for fruit. Leaves similar to maple, deciduous.

alnifolium—American, “Hobble Bush”. Very distinct shrub; large leaves turn deep claret red in autumn. Large inflorescences in May and June—deciduous.

atrocyaneum—Himalayan, 3 to 10 ft. Evergreen, fine textured foliage resembles boxwood. Steely blue-black fruits are ellipsoidal and smooth.

betulifolium—Chinese, tall growing, large bunches of red currant-like berries, deciduous.

bitchiuense—Japanese—taller and more slender than *V. Carlesii*, sweet scented, deciduous. April flowering.

bodnantense—hybrid (*fragrans* X *grandiflorum*), winter blooming, fragrant rose tinted flowers; deciduous and frost resistant.

buddleifolium—Chinese. Large semi-evergreen leaves 5 to 8 inches long. Berries red, finally black. Not too hardy.

Burkwoodii—(*Carlesii* X *utile*). Flowers from February to April, taller than *V. Carlesii*, fragrant; semi-evergreen, shiny green leaves.

calvum—Western China, very rare, Evergreen, gray green leaves, greenish white flowers in May, blue-black fruit.

carlcephalum (*Carlesii* X *macrocephalum*), deciduous, erect growth to eight feet; large heads of fragrant flowers in May.

Carlesii—Korean—deciduous; very fragrant, large rounded clusters of flowers April-May, rarely over five feet.

cassinoides—American—excellent for fall color and blue-black fruit. Used in conservation plantings. Smooth glossy leaves, deciduous.

Chenaultii—a form of *V. Burkwoodii*.

cinnamomifolium—evergreen—medium height up to 10 or 12 feet; deeply veined leaves—“cinnamon leaf”—from W. China. Conspicuously three-veined leaves similar to *V. Davidii*.

cotinifolium—in Arboretum. Of Himalayan origin; deciduous, not yet flowered. Related to *V. Lantana*.

cylindricum (*coriaceum*)—evergreen species from China, India, and Java. Oblong waxy leaves; growth about 15 ft. in cultivated species. Cymes 3 to 5 inches across, in midsummer; flowers are very small. Multiple stemmed, coarse growth, good for background planting.

Davidii—David's Viburnum—W. China. Leaves deeply three veined, leathery, dark green, rugose, oblong to obovate, 2 to 6 inches long. This evergreen is more particular in its needs, wants some shade to be luxuriant and will not tolerate heat and drought. Flowers May to June; fruits metallic turquoise blue. Low growing, about 3 feet.

dentatum—Eastern N. America—Thicket forming species. Used in conservation planting to attract birds; lovely blue-black fruit. Arrow-wood.

dilatatum—Japanese. Berries profusely; 7 to 9 feet. Very amenable to pruning, good for hedge use. Fruit red, leaves deciduous.

d. 'Xanthocarpum'—in Arboretum. Fruit orange-yellow.

erubescens—Himalayan—one of the rarest and choicest. Fragrant pink tinted flowers in drooping panicles in June-July. Handsome foliage, deciduous.

e. var. gracilipes—Chinese variety, Hardier.

foetens—Himalayan. Fragrant winter flowering species. Smooth leaves and loose inflorescence of white flowers. Needs shady location; deciduous.

foetidum—Semi-evergreen—important scarlet fruit—medium growth but rather tender. Rare in cultivation.

fragrans—Chinese. Winter flowering, 6 to 10 feet, flowers pink or white, fragrant. Of erect growth, deciduous.

'Nanum'—dwarf variety. The *fragrans* group is one of the most neglected of viburnums—the better cultivated forms should flower abundantly.

f. v. roseum and 'Bowles'. Pink flowers.

f. v. candidissimum—white flowers and lighter green leaves.

grandiflorum—Himalayan—winter blooming. Larger flowers than *V. fragrans*, deeper rose pink.

Harryanum—Chinese—evergreen. Small, one inch long, privet-like leaves, dull green, obovate; small terminal cymes of flowers. Bushy growth, 6 to 8 feet. Rare evergreen and quite distinct from all other cultivated viburnums.

Henryi—Central China—develops into small tree of ten feet. Semi-evergreen to evergreen, dark shiny leaves. Stiff pyramidal panicles two to four inches long, flowers in May. Coral red fruit turning to black. Excellent for accent planting. Specimen in Volunteer Park, Seattle.

Hillieri (*V. erubescens* X *V. Henryi*)—wide spreading plant with dark green foliage copper tinted in summer and bronze colored in winter. Grows to six feet in Arboretum; is semi-evergreen or evergreen depending on climate. Cream colored flowers in panicles in May followed by red fruits turning to black. Very fine cross produced at Hillier's Nursery in England; known as 'Winton'.

hupehense—deciduous—from China. A tall, upright shrub; shiny foliage and bright red berries. Not common, but worth seeking.

japonicum—Japanese evergreen difficult to procure but important among viburnums—often mislabeled as *odoratissimum*. Broad, lustrous, cuneate, glabrous leaves. Fragrant white flowers in cymes four inches across. Rather tender and needs a sheltered place.

Juddii—in Arboretum. (*V. Carlesii* X *V. bitchiuense*). Intermediate between the parents. A valuable, fragrant, spring-flowering shrub.

Lantana—the “Wayfaring Tree” viburnum—ten feet or more. Creamy white cymose clusters—dense rounded shrub. Fruit red, turning black.

L. 'Aureum'—golden green foliage in summer.

L. 'Variegatum'—variegated foliage.

L. v. rugosum—produces abundant flower clusters and is a choice fruiting shrub; deciduous.

Lentago—Eastern N. American species, “Sheep-berry”, six to ten feet, deciduous.

lobophyllum—Chinese, growing to 15 feet, deciduous. Broadly ovate foliage abruptly narrowed at apex. Shiny red berries in four to five inch clusters.

macrocephalum—The “Chinese Snowball”. Huge snowball clusters six to eight inches across. Deciduous or semi-evergreen; very beautiful but needs good soil and protection.

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Pruning Young Landscape Trees

RICHARD W. HARRIS*

PRUNING is an ancient practice, well understood by the horticulturist and well described in many books. However, the principles seldom are practiced or appreciated. Tragically, this lack is all too common with young, broad-leaved, landscape trees. Many such trees become misshapened, form weak branch structures, or do not serve their intended purpose in the landscape.

The most common situations which may lead to future difficulties are:

1. Main branches too low to the ground.
2. Branches arising too close together on the trunk.
3. Branches outgrowing the main leader (the intended trunk).
4. A branch developing equally with the main leader.
5. Branches forming acute angles of attachment with the trunk.

The last two situations result in weak branch structure which may become hazardous as a tree matures.

All of these situations can be avoided by using simple pruning practices while the trees are young. The following comments are to provide an understanding of two important concepts that form the basis of pruning.

The first is the influence pruning has on a plant or a part of a plant. The effects of pruning are seemingly contradictory. Pruning *invigorates* a plant but at the same time dwarfs it. Mature fruiting plants may be the exception to the latter part of this statement.

Pruning removes leaves and shoots, or buds which will develop into leaves and shoots. After pruning, a plant has fewer growing points (buds or shoot tips) than before, but it has essentially the same root system. This has the effect of increasing the water and nutrient supply to the remaining growing points. Shoots will grow more rapidly and later into the season. In this regard, pruning

is similar to nitrogen fertilization; the leaves also will become larger and greener.

Even though individual shoots on pruned plants will become longer with greener leaves, the total leaf area usually will be less than on an unpruned or more lightly pruned plant. In addition, the total leaf area on the more severely pruned plant will not be completed as early as on the unpruned. The net result is that the more severely pruned plant will have less leaf area effective for a shorter period of time. Less food will be produced by the pruned plant. Total growth of a shoot or a plant will be less after it is pruned.

These influences are the key to pruning. They can be used to full advantage in training young trees. In order to encourage a limb or a plant, it should be pruned lightly or not

Below—

Lateral branch with narrow angle of attachment showing poor union in the crotch (Modesto ash, *Fraxinus velutina* 'Modesto')

PHOTO BY: UNIVERSITY OF CALIFORNIA
DAVIS, CALIFORNIA

FIG. 1



*Dr. Harris is Chairman of the Department of Landscape Horticulture, College of Agriculture, University of California, Davis.

at all. A limb also may be favored by pruning other branches to let more light to the leaves of the branch to be encouraged. To discourage or slow the growth of a limb or plant, prune it more heavily. The more severe the pruning, the greater will be its invigoration effect as well as its dwarfing influence.

