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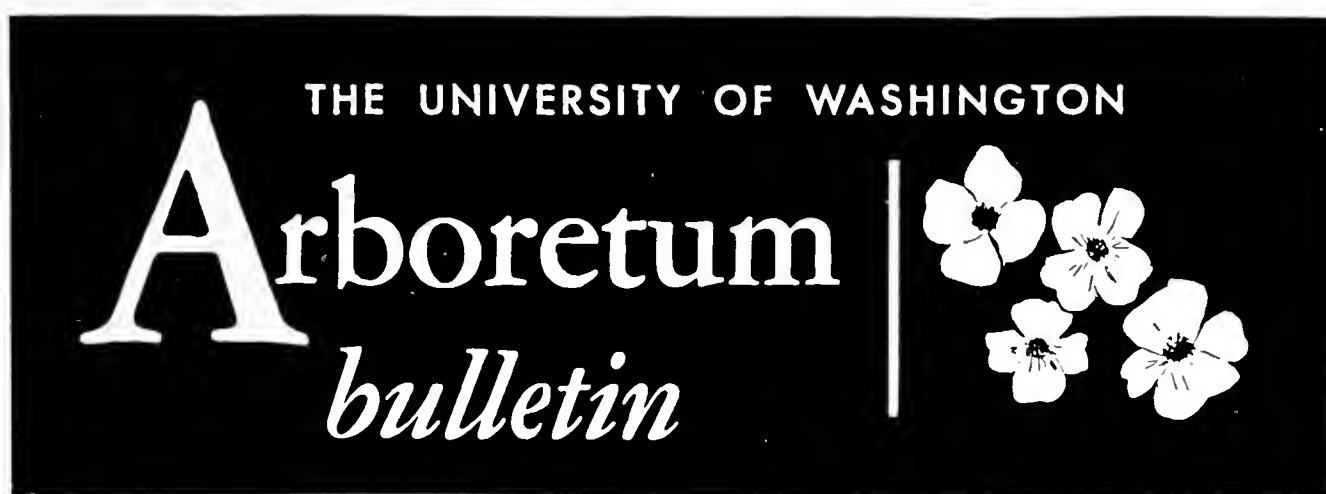
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COVER PHOTO:

Rosa macrophylla, native of the Himalaya, flowering in the Arboretum,
 late in May, 1957. Flowers are rose pink about 2½ inches in diameter.

PHOTO BY: DON NORMARK

The Gardens at the Government Locks in Seattle

ARTHUR R. KRUCKEBERG*

THE flow of visitors to one of Seattle's most outstanding sightseeing attractions gathers greater momentum year by year. In 1955, over 735,000 people thronged to the Government Locks, officially named the "Hiram M. Chittenden Locks" in 1956. Conjure up a mental image of this popular and familiar landmark. Then, in your mind's eye, erase the vision of the broad sweeps of lawn, the stately trees and the colorful plantings in the many spacious drifts and you have lost the elusive but significant esthetic quality that is the Locks. To be sure, the average visitor enters the grounds bent on viewing the activity of boats and people at the lock-sides. Yet, once entering the north gate one senses the change from the clutter and crowding of city life to the serenity and expansive beauty of a park. To the knowing eye, the plantings are not at all typical of just any park or estate. The keen gardener, horticulturist or botanist is at once convinced that he has stepped into a botanical sanctuary—a true arboretum.

The seven acres of gardens at the Locks trace their origin back to 1916, when, even before the facilities were completed, plantings were begun. Much of the earliest plant materials were donated by the Seattle Park Department. However, the development of the Locks as an outstanding botanical garden must be traced from a later date. In 1931, Carl S. English, Jr., joined the staff of civilian personnel as horticulturist. From then on, the gardens began their rapid evolution towards their present renowned status as a mecca for garden enthusiasts seeking the choice, rare and the beautiful in ornamental plants. Mix a dash of taxonomist and horticulturist with liberal portions of the field botanist and "dirt gardener" and you have Carl English, the versatile plantsman (fig. 9).

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But that is not the whole man. With these ingredients some divine power has blended the qualities of humility, generosity, love of all nature, and unbounded energy and industry. Carl English's inborn "green thumb" was given a college education under the guiding spirit of Professor Harold St. John (now Professor Emeritus at the University of Hawaii). Among Professor St. John's loyal and enthusiastic cadre of students in botany was one Edith Hardin. Joined in marriage and deep mutual interest in plants, Edith and Carl English have made their names synonymous with the word "botany" to all their gardener friends, their many students, as well as to customers to their unique home nursery.

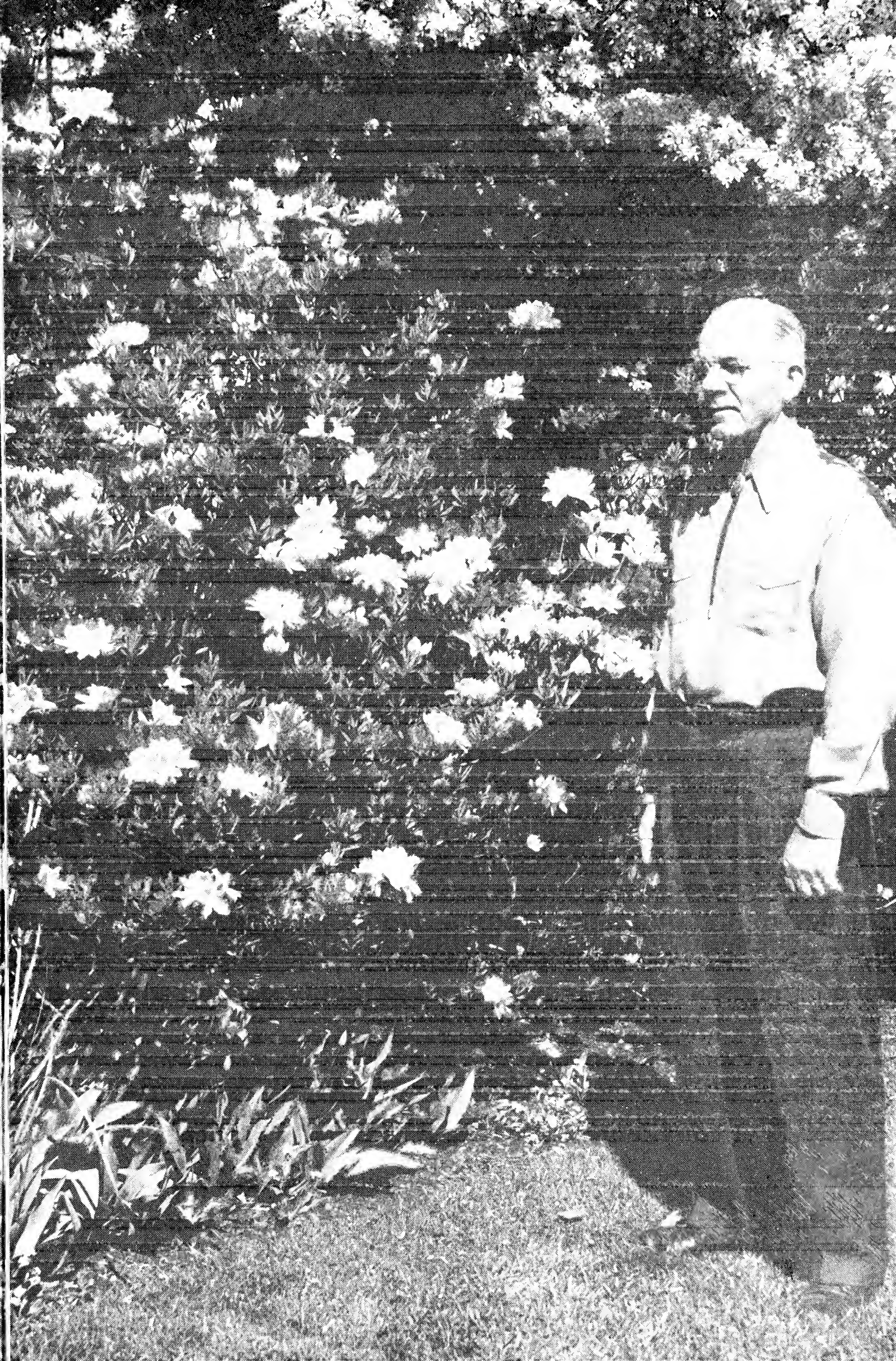
To say that the gardens at the Locks are Carl English's full-time vocation is an understatement. In addition to the superhuman task of maintaining the grounds with only one full-time assistant, Carl has spent many hours in the procurement and propagation of unusual ornamentals. With his first love, the native plants of the Pacific Northwest, he has, over the years, built up impressive seed and plant lists which serve as the basis for procuring the rare and unusual in plant materials by exchange. All but the oldest trees at the Locks have been grown mostly from seed, obtained through Carl's lively seed exchange with private individuals and botanic gardens throughout the world. In addition to seed sources in North America and Europe, the Englishes have carried on exchange with collectors in South America, Japan, Burma, New Zealand, China, and practically any other region of the world where plants hardy to the Northwest can be had.

What specifically has this long sustained energy brought to the Locks? For an answer we must tour the gardens. From the main

Mr. Carl S. English, Jr., horticulturist
at the 'Government Locks.'

FIG. 9

PHOTO BY: WILLIAM ENG



gate, the visitor walks toward the Locks along a concourse (fig. 10) lined with stately maples—the Norway maple (*Acer platanoides*) and the sycamore maple (*A. pseudo-platanus*). Half way down along the main thoroughfare, our attention is caught by a planting to the west which takes advantage of the seepage coming down from the hill off to the west. Several bald cypresses (*Taxodium distichum*) stand out among such other notable trees as *Liriodendron tulipifera*, the tulip tree; *Metasequoia glyptostroboides*, the “dawn redwood”—glamourized as the living fossil from central China, and a fine collection of tupelo (*Nyssa sylvatica*). At ground level the springy soil supports both the North American and Japanese skunk cabbage species (*Lysichitum americanum* and *L. camtschaticense*) and an extensive patch of that magnificent water saxifrage, with the huge umbrella-shaped basal leaves, *Peltiphyllum peltatum*. Equally bold and large are the leaves of an adjacent planting of *Gunnera chilensis* from South America. Both these latter plants

of outsized leaves and rhizomatous habit are splendid innovations for the discriminating gardener blessed with a wet spot on his land.

