

**THE AMERICAN**  
*Horticultural*  
**MAGAZINE**



# AMERICAN HORTICULTURAL SOCIETY

*A union of the American Horticultural Society  
and the American Horticultural Council*

1600 BLADENSBURG ROAD, NORTHEAST • WASHINGTON 2, D. C.

*For United Horticulture*

★★★ *to accumulate, increase, and disseminate horticultural information*

B. Y. MORRISON, *Editor*

JAMES R. HARLOW, *Managing Editor*

## *Editorial Committee*

JOHN L. CREECH, *Chairman*

W. H. HODGE

FREDERIC P. LEE

CONRAD B. LINK

CURTIS MAY

FREDERICK G. MEYER

WILBUR H. YOUNGMAN

## *Officers*

### PRESIDENT

HENRY T. SKINNER  
*Washington, D. C.*

### FIRST VICE-PRESIDENT

RAY C. ALLEN  
*Mansfield, Ohio*

### SECOND VICE-PRESIDENT

FRITS W. WENT  
*St. Louis, Missouri*

### ACTING SECRETARY-TREASURER

GRACE P. WILSON  
*Bladensburg, Maryland*

## *Directors*

### *Terms Expiring 1963*

MARY W. M. HAKES  
*Maryland*

GRETCHEN HARSHBARGER  
*Iowa*

FREDERIC HEUTTE  
*Virginia*

W. H. HODGE  
*Maryland*

ALBERT J. IRVING  
*New York*

### *Terms Expiring 1964*

R. C. ALLEN  
*Ohio*

P. H. BRYDON  
*California*

CARL W. FENNINGER  
*Pennsylvania*

JOHN E. GRAF  
*District of Columbia*

GRACE P. WILSON  
*Maryland*

### *Terms Expiring 1965*

HAROLD EPSTEIN  
*New York*

FRED C. GALLE  
*Georgia*

FRED J. NISBET  
*North Carolina*

J. FRANKLIN STYER  
*Pennsylvania*

DONALD WYMAN  
*Massachusetts*

*The American Horticultural Magazine* is the official publication of the American Horticultural Society and is issued four times a year during the quarters commencing with January, April, July and October. It is devoted to the dissemination of knowledge in the science and art of growing ornamental plants, fruits, vegetables, and related subjects.

Original papers increasing the historical, varietal, and cultural knowledges of plant materials of economic and aesthetic importance are welcomed and will be published as early as possible. The Chairman of the Editorial Committee should be consulted for manuscript specifications.

Reprints will be furnished in accordance with the following schedule of prices, plus postage, and should be ordered at the time the galley proof is returned by the author: One hundred copies—2 pp \$6.60; 4 pp \$12.10; 8 pp \$25.30; 12 pp \$36.30; Covers \$12.10.

Entered as second class matter in the post office at Baltimore, Maryland, in accordance with the Act of August 24, 1912. Additional entry for Washington, D.C., was authorized July 15, 1955, in accordance with the provisions of Section 132.122, Postal Manual. A subscription to *The American Horticultural Magazine* is included as a benefit of membership in the American Horticultural Society, Individual Membership dues being \$6.00 a year.

## Contents

New Achimenes for Indoor Gardens PAUL ARNOLD .....	67
Landscape Architecture—The Invisible Art JAMES FANNING .....	73
Tulips For The Home Garden BARBARA BLACK .....	76
The Natal Plum HAROLD F. WINTERS .....	92
Rooting and Night-Lighting Trials with Deciduous Azaleas and Dwarf Rhododendrons C. J. WEISER and L. T. BLANEY .....	95
The Morton Arboretum E. L. KAMMERER .....	101
A Book or Two .....	105
The Gardeners' Pocketbook	
Montanoa—An Attractive Genus. ALEX D. HAWKES .....	110
<i>Ipomoea wolcottiana</i> —A Tree Morningglory. P. K. SODERHOLM and M. H. GASKINS .....	111
Two Dissimilar Members of the Aristolochia Family, Native of California. MABEL SYMMES .....	113
Delayed Appearances. B. Y. MORRISON .....	116
<i>Poncirus trifoliata</i> , the Trifoliolate Orange— A "Dividend" Tree. EDGAR DENISON .....	116
Two White Petunias for Greenhouse Display. DONALD G. HUTTLESTON .....	120
Plants and Abnormal Weather Conditions, Houston Area, 1961-1962. FRANK PIERATT .....	123
<i>Ornithogalum saundersiae</i> . B. Y. MORRISON .....	124
Butcher's Broom— <i>Ruscus aculeatus</i> . ELIZABETH LAWRENCE .....	125
<i>Arisaema serratum</i> . FREDERICK G. MEYER .....	126
Notes on <i>Hymenocallis</i> , the Spider Lilies, ALEX D. HAWKES .....	126

APRIL COVER ILLUSTRATION [Pen-and-ink Drawing by EDGAR W. DENISON]

### *Poncirus trifoliata* in full flower

See Page 116 for a "revisited" account of the Trifoliolate Orange, an unusual small tree recommended for restricted areas of suburban plots.