Pruning may not dwarf a mature fruiting plant. Pruning normally removes more potential fruit than leaves. Since fruit has first call on food produced by the leaves, shoot and root growth may be greatly reduced on a fruiting plant. In such cases, pruning not only invigorates the plant so that individual shoots are longer but also increases the total growth of the plant.

Pruning usually will delay the flowering and fruiting of young plants which produce flowers on one-year-old wood, e.g., flowering plum, crabapple and cherry. In order to form flower buds, plants with these flowering characteristics need conditions which favor

Below—

Lateral branch with wide angle of attachment
(*Morus alba* 'Fruitless')

PHOTO BY: UNIVERSITY OF CALIFORNIA
DAVIS, CALIFORNIA

FIG. 2



both adequate nitrogen and food supply early in the growing season. Pruning, and likewise nitrogen fertilization, may favor rapid shoot growth at the expense of flower bud formation. Certain young plants may be delayed in flowering several years by heavy pruning. Others may be little affected.

The second concept of pruning is the type of pruning cut and the plant response to it. Two general types of pruning cuts can be described which differ in the manner in which they are made as well as the plant response to them.

Heading back is cutting to a stub, a lateral bud or a lateral branch so small that the new growth usually comes from a few buds near the cut and is vigorous while the lower buds may remain latent. The vigorous, upright growth results in a compact, unnatural appearing plant with dense shade. In older trees, the new growth from stubs seldom becomes strongly attached and may split out readily.

Thinning out or cutting to laterals is the removal of lateral branches at their point of origin, or reducing the length of a branch by cutting to a lateral large enough that it tends to assume the terminal role and new growth is modified accordingly. New growth is not concentrated near the pruning cut but usually is distributed along the entire branch. Thinning-out pruning results in an open, airy, natural appearance with good light penetration.

The size of a plant may be more effectively controlled by thinning out than by heading back. Thinning to lower growing laterals will result in less growth of individual shoots. Thinning out of equal severity is less invigorating and dwarfing than is heading back.

There is a place for each type of pruning. However, heading back should be mainly restricted in training to influence the location of lateral branching, to repress one branch in relation to others or to encourage more upright growth of a spreading branch. Heading back may be used to stimulate flowering

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Leaves from the University of Washington Arboretum

ARTHUR R. KRUCKEBERG*

THE 10th International Botanical Congress convenes in Edinburgh, Scotland, during August of 1964. Should any of the details of this event reach the pages of the daily press, I would predict that only the somewhat garbled accounts of new discoveries in plant disease, horticulture, antibiotics, or plant breeding would be heralded. Yet, in fact, this international body convenes every five years not only to review the progress in botany as a whole but to consider proposed changes to the rules of botanical nomenclature.

The Naming of Plants

The agenda of the Nomenclature Section would read as much like a legal document as it would a botanical one. Practitioners of the "art" of nomenclature have to follow intricate rules. Moreover, these rules are codified, largely stabilized and rarely changed under international agreement. I have before me a 400-page book, *The International Code of Botanical Nomenclature*, which sets forth in English, French and German the principles, rules and recommendations for the naming of plants. Portions of the preamble to the Code will reveal the basic intent of botanical nomenclature:

"Botany requires a precise and simple system of nomenclature used by botanists in all countries, dealing on the one hand with the terms which denote the ranks of taxonomic groups or units and on the other hand with the scientific names which are applied to the individual taxonomic groups of plants. The purpose of giving a name to a taxonomic group is not to indicate its characters or history, but to supply a means of referring to it and to indicate its taxonomic rank. This Code aims at the provision of a stable method of naming taxonomic groups, avoiding and rejecting the use of names which may cause error or ambiguity or throw science into confusion. Next in importance is the avoidance of the useless creation of names. Other con-

siderations, such as absolute grammatical correctness, regularity or euphony of names, more or less prevailing custom, regard for persons, etc., notwithstanding their undeniable importance, are relatively accessory.

"The only proper reasons for changing a name are either a more profound knowledge of the facts resulting from adequate taxonomic study or the necessity of giving up a nomenclature that is contrary to the rules."

The impressive body of stabilized nomenclature and its eminently workable machinery for keeping the names of over a million kinds of plants in order, is a tribute to the several generations of plant taxonomists who have brought order and system to Nature's vast floristic diversity. Within the framework of regulated and stabilized plant nomenclature, we will now begin to examine the "what," "how" and "why" of plant names.

Common Versus Latin Names

Our initial encounters with plant names are usually painfully unrewarding. To confront the Latin name, *Gaultheria Shallon*, for the first time is bad enough, but if you are an easterner, the common name, "salal," is not much better. It is simply that a strange name has no inherent information content. But having been shown a specimen with its name-tag fulfills the information gap. Both names now have meaning. Then why not use common names exclusively? If each kind of plant were unique—without a sign of kinship to any other kind—then a simple common name might do. But within Nature's array of diversity there is also the strong element of relatedness. Thus, two kinds of *Gaultheria*, when called by their common names, "salal" and "wintergreen," are forever separated. But, by their Latin names, *Gaultheria Shallon* and *Gaultheria procumbens*, the two are joined in *Gaultheria* to reflect their bond of kinship.

We must relegate common names to subordinate usage for other reasons. First, they lack universality of application. Common

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names are usually indigenous to a single country, or even only to one part of a country. In Europe the inhabitants of a single village or valley may have passed on a local name for generations. The bipolar shrublet, *Empetrum nigrum*, is a simple case: Americans call it "crowberry," the Russian says "vodyanika" and the German says "Krahenbeere" or "Rauschbeere." For more aggravating and picturesque examples we can turn to the flora of rural England; the Briton has been lavish with common names for one and the same plant. In that delightful work by Geoffrey Grigson, "The Englishman's Flora," I counted nearly a hundred different common—and often very local—names for *Caltha palustris*: to name a few, Marsh marigold, bachelor's buttons, cups and saucers, water goggles, *et cetera ad nauseam*. Then, sometimes the same common name may apply to several very different plants. The name "may flower" has been given to *Podophyllum* in the midwest, to a member of the Heath family in New England, to the hawthorn, marsh marigold and cuckoo flower in England and to a legume in the West Indies. Though such examples could be repeated *ad absurdum*, I cannot resist just two more to further the proof of confusion in common names. A handsome member of the sunflower family was called "Venus' paint brush" when it first appeared in America; later, as it proved to be an aggressive noxious weed, it became known as the "Devil's paint brush." Finally, there is the case of corrupted meaning through centuries of usage. Plants of the genus *Cornus* were once called "dagwood," as "dags" were made of its wood for use as skewers. Need I tell you its present form and corrupted meaning? To be historically correct, you should call our native "dagwood" the skewerwood—if you wish!

The use of common names really breaks down in a ludicrous fashion when they are "manufactured." A large portion of the flora of any region consists of plants largely ignored by the layman and hence devoid of any common names in everyday usage. Yet, when writing a manual of such a regional flora,

the author may be compelled to give each species a common name, since he may have listed some for species where the common name is in wide usage. "Tweedy's rattleweed" does not add much to the binomial, *Astragalus Tweedyi*, does it? Are you any better off knowing that *Tropocarpum caparideum* can also be called "caper-fruited tropocarpum"? Enough said of common names—established as well as contrived—except to say that when in wide lay use they should be retained and used. But they do not serve well the conduct of the international business of scientific botany.

The Binomial or Latin Name

There is really nothing scientific about the so-called "scientific name" in biological nomenclature. It is derived neither by experiment nor by observation and it cannot be tested like a hypothesis. Yet it is the only valid "handle" which can be attached to organisms. The scientific or Latin name is a compound of two Latin or Latinized words, the generic and the specific epithets. This double epithet is the species name. Thus the binomial, *Pinus ponderosa*, is applied to a particular kind of pine—one with a distinctive ensemble of structural features and which occurs in self-reproducing populations throughout a wide but delimited geographic and ecological range.

Let us emphasize the last point with an example of horticultural value. The name, *Rhododendron racemosum*, stands for a particular kind of rhododendron. This binomial may be used to single out an individual plant in a garden or nursery bed, or a plant in its native habitat in western China. But more fundamentally, *R. racemosum** is a collective name standing for all the individuals which have the aggregate features of this plant. Where the kind of plant is only known in the wild, its species name stands for the system of natural populations made up of interbreeding individuals conforming closely to the species description. For plants of horticultural value, the binomial Latin name would apply

*Note that we can abbreviate the generic name when using it later in the same text—if no other binomial is interposed.

collectively to both natural populations and to the array of individuals in cultivation.