Approaching the Locks proper, we encounter both formal and informal plantings, each of which contains one or more rare gems. Along one of the shop buildings can be seen a small hardy palm, *Trachycarpus Fortunei*, the windmill palm of Chinese origin. Near it, we notice the dusty blue-green leaves of a semi-hardy eucalypt, *Eucalyptus Gunnii*. In the broad east-west walkway between the main office and the shops, two types of Japanese cherries stand out in mid-spring, *Prunus serrulata* cultivars, ‘Taizan Fukun’ and what Mr. English believes is a different ‘Kwanzan,’ the ‘Yae-Kwanzan.’ In the same general area, the trained eye notes other unusual plants; the compact, bushy foxtail pine of high, arid western mountains, *Pinus aristata*. East of these can be seen magnificent specimens of *Eucryphia glutinosa*, that showy Chilean shrub with large gardenia-like flowers; nearby is an imposing specimen of the Chinese goose-



berry, *Actinidia chinensis*, climbing in a tree. It is noteworthy that the survival of the Eucryphia and Actinidia through the freeze of November 1955 points out the climatic advantages of the location of the Locks near Puget Sound. Although many fine specimens were lost at the Locks during this rude, cold blast from the north, the losses here and in other gardens adjacent to the Sound were definitely less severe than those in the Seattle hinterland.

A closely interlaced planting of choice and unusual plants transfigures the mundane rest-rooms bordering the Locks walkway into a focal point of real aesthetic interest. The fine *Magnolia Sieboldii*, with white flowers and crimson stamens around June 1, is found with more Eucryphas, *Kalmia*, *Pieris formosa* and others on the east side of the building. The novel use of our native flowering currant, *Ribes sanguineum*, espaliered against one of the entrances, is eye-catching. In this same planting, such species as *Arctostaphylos pechoensis*, *Aesculus californica*, *A. parviflora*, and the Chilean fire bush (*Embothrium coccineum*) are represented with outstanding specimens.

Taking now the S-shaped walkway westerly toward the upper road that passes the resident engineer's home, we look for other beds of particular interest. At the upper end of this walk, a notable planting includes the odd *Poncirus trifoliata*, a spiny member of the citrus family. This plant is completely surrounded by that near relative of *Pieris*, the evergreen *Chamaedaphne calyculata*. A particularly fine group of the arborescent *Erica australis* in both its typical (pink) and white forms is to be seen near this spot.

Having now gained the main road leading past the south entrance to the residence, a stop will surely come involuntarily. For at any time of the year, the large oval planting near the junction of the 'sigmoid' path and the upper roadway is the envy of many a



A long maple-lined main concourse
looking westward.

FIG. 10

PHOTO BY: WILLIAM ENG

gardener. In very early spring a fine witch-hazel, *Hamamelis mollis*, will bedazzle the spectator. Then, in a procession of bloom, you can look for more Embotheriums, the rare *Cladrastis sinensis* (yellow-wood), the princess tree (*Paulownia tomentosa*), the golden-rain tree (*Koelreuteria paniculata*), and many other fine shrubs and trees.

On west up to the residence is a solid mass of shrubbery, given over to an array of evergreen and deciduous species. The first and lowermost along the rising road is a huge specimen of *Elaeagnus multiflora*, with light green, scaly leaves on arching branches, bearing heavily scented greenish-yellow flowers. Other memorable items along this swath are *Erica lusitanica*, *E. australis* again, the fine flowering cherry, *Prunus Sieboldii*, *Tsuga Mertensiana* (mountain hemlock) and *Osmanthus ilicifolius*, a handsome evergreen holly-like species. Making a remarkable showing here under the regimen of a mild climate and cultivation is the Great Basin xerophyte, *Cercocarpus ledifolius*. This evergreen, the mountain mahogany, bears narrow, dark green leaves and, after flowering, reveals dainty plumed, corkscrew seeds. An outstanding novelty at the front door of the dwelling is the "dwarf" palm, *Chamaerops humilis*, now as tall as the lower eaves of the building.

Going on from here to the extreme western end of the grounds, the rewarding view is that of the white cherry, *Prunus serrulata* cultivar 'Shogetsu,' overlooking the Locks below and surrounded by a profusion of smaller trees and shrubs. Beyond the cherry on the west slope, Mr. English has planted one of his favorite western North American natives, the evergreen tanbark oak (*Lithocarpus densiflora*). As of 1959, the oaks are small, but the proof of their worth and survival is seen elsewhere in the gardens. Here and there the visitor finds good-sized specimens of the tanbark oak, as well as other evergreen oaks from California (*Quercus chrysolepis*, *Q. vaccinifolia*) and from Europe (*Q. Ilex*). It is small wonder that we are impressed with the number and quality of the broadleaved evergreens at the Locks. Mr. English has amassed

a distinctive collection of them—oaks, manzanitas, osmanthus, mahonias, barberries—a choice diversity of leaf textures and sizes. Incidentally, another favorite evergreen of his is Garrya, or silktassel bush, in its several species, all endemic to western North America. *Garrya elliptica* and *G. Fremontii* are truly spectacular in the early spring with the long graceful yellow catkins of the male tree and the soft silky tassels of the females.

In almost every planting at the Locks, one finds fine rhododendrons and azaleas, both hybrids and species in several series. Just listing them would be a formidable task. But simply viewing them as one moves from one drift of shrubs to another or makes repeated visits to the Locks during a season is rewarding enough. Like the rhododendrons, conifers get a prominent place in the grounds. In addition to the ones already named, fine specimens can be seen of Japanese red pine (*Pinus densiflora*), Colorado blue spruce (*Picea pungens*) and an impressive colony of Alaska cedar (*Chamaecyparis nootkatensis*). Mr.

English is endeavoring to replace the several untidy and ungainly Sawara cypresses (*Chamaecyparis pisifera* cultivars) with other more desirable trees. Too often one sees older specimens of this conifer dominating a landscape in a negative way. It is a species that can and should be used sparingly.

Two more species should be mentioned. Along the upper east border planting (in the opposite direction of the view in figure 11), look for the conspicuous, festooning “handkerchiefs” of the dove tree (*Davidia involu-crata*) in early May. These young trees have flowered in 1959 for the first time after having attained a height of 15 feet. But you will admit that the wait was worth it! For another thrill, try to find the greenhouse area, tucked away among the shop buildings to the

(Continued on Page 61)

Below:

Standing beneath this Norway maple, one looks down a vista of cherries, rhododendrons, conifers and many other plants.

FIG. 11

PHOTO BY: WILLIAM ENG



The Principles of Landscape Design Applied to Gardens*

RALPH D. CORNELL

THIS is a topic which, at first glance, might seem to be very controversial because of the fact that design, and taste in design, can mean something different to each who observes or concerns himself with such matters. Design is what the individual sees and puts into any arrangement of objects or forms or patterns or colors when he undertakes to compose them in a manner he hopes will be pleasing. We do not all see eye to eye. Our backgrounds, experiences, education, all vary. These matters of training, as well as those of individual temperament and potential, affect our attitudes, our likes and our dislikes. Furthermore, both the abilities and the tastes of any individual, however talented he may be, incline to run rather a wide gamut of variation during the period of his lifetime.

So it is, in considering the principles of landscape design, that one must avoid personal likes and dislikes and consider only the basic controls which govern design. The principles are sound and fundamental. All artists, whatever their bent, have the same materials with which to work as do their contemporaries. Only that spark which the individual artist is able to provide can make one design different from another, if a common program and use requirement is established for the problem. From the same stock of ingredients may come products of highly varying quality.

Education has a great deal to do with both tastes and our abilities. Therein lies both a danger and a wonderful well of opportunity because we are inclined to enjoy and appreciate the things to which we have been educated. We usually like that to which we are accustomed and which we have been taught to like.

If one were born and raised in a stable, then a stable would be home sweet home to him. Thus it is important that we provide desirable surroundings for our children—and ourselves. And also it is important that we disassociate merely personal likes and dislikes when we consider the principles of design.

It probably is good that to the first title of this talk was added the afterthought, "Applied to Gardens," since it pins it down a bit and makes it possible to talk of but one phase of the work encompassed by the profession of landscape architecture. *Landscape architecture deals with the planning of space, its use, and the placement of objects upon or within it. It is land or land-use planning.* At the turn of the century it was defined as "The Art of Fitting Land to Human Use and Enjoyment." Please note that it is a recognized art, by that definition and by general acceptance by the other arts. Initiated as a course of instruction in the most advanced schools of our country, late in the nineteenth century, it had an innocent beginning relatively free from complications. Quickly, however, it developed a side-arm of City Planning and other types of specialization, some of which have outgrown their humble beginning until they scarcely admit or recognize the little red schoolhouse where the profession got its start. Now the well-qualified landscape architect may engage in the design of home gardens, public gardens, parks, recreation areas, industrial grounds, schools, institutions, cemeteries, subdivisions and city planning of various sorts.

Although already quite specialized, landscape architecture probably is the youngest of the accepted professions, having been recognized as such, in this country, for little more than half a century. In other eras of culture, back through the centuries, it seem-

*Presented before the Southern Cal. Hort. Inst., Oct. 9, 1958. Reprinted from "Landscape Leaves," IX, (1), Winter, 1959, by courtesy of the editor, Louis B. Martin, and Mr. Cornell.

ingly was the trend of the times for an artist to operate in many fields, not just in one branch of design. The architect also was the sculptor, the painter, the landscape designer. He produced a total product rather than just one phase of a given undertaking. And it was good, if we can judge from what has been left unto our day. Now the tendency is for collaboration of the many, each a "specialist" in some particular phase of all that it takes to complete a total project.

This comment, however, deals primarily with gardens and the principles of landscape design as applied to them. As landscape architecture probably is the youngest of all professions, so is gardening the oldest of professions—as old as man himself. Gardens are as old as the records and date from the Garden of Eden. The first garden was started when one of our ancestors crept from his cave and consciously planted a seed in the accumulation of debris which he had piled about its entrance. From then on our profession was in the running, though a bit embryonic. There are records of gardens that go back as far as 3000 B.C., the temple of Karnak in Egypt perhaps being the oldest one of note. The gardens of the Great Mughals, the Hanging Gardens of Babylon, the lovely gardens of the Orient, those of the Renaissance in Europe (without reference to correct chronology) all are part of the garden heritage. In the great Euphrates and Tigris valleys of today's Iraq, are remnants of irrigation canals that are 1500 years old, with indications to suggest that those people knew much about the ways of plant growth in an arid land.

There have been many types and styles of gardening throughout the centuries. For the most part gardens have been designed for pleasure, enjoyment, leisure, peace and tranquility, for protection from the outside world and expansion of family life within their walls. The Roman atrium was a forerunner of the modern patio. The gardens of Babylon and the Moorish gardens of Spain expressed reaction to the harsh environment of their surroundings and made use of the sound and

sparkle of water movement. The Italian gardens of the Renaissance reflected the society and environment of their time and stressed seclusion from outside influences. The Grand Style of le Notre (much copied by others) was a reaction to the lavish court life of that era. English gardens ran the gamut, copying many other styles and developing their own idea of the country park—introducing the romantic and melancholy into some of their parks, by use of dead trees and gloomy objects. Even this country developed highly stylized garden design of considerable merit in the New England, the Southern and the Monterey Colonial eras, much of which still exists in original or copied form. Now comes the contemporary garden in an upsurge of creative design.