NETHERLANDS FLOWER-BULB INSTITUTE

### **Tulip 'Artist'**

Coloring is exceptionally delicate, shading on the outside from green at the base to rose and apricot at the edges of the twisted, sharply sculptured petals. Inside, green shades to cream at the center and salmon-rose at the edge. Color passes entirely green as the flower ages. See Page 76 for a new experience in tulip growing.

# New Achimenes For Indoor Gardeners

PAUL ARNOLD\*

A new plant to grow indoors was introduced in 1778 to British conservatories and heated greenhouses by William Forsythe. This importation from Jamaica was enthusiastically received because of its very many bright scarlet flowers on a plant about twelve inches tall. Its particular merit was the habit of blooming continuously for many weeks in late summer and fall when plants in full flower are scarce. Easy to propagate and simple in its cultural demands, *Cyrilla pulchella*, as it was named by L'Héritier, was soon at home in the collection of every serious gardener in England.

The British physician, Patrick Browne, had first described this plant and named it *Achimenes minor* in 1756 in his *History of Jamaica*. In 1786, Scopoli published the name *Buchneria coccinea* for the same plant. Eventually, the generic name *Achimenes* and the species name *coccinea* were joined as valid names under the rule of priority.

Dr. Browne had written, "This little plant has a great deal of beauty and elegance . . . and richly deserves to be cultivated in all the flower gardens in America." Almost two hundred years would pass before *A. coccinea* and its cousins from Mexico and Central America would become popular indoor plants in the United States, but that time has now arrived.

In 1962, some twenty U. S. dealers advertised achimenes by named varieties and twenty additional growers listed either seed mixtures or unnamed dormant rhizomes. A few small growers today offer dormant material by color only; white, purple, red, blue, etc. Three dealers have extensive offerings of forty or more varieties; J. M. Apperson, Albert Buell, and House of Plants. The number of indoor gardeners in this country who grow *Achimenes*—on a window sill, un-

der fluorescent lights with African Violets and other gesneriads, or in a home greenhouse—has increased enormously during recent years. In the southern states, of course, *Achimenes* are grown out of doors on shaded porches and terraces.

## New *Achimenes* Hybrids

American hybridizers of *Achimenes* have been busy creating new varieties. Some beautiful and interesting plants were raised by the late Eric Wetterlow, a florist of Manchester, Massachusetts. Lyndon Lyon, the celebrated African Violet breeder in Dolgeville, New York, and Karl F. Borges, an amateur grower in Fernandina Beach, Florida, have produced attractive new hybrids that are now commercially available. Geo. W. Park Seed Co., of Greenwood, South Carolina, announced two new hybrids in 1962. Cytological studies of the GESNERIACEAE at Cornell University recently have yielded a by-product bonus of outstanding new achimenes which may eventually be released to a waiting world of interested gardeners.

Perhaps the most outstanding of recent American hybrids is 'Wetterlow's Triumph,' a 1957 introduction of House of Plants, which has enormous bright pink flowers in profusion on compact plants. The face of the flower is embossed in most unusual fashion, suggesting a cameo. The well-named *Achimenes* 'Peach Blossom' from Carl Borges is an attractive new color and, although the flowers are of moderate size, they are borne in profusion on plants ten inches tall. Two *A. coccinea* hybrids, 'Coral Gem' and 'Crimson Tiger,' have tiny "semi-double" flowers showing petaloid development of the stamens. These products of Geo. W. Park Seed Company make an interesting addition to 'Violacea Semi-Plena,' the only previously known semi-double *Achimenes* with deep-purple trumpet-shaped flowers that have been popular since the 1850's. Two *Achimenes*

\*Mr. Arnold has accumulated in Binghamton, New York, for study in connection with his duties as International Registrar for the GESNERIACEAE, excluding *Saintpaulia*, the largest collection of *Achimenes*, private or public, known at the present time.