Note well that when referring to a kind of plant the binomial *in toto* must be used—written or spoken. In our example of *Rhododendron racemosum*, the word “racemosum” by itself is useless. It could be (and is!) applied to another species in any other genus. The generic epithet, *Rhododendron*, does have information content when used alone. But as such it no longer refers to a particular kind. It, by itself, connotes an unspecified kind, or more than one kind, or all kinds within the collective group, the genus.

A word now about those cryptic abbreviations following a binomial. Each species name is the product of authorship, wherein the original describer of the plant bestows, together with his printed and often illustrated description of the new species, his signature. Thus the full citation of salal is *Gaultheria Shallon* Pursh. *Fl. Am. Sept.*, 283. 1814. (Lewis, Columbia R.). Deciphered, this statement tells us that *G. Shallon* was published by one Mr. Pursh in the *Flora Americana Septentrionalis*, on p. 283, in 1814, from a specimen collected by Lewis on the Columbia River. For another species of *Gaultheria*, *G. hispidula* (L.) Muhl. *Cat. Pl.* 44. 1813, we encounter a more complicated citation. The letter in parentheses stands for Linnaeus who published this species under another genus (*Vaccinium*). Muhlenberg felt that the species belonged to *Gaultheria*, not to *Vaccinium*; he therefore made the name change but by rule retained the name of the original author. For another ericaceous plant, *Allotropa virgata* T. & G. ex Gray, *Proc. Am. Acad.* 7:368. 1867, the “ex” is the added complication. By this device the provisional name of Torrey and Gray is made valid by Gray’s later publication of same. Note also that those who figure prominently in botanical authorship are frequently designated by an initial: L. for Linnaeus, T. & G. for Torrey and Gray, H. B. K. for Humboldt, Bonpland, and Kunth, *et cetera*. After all that on binomial authorship you will be pleased to learn that no one ever uses the authors’ names in

speech, nor are they usually used in horticultural or gardening publications. But perhaps some reader’s curiosity is now satisfied.

The Taxonomic System

Our discussion of the binomial suggests that the two categories of plant names—genus and species—are collective terms. The species category collects unto it individuals, while the genus contains one to many species. Both categories are levels of inclusiveness; one (the genus) more inclusive than the other. In fact, the whole vast array of biological diversity—all the species from tundra to tropics can be “nested” in successively more inclusive categories. This hierarchy of categories constitutes the taxonomic system. Though the lowest level is logically the individual, the species is actually the lower formal rank; the variety or subspecies often is subordinate to the species. The catalog of categories does not stop here, however. When looked at from above, the most inclusive category would gather unto itself all plants—the Kingdom *Plantae*. Looking downward from maximum to minimum inclusiveness we find the following array of categories:

<i>Category</i>	<i>Example</i>
Kingdom	Plantae
Phylum	Tracheophyta
Subphylum	Pteropsida
Class	Angiospermae
Subclass	Dicotyledonae
Order	Ericales
Family	Ericaceae
Genus	Rhododendron
Species	calostrotum
Variety	calciphilum

As the categories become less and less inclusive, there will be variant kinds of each of them at successively lower levels. Thus, while there are only three kingdoms, there are at least twelve phyla, many classes, orders and families, and over a quarter of a million species of plants.

Utter despair at trying to grapple with this vast taxonomic system must have descended upon the reader by now. Be henceforth heartened by the thought that the horticulturist-gardener can disregard all categories but the genus, species, and possibly, as well, the family. Simply keep in mind that

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Chemical Weed Control for Ornamental Plantings

ARTHUR S. MYHRE*

THERE is a real need for a safe, dependable and economical year-round weed control program for ornamental plantings in western Washington. No one will question the fact that weeds deprive plants of moisture, nutrients and sunlight and interfere with their root development, thereby resulting in reduced plant growth and poor quality plants. Our moderately cool summer temperatures, relatively warm winters and abundant moisture cause many kinds of weeds to spread and grow with such rapidity that even the most ardent gardeners can become quite discouraged with the time-consuming and back-breaking operation of just trying to keep weeds under control.

Not too many years ago weeds were removed almost entirely by hand or mechanical means and also were kept partially under control with the use of mulches. These practices for some situations and conditions are still applicable and it is not always feasible to replace them with the more popular and easier method of eliminating weeds with chemicals. There are, however, nurseries and various public institutions that have ornamental plantings that readily lend themselves to a full-scale chemical weed control program. Usage of weed-killing materials by nurserymen, landscape gardeners, ground sprayer operators, etc., has increased during the past few years, but there are many that have not attempted to use them for fear of causing injury to ornamental plants.

What everyone is looking for is a selective herbicide, one that will kill all kinds of weeds at the same time and do no damage to the ornamental plant. I doubt that we will ever find such a herbicide but we are fast approaching these goals with some of the new herbicides. If the operator will choose the correct chemical to fit the species, apply it at the proper rate and under proper conditions,

many ornamental shrubs can be weeded successfully by chemical means.

When applying herbicides one must at all times use precaution and understanding. It cannot be assumed that most weed killers behave in much the same manner. Often even a technically trained operator may take for granted that once he has learned the precautions needed in applying one herbicide he is ready to use any of the others. This is not the case, so one must learn the limitations of the chemical. These appear on the label of the product and should be carefully read and adhered to.

Extensive weed control research investigations involving the testing of many different chemical herbicides on different species and varieties of ornamental shrubs are under way at the Western Washington Experiment Station. Results obtained from these studies indicate that, when properly applied, certain herbicides will do a fine job of controlling many kinds of weeds with little or no damage to a wide range of ornamental plants.

Our weed control research program is designed especially for nurserymen. Rooted cuttings of many different species and varieties or ornamental shrubs are lined out in nursery rows each year and sprayed with promising new herbicides, using power equipment to provide good agitation of spray materials, accurate calibration and good coverage.

Pre-emergence herbicides have shown much promise for use in ornamental plantings. They are most effective when applied to weed-free soil and kill weeds in early stages of germination or growth. Standing weeds are usually not killed readily unless exceedingly high application rates are used. This, of course, is not desirable since considerable injury may occur, especially on certain sensitive broadleaved evergreen shrubs. Best results have been obtained in our experimental plots when sprays are applied as soon as possible after soil has been cultivated and crop plants

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hoed. Moisture is necessary to activate the chemical and to bring about fast weed seed germination in the surface soil. It is essential, therefore, that irrigation should commence shortly after spray application if rainfall does not occur. It is also important that the sprayed area should not be disturbed since cultivation will bring weed seeds to the surface where they will germinate.

Our studies show that differences exist in degree of plant tolerance to pre-emergence herbicides. Coniferous evergreen shrubs, such as juniper, arborvitae, cypress and yew, have shown considerable tolerance, whereas broad-leaved evergreen shrubs, such as certain varieties of azaleas, Japanese holly and boxwood, are more sensitive and sprays must be applied at lower rates.

Application rates will differ with soil type. In general, the lower recommended rates should be used on light, sandy soils which are usually low in organic matter, whereas higher rates can be applied on heavier soil. Application rates also will vary somewhat with the season (amount of rainfall, temperature, soil moisture) and type of weeds to be controlled.

Of more than fifty herbicides tested, the following pre-emergence herbicides have shown most promise to date from the standpoint of good weed control and least damage to plants: Simazine, Herban, Casoron. Other pre-emergence herbicides now under test are Alipur, Atrazine, Dacthal, Enide, Neburon, Propazine, Swep.

Simazine, especially, has consistently given us fine control of such common weeds generally found in most areas of western Washington: Redroot, Smartweed, Lambsquarter, Wild mustard, Chickweed, Groundsel, Shepherds purse, Pineapple-weed, Corn spurry. Rates of four pounds Simazine 80% W per acre applied in May have given excellent control of annual weeds with no damage to the following plants: *Arctostaphylos Uva-ursi*, *Chamaecyparis pisifera* 'Cyano-viridis,' *C. Lawsoniana* 'Ellwoodii,' *C. pisifera* 'Plumosa,' *Cotoneaster horizontalis*, *Erica carnea*, *Erica darleyensis*, *Euonymus radicans*, *Ilex Aquifolium*, *Juniperus chinensis* 'Pfitzeriana,' *Pru-*

nus Laurocerasus var. *Zabeliana*, *Pernettya mucronata*, *Potentilla fruticosa*, *Rhododendron* varieties 'Bowbells,' 'Cynthia,' 'Jock,' *Taxus baccata* and 'Repandens,' *Taxus cuspidata*, *Thuja occidentalis* 'Globosa' and 'Umbraclifera,' *Veronica cupressoides*. Rates of two pounds have given good weed control with no damage to *Azalea* 'Hinodegiri,' 'Rosebud,' *Rhodn. mucronatum*, *Ilex crenata*, *Osmanthus Delavayi*, *Pieris japonica*, *Rhododendron* 'Blue Diamond,' 'Sapphire,' *Viburnum Davidii*, *V. Tinus*.