A design, of any kind, is neither good nor bad because it is traditional or contemporary. Whether or not one likes it may be purely a matter of taste, perhaps one of education—depending upon which billboard he was exposed to in his youth. However, the basic principles of design remain constant and apply to any style or type garden one may fashion. Regardless of its type, those which have been successful and have remained as satisfying examples of the art of garden design, always have expressed a way of life of a people and have been adapted to the climatic surroundings and environment of their location. Thus, each of those which are mentioned in this talk was an expression of its day, of the people and their culture and their adjustment to physical environment. Without such adaptations a style does not develop and cannot live as an expression of a culture.

Very few people are endowed with creative genius. Most of us are followers rather than leaders. We try to copy something that another has created with feeling and understanding, but which we perhaps do not comprehend. True art has a meaning and expresses many things in many ways. A mere copying of zigs and zags, an uncomprehending use of tricks and foibles does not constitute good design.

The owner of a garden should have the

type of garden that his heart desires, because that is why he builds it. It may not satisfy the tenets of good design but if it satisfies the owner, he (perhaps alone) is happy. Thus it always is important to know, at the outset, why one is building a garden. If the owner interest is dominantly horticultural and he wants only a plant museum, should that not be his privilege? If his garden is for social entertaining, or for personal seclusion, it should abet such uses. And if enough gardens develop along similar lines to express a community, a local or a national way of life—then is a style developed. But the purpose, the reason, the program for its design must come before the garden is built.

A copy of any style, transplanted into a new land and different society, is a legitimate thing for anyone to possess but it is never more than just a copy of something else. It does not express anything vital within the current life of its new setting. Perhaps it may be a collector's item, justifiable only as such. Only as the designer is able to free himself

from the copying of other work or other styles does he himself become a creative artist, and to be creative he must design to fit the conditions at hand. Since all designers have the same materials with which to work, it is the way these materials are used and put together that establishes the success of their effort (fig. 12).

Materials from which gardens are designed include space, air, land, sky, trees, forms of many kinds, textures, colors, architectural objects, sculpture—anything that is seen or used. With the purpose of the garden in mind, the designer seeks good space composition in the arrangement of his materials. He must recognize the need, the way of life, the program of plan and design before he starts. Without such understanding he expresses the wrong meaning.

If a physician were to diagnose a patient's

Below:

Succulent Garden in Santa Barbara
designed by Ralph T. Stevens.

LARGE-LEAVED PLANT—*Agave Attenuata*

FIG. 12

PHOTO BY: RALPH D. CORNELL



symptoms incorrectly, and prescribed on the basis of his diagnosis, he would be treating the wrong ailment and might not succeed in a cure. Similarly, if one fails to analyze the garden problem and need, it is very possible that he may build a garden without much meaning or use efficiency. He must adjust his pattern and detail to the site, its topography, its size, shape and surroundings as he "applies the principles of design" to his problem.

These design principles are constant for all of the Arts—for music, painting, architecture, sculpture, home decoration, dress design, whatever may be. They seek unity, with interest, and become concerned with balance, rhythm, repetition, sequence, texture, form, accent, contrast, color, dominance and subordination. If one is familiar with any one of the arts he may apply the basic principles that govern that art to any of the other forms of expression.

Although unity is sought in all design, absolute unity may become monotony, just as utter lack of unity does become chaos. In a musical score, complete unity of note and tone may be tiring, and so the composer introduces a bit of contrast in the form of staccato or allegro to give animation to the composition. He adds sparkle by injecting accent, contrast and color, and change of pace. Crescendo and diminuendo contribute variety and the elements of dominance and subordination enter into his composition. From these comments it will be apparent that I am not a musician but I try to make a point. These same values enter into any design and most surely apply to a garden.

First of all, by the simple etymology of a word, a garden is an enclosed space. It does not become a garden until it is enclosed. Enclosure thus provides the first sense and awareness of unity but, alone, may not create interest. So following the program one then decides what is to be the purpose and dominant motif of the garden, how the subordinated elements are to contribute to that dominance and how interest and variety can be introduced to animate the design without

loss of unity and functional efficiency. Faithfulness to idea and purpose is very important, particularly since there seems to be a human tendency to collect things. If all plants and objects within a garden carry individual interest to the point where they attract attention to themselves they become competitive and can very quickly defeat the principles of design by approaching or creating chaos. If a lady designs a dress well, she does so with more concern for the ultimate effect than for the quantity of lace, ruffles and embroidery she can bestow upon the tout ensemble. So it should be with the garden. Use what you already have of experience, and apply it to the design of the garden. One sometimes observes a tendency to confuse a multitude of details with design. It takes more than a collection of gadgets to create a garden.

And then there is color. Design can be done in color, just as in form, space, line or texture, but the garden designer must consider the complex use of all these factors. His problem is not simple and color is a medium that carries tremendous impact. In fact, the power of color is so great that it alone may make or ruin a design. It carries psychological as well as visual significance. We all know that we can be "tickled pink" or turn green with envy, purple with rage, white with fear; we feel blue, act yellow and sometimes get a dark brown taste that dissipates but slowly. Such a metaphor is not idle chatter but carries a deep connotation which should be heeded well by those who "dabble in color."

The same principles apply to the use of color as apply to all other media of design. Color presents excellent opportunity and material for establishing unity, accent, focal interest, rhythm, harmony, contrast, scintillation, and so on. Since it can be dynamite, however, it is important that it be used only with skill and intelligence. A little intense color might be very good in a situation where excessive use of color would destroy the composition entirely. Let's say that a suit of clothes has a hundred times as much material in it as has a single necktie. Then, if a red

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Some Colorful and Exotic Wildflowers of Tropical Mexico

EDITH H. BANGHART*

READERS of the *Arboretum Bulletin* of a year ago (June, 1958) may remember my outline on the wildflowers encountered during my sojourn in the five western states of Mexico, viz. Sonora, Sinaloa, Nayarit, Jalisco and Colima.

Last fall I returned to Mexico. This time I spent several months surveying the flora on the mid-central, eastern and southern slopes. This took me through the states of Guanajuato, Hidalgo, Morelos, Veracruz, Tabasco, Oaxaca, and the southerly state of Chiapas, bordering on Guatemala.

Conspicuous to a marked degree is the difference in the flora of these two regions. The transition is gradual and intensely impressive as the fundamentals that underly each association become evident.

From west to east, one travels through a veritable panorama of high mountain ranges and thence through low tropical valleys. While the flora of the west coast is highly colorful, being tempered as it frequently is by the cooler winds from the ocean, its tendency is to keep its natural stature, while on the east coast, it is just the opposite. The central, eastern and southerly sections of Mexico are fanned by the warm and tropical mist-laden winds from the Gulf — hence a much more prolific growth and intense vivid coloring is portrayed in the flora.

Traveling over the mountains, as the roads wind ever upward, one leaves behind vast deserts studded with colorful and unusually interesting types of cactus. In the upper regions, there are monstrous gnarled and ancient oak trees and shapely junipers, and in the distance one visions the commanding and picturesque "ahuehetes," or Montezuma cypress (*Taxodium mucronatum*), hundreds of years old and many feet in diameter.

The mountain sides are steep and awe-

inspiring. Hundreds of foaming waterfalls and streams rush violently to the floor of the valleys below. Wildflowers are rampant everywhere on the hillsides and hundreds of gentian-blue salvias, orange and yellow marigolds, pink and purple cosmos, and countless red and purple zinnias bedeck the landscape.

The character of the topography changes momentarily, however, and in a short while one is conscious of a vastly recreated area tending towards the luxuriant. Here the tropical flora intermingles with that of the temperate zone, types become more exotic, foliage more lush, the air is balmy, and there seems to be fragrance everywhere.

Where I stayed for several weeks in the charming little villa of Orizaba in the State of Vera Cruz, the elevation was 5,000 feet. One could easily, in the space of an hour or so, be high in the alpine areas, climbing through shadowy forests of 'ocote,' Montezuma pines; or on the other hand, by the same token, descend quickly to the completely verdant and moisture-laden valley below.

Quite near Orizaba there are great gorges where the river rushes through. Monstrous magnolias, hundreds of years old, and imposing old oak trees guard the hillsides. Heavy mosses embellish the branches and in the ravines there are countless numbers of scarlet bromelias, great tree ferns, palms, wild acacias, purple daturas, red llamaradas, and hundreds of wild orchids blooming in the trees, yes, and on the telephone poles, and even on the wires, where the cotton fluff from the *Cordia* trees has made a soft cushion for them to rest upon.

So impressive are the vistas, so momentous and magnificent the countryside with the ancient and historical atmosphere crowning the surroundings — so bewildering the array of tropical flora encountered, that in this limited space I can outline only a few of the more novel and interesting varieties that from my

*We are happy to have another contribution from our "faithful" traveler, Mrs. Banghart, on her further sojourns into Mexico.

personal point of view were distinctive and meritorious.

The yellow radiance of the acacias, of course, was noticeably evident everywhere. *Acacie cornigera* grew in luxuriant masses in the States of Veracruz, Tabasco and Chiapas. In these sections they had much longer and more pendulous flowering racemes than those of the west coast, and their trunks were decorative with handsome and imposing mahogany spines. Here, too, were many pink flowering *Mimosa distachya*, and in Oaxaca were hundreds of the beautiful pink albizzias, similar to an acacia, with graceful feathery silken flowers.

Along the shores of the Gulf of Mexico, from Veracruz southward, were hundreds of lovely long-spined *Amorpha fruticosa*, in striking shades of blues and purples. These associated themselves happily with masses of pink convolvulus, the flowers of which were fully three inches across. The yellow *Allamanda grandiflora* grew here and with the orange and creamy blossoms of *Bidens grandiflora* made an unusually picturesque effect, framed as they were by the deep blue waters of the Gulf.

The glowing blue-flowered *Anoda cristata* bedecked many a verdant hillside and formed a striking combination with the yellow poppy, *Bocconia arborea*. Near Jalapa I saw many distinctive plants of *Boehmeria argentea*. This shrub had handsome large gray-green foliage and attractive pendulous catkins a foot or more long, giving a most unusual and almost grotesque effect.

Many bouvardias were significant in the tropical sections of Chiapas and Oaxaca, both shrubs and climbers. Colorful specimens of *Bouvardia ternifolia* were here, with bright crimson flowers three and four inches long, and also a lovely climber with white fragrant spicy blossoms.

Everywhere in the warmer sections, especially around Veracruz, were wonderful examples of the spectacular flowering tree *Bombax ellipticum*, or corn-silk tree. These bore long tasseled blooms of a startling rose-red color, and here, too, were groves of cassia

trees; particularly effective were the bright yellow *Cassia alata* and *C. tomentosa*. There were also many flowering capulins in this locality. Particularly interesting was *Prunus capuli*. The fruit of this attractive shrub is made into a delectable marmalade by the natives.