Split applications in which Simazine was applied at various rates in both fall and spring have given satisfactory year-round results in recent tests.

Post-emergence treatments are those in which certain type herbicides are applied to existing weeds. This involves the application of directed sprays on actively growing weeds; special precaution to avoid hitting foliage of ornamental plants is necessary since severe discoloration and stunting of plants may occur. Amitrol and Dalapon and combinations of Amitrol with Simazine and Atrazine to give residual weed control have been tested to a limited extent in our research studies.

Contact herbicides are those that kill the plant tissue to which they are applied. They are effective in killing annual weeds but will only burn off the tops of perennial weeds. Care must be exercised to apply them as a directed spray around ornamental shrubs at moments when air movements are quiet. For small areas, sprays can be applied with a two- or three-gallon pressure type garden sprayer equipped with a flat fan, wide-angle type of nozzle which can be held close to the ground to reduce drift. A nozzle size equivalent to an 8004 Teejet has worked out well for this type spraying. Two new contact herbicides, Paraquat and Diquat, have been under observance and show promise. They may have a definite place in home gardens as a general weed killer in and around established woody ornamentals such as roses, evergreens, trees and also for graveled walks and driveways. Both destroy green tissue rapidly

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The Sterling Morton Library

THE Sterling Morton Library building, opened in October 1963, is a gift to the Arboretum from Preston Owsley Morton in memory of her late husband. Sterling Morton, the only son of the Arboretum's founder, Joy Morton, was a trustee for 39 years, from the inception of the Arboretum in 1922 until his death in 1961. For the last seven years of that period he served as Trustee Chairman. The Trustees of the Arboretum are deeply grateful to Mrs. Morton for this handsome, appropriate memorial to a man who had inherited his family's love of books and trees.

The library building forms the east wing to the group of buildings on Illinois Route 53 known as the Arboretum Center. The new library, designed by Harry Weese, is a single story and basement building which continues the Lannon and Bedford stone combination of the earlier sections. The main floor is devoted entirely to a spacious Reading Room attractively subdivided by an oval of free-standing bookcases, creating the impression of a room within a room. The floor is of handmade hexagonal tile, the woodwork of cherry, the shelving of plate glass. Wide floor to ceiling windows look south and east over the Arboretum grounds; a clerestory washes the walls with daylight. There is a fireplace with couch and chairs before it and a group of four engravings of Audubon waterbirds on the wall above. The setting is informal, residential, and contemporary.

The floor below the Reading Room, in addition to book stacks, staff workrooms and study carrels, houses special areas for nursery catalogues and photographic collections.

We believe that this account of the new Sterling Morton library, at the Morton Arboretum, Lisle, Illinois, will be of considerable interest to many of our readers, particularly those who utilize the resources of our own small library.

Permission to republish this brochure has been kindly granted to us by the authoress, Mrs. Suzette Morton Zurcher, Chairman of the Board of Trustees of the Arboretum.

The May T. Watts Reading Garden

The May T. Watts Reading Garden is reached through a door in the east end of the Reading Room. In favorable weather, this walled garden, named in honor of the Arboretum's distinguished Naturalist Emeritus who originated the idea for it, offers the reader the choice of a tree-shaded corner or a sunny pool-side seat. Designer of the Reading Garden, planned to express a number of the concepts of the much loved teacher it honors, is her former pupil Mary K. Moulton, a landscape architect and now librarian of the Sterling Morton Library.

History

With the new building and a staff devoted exclusively to the Library, books have become a major Arboretum concern. The collection includes volumes that have belonged to four generations of the Morton family. A number carry the Arbor Lodge bookplate and often the signature of their owner, J. Sterling Morton, across the margin of page 32. (He was born in 1832.) J. Sterling Morton, founder of Arbor Day and first incumbent of the cabinet post of Secretary of Agriculture, had in early manhood gone as a pioneer to the Territory of Nebraska. Arbor Lodge, his Nebraska City homestead, is now a state park and museum. It was he who originated the emblem of an oak over the legend "Plant Trees" which was later adopted by his eldest son Joy as the seal of the Morton Arboretum.

Like his father, Joy Morton was an avid reader. His favorite retreat was the library at Thornhill Farm, his estate at Lisle which formed the nucleus of the Arboretum's 1,400 acres. Under the guidance of Professor Sargent of the Arnold Arboretum, who served as his mentor in planning the new midwestern arboretum, Joy Morton early set about acquiring some of the cornerstones of botanical literature. He formed the beginnings of an outstanding rare book collection which was

augmented by gifts of some important color plate books by his widow, Margaret Gray Morton, a generous benefactress of the Arboretum.

When Joy Morton died in 1934 his daughter, Jean Morton Cudahy, succeeded him as Trustee Chairman. Soon the books were divided between the original library and the library in the building that she erected as a memorial to her father. During the 19 years that Mrs. Cudahy was chairman and the seven years of her brother Sterling Morton's tenure the acquisition of books was limited to a relatively modest array of current domestic and foreign titles. These were discriminatingly selected by E. Lowell Kammerer, Curator of Collections, who contributed further to the Library's resources by making through the years an extensive and valuable index of relevant periodical literature.

The Arboretum's late chairman, Sterling Morton, recognized the need for classifying and bringing together the approximately 8,000 volumes housed in various locations. He initiated their cataloguing and at the time of his death was giving consideration to the possibility of greater, more centralized library space. It followed most naturally that Mrs. Sterling Morton should choose this form of memorial and that concurrently the new Trustee Chairman, his daughter, Suzette Morton Zurcher, herself a typographic designer, should further the development of the Library. Mrs. Zurcher has also added substantially to the rare book collection in memory of her father.

Aims of the Sterling Morton Library

In surroundings which provide the reader in winter with an open fire, in summer with the shade of a hawthorn, the Sterling Morton Library has the double purpose of documenting the Arboretum's extensive out-of-door museum of woody plants for staff, students and visitors and of presenting to them the history, art, literature and lore of botany. This small specialized, country library is designed to be informative and useful at various levels — scientific, historical, esthetic, practical. Its intimacy renders accessible to

the interested layman rare book treasures which in larger libraries must be kept secure in virtually impenetrable sanctums. The Arboretum's library, located as it is amid woods, prairies, gardens and nurseries, gives the reader, oriented by librarians well versed in the Arboretum's plantings, the unique advantage of walking out onto the grounds to observe at first hand the subject of his concern. In the Library the taxonomist may check classifications and verify them by comparison with both growing plant outside and pressed specimen in the adjacent Herbarium, while the amateur gardener may consult the latest nursery catalogues to locate a species the Arboretum may have inspired him to plant. The bibliographer may study books dating back to the early years of printing; the student of botanical illustration may compare five centuries of styles and techniques; the lover of fine printing may examine the pages of Plantin, Estienne and Didot; and the herb fancier may delight in the quaint prescriptions of the old herbals with their charmingly archaic woodcuts. Here the landscape architect may tour by book gardens from sixteenth century Nuremberg to twentieth century Brazil. The whimsical may go gazebo hunting, learn the "Language of Flowers", or speculate upon the mandrake root, and the romantic may see the signature of Marie Antoinette herself, endorsing an order for plants for the gardens of the Trianon. The world of trees and plants will be explored in many new aspects through the collections of the Library as interpreted in exhibitions, lectures, and informal discussion groups.

Rare Books

The growing collection of rare books in the Sterling Morton Library contains early writings on science, natural history, gardening and husbandry; accounts of botanical travels; systematic botany, including first editions of Linnaeus' *Genera Plantarum* (1737) and *Species Plantarum* (1753); historic floras from many countries, and books on landscape architecture and garden design. Books noted for their illustration are especially well rep-

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The Arboretum Bulletin

VOL. XXVII SEATTLE, WASH. SPRING, 1964

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9 a. m. to 4:30 p. m.
Monday through Friday
Phone East 5-4510

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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 will be dropped and THE BULLETIN will be discontinued.