Graceful calliandras were growing everywhere in the warmer sections of Veracruz and Oaxaca. Unusually attractive was *Calliandra anomala* with its dainty fern-like foliage and very showy feathery scarlet blossoms.

Many large bottle-brush trees were here also. Although similar in appearance to the calliandras, *Callistemon speciosus* grew into large impressive trees. These bore dense spiky bright red blossoms tipped with prominent yellow anthers, producing an effect of singular beauty.

In the mountains around Guanajuato, hundreds of ornate 'casahuate,' or *Ipomaea arborescens*, were blooming with clusters of white blossoms resembling a fragrant Easter lily and growing in among them was the very large-flowered 'heavenly blue' morning glory. This produced a combination of breath-taking beauty.

Many red-flowered *Cordia sebestena* were seen in the southern sections of Tabasco and Chiapas, and there were plants of *Parsonsia (Cuphea) aequipetala* which were almost shrubs, five and six feet tall, with brilliant red and purple blossoms. Colorful purple and white daturas were plentiful and I saw a number of the very rare and unusual red-flowering *Datura sanguinea*.

The exquisite little shrub *Duranta repens*, one of the most beautiful in all Mexico, was prevalent in several sections, its attractive feathery sprays of lavender-blue flowers being made the more conspicuous by the dainty yellow fruit which appeared at the same time as the blossoms.

In southern Mexico many picturesque tree Dahlias were growing. *Dahlia Maxonii*, and the ornamental *D. excelsa*, were most beautiful. These grew fifteen and twenty feet high and their frail and dainty lavender blossoms

looked like the graceful blooms of a lovely clematis.

Near the Yucatan border were many varieties of unusual cactus, and handsome specimens of echeveria were in evidence. The large-leaved *Echeveria gibbiflora*, with huge gray-green succulent foliage nearly a foot across, had great tall spires of lovely rose colored blossoms. Here, too, were the daintier *E. glauca*, with its powdery slate colored foliage and racemes of a brilliant scarlet.

Many epiphyllums were in this section. These grew high on the trunks of trees. *Helio-cereus elegantissimus* is widely distributed throughout southern Mexico and is particularly showy with fragile scarlet tubular blossoms. In Oaxaca, the very beautiful *Epiphyllum caudatum* grew plentifully and their colorful rose and yellow blossoms were unusually decorative.

One of the most beautiful flowering trees in Mexico is *Erythrina americana*, or 'colorin' tree. Their brilliant carmine spiky flowers appear on the branches long before the leaves, and later develop a long brown leguminous pod in which there are eight or ten bright red seeds; these are used by the natives as beads and for other decorative purposes.

In the extremely humid section of Chiapas, near Tuxtla Gutierrez, there is a large, deep canyon—the Barranca el Summeride. Here grew a superbly radiant and dazzling array of hundreds of colorful flowers growing in an impenetrable mass. There were gorgeous fuchsias growing ten and twelve feet high. *Fuchsia arborescens* had handsome and ornate clusters of rosy racemes hanging esthetically from its branches, the foot-wide foliage exquisitely modeled in reds, greens and crimson.

Begonia gracilis were almost unbelievably large shrubs, and there were eupatoriums, huge leaved caladiums, *Philodendron monstrosum* and the castor oil bean, *Ricinus communis*, growing to tree-like proportions. Here, too, countless numbers of fragrant jasmines, bouvardias, passion flowers, *Cobaea scandens* and many other outstanding and brilliantly colored vines entwined themselves in a prismatic and elaborate array.

Several hundred miles below Veracruz in the southerly part of the State, and about 6,000 feet in the mountains, there is a beautiful lake, Lago de Catemaca. Here I believe the native flora and exotic birds must be the most colorful and spectacular in all of Mexico.

Great *Heliconia latispatha* were growing here. These regal and bizarre-looking plants closely resemble a huge Strelitzia or Bird of Paradise plant, only their large blooming bracts were of a bright scarlet color. Many red flowering Jacobean lilies, *Sprekelia formosissima*, were in the meadows. Here also was the vivid gentian-blue *Tradescantia erecta* and the beautiful lush mimulus-like *Martynia fragrans*.

Near the lakes of Patzcuaro and Queretaro, in central Mexico, hundreds of orange flowered *Tigridia pavonia* and many bright blue *Commelina coelestis* were providing an elaborate splash of color, and the orange, yellow and bronze Mexican sunflower, *Tithonia rotundifolia*, bloomed profusely everywhere in the warmer sections.

Thevetia peruviana (neriifolia), the lovely wild oleanders, with their refreshing deep yellow blossoms, were much in evidence, and the carmine flowered Mexican trumpet vine, *Phaedranthus buccinatorius*, grew luxuriantly in Chiapas and Veracruz where it romped over every prop it could get its tendrils on.

In Jalapa, Orizaba and Veracruz, one frequently came in contact with the extremely fragrant and celestial plants of the night-blooming cereus, *Selenicereus hamatus*, and here, too, were many plants of the beautiful 'Amapa Rosa,' *Tabebuia pentaphylla*, spreading its decorative rose-clustered blossoms everywhere.

The llamaradas, *Pyrostegia venusta (ignea)*, attracted much attention in many sections. These bore masses of orange and scarlet flowers not unlike our own wild honey-suckle, only much larger and more brilliantly ornate in every detail.

Handsome trees of the Mexican magnolia, *Talauma mexicana*, were prevalent with fra-

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Red Alder*

(*Alnus rubra* Bong.)

C. FRANK BROCKMAN

AT this time of the year we are so engrossed with numerous summer activities and so enamored with the varied scenic components of mountain and seashore that the interest and values of some of the more plebeian native trees are given scant attention. This is particularly true of the red alder. But a few months hence, when a cheery fire on our hearth dispels the effects of a fog-en-shrouded landscape, of cold driving rains beating against our windows, and the moan of winter winds, the red alder comes into its own. The wood of this species has long had an enviable reputation as fireplace fuel, for unlike many other species, burning red alder logs do not snap, pop, and scatter embers upon the rug of the living room floor. It burns gently and quietly, casting a mellow glow and providing even warmth. Such a relaxing fire allows us to savor fully the comfort of our fireside. Indeed, winter's most vigorous efforts only intensify the feeling of satisfaction and well-being that alder logs burning quietly on our hearth invariably develop.

Red alder is the most common deciduous broadleaved tree in the Puget Sound region. Approximately 70 per cent of native Pacific Northwest hardwoods are of this species. Such abundance obviously develops the familiarity that breeds contempt. Lacking most of the attributes of beauty typical of many other native trees it is generally shunned by those who seek interest for their gardens in grace of form, interest of foliage, or floral color; consequently it is unlikely that it will ever find favor as an ornamental. Further, its abundance on waste lands often favors the development of epidemics of the tent caterpillar, an insect pest that has an obvious taste for the foliage of red alder and periodically causes fastidious gardeners no end

of work and trouble, for such infestations often expand into nearby cultivated areas.

For a variety of reasons foresters, too, have taken a dim view of the red alder. Yet today, as a result of recent research, the commercial importance of this species is becoming more generally recognized. The very abundance of the red alder in this area, coupled with its aggressiveness and its ability to rehabilitate sterile or impoverished soils, was largely responsible for this research. Its objective was the discovery of ways and means of economically utilizing this abundant tree, not only for itself but also in order to favor later development of more valuable or interesting forest cover.

The ability of the red alder to enrich the soil upon which it grows has long been known. Such enrichment is due largely to nitrogen-fixing nodules on its roots, coupled with the annual deposition of foliage and related tree litter upon the forest floor. In this respect the red alder is of greater value than any other native northwestern tree. Since it is also an aggressive pioneer species, it is of importance in the improvement of soils damaged by improper past logging practices, inadequate fire protection, severe erosion, and roadside cuts resulting from highway development. As a result, areas upon which red alder has grown to maturity are eventually returned to more complete productiveness.

In addition to its value as a tool in forest management, research has also uncovered qualities of its wood which had been unknown, overlooked or neglected in previous years, largely because of economic factors which were instrumental in retarding its wider utilization.

The wood of red alder is not durable under damp conditions. It deteriorates rapidly when in contact with the soil. Although this quality is a decided advantage when alder sawdust serves as a garden mulch and soil con-

*The nineteenth in our series on Trees Native to the Northwest, by Prof. Brockman of the College of Forestry, University of Washington.

ditioner—a use for which it is highly favored—it eliminates it from consideration wherever durability in contact with the elements is paramount. But where such durability is not a primary consideration—such as in furniture or paneling—rapidly growing interest and use of red alder implies considerable future promise. For instance, along with other Northwest hardwoods, red alder has been used to a limited degree for certain types of furniture stock for about fifty years. Its value for this purpose, gradually extended in recent years, is destined to develop as improved management techniques enhance the size and quality of available logs and as harvesting operations become more closely geared to the vagaries of economics. The wood is even-textured, non-resinous, and pleasing in appearance. It also takes a variety of stains which enhance its inherent qualities so that, in appearance at least, it compares favorably with more highly regarded and consequently more expensive species. However, the factor which is most responsible for the greatly

stimulated interest in red alder is its rapidly growing use for paper pulp. This has resulted from the development of improved handling and processing techniques which largely surmount certain former disadvantageous characteristics of red alder wood for that purpose. It gives considerable promise to the management of the extensive stands of red alder which heretofore were of little if any economic importance.

Red alder is essentially a coastal species ranging throughout the moist, cool transition zone from southeastern Alaska to southern California. Best development occurs in the coastal forests of Oregon and Washington. A rapidly growing tree, it not uncommonly attains a height of 60 to 90 feet and a diameter of 18 to 30 inches; maturity is reached between 60 and 90 years. The bark

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Below:

Red alders and sword ferns; Quinault river valley, western Washington.

FIG. 13

PHOTO BY: B. O. MULLIGAN



Educational Programs for Children and Adults at the Missouri Botanical (Shaw's) Garden*

KENNETH PECK†

A. CHILDREN'S PROGRAMS

FOR the first time in the history of the Missouri Botanical Garden, there is an organized series of comprehensive educational programs for children of a wide age range. The sustained response to the various new activities has been gratifying and, in accordance with Henry Shaw's desire to acquaint the general public with the Plant Kingdom, a great number of children have been exposed to botany and horticulture.