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The Arboretum Foundation,
University of Washington Arboretum
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I hereby apply for membership in the Arboretum Foundation and remittance for same is enclosed to cover dues for the next succeeding 12 months.

Name

Address

All memberships are non-assessable.

Notes and Comment

The spring of 1956 was bleak and sear after the devastation caused by the terrific cold in November the previous year. The brightest spot in the desolation was the response of Arboretums and Botanic Gardens all around the world to our requests for seeds, scions and plants to serve as replacements for our blasted Rhododendron and Azalea collections.

The first of these came on January 11, 1956—a shipment of scions of twenty-seven Rhododendron species from the Botanic Garden of the University of California at Berkeley. This was followed by 105 packets of Rhododendron seed from Windsor Great Park, England, and similar gifts from other great British and Scottish gardens. In all, about 300 numbers of Rhododendron seeds were planted. Germination was unusually good and by 1958 new frames had to be constructed to accommodate the many seedlings and young grafted plants. Large numbers of these graduated to the Arboretum grounds after the usual schooling in frames or the lath house, then the nursery.

This spring is going to see many flower for the first time. Some species will be new to our collections. February saw the rich victorian mauve of the bell-like flowers of *R. Ririei* (scions from Berkeley) and each succeeding week will find others opening for the first time in the Arboretum.

Many of these have been planted in the long Rhododendron bed that is west of the Magnolia collection. Some, particularly the members of the Triflorum series, are on the south bank of the Glen and still other groups are scattered from Loderi Valley to the Japanese Garden.

This is going to be an interesting spring for the staff and for anyone interested in *Rhododendron* species.

As in past years the Arboretum office will be open on Sunday—10:00 a.m. to 5:00 p.m.—through the months of April, May and into early June. Mr. Witt, Assistant Director, will be in attendance.

Leaves from the University of Washington Arboretum

(Continued from Page 11)

when you use a binomial like *Daphne Cneorum* it is not a disconnected, unattached entity. It fits into a framework of the system through attachment to a family, an order, a class, a phylum, and the Kingdom Plantae. And now, let us get back to scientific, botanical, Latin, binomial, nomenclature! (To be continued in the next issue.)

The annual convention of the Western Chapter, International Shade Tree Conference, will be held this year for the first time in Seattle, at the Benjamin Franklin hotel, June 21 through 24, and will be followed by a short tour of the Olympic National Park. President of the Western Chapter this year is Brian O. Mulligan, Director of the Arboretum.

The American Rhododendron Society will hold its annual show and meeting in Seattle, the former at the Exhibition Hall of the Seattle Center, Friday, May 15 (noon), through Sunday, May 17, the latter at the Edgewater Inn, Saturday, May 16. For information call Mr. Lewis Inkster, Edmonds (743-1179).

The Kelly Nishitani Bonsai Arboretum Unit No. 73 will sponsor a Bonsai Exhibit at

the Seattle Art Museum, June 11 through 14. Hours 10:00 a.m. to 5:00 p.m. each day, except Sunday, noon to 5:00 p.m. Also Thursday evening 7:00 to 10:00 p.m. General admission 50c.

There will also be three lectures by Mr. Yuji Yoshimura: Thursday evening, June 11, 8:00 p.m., "Japanese Art of Miniature Trees and Landscapes"; Friday, June 12, at 1:30 p.m., "Demonstration — creating a Bonsai. Fundamental technique of wiring, trimming, potting," and Saturday, June 13, 1:30 p.m., "Demonstration creating a rock planting and a group planting." Admission to each of the above \$1.50.

The Norfolk Botanical Garden Society (Airport Road, Norfolk 18, Va.) has sent us a copy of their first *Quarterly*, entitled *Azaleas & Camellias*, edited by Frederick Heutte, Director of the Garden.

This is a sixty-page booklet, freely illustrated by line drawings, which covers briefly but adequately the cultivation of these two groups of shrubs in Tidewater, Virginia, with lists of recommended varieties. A separate chapter is devoted to propagation, in some detail and with good illustrations. The book concludes with a nine-page list of the numerous varieties growing at the Botanical Garden.

Copies may be obtained for \$1.00 postpaid at the address given.

This is your Arboretum, kept alive by your support

We are pleased to welcome the following new members (January 1 through March 13, 1964): *Sponsor*—O. D. Fisher Charitable Foundation, Graham, Green, Dunn, Johnston & Rosenquist, G. E. Karlen, Raymond G. Wright. *Supporting*—Jay Morrison, Preston, Thorgrimson, Horowitz, Starin & Ellis. *Contributing*—Lucien F. Marion. *Sustaining*—Mrs. George C. Miller, John E. Ryan, Jr. *Annual*—Mrs. A. D. Ayrault, Jr., Mrs. Maurice C. Balcom, Mrs. F. W. Beal, Mrs. T. H. Berglund, W. A. Brown, Mrs. William A. Bullock, Mrs. Karl Burgess, Mrs. John R. W. Carlson, Mrs. Steve W. Collman, Mrs. Ethel E. Crawford, Mrs. D. L. Cuykendall, Stuart O. Dawson, Mrs. Lloyd Edstrom, Mrs. Arthur L. Fram, Mrs. J. David Gardner, Mrs. George A. Graham, Mrs. James W. Grant, Mr. and

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We are also most grateful to the following members who have increased their dues to: *Sponsor*—Mr. and Mrs. Lawrence McLellan. *Sustaining*—Mrs. John Dare, Mrs. Gordon McLean, Birger Peterson.

Some of Our Favorites☆

☆Won't You Send Us Yours?

Enkianthus Campanulatus

ONE Sunday in late winter about twelve years ago while driving near Edmonds I suggested we browse through the nursery of old Mr. Heinke who had always had the reputation of growing choice shrubs. This was before the nursery was fenced, so, even though we didn't find him there, I felt free to wander among the plantings which were all labeled and priced. It wasn't long before a group of shrubs caught my eye, for, even though they were leafless, their interesting branching pattern made them stand out. Since there was no one to ask, I couldn't find out if it even flowered, what its ultimate size and cultural needs would be. But I knew I wanted it anyway. I certainly have never regretted taking the three plants of *Enkianthus campanulatus* (we left a note and check tucked under the door of the little office) for they have given much pleasure at all four seasons of the year.

Our plants, natives of Japan, were about three feet tall and are now about eight feet so they don't soon outgrow their situations. Both the branches and pointed leaves grow in whorls (you can see why their branching pattern was so intriguing) and the young shoots are reddish in early spring. The flowers, freely produced in May, are pendulous racemes of pale luminous apricot, veined and tipped in candy pink; then in autumn the leaves turn a beautiful gold or red.

If possible, it is well to plant them where the bells can be looked up into, but they do need moisture and dislike heavy shade and soil, enjoying much the same conditions and looking well with azaleas. They are closely related to the andromedas (*Pieris*) and need the same conditions that most *Ericaceae* enjoy, that is a peaty soil in partial shade, with prompt removal of dead flower heads. They

may be propagated from seeds or from cuttings taken in June or July.

There are several other varieties of *Enkianthus* that do well here. *E. campanulatus* var. *Palibinii* is another one we enjoy. It has the same branching characteristics, but the flowers are smaller and a deep rich red. *Enkianthus perulatus*, also from Japan, grows three to six feet tall and as wide, with its branches arranged in tiers; its urn-shaped flowers are white and come before the leaves are out, which turn even brighter than *E. campanulatus* in the fall.

MYRTLE DEFRIEL

Prunus Mume 'Dawn'

ASKING a person who thoroughly enjoys all trees and shrubs to pick her favorite is like asking a mother to select the child she loves best from among her children—it's really impossible to choose. I find I have different favorites at different times of the year! In January and February, the months just passed, *Chimonanthus praecox*, with its small yellow sweet scented bells, and *Hamelis mollis* with its fragrant, almost flamboyant display of bloom vied for my affection.

Prunus mume 'Dawn' is almost certain to be my favorite this month. My tree was brought to me by a friend from Clarke's in San Jose about twelve years ago. It is not a vigorous grower—in fact, at times it has seemed almost downright ornery about growing at all. I have babied it a good deal and have moved it a number of times hoping to find exactly the warm sheltered position it needs, but I feel it has been worth it. It is a very small tree with an open habit, pleasing in line, even when its branches are bare. It comes into flower just before it leafs out. The flowers are ruffled, double, blush pink and have, to my mind, the additional asset of being exquisitely fragrant.

For me this tree truly fulfills all of my requirements for a favorite.

NORA STEEN

BOOK REVIEWS

The Leyland Cypress

THE *Quarterly Journal of Forestry*, Vol. LVIII, no. 1, (Jan. 1964), the official publication of the Royal Forestry Society of England, Wales and Northern Ireland, contains two articles of unusual interest to us in this Arboretum.

One is *The Clones of Leyland Cypress*, by H. Ovens, W. Blight and A. F. Mitchell; the other, *The Forests of Southern Chile*, by Desmond Clarke. Both have direct application here, since we have been growing the Leyland cypress since 1950, and possess a number of the Chilean trees, notably species of *Nothofagus*, *Libocedrus chilensis*, *Eucryphia glutinosa* and *Embothrium coccineum*, whose native habitat is here well described.

The Leyland cypress is a natural hybrid between the Monterey cypress (*Cupressus macrocarpa*) and the Alaska cedar (*Chamaecyparis nootkatensis*), which has appeared in several different places under cultivation. The first plants noted arose from seeds collected from an Alaska cedar at Leighton Hall, Welshpool, Wales, in 1888; the second occasion was in 1911, at the same place, but this time the parent tree was the Monterey cypress.

This illustrated article gives the complete history of all the known seedlings, and of the earlier trees propagated from them, including their present height and girth. Five of the original six still remain, and have attained from 66 to 78 feet in height since they were planted in 1892-93, thus averaging slightly more than a foot a year over 70 years. However, one of the second lot of seedlings, planted 1912, was 82 ft. high in 1961, after 49 years growth, an average of twenty inches each year. Another of the same group, blown down in 1955, had then attained 90 feet., so these trees are obviously of great vigor. A pair of our own, raised from cuttings received from the Institute of Forest Genetics, Placerville, California, and planted out in 1952, were 25 ft. tall in 1962. We have propagated and distributed this form (to some 16 other similar institutions), which from the key provided in the article is evidently No. 11, from Leighton Hall, and is now given the clonal name of 'Leighton Green'.

This winter, for the first time, we noted cones developing on several of our trees, but the authors of this article state that no second generation seedlings have been raised and that the individual hybrids may be self-sterile. They might, however, be pollinated by one of the parents, or by some other species in the same genera, which in our Arboretum would be possible.

What height do you imagine our trees, which are planted near the south end of Arboretum Drive East, as well as in the Pinetum, will have reached in another 40 years?

B. O. M.

American Camellia Society Year Book 1964, American Camellia Society, Tifton, Georgia.

THE YEAR BOOK FOR 1964 supplies a wealth of information for both the amateur and professional horticulturist alike.

For the amateur there are lists of camellias grown out of doors in the colder climate of Washington, D. C., and New Rochelle, N. Y., the methods and cultural practices that have proven

successful in these areas, as well as those used in greenhouses. Lists of new varieties from both the Southeast and West Coasts that are different and have much promise. A very interesting article on backyard hybridization by Dr. R. K. Cutter of Berkeley, Calif., that should interest the amateur.

Pictures of the arrangements for the 1962-1963 arrangements contest winners are shown. Among them are those of the Seattle Fair "Space Needle" contest.

The flower photographer will find a valuable detailed article on closeup pictures of camellias by Russel Gainer of Newberg, Oregon.

An article on the raising of camellia seed to blooming size in two years and a lengthy report on the Camellia Breeding Project, of which the objects are to find new color variations, more fragrance and greater cold hardiness.

The article on the treatment of buds with gibberellic acid and the results obtained in Columbia, S. C., is extremely interesting.

I think that everyone will find something of interest in this Year Book, which is distributed to members of the Society and can be seen in the Arboretum library.

JAMES A. BUZARD

* * *

The Last Redwoods. Philip Hyde and Francois Leydet; Sierra Club, San Francisco, 1963. Price \$17.50.

GROWING public interest in the preservation of significant bits of the beauty and interest of the American scene is superbly expressed in this book. The beautifully written text is a reflection of the authors' understanding of ecological principles and their efforts in the presentation of varied factors which bear upon the botanical relationship of *Sequoia sempervirens*, the history of man's interest in this species, and the many conditions which have contributed to its destruction throughout much of its original range. In this they have been aided by many individuals who have personal experience and knowledge of this species and its environment.

The book is profusely illustrated with magnificent photographs by Mr. Hyde and others. It contains an extensive bibliography and a foreword by Secretary of the Interior Stewart L. Udall. There is also a publisher's note by Mr. Edgar Wayburn, President of the Sierra Club, which includes a plea for the preservation of more extensive areas of these trees before such opportunity has completely vanished.

C. FRANK BROCKMAN

* * *

The Moutan or Tree Peony, by Michael Haworth-Booth. St. Martin's Press, New York, 1963. Price \$3.95.

THIS is a brief little book that can be read in an evening but it is full of surprising information. The author speaks of tree peonies which are large shrubs of 'permanence and vigor' and of 'great age.' Imagine a tree peony, 80 years of age, 15 feet across, carrying 400 flowers 8 to 9 inches in diameter! Moreover, he points out that the tree peony has a wide climatic range and tolerates all types of soils, so long as they are reasonably fertile.

This description does not seem to fit the rather unhappy specimens that one so often sees in this area, a discrepancy that may be explained in part by the discussion of the Moutan's susceptibility to fungus disease and, further, when he deals with the wide variation in the quality of individual plants both in flower and growth habit. So it may be that much of the material now in commerce in this area is either infected or of low quality.

He gives an extensive check list of named varieties with brief descriptions and an appraisal of their relative value. Unfortunately, I have not seen many named varieties offered here, although, of course, there may be. He includes no information on propagation by cuttings, perhaps because he advocates that tree peonies be grown from seed. I found this somewhat confusing, since it seems to nullify the value of the check list. However, he suggests that tree peonies, like lilies, are subject to diseases which are transmitted by vegetative propagation but not through seed. His directions for seed propagation are so explicit and seem so simple that I'm looking for a source for good seed.

Altogether, the book is interesting reading and a good survey of the history, culture and propagation of the tree peony.

ESTHER BERRY

* * *

The Rhododendron and Camellia Yearbook, 1964.
The Royal Horticultural Society, London, England. Price \$2.50.

THE 1964 YEARBOOK is, as usual, very well printed and illustrated. The interest in camellias in Great Britain has been growing in the last ten years or so, as is seen by the number of articles on these plants. In this country, the greatest number of camellias is grown in the Southeastern states, where rhododendrons can't be grown or, at least, are not much grown at present. Here, on the West Coast, which is the center of rhododendron interest in the United States, some camellias are found, of course, in most gardens, but only as a supplement to other plants. However, they are very beautiful shrubs and will blend in with most plantings. Propagation of camellias is well covered, and illustrated, by P. Wiseman.

The leading article in the Yearbook, "Giants of the West," deals with the large-leaved tree-type rhododendrons. They are extremely interesting plants, but are not for small plantings but really for woodland. Another disadvantage is they do not begin to bloom until they are around 15 to 20 years old.

"Pukeiti," in New Zealand, where tree ferns grow in nature, and where *Rhododendron Nuttallii* grows out-of-doors, seems to be one of the best natural gardens in the world. It is too bad that it is too far away for most of us to ever see.

Several articles on camellias follow, including hardiness and propagation, then a landscape evaluation of rhododendrons for form, foliage and structure.

"Extracts from Letters to a Cornish Gardener" concerns the late E. J. P. Magor, who was one of the pioneers of modern rhododendron hybridizing. He worked closely with Prof. I. B. Balfour at the Royal Botanic Garden, Edinburgh, when so many

of the new rhododendron species were unplaced and had to be classified.

Articles on Rhododendron and Camellia shows follow, but no American show is mentioned.

Dr. H. H. Davidian continues the "Review of Rhododendrons in Their Series," including series *Virgatum* and *Scabrifolium*. More changes are being made, and if one is to keep up with what is being done the Yearbook is a must, if on this account only.

Lists of awarded rhododendrons and camellias and new registered hybrids close the book, which has many fine plates, including several in color, notably that of *R. Mollyanum*, 20 feet high, at Brodick Castle, in western Scotland.

LESTER E. BRANDT

* * *

A Garden Century, the Christchurch Botanic Gardens, 1863-1963. Published by Christchurch City Council, New Zealand (1963). No price indicated.