Tours

Guided and self-guided tours are provided, but no tours are regularly scheduled. Guided tours are scheduled by appointment and include general tours of the Garden, the Tree Trail, and a tour entitled, "Introduction to Botany." Teachers or group leaders interested in bringing a group for the Tree Trail are given or sent a guide booklet describing the trail and providing general information about the 40 trees found on it. Each member of a group receives a free Tree Trail Guide Sheet showing leaf outlines and tree silhouettes of trees on the trail in addition to a map of the trail. All trail trees are individually numbered and labeled. Since its inception in September of 1957, the Tree Trail has been walked in whole or in part by an estimated 12,000 to 15,000 children and adults. A group desiring a guide is directed for the first half of the trail although the tour may be taken unguided. The "Introduction to Botany" tour, primarily confined to the conservatories, requires a guide who serves to point out such botanical curiosities as insectivorous plants, epiphytes, orchids, and peculiar plant growth habits.

In addition to tours guided by Garden staff members, there are a number of volunteer

guides headed by Mrs. Paul H. Britt. Directing tours for both children and adults, these volunteers have been trained at the Garden and all participate regularly in Garden activities.

Summer Nature Classes

During the summer of 1958, two five-week sessions of nature classes were offered in the Pitzman Nature Program at the Garden. The classes covered trees, birds, animal and insect pests, and plants in general. In the "Trailfinders" class, children made leaf prints of 30 to 50 trees and pressed fresh leaf material. Some magnificent leaf and leaf-print notebooks were made and entered in competition in the 1958 Fall Harvest Show. The class in "Birds," instructed by members of the St. Louis Audubon Society, covered habits of migration, nesting, and feeding, and offered bird walks and films. In "Man's Enemies," the children looked at animal and insect pests. They made their own insect collecting nets from coat hangers and cheesecloth and mounted their insects in cigar boxes. "Plants and Man" was a course which attempted to introduce children to the Plant Kingdom through the study of flower structure, seed dispersal, plant anatomy, and the life cycles of mosses and ferns.

These summer classes met twice a week and were attended by nearly 300 children. Nature films were shown in the event of inclement weather, but classes were otherwise held out-of-doors. The classes dealing with plants and insects were instructed by Garden staff members. Each child was required to register for the course or courses in which he was interested. Certificates were awarded to children who attended at least 60% of the meetings of any one class.

Saturday Activities

The most recent program for children is the year-long series of Saturday morning classes. These classes run one and a half hours and

*No. 3 in our series on Educational Programs.
†In charge of visitors' activities, Missouri Botanical Garden. R. J. Gillespie, L. G. Brenner and Dr. N. H. Nickerson also contributed to this article.

are conducted by two Garden staff members. Insofar as it is possible, the individual morning activities are planned so that one activity is not a prerequisite for another. This enables anyone attending for the first time to fit into the schedule of a single morning's activity. Some unavoidable instances of where this is not entirely possible is in the case of a class covering propagation of plants from cuttings or sowing seeds for a garden—each an activity requiring a child to return to pot rooted cutting or transplant seedlings.

The schedule of activities is printed on 4x5 inch cards which are available through the Garden. Each activity is attractively, if not intriguingly, titled. Activities have included tours, plant propagation from cuttings and seeds, making Christmas wreaths and miniature gardens, and hearing demonstrated lectures in botany and horticulture. Nature films are shown every six weeks and, as far as possible, pertain to a particular morning's activity.

The average Saturday morning's attendance has been 70 children. As many as 15 first-comers have attended on a single morning, and since the first class on December 13, 1958, more than 250 children have attended the classes. There is no registration but attendance records are kept on each person for the purpose of issuing certificates.

There is no charge for any of the programs described above and no limit is placed on the number of children who may attend. Two age groups, 7 to 10, and 11 to 18, are designated for all programs except tours. Attendance is kept by making a name tag for each person. The tags are punched and hung on a pegged board. When a child comes for a class, he removes his name tag from the board and turns it in to the instructor.

The emphasis in most classes is placed on plants and all plant material is provided by the Garden. For classes in which something technical, such as seed structure or fern and moss life cycles, is studied, an illustrated, one-page, mimeographed information sheet is given to each child. Since very little is required of these children with respect to learning something, they are told that they need

not remember *anything*, but are asked to understand *one time* what they are being told. After this, they relax and are more often than not attentive. It has been found that the best follow-up procedure is giving the class something to do relative to what they have been told, and, if possible, giving them something to take home.

Three major difficulties are encountered in planning and executing these programs. In the case of the Saturday classes, there is the problem of knowing how many to plan for. This has been solved only by keeping an attendance record and noticing what kind of activity is most popular. For example, the attendance for movies is usually between 50 and 60, while the attendance for miniature gardens was 85. The second problem is that of discipline, or, more aptly, a substitute for discipline. This substitute has proved to be some sort of physical activity, though this may not always work. Rowdy children are asked to leave the class. Sometimes, however, a group will sit and listen to a lecture on mosses or ferns for an hour and be most attentive. The third problem is finding a large variety of interesting projects in which large numbers of children can participate. It is known that some projects will be popular, but the attractiveness of others has to be tried.

It is not the purpose of these programs to make botanists and horticulturists out of every child who attends the classes, though a few may pursue the study of plants some day. In a time when Buck Rogers and Flash Gordon are rapidly becoming non-fiction, science for its own sake is given great emphasis. Much of this is necessary but care must be taken to insure a person's individuality from his scientific accomplishments. The purposes of the programs described above are to provide diversion to children as well as a scientific approach, with a personal touch, to the study of the Plant Kingdom.

B. PROGRAMS FOR ADULTS

Educational programs for adults have been offered for many years at Shaw's Garden. All of these have taken up the basic phases of

horticulture such as the culture of bulbs and orchids, and the propagation of plants from seeds and cuttings.

The largest of these courses is Spring Horticulture and is mainly concerned with growing plants from seeds. Each student may sow 25 to 30 kinds of seeds which he chooses from a selection of over 70 varieties of flowers and vegetables supplied by the Garden, and takes home 400 to 500 seedlings. The lecturer discusses lawn and garden care, pruning, and the uses of fertilizers and insecticides. Specific treatments of such things as roses, azaleas, and geraniums are taken up as well. The course is divided into four sections and runs for a period of five weeks, each section meeting once weekly. It is not unusual to have 125 students enrolled in this course.

Another popular course is the one in Plant Propagation which is given in September and January. This course also is divided into four sections which meet only twice. The September session deals primarily with the propagation from cuttings of broad-leaved evergreens, whereas the January session emphasizes the propagation of house plants. Each student receives a plastic covered propagation box and cuttings of approximately 40 kinds of plant material. The lecturer discusses the theory and techniques of propagation as well as the care and feeding of the plants being propagated. The average attendance for one session is 65 students.

The Bulb Forcing course has an average attendance of 45 and is given in October. There are five sections which meet only once for a period of three hours. Students are each given five pots and a mixture of 25 top size daffodil, tulip, and hyacinth bulbs. The potted bulbs are kept in a dark, cool room at the Garden for 60 to 80 days after which students are notified to pick up their bulbs. Class discussion covers both the methods of bulb forcing and the history and culture of bulbs for the home garden.

Another course which has been offered for a number of years is Orchid Culture in Home and Greenhouse. This course is given in two identical sections, each on a Saturday in April

from 10:00 a.m. to 3:00 p.m. and is limited to 20 students. The lecture period covers orchid culture with emphasis on home culture of the major orchid groups. Each student brings a lunch and the Garden supplies soda and coffee. After lunch, a short lecture and demonstration on orchid potting and dividing is given. Under supervision in the lab period, each student repots an orchid plant which he takes home after the course. Following the lab, an informal tour of the orchid greenhouses is given.

New Courses

Since November 1958, extended course offerings in horticulture, orchid culture, grounds care, and botany have been instituted. Among the new courses is Modern Horticulture for Home Gardeners which is given in November and April. The class meets at night once a week for five weeks. Practical work in the November session includes soil testing, propagation, potting plants, mixing soils, and drawing and labeling plant parts. Practical work in the April session deals with seed sowing, grafting and budding, seed transplanting, and elementary landscaping. Each period of practical work is preceded by a lecture.

Two advanced orchid courses are now given. Both are lecture courses which meet just once. The November session covers greenhouse culture of orchids and the use of new or special greenhouse equipment. The May course takes up the techniques of flowering the major cultivated orchid genera.

The Grounds Care course, given in February, is designed for those people having small acreages in the country primarily for weekend recreational use. Minimum maintenance techniques are presented as well as simple, effective means of erosion control and control of brushy and weedy vegetation. A brief introduction to plant ecology is given as a background for development and management of such plant communities as white oak-sugar maple, oak-hickory, rocky glades, prairies, meadows, marshes and ponds, with special reference to wildlife and wild flower gardening. Recommendations are given for the selection

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Heather Garden at the Children's Orthopedic Hospital

N. DERING MARRETT*

THE decision by the Garden Committee last summer to plant a heather garden in the grounds of the Children's Orthopedic Hospital in Seattle fulfilled the writer's great desire to build one, which he believes to be quite a rarity in Seattle and the Pacific Northwest.

The site lends itself perfectly to such an idea, as it faces south with a gradual slope. It is exposed to the full sun all day, except for a small area next to the wall of the south wing of the building, where a shadow is cast during the afternoon. The position is isolated, with the building on two sides and a curved cement sidewalk along the third, making roughly a large triangle of 4500 square feet.

Heaths and heathers, when established, cost perhaps the least of all shrubs to maintain, and need only an occasional top dressing of peat and the trimming back of the faded blooms with shears after flowering. In return they give a variety of colors in flowers and foliage throughout the twelve months of the year unsurpassed by any other shrubs.

The site had been graded during the building of the hospital; what was left was the stiff heavy clay which we have to contend with in many other areas around the hospital and which, of course, heathers will not tolerate. Luckily, in this case, instead of having to first remove the clay and replace it with good soil, we were able to add this on top of the clay. About 120 yards of sandy soil was added. With this, we broke up the flatness of the slope and moulded the soil into mounds, slopes and gullies. Several tons of local stone were used in making bluffs and outcroppings which added to the attractiveness of the area. When finished the top soil over the clay ranged from a minimum of 9 inches to 36 inches in depth. To give more

nutritional value to a rather poor material, 25 yards of compost and 16 yards of spent mushroom manure were spread on and well forked in. No commercial fertilizer was added at any time. Then paths twenty inches wide were laid out, winding around and up and down the slopes, cutting the ground into eight irregular beds. The paths will allow visitors to walk through the garden and look at varieties otherwise obscured from view from the sidewalk by the grading. To add to the setting eight trees were planted; two Scots pines (*Pinus sylvestris*), Bristle-cone pine (*Pinus aristata*), pink dogwood (*Cornus florida* 'Rubra'), Japanese dogwood (*Cornus kousa*), European birch (*Betula pendula*), Sweet Gum (*Liquidambar styraciflua*) and Sargent's cherry (*Prunus Sargentii*). All this was completed last fall and allowed to settle during the winter months.