THIS attractive, small, well-designed and handsomely illustrated book of some 180 pages forms a worthy record of the past history and present state of the 75-acre Botanic Gardens in the city of Christchurch, N. Z. It has been compiled almost entirely by the present Director, Mr. H. G. Gilpin, his predecessor, Mr. M. J. Barnett, and the Assistant Curator, Mr. L. J. Metcalf, who are to be congratulated both on its appearance and contents. Some of the 14 chapter headings are: The First Hundred Years, The Men Who Made the Gardens, New Zealand Plants, The Glasshouses, Notable Trees and A Garden Tour.

From the information given it is evident that Christchurch must enjoy a climate approximating that of San Francisco, although data on average monthly temperatures, rainfall and sunshine are not supplied. However, the successful cultivation of the South American pepper tree (*Schinus Molle*), the Cape honey-flower (*Melianthus major*) and *Protea cynaroides* from South Africa, *Gordonia axillaris* from South China and Taiwan, *Eucalyptus delegatensis* (*E. gigantea*) now over 100 feet in height and 6 feet 8 inches D.B.H., as well as the Kauri pine (*Agathis australis*) from Australia and Torrey pine from Southern California, 120 feet tall in 93 years, clearly support this presumption.

The 14 color plates, generally of full page size (5½x8½ inches) are of very high quality and depict a variety of plants in the Gardens or glasshouses. That of the magnificent group of 80-year-old trees of *Pinus Pinaster* particularly deserves mention, both for its artistic quality as well as the beauty of the trees.

Eighty-eight monochrome illustrations portray the development of the Gardens over the whole period, its various uses by an appreciative public, some of the birds to be found there, maintenance operations and, of course, a cross-section of the varied plants grown, both indoors and out.

The City Council of Christchurch must be warmly commended for publishing this handsome souvenir of the Gardens' growth over the past century—an admirable example of its kind, but one seldom produced in these days. We are happy to add it to our library shelves and to draw our readers' attention to it.

B.O.M.

(See Also Page 28)

Arboretum Progress, Fall-Winter, 1963-1964

(Continued from Page 4)

during November. Another of the latter was given to one of the Arboretum Units in February.

Three tours were conducted by Mr. Witt in October to see the fall color, which was excellent and prolonged last year. Six talks on the Arboretum were also given by him from October 1, 1963 through February 29, 1964; one TV program by the Director.

Miscellaneous

The firm of H. Sasaki & Associates, of Watertown, Mass., is now engaged in making a full study of the Arboretum, its resources, facilities and problems, especially as these relate to use by the public. One of the most pressing matters is to decide locations for our anticipated new administration building, including an auditorium, and the Floral Hall to be constructed by the Arboretum Foundation. A report is expected by Sept. 1964, which will then be considered by a committee representing the City of Seattle, the City Planning Commission and Park Board, the University of Washington, the Arboretum, and the Arboretum Foundation.

In October last arrangements were made with the University Library to have the books microfilmed which contain the entries year by year of all plant material received since the founding of the Arboretum. So far, four volumes have been completed and a fifth is at the Library; the resulting films will remain there in charge of the Special Collections Division.

The traffic count made outside the office showed a total of 123,527 vehicles for 1963. This compared with 152,005 in 1962 (The

World's Fair year in Seattle), and 148,145, in 1961. Poor weather in late spring and early summer, as well as the traffic diversion from the north end of Lake Washington Boulevard probably account for the reduction. Telephone enquiries for information numbered in 1963, 1897; in 1962, 1940; in 1961, 2061. Attendance at the Japanese garden fell in 1963 to 41,042. In 1962 it was 91,338; in 1961, June through December only, 52,113.

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Pruning Young Landscape Trees

(Continued from Page 8)

of plants which bloom on current-season's growth. It is practiced in pleaching of such trees as London plane.

Thinning-out pruning should be used on most landscape trees and shrubs except for the situations mentioned above. Thinning-out requires more skill and time to perform than does heading back. However, the trees will be more natural appearing and should not need to be pruned as often as trees which have been headed back.

An understanding of the foregoing comments should make your pruning more effective and enjoyable. To bring these two concepts into focus on the job of training young trees the following points are noted:

1. The less a young tree is pruned, the more rapidly it will develop and the sooner it will flower and fruit. However, severe pruning may be needed to develop proper branching or alter relative growth rates of branches.

2. Direct growth by pruning. Prune lightly or not at all to encourage a limb. Prune more heavily to slow the growth of a limb. Thin to an outside limb to spread one that is too upright. Head back a limb that is growing too flat.

3. Encourage the leader or it may be crowded out. Let only one limb arise at one level from the trunk. Maintain greater leaf area on the leader above any given branch than is present or will be present on that branch.

4. Remember the height at which a branch arises on the trunk will remain the same. If the lowest branch is wanted 8 feet above the ground, the first branch should be selected at that height.

5. After the lowest branch is selected, the others should be spaced up and down the trunk as well as around. The vertical spacing varies with the ultimate size of the tree. This spacing should be one to three feet for medium to large trees. Five to seven branches are sufficient to give symmetry to a tree.

6. Encourage strong branch attachments

to the trunk by selecting branches which form wide angles of attachment with the trunk. The branch should be smaller in size than the trunk at the point of attachment. In such cases the trunk will tend to grow around the branch like a dowel in a chair leg.

7. Leave temporary limbs on the lower part of the trunk in order to protect it from the sun and to provide nourishment for the trunk. These temporary limbs should be kept small by heading back to two to three buds at the dormant pruning and not letting growth become too vigorous during the growing season. Summer pinching of vigorous unwanted growth may be necessary. Slow-growing trees will be benefited more by this practice than will faster-growing trees.

The above comments are not to say that all trees must have a single trunk with the first branch 8 to 10 feet above the ground. Adherence to certain of these points, however, should result in a branching structure which will be stronger than it might otherwise attain without such care. Multiple-trunked trees for certain landscape uses can be developed utilizing these suggestions.

Chemical Weed Control for Ornamental Plantings

(Continued from Page 13)

and are completely inactivated on contact with soil. Because there is no residual activity, further spraying, however, is necessary to kill weeds that emerge later. It is safe to plant immediately in areas previously sprayed with these two herbicides. Tests are being conducted here in which they will be combined with systemic, pre-emergent type herbicides to further increase their usefulness for nursery operations.

The challenge for wider usage of herbicides for killing weeds is tremendous. I am sure that in the near future we will see much progress in this direction, not only by the nurserymen, spray operators, etc., but also by some of the more careful home gardeners.

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Viburnums

(Continued from Page 6)

molle—Kentucky viburnum, grows to 12 feet, has interesting peeling bark and is good for autumn color and blue-black berries.

nudum—American “Possum-haw”, has three- to four-inch-long lustrous leaves turning dark red in autumn, blue-black fruit; likes swampy ground and acid soils.

odoratissimum. Native to Japan, China and India; will grow from 10 to 25 feet depending on its location. Evergreen and not always completely hardy; varies greatly in nurseries. Foliage is dense, bright green, shiny, oblong, much like broad leaved rhododendrons. Fragrant, pure white flowers in pyramidal panicles, seldom produced here, followed by red berries turning to black. Ideal for hedging; sometimes mislabeled *V. macrophyllum* or *V. japonicum*.

Opulus—European highbush cranberry—blooms in summer, deciduous; widely used in America; extremely hardy but not recommended because it is subject to severe aphid infestations; will grow to 12 feet. Ornamental red fruits.

O. ‘Roseum’ (‘Sterile’)—European Snowball. Sterile flowers, no fruit.

O. ‘Nanum’—two-foot dwarf, non-flowering.

O. ‘Compactum’, smaller form, four-five feet, red fruit.

var. *americanum*. See *V. trilobum*.

plicatum (*tomentosum* var. *sterile*) Japanese Snowball. Will not stand severe winters; very graceful, to nine feet, with wide spreading horizontal branches, two- to three-inch globose clusters of white flowers. Better than European *V. Opulus* ‘Sterile’; not subject to aphids. Mahogany-red fall leaf color.

p. ‘Grandiflorum’—slightly larger flowers, ovate three- to five-inch leaves, conspicuously toothed, undersides tomentose.

p. f. tomentosum (*V. tomentosum*). From China and Japan. Fertile wild form of Japanese snowball; less ornamental in bloom, but handsome in form and foliage. Enjoys sunshine; to eight or ten feet tall.

p. ‘Mariesii’. Larger flowers than type.

propinquum. Central and western China; insignificant flowers and fruits but a dense, compact evergreen with glossy dark green obovate leaves.

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prunifolium. American, deciduous, dense growing, good for a hedge, beautiful blue-black fruit. "Black Haw or Stag Bush". Small tree; grows to 15 feet. Can color red in fall.

pubescens—leaves ovate, 1-1½ to 3 inches; six to ten feet, bushy shrub. Eastern N. American species. Closely related to *V. dentatum*.

pyrifolium—See *V. prunifolium*.

Rafinesquianum—N. America. June flowering, white flowers; red and orange autumn coloring.

rhytidophyllum—evergreen, "Leather Leaf", 10 to 15 feet. Large deeply rugose leaves, glossy above and densely tomentose beneath; creamy flowers in eight-inch clusters. Berries red, finally black; single plants don't berry well. China.

rufidulum—American—hardy. Large shrub or small tree, will reach 25 feet. Leaves glabrous and shiny—cymes three to five inches broad. Southern black haw.

setigerum—Chinese, deciduous, grows to 12 feet. Brilliant autumn foliage and bright red fruits. Sometimes labeled *V. theiferum*.

Sieboldii—the Siebold Viburnum from Japan. Large shrub or small tree, deciduous, vigorous, growing 15 or 18 to 30 feet; not for small gardens. May be trained to single stem or grown with multiple stalks; three-to-six-inch inflorescences of fertile flowers in late May. Good for large estates or public parks. Fruit at first pink, changing to blue-black.

suspensum. Sandankwa viburnum, from southern Japan, evergreen. Fragrant, waxy flowers clustered in dense, two- to four-inch panicles of semi-globose form secluded by terminal leaf growth; dense, compact growth up to six feet. Ideal as tubbed specimen plant. Hardiness in Seattle questionable.

V. theiferum. See *V. setigerum*.

Tinus—the Mediterranean viburnum or Laurustinus. Grows generally six to eight feet, will attain 12 feet. Widely grown in south of Europe; not hardy north of Washington, D.C. on east coast. Compactly branching evergreen shrub that blooms from October to May. Ideal for many locations; can be used for hedge or specimen plant.

T. v. hirtum—Leaves have bristly hairs.

T. v. lucidum—with glossy leaves; flowers in April.

T. 'Purpureum'—purplish tinted foliage.

T. 'Strictum'—narrow upright form.

T. 'Robustum'—upright, strong growing.

T. 'French White'—large lacy white flowers.

trilobum (*Opulus* var. *americanum*) — Highbush cranberry. Native to E. and N.E. U.S. Very similar to *V. Opulus*.

utile—evergreen—seldom over five feet. Wide ovate leaves, shiny dark green above and whitish beneath; white waxy flowers in April, blue-black fruit in late summer. One of the hardiest evergreens with slender arching branches, fine textured growth. Native of China.

venosum—A synonym of *V. pubescens*.

Wrightii—deciduous. Upright in form, grows to ten feet. Flowers white, in short stalked cymes, blooms in May and June; fruit red. Hardy and makes a good specimen. Native of Japan.

v. Hessei—dwarfer, denser growth.

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The Sterling Morton Library

(Continued from Page 15)

resented. Among sixteenth century examples are the *Ortus Sanitatis* (Venice, 1538), works by Dioscorides, Clusius and Gesner and the herbals of Dodoens, Matthioli, Egenolf and Fuchs whose *De Historia Stirpium* (1542) is one of the Library's treasures. Outstanding among seventeenth century illustrated books are Camerarius' two volumes of symbolic emblems, the medical herbal of the Commelins and Dodart's *Estampes pour servir a l'Histoire des Plantes* (1701). In the great flower books of the eighteenth and early nineteenth centuries the Sterling Morton Library is particularly well favored. Redoute and Thornton are admirably represented. Brookshaw's *Pomona Britannica* (1812), a Chatsworth copy, is in an impressive armorial binding. There are good examples of the art of Bessa, Turpin, Poiret, Curtis, Jacquin, Miller, Hooker and the lady renderers, Elizabeth Blackwell and Mrs. Bury. Since the Arboretum's

major concern is the woody plant, its book collection includes many arboricultural works, with notable editions of Evelyn, Duhamel de Monceau and Michaux, and important monographs such as Morrison's *Plantarum Umbellifarum distributo nova* (1672) and Lambert's *Description of the Genus Pinus* (1837). A number of the older botanical periodicals also may be classed as rare books. The serial publications of Aiton, Curtis, Paxton, Lemoine, Loddige, Edwards, Maund, Hooker and Hayne are outstanding among the Library's plentiful nineteenth century periodicals.

General Collection

In addition to extensive botanical reference materials relating to plants of every part of the world, the Sterling Morton Library offers its readers titles on such related subjects as arboriculture, forestry, gardening, propagation, nursery practices, soil, conservation, entomology, ornithology, plant physiology and pathology, municipal and national parks, roadside planting, landscape architecture, na-

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ture education, flower arrangement, exploration and travel.

The Library also maintains a generous collection of journals and periodicals in the various fields of its interest, scientific and popular. The publications of arboreta and botanic gardens are kept, as well as a large number of circulars and pamphlets on special subjects and a comprehensive file of commercial nursery catalogues. An additional resource is a large collection of photographic slides and prints recording the Arboretum's specimens at different seasons.

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Book Reviews

(Continued from Page 20)

The Rhododendron Handbook, Part One, Rhododendron Species in general cultivation, 1963 ed., The Royal Horticultural Society, London, edited by P. M. Synge; 266 pages, cloth. Price 16 shillings, ordered directly, or about \$2.00 purchased locally.

TO a veteran rhododendron grower, the periodic editions of the RHS *Rhododendron Handbook* are as familiar and indispensable as charts for a boat owner. However, for newer growers, an explanation may be in order.

The portion of the *Handbook* which concerns us here is Part One, covering rhododendron species. It is a sort of dictionary or condensed encyclopedia, containing the following information:

- (a) A list showing the classification of rhododendrons into groups which share the same characteristics (the "Series" and Subseries").
- (b) Ratings and concise descriptions for the several hundred rhododendron species in general cultivation.
- (c) Botanical keys, used to identify unknown plants.
- (d) Lists of the rhododendron seeds collected by various plant explorers in Asia.

The *Handbook* is a horticultural rather than a botanical publication. However, it reflects all important research to date on the taxonomy of the non-tropical rhododendrons.

This little volume is inexpensive and can easily be carried around, but contains all information needed by a species grower when on a buying tour or when arranging his garden. Other publications give similar information, but usually are not so clear, complete or portable and often are not so useful in the Puget Sound climatic area.

The 1963 edition is not much thicker than the 1956, but contains perhaps twice as much information. Ratings of each species are now in four parts, separately covering hardiness, flowers, leaves and habit. Also, these ratings indicate the range of quality which can be expected in good and poor forms of one species. For example, the flower quality of *R. strigillosum* is shown as ranging all the way from 1 ("of little merit") to 4 ("excellent")—no surprise to the experienced grower, and fair warning to the novice who wants to buy this plant.

Emphasis on variability is the major innovation, but by no means the only new feature. Many growers will be interested in the award-winning hybrids under each species parent, and it is most useful to find notes concerning the species which tend to be variable when grown from self-pollinated seed. Rhododendron growers with a broad range of interests will also be quick to notice two other changes. First, the seed numbers for earlier Asiatic expeditions are restored, after having been deleted from the 1956 edition. And, in this edition, the descriptive entries for certain obscure species have been eliminated. Some of these deletions will be controversial, but most are clearly justified.

The sharp, salty style of Dr. Harold Fletcher is apparent throughout. And, of all books required in a rhododendron grower's library, this is within the first two or three.

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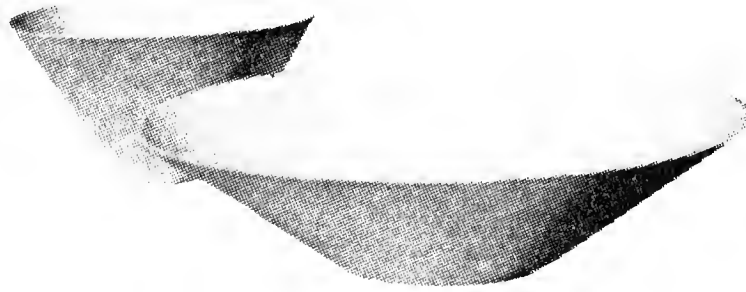
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