Early this spring the heaths and heathers were planted. It has been our aim to have some color all over the garden throughout the year and not just in one place at one time. This has meant duplicating the same variety in different parts of the garden. With first class varieties such as the double pink *Calluna vulgaris* 'H. E. Beale,' the best of this species, *Erica vagans* 'Mrs. D. F. Maxwell,' deep cerise, 'Lyonesse,' the best white, *E. carnea* 'Springwood,' 'Vivellii,' carmine red, and others, we do not feel it is a mistake to have a second look at these beautiful plants. The planting has been done in drifts, merging one variety into another with due regard to size, height, color of flowers and foliage and time of flowering. We selected about 30 varieties which we considered among the best, to give us a continuation of blossom throughout the year, and planted these in bold groups of 15 to 30 plants, thereby showing the color of that variety to its fullest ad-

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*In charge of grounds at the Hospital

New or Unusual Plants in the Arboretum

J. A. WITT

7. *Stauntonia hexaphylla* Decaisne.

CLIMBING evergreen vines are none too common in the Pacific Northwest, being limited to *Clematis Armandii*, *Hedera Helix*, the common English ivy and its various forms, and occasionally such plants as *Bignonia capreolata*, the cross vine, *Pileostegia*, *Kadsura japonica*, *Lonicera japonica* var. *Halliana* and a few others. The family *Lardizabalaceae*, a little family of vines and shrubs related to the Barberries, gives us two of the more interesting evergreen vines; *Akebia quinata* from Japan, which is not truly evergreen in our more severe winters, and the subject of this note, *Stauntonia hexaphylla*.

In 1950 we received two seedlings of *Stauntonia* from Mr. Carl English, Jr., of Seattle, and three years later planted one at the foot of a western red cedar near the office. This plant has not done especially well although it has scrambled some eight or nine feet into the cedar's lower branches, and survived the killing frost of November, 1955. The other plant was placed at the west end of the northeast lath house in 1956 and has now become very well established there, forming a lacy evergreen screen and twining its way onto the roof, for a total length of some fourteen or more feet. In April 1958 this plant flowered, and again very freely this April and May (fig. 14).

Stauntonia hexaphylla may become a vine of some forty feet or more in length with stems up to four inches in diameter at the base. The long petioled evergreen leaves are divided into from three to seven leaflets, with five being the average number, despite the specific epithet *hexaphylla* meaning six leaved. The leaflets, elliptic in outline, about two to four inches long and somewhat less than half as wide, are of a rather leathery texture. They are arranged in a digitate manner at the end of a long petiole, on somewhat shorter petiolules so that the whole resembles half a wagon wheel set on a long pole. In the spring

the new foliage is light yellow green, contrasting with older and darker almost dull green leaves. In early April the flower buds become evident, greenish little tear-drops carried on long stems arising from the axils of the leaves. As the flowering season progresses the buds open into clusters of creamy white bells tinged with purple or brown, about $\frac{3}{4}$ of an inch long, made up of six sepals, since petals are wanting in flowers of the *Lardizabalaceae* family. This family also tends to have unisexual flowers, and our plant is male, hence it will never produce the purple fruit eaten by the Japanese and also used by them for the treatment of certain eye diseases. Perhaps our second smaller plant will be female so we may see and taste this fruit. Native to Japan and Korea, it is found in the mountain woods at about 2000 feet.

There are other *Stauntonias* native to Eastern Asia, but none in cultivation, at least in the more northerly parts of our country. A closely related plant, also a climbing vine, has been called *Stauntonia latifolia*, but is more correctly *Holboellia*. The generic name commemorates Sir George Staunton, a physician who accompanied the 1794 English embassy to China and made the first collections of such plants as *Rosa bracteata*, *Cupressus funebris*, and *Macleaya cordata*. The *Stauntonia* was first introduced into cultivation in 1876, according to Dr. Alfred Rehder, but was certainly known much earlier than that since it was mentioned in Miller's *Gardener's Dictionary* in 1807.

Its cultural requirements seem simple enough—a warm wall to climb on, with a trellis or such for support, since it climbs by twining and not with tendrils or hold-fasts as do grapes or Boston ivy. The soil should be rich and fertilizer added regularly to keep

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→
Stauntonia hexaphylla on lath house.
FIG. 14 PHOTO BY: J. A. WITT



The Arboretum Bulletin

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

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All memberships are non-assessable.

Notes and Comment

The Japanese Tea House

This, a gift from the City of Tokyo to the City of Seattle, was first exhibited at the Trade Fair here late in April, subsequently dismantled and transferred to the Arboretum in mid-May for re-erection in the area now allocated for an authentic Japanese garden. The tea house site is on the west side of the Boulevard and pond south of Interlaken Blvd., close to the original Japanese maple area and small stone bridge built about 1937. Construction is by Mr. Sad Ishimitsu, of K. Ishimitsu & Sons; representatives of the builders, the Shimizu Construction Co. of Tokyo (Mr. T. Kato) and of the Tokyo Metropolitan Government (Mr. H. Hasegawa) have also been present to supervise the work. Mr. Harrison Overturf acted in a similar capacity for the Arboretum Foundation.

With funds donated by Unit 41, the Arboretum has been able to acquire a traffic counter of its own which has been placed semi-permanently on Arboretum Drive North. This relieves us of the bother and responsibility of borrowing a counter from the Safety Division on the campus, and will give us a more accurate picture of traffic movement through the Arboretum. The counter was placed on May 13, and by June first had logged some 14,120 cars, which when projected to include the whole month makes a total of some 22,700 cars passing the station. A count of the number of passengers per car made one Sunday indicates that each car carries an average of 2.9 persons. This would give, then, a total of nearly 66,000 persons viewing the Arboretum in May. May was cool and damp this year, and past records show that our peak traffic is in March and April (for the cherries and early rhododendrons), so we might estimate a total of some 200,000 visitors for the three months of March through May, 1959. This represents an increase of about 80,000 visitors, over the same period of 1958.

Red Alder

(Continued from Page 51)

A ground-breaking ceremony was held on May 19, in the presence of Mayor Gordon S. Clinton, Japanese Consul-General Takeno, Mr. E. B. Dunn and Mrs. Neil Haig representing the Arboretum Foundation, and Dean G. D. Marckworth, Chairman of the Arboretum Board, University of Washington.

The building is expected to be completed early in June; necessary grading around it will follow, then erection of a suitable type of fence and later the development of the surrounding garden, to be designed by a Japanese landscape architect. Two stone lanterns have been donated by the City of Kobe, as well as one from Tokyo.

As indicated in our Spring issue, the cost of the garden will be borne by an anonymous donation to the University for this specific purpose.

The new propagating greenhouse, 40 feet long by 16 feet wide, being erected by Evergreen House, Inc. of Seattle for the Arboretum Unit Council, is now complete so far as the structure and glazing is concerned. Interior connections and fittings, including water and electricity, remain to be done. Automatic ventilation has been included. At the west end a section 15 feet long will be used as a workshop and for storage of materials and equipment.

The location is immediately behind (south of) the existing east greenhouse.

This spring has been remarkable for the unusual quantity of bloom on almost all our trees and shrubs, undoubtedly due to the additional hours of sunshine recorded in Seattle in 1958.

Amongst those flowering most profusely and thus drawing greatest attention have been the camellias in March and early April, closely followed by the magnolias. Rhododendrons and azaleas reached their peak during May although their season covers a full three months from March to June. The wisterias and the rose 'Ruth Alexander' on the Broadmoor fence have never been lovelier, while the variously colored brooms (*Cytisus*) played a gay part in the show. Multitudes of blooms on the hawthorns, mountain ashes and pyracanthas promise a rich load of fruit later in the year.

It has certainly been our finest display since 1955, and for some groups probably the best yet seen here.

of smaller immature specimens is smooth and a distinct gray-blue in color, but at maturity the bark is much darker and breaks up into numerous large irregular-shaped, flat surfaced plates (fig. 13). Inner bark has a bright reddish-brown color, a fact that undoubtedly accounts for the common name. In winter the red alder may be readily recognized by its distinctive stalked buds which are enclosed by three valvate scales. Early spring finds its branches festooned with numerous pendent staminate catkins, preformed during the previous summer, which from a distance impart a distinctive reddish-brown cast to the large patches of red alder that clothe many of our hillsides. Closer examination of the branches will also reveal the immature pistillate flowers borne near the base of the staminate catkins. These will develop by early summer into bright green, cone-like strobiles which bear numerous tiny seeds disseminated by the wind when the scales of these strobiles open at maturity. Seed dissemination occurs over a period of several months, from late summer through the winter. The strobiles, which quickly turn black, persist upon the tree into the following year. The prominently veined leaves, three to six inches long and elliptical in outline, are characterized by a coarsely doubly-toothed margin which is slightly curled under (revolute); in addition leaves are dark green on the upper surface and a lighter green with patches of rusty-brown hairs (pubescence) beneath.

A number of other species of alder which only attain the stature of shrubs are also native to the Puget Sound region. These are invariably found growing in the barren rocky soils bordering our mountain streams. In addition, the white alder (*Alnus rhombifolia*) is also found in the Pacific Northwest. This species, basically similar to the red alder of the coastal region, is found east of the Cascades and south into the Sierra of California.

ARBORETUM NOTEBOOK

This section is particularly designed for notes, information and queries concerning beautiful or unusual plants from growers of all types or experience. We solicit your remarks and ideas, but space limitations may sometimes restrict us to publishing those of the widest interest.

Garden Hints . . .

JULY

Stuartia (often spelled Stewartia) is in bloom in July. *Stuartia malachodendron* has stunning flowers, three to four inches across, white with a mass of purple stamens and blue anthers. It is deciduous but during the summer months it makes a mass of lively green and is not discouraged with hot weather. However, it prefers a moist spot with peat to make the soil porous. There are specimens of several stuartias in the Camellia Garden in the Arboretum. A native of the eastern United States, it takes kindly to our climate.

This summer when ordering your bulbs for next spring try to include a few *Narcissus triandrus*, Angel's Tears. It is interesting to note that someone slipped when naming this flower. It is a true narcissus with six stamens but its baptismal name was given as triandrus. It is supposed old Clusius named it but he evidently failed to count the stamens. It is a precious bit of beauty about four inches high and may, if happily placed, produce four to five blooms on a straight, single stem.

Several years ago I visited a garden where I saw one plant of *Daphne Cneorum* at least six feet across each way. The owner of the garden said she had never given it any lime. *D. Cneorum* has been a challenge to many gardeners. Because it grew originally in the limestone Alps is no reason, apparently, why it needs lime. This is a suggestion to those who love but have failed with *D. Cneorum*. It is beautiful this season.

Box hedges may be clipped in July and all dead wood removed.

The country roads in July are beautiful with great plantings of Queen Anne's Lace and an occasional plant of azure-blue chicory.

Adiantum pedatum, the Maidenhair fern, seeds itself in most fascinating places, along

brick walks and walls, achieving a bewitching picture even with no companion growths.

AUGUST

The shrub whose beauty dominates the August garden, *Eucryphia glutinosa*, can be seen in the Eucryphia area near the holly planting in the Arboretum, or in the grounds of the Government Locks at Ballard. Everyone that loves a garden should see the beauty of this bush. It has everything you could wish; prolific blooms of beautiful symmetry, a shining whiteness and a delicious fragrance. I cannot be too enthusiastic. After it has reached maturity it blooms every year. Besides its charming bowl-shaped flowers the orange-yellow fall foliage is so beautiful it is desirable for that alone. It likes a moist soil; a cover over its roots of low heathers is often used but some growers prefer a mulch of leaf mould, peat or well-rotted manure. It is quite hardy and most loves an open, sunny position. It was brought from Chile in 1859 where it grows to 35 feet tall. It has only one requirement—a lime-free soil.

One should keep a sharp lookout for suckers on the rhododendrons. Many of our fine rhododendrons have been grafted on the wild species *R. ponticum*, and new growths, hale and hearty, often start below the graft. Almost before we know it there is a fine bush of *R. ponticum* but no hybrid. The same may be true of roses. Any suckers from old stock and all weak wood should be cut out.

When necessary colchicums should be divided in August, or earlier, as the season's growth finishes. The foliage takes a large spot in the garden but the pleasure the fall blossoms give is more than compensation.

The monkshoods are perennials that are valuable to carry on a blue color in the area where delphiniums have stopped blooming. I grew an Aconite, *Aconitum Napellus*,

Spark's variety, an outstanding and unusual deep violet blue. It makes a fine background.

Many gardeners do not have too much time to spend in their gardens and to them I should like to commend *Fuchsia magellanica* var. *Riccartonii*. With different forms of hydrangeas and this fuchsia the late summer is blessed with flowering shrubs hard to duplicate. The fuchsia is hardy with a long flowering season. Its graceful form of growth, arresting colors, tolerance of wind and its easy propagation make it a most valuable shrub. It is said to be a hybrid form raised from a plant brought from Chile or Peru to Edinburgh, Scotland about 1830. It is a familiar plant in all English gardens. There is a white variety, 'Alba,' which is charming with crystal-like blooms faintly tinged pink. For a fairly thin hedge either variety is an addition to any garden. It is not particular about its soil or position.

Of course this is the month for propagation activities. Herbaceous plants generally root better if taken in August than later. They are in a better condition to stand the cold and damp of winter.

SEPTEMBER

Roman hyacinths make charming winter decorations when forced in bowls. They will need about five weeks in darkness after planting before they are brought into the light.

September is perhaps the best month to take cuttings from such plants as geraniums, fuchsias and heliotrope. New roots form more quickly in warm weather and plants have a chance to become established before winter comes. Geranium cuttings seem to be more successful when laid out in cool shady places before planting. They should be taken from the side of the plant which has had the most sunshine where shoots are firmer and riper than those grown in the shade. Fuchsia cuttings may be taken near the base of the stems where the shoots are semi-ripe. Heliotrope cuttings should never be hollow stemmed. Only a firm, stiff shoot will root.

Shrub borders often need a ground cover

of plants that keep the soil moist and form a pleasant companionship. There are many perennials that definitely add an interest to a shrub planting, the shrubs forming a wind break and the perennials making spots of color when the shrubs are not in bloom. Lilies love to push through branches of shrubs and there are many plants that are able to enhance a garden border of shrubs. The cimicifugas (Bugbanes) are especially lovely, growing from three to five feet high with long, plummy spires of white bloom. *C. cordifolia*, *C. racemosa* and *C. simplex*, a late bloomer, are among the best. These are plants of reliability and fine foliage. For low growing plants one should try the species geraniums. Most of them have interesting colors—purple, pink, lavender—but some have magenta blooms, extremely obnoxious to many gardeners. One of my favorites, (I have listed it many times), *Lysimachia clethroides*, would increase the beauty of such a planting. For late flowering, one could use the Japanese anemones in white and shades of pink. They love the protection of shrubby twigs and do well in partly shaded situations or in city gardens.

G.T.D.

The Gardens at the Government Locks in Seattle

(Continued from Page 42)

east of the main concourse. Scrambling along the fence and running the full length of the north side of the greenhouse is a fine display of that handsome evergreen vine, *Akebia quinata*, with its unique five-leafleted foliage and a profusion of fragrant mauve flowers.

Some day, when he finds the time, Mr. English plans a checklist of the plants grown at the Locks. When this list becomes available, it will contain a treasure-trove of fine, unusual trees and shrubs, tested over the years for survival in the Northwest. The list will be a vast expansion of the sampling assembled in this brief tribute to a truly significant horticultural mecca of the Pacific Northwest and to its creator, Carl English.

BOOK REVIEWS

The 1959 Lily Year Book, Royal Horticultural Society, London (1958). Priced in the U.S.A. \$1.65.

THIS is the 22nd Year Book published by this Society and is dedicated to Miss Christabel Beck in acknowledgment of her work on Fritillarias. A picture of Miss Beck occurs opposite the frontispiece. P. M. Syngé and Miss G. E. Peterson are editors and the editorial board of ten members contains many well-known names in English horticulture. The cover illustration is a handsome *L. testaceum* in color and another colored picture is included of hybrid lilies exhibited by the Oregon Bulb Farms at the Lily Show in London last July. More than one hundred and twenty-five black and white illustrations are included.

The Lily collection in the Royal Botanic Garden, Edinburgh is described by the curator, E. E. Kemp, and his assistant, A. Evans. A review of the collection gives a good idea of the various lilies grown in the garden and of the garden itself. Quoting: "The lilies here are nearly all planted in association with rhododendrons growing in open woodland in the Woodland Garden and in the Copse, while those of lower stature which require a more open situation are planted among dwarf rhododendrons mainly in the Peat Garden. The soil in the Royal Botanic Garden is alluvial sand overlying clay, which however occurs at a considerable depth."

Several symposia or discussions follow.

"The Feeding of Lilies" is the first subject dealt with and contains very sound advice, the result of actual experience. "When I Prick Out My Seedling Lilies" should prove an incentive to amateurs to try their hand at this most fascinating project.

Another deals with "Fritillaries in the Open." The discussion includes many well known names, Miss Beck taking part.

"The Vegetative Propagation of Lilies" and "Lilies in Pots" serve as subjects for discussion. A report of a question and answer session follows.

Short notes by various writers on lilies such as *L. auratum*, *L. speciosum*, *L. Brownii*, *L. Martagon*, *L. monadelphum*, *L. Szovitsianum* and many other well-known kinds are included; a report from Auckland, New Zealand, adds interest.

A sad undertone of losses runs throughout the book and amateurs must accept the challenge by the thrilling process of growing from seed which is dealt with in "When I Prick Out My Seedling Lilies."

The 1959 Year Book issued by the Royal Horticultural Society is a decided addition to lily literature and should find a place in the library of every flower lover.

M.R.T.

TWO Lily Year Books have been published recently, one, the eleventh, by the North American Lily Society; editor, George L. Slate of Geneva, New York.

A foreword by Norma E. Pfeiffer speaks of the fine spirit of fellowship among members, its effective seed exchange, growing Kodachrome

collection, excellent foreign membership division, as well as of its media for the exchange of ideas.

The Year Book comprises ninety-one pages, exclusive of the constitution and membership list, and furnishes much valuable information on the large and intricate subject of lilies.

L. Parkmannii is the subject for a discussion by A. A. Samuelson of Pullman, Washington: "Root Rot of Easter Lilies" is a subject discussed by several members. "Lily Breeding Notes" by Leslie Woodruff tells in detail of his extensive work with lilies at Harbor, Oregon.

There are articles from many parts of our country. Also from Canada and far away St. Jean de Braye, France.

Mrs. Pretzer's notes on the Lily Show held in Frederick & Nelson's Exhibition Hall last year causes us to look forward to another in 1959.

M.R.T.

The Principles of Landscape Design Applied to Gardens

(Continued from Page 46)

necktie is par excellence as a coup in haberdashery, is a red suit one hundred times as good? Que dicen, amigos?

Now, how do garden design and horticulture relate one to another? Each is dependent upon the other if it is to achieve its highest expression, and yet they are entirely separate professions. Training or skill in either of the two does not insure one's understanding of the principles that govern the other. A good landscape designer may be a poor horticulturist and knowledge within horticultural fields does not qualify one as a landscape architect—although there seems to be much lack of understanding of such fact. With building construction, a skilled mason or carpenter, who knows his trade well, seldom considers himself to be an architectural designer. So it is in landscape work, a knowledge of plants does not suffice to certificate one as a designer.

With gardening as perhaps the oldest profession of man, it would seem rather logical that the best results in garden building might be achieved by the "wedding" of garden design and good horticulture practice. Each will profit by its consideration for the other. To realize its highest development, each must

depend upon the other. The landscape architect and the horticulturist should join hands and work together, rather than as independents who assume responsibilities for which they may not be trained.

It may be helpful quickly to enumerate some of the common pitfalls to which many of us fall heir in building a garden. They would include, but not be limited to, the following:

- (1) Lack of a precise program.
- (2) Failure to hold a firm objective.
- (3) Overcrowding of things within a design pattern, with too many items of individual interest.
- (4) Lack of a dominant feature or motif, in relation to which other details are subordinated.
- (5) Confusion tending toward chaos, instead of simplicity and unity.
- (6) Failure to provide proper enclosure and to screen from view the neighborhood distractions of many kinds.

Although it is oft misquoted it still is good, and I would like to close these hurried and inadequate remarks with words spoken by Francis Bacon, about three hundred years ago, who said: "God Almighty first planted a garden and, indeed, it is the purest of pleasures. It is the greatest refreshment of the spirit of man, without which buildings and palaces are but gross handiwork; and man shall ever see that when ages grow to civility and elegancy, man shall come to build stately sooner than to garden finely, as if gardening were the greater perfection."

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Some Colorful and Exotic Wildflowers of Tropical Mexico

(Continued from Page 49)

grant blossoms of creamy yellow. Often seen growing on these trees was the scarlet mistle-toe-like epiphyte *Psittacanthus calyculatus*, which gave a charming if even a grotesque appearance.

The frangipani tree, *Plumeria rubra*, was outstanding growing around Orizaba. The flowers of this gorgeous tree are a deep rose color which appear long before the leaves, as on so many other tropical types of trees. In Veracruz there is a lovely white flowered *Plumeria*, with very fragrant blossoms.

Near Gutierrez Zamora on the extremely scenic Tecolutla River and also at Papantla, one finds himself in the center of the vanilla orchid belt. Here one sees thousands of the ethereal yellow and green orchids, *V. planifolia* and *V. tahitensis*, blooming profusely in the trees. Interesting, too, are the foot-long pods in massive clumps, the beans from which the vanilla essence is extracted.

Just a short distance from this section is a small villa by the name of Banderilla. Here is located one of the most outstanding and exotic botanical collections of rare plants to be found anywhere in Mexico.

These two maiden ladies, twins and eighty-two years of age, are the last of a long line of horticulturists and avid collectors dating back four hundred years. Their large garden of exotic flowers is a thing of beauty and extreme wonderment to everyone who sees it. In it, one will find many celestial orchids hanging from trees and in baskets; there are the wild Mexican white and purple laelias,

gold and bronze oncidiums, coelogynes, vandas, and many beautiful purple and lilac hybrid cattleyas.

My attention was directed particularly to a collection of rare and colorful cyripediums, handsome specimens in colors of rose-purples, bronze greens and deep carmines. Standing out among these was the very unusual *Cyripedium Curtissii*, breath-taking in its green and mahogany coloring accentuated with dark brown marbled spots. Here, too, were handsome specimens of the curious *C. Fairicanum*, several shades of a shiny luminous green with a darker green lip and exceptionally large foliage, and there were many others. Hundreds of beautiful foliage plants, alocasias and exotic ferns were growing in this unusual garden.

Immense highly colored caladiums with leaves eighteen inches across stood ten and fifteen feet high, with a spread large enough to walk under. There were oddly shaped abutilons with striking yellow and mahogany flowers, huge *Philodendron triumphans* that looked like "trees from Mars," mammoth *Fuchsia arborescens* and the handsome gray and crimson leaved *Begonia imperialis*.

Tall tree ferns and other Cycadaceae were growing in great abandon. The huge fronds of *Alsophila*, the Australian tree fern, grew twenty feet high or more. *A. myosuroides*, the beautiful native Mexican species, was handsome, as was *A. Salvinii* with widely spreading fronds, and *A. quadripinnata (pruinata)* stood out among all the rest with its colorful blue colored fronds; this and *Cibotium Schiedeii* were particularly beautiful.

There were xanthosomas and other large

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leaved Arums. Among these were tiger-striped *Vriesia speciosa*, with huge leaves, and *Wigandia macrophylla*, whose large wrinkled leaves had extremely prickly and hairy surfaces, and the long recurved flower stalks bore intense purple blossoms.

In closing I would not feel satisfied if I did not bring to the attention of those that might be interested the knowledge of one of the most rare and outstanding collections of Orchidaceae in Mexico.

This is to be seen at the unique, fascinating and extremely picturesque little villa of Jungapeo, set like a beautiful jewel in a tropical pocket in the mountains, fully protected from the wind, six miles below San Jose Purua, a famous watering 'spa' in the State of Michoacan.

Here this ingenious old gentleman has assembled a fabulous collection of blooming plants of rare orchids from all over the world and is growing them in trees and other locations as nearly amenable as possible to their native habitats.

There were handsome cattleyas and laeliocattleyas, beautiful cymbidiums, coelogynes, dendrobiums, epidendrums, oncidiums, odontoglossums, miltonias, gorgeous phalaenopsis, colorful vandas and hundreds of other magnificent types and species.

It would be impossible for me to describe here this celestial and exotic outlay, its grandeur was just too fascinating to assimilate all at one time, but suffice it to say, it was worth traveling many miles to see; while it is not possible to describe many of them, having made notes of many of the most outstanding specimens, there were several pic-

turesque beauties that stand out in my mind's eye.

The startling vivid scarlet *Odontioda* 'Aritia,' the orange-scarlet coloring of an exotic *Sophronitis grandiflora*, the eccentric *Epidendrum ciliare* should be mentioned, and, too, one could never forget the lovely *Vanda caerulea* or the unique *Phalaenopsis* species, or the fragrance of the ethereal ghost-flowered *Peristeria elata*. Beautiful, but odd, were the bronze and scarlet blossoms of *Cattleya Leopoldii*, and exotic in the extreme those of *Pleurothallis medusae*, with its long and airy tassels.

This recent trip to tropical Mexico was an outstanding experience for me, the most unusual of all I have taken. I must, at this time, take the opportunity to gratefully express my sincere appreciation to certain members of the staff at the Institute of Botany of the University of Mexico, for their untiring and gracious aid in helping me to identify many of the specimens collected on my sojourn.

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Heather Garden at the Children's Orthopedic Hospital

(Continued from Page 55)

vantage and at the same time making a striking display.

Round these we planted other varieties in smaller quantities; among them are *C. vulgaris* 'Tib,' double rosy crimson flowers; 'Foxii nana,' attractive deep green pincushions with purple flowers; 'Mrs. Pat,' distinct pink tips to the new shoots in spring; *E. carnea* 'Ruby Glow,' dark red, a choice variety; *E. ciliaris* 'Mrs. C. H. Gill,' red; *E. cinerea* 'Golden Drop,' coppery foliage turning red in winter; *Daboecia Praegerae*, pink bells, and *E. Tetralix* 'Darleyensis,' salmon pink, an unusual shade in heaths. We have also included several of the tree heaths; *Erica terminalis (stricta)*, Corsican Heath, *E. australis*, Spanish Heath, and the variety 'Mr. Robert' with white flowers; *E. arborea* var. *alpina* and *E. lusitanica*, the Portuguese heath.

In all, over fifty varieties of heaths and heathers have been planted; there are still several we would like to have such as *C. vulgaris alba* 'Carlton,' *E. Tetralix* 'Con Underwood' and 'L. E. Underwood,' *E. cinerea* 'C. D. Eason' and 'Eden Valley,' *E. carnea* 'Eileen Porter,' 'Praecox Rubra,' 'Queen Mary' and 'Winter Beauty.' Most of these seem to be difficult to obtain in the United States.

Certain shrubs harmonize well with heaths and we have added one or two that are suitable. *Pernettya mucronata*, evergreen azaleas, *Bruckenthalia spiculifolia*, *Kalmia latifolia* and *Cassinia fulvida*, the so-called 'Golden Heath' from New Zealand, because of the golden color underneath the foliage and heath-like habit. Its white flowers open in June.

Next to the hospital building, where a shadow is cast during the afternoon, we have planted many allied shrubs that would perhaps prefer the shade and be happier there than the heathers. These include *Enkianthus campanulatus* and *Zenobia pulverulenta* with its white nodding flowers in summer and glaucous foliage; a plant not often seen, but well worth growing. *Leucothoe Catesbaei*, *Pieris formosa* and *P. japonica*, *Andromeda glaucophylla*, *Gaultheria Miqueliana* and *G. procumbens*, and several rhododendrons: *R. Williamsianum*, 'Blue Tit,' 'Wilsonii' and *R. polylepis*.

We may, perhaps, have made mistakes in our color blending of the varieties or belittled a variety here and praised one unnecessarily there, but time will help us decide these questions. One day we hope to have this part of the grounds where upkeep will be at a bare minimum, but where joy and pleasure will be great to all who pass by, whether it be spring, summer, fall, or the cold, long days of winter.

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Educational Programs for Children and Adults at the Missouri Botanical (Shaw's) Garden

(Continued from Page 54)

and planting of plants for wildlife food, and suggestions are made for the multiple use of small areas for softball, archery, hunting, fishing, and wildlife. The course meets one night a week for five weeks.

In the field of botany, there are four courses offered. Technical Botany for Home Gardeners is a course designed to acquaint the gardener who already had been handling plants for a considerable length of time with some of the reasons why different plant parts behave as they do. A typical plant is studied externally, then a woody twig is dissected. Plant nutrition and photosynthesis are simply demonstrated and lead to a discussion of atom bombs and radiation as they affect genetics and different evolutionary developments of plants.

The Spring Flora I and II and Fall Flora course are designed to teach people how to use keys to identify plants, where to find specific kinds of plants in nature, and some of the ecological reasons for their existence in certain localities. Field trips both in the Garden and at the Missouri Botanical Garden Arboretum are essential parts of these presentations. Tree flowers and their specialization to wind pollination are a part of the early spring course, and the use of twig characters in keying out woody plants is likewise stressed.

The botany courses each meet five times, in the evening, and on at least one Saturday afternoon for the extensive field trips in the flora courses.

In addition to the adult courses described above, the Garden is intending to conduct a series of fifteen classes for teachers of high school biology in the St. Louis area, under the sponsorship of the National Science Foundation. This program, called the In-Service Institute in Botany, has a threefold purpose: (1) to strengthen subject matter background in botany and the methods of science, (2)

to help teachers of biology with their own instructional problems by presenting items which can be of immediate adaptability to their own courses, and (3) to assist teachers of biology in encouraging young people to consider careers in science.

Emphasis in all of these courses is placed on how to do things accompanied by the reasons why they are done. Practical work, as much as possible, is geared for the growing, caring and propagating of plants in the home and on the home grounds. Lectures are prepared with the idea in mind of giving students a working knowledge and understanding of plants, however limited this may have been before. Not to be overlooked, of course, are the answers to many hundreds of questions of students whose desire to learn more about plants makes all of this possible.

New or Unusual Shrubs in the Arboretum

(Continued from Page 56)

the showy leaves a shining green, since they have a tendency to be somewhat yellowish if under-nourished. Insects and diseases it has few—although our largest plant has its leaves somewhat disfigured by a leaf-spot, due perhaps to a fungal invasion. Propagation is by cuttings, taken in July or August, or by seed. If one has a female plant and a male or a source of male flowers, seed production should be a very easy means of increasing this fine vine. By whatever means, propagated it should be so we may have more of it in our Pacific Northwest gardens.

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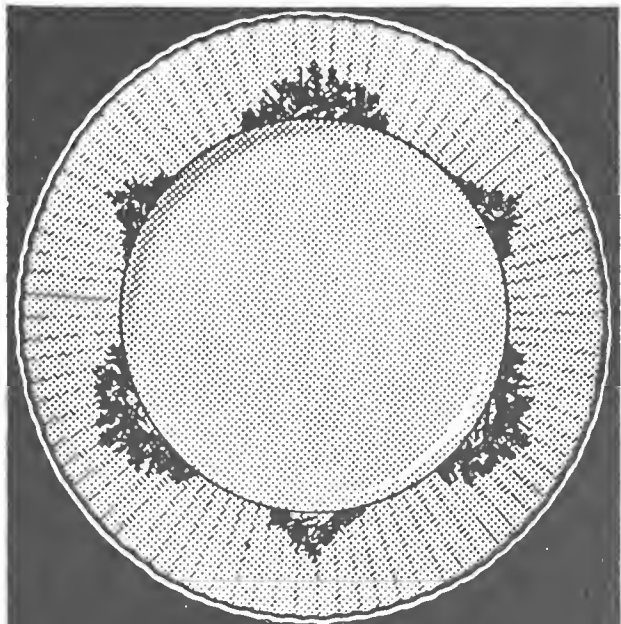
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