*Achimenes patens*

*The true species from Mexico, with a long spur at the basal end of the tube of its brightly colored flowers, has only recently been cultivated in the United States*

acclaimed in England last year, 'Shirley Fireglow,' an *A. coccinea* hybrid, and 'White Dwarf' (also called 'Shirley Dwarf White' and 'Shirley White Compacta'), apparently are not new plants but instead are new synonyms for plants distributed by Suttons ten years or more ago.

A beautiful bigeneric hybrid 'Kuan

Yin,' produced by crossing an *Achimenes* with a *Smithiantha*, was grown by Mrs. J. D. Batcheller of Durham, New Hampshire, and will be available on a limited scale in 1963. Other bigeneric hybrids in which the *Achimenes* parentage dominates over the *Smithiantha* characters have been produced in England and are offered by Butcher's, Shirley, Croydon.

Success in plant hybridizing, of course, depends on the quality of the parental stocks available for breeding. The crossing of *Achimenes* species to produce hybrid varieties started in England in 1842 and rapidly spread to Holland, Switzerland, France, and Belgium. During more than sixty years of cultivation, *A. coccinea* (recently revealed as a natural tetraploid) had never sported. It remained the only known species until September 1841 when three new *Achimenes* flowered in the hot house of the Royal Horticultural Society in London. Plant breeders began to glow with anticipation. These new arrivals were *A. rosea* (later judged to be only a Guatemalan variation of *A. coccinea*), *A. pedunculata* with orange flowers, and *A. longiflora* with blue or violet flowers of exceptional size. These three species had been forwarded from Guatemala by Theodor Hartweg, a famous plant hunter sent out by the Horticultural Society of London to explore the New World for ornamental plants.

With *A. longiflora* providing blue, lavender, or white flowers of large size having more or less yellow in the throat, added to *A. coccinea* whose scarlet flowers were already at hand, plant breeders had all three primary colors with which to work. Additional yellow flower and variant form possibilities were provided by *A. pedunculata* and the arrival soon afterward of *A. patens* and *A. grandiflora* added to the genetic possibilities. The results can be followed in dealer's catalogs of the time.

By 1850, Bass & Browns of Sudbury, Suffolk, were listing thirty-six varieties of *Achimenes*. William Bull of Chelsea, London, listed twenty-three varieties in 1860, and his list increased to sixty-one varieties in 1876. Perhaps the listings of Louis Van Houtte, the famous nurseryman of Ghent, are the most revealing of the enormous enthusiasm for growing and hybridizing *Achimenes* which took place in Europe a century ago. A sampling of Van Houtte's catalogs show the following numbers of *Achimenes* varieties:

1842	5 varieties
1845-1846	13 varieties
1849-1850	48 varieties
1858	67 varieties
1898	45 varieties

### The Growing Popularity of *Achimenes*

European enthusiasm for this tropical American plant a century ago was not matched in the United States. Meanwhile, two World Wars with restrictions on growing ornamental tropical plants in Europe due to food necessities and fuel shortages, brought about a dearth of *Achimenes* until the current revival of interest. In the decades before 1947, growers in India, particularly in Bengal, continued to grow *Achimenes* in their outdoor cultures, but in the United States representative collections could be found only in the southern states, in California, Mississippi, and Florida particularly. The situation changed in 1947 when Barnes Importers of East Aurora, New York, offered nine varieties, imported from Van Tubergen in Holland. When they discontinued the business in 1952, Barnes Importers were listing twenty-four *Achimenes* varieties and the current upsurge of interest in growing and collecting *Achimenes* in the United States was well under way. Today there are avid growers and collectors of *Achimenes* varieties in all parts of the United States, from Maine to Florida, from Minnesota to the Gulf states and particularly in Oklahoma and Missouri, and on the West Coast from Alaska and the Gulf Islands of British Columbia to Southern California.

*Achimenes* plant collecting has enormous appeal because of the great variety of plants available. The flowers come in every color and color combination imaginable. They vary in size from tiny *A. misera* flowers less than a quarter of an inch across, to huge *A. longiflora* hybrids exceeding two inches in diameter. They offer a variety of forms from short-tubed spreading corollas with wide open mouths to long, megaphone-shaped flowers with narrow limbs. The plants range in habit from upright dwarfs only six inches in height to tall plants rising thirty to thirty-six inches above the ground.

Most of the *Achimenes* hybrids now in cultivation were derived from *A. longiflora* and are easily identified by the long, downward-bent tube, the distinguishing characteristic of that species. A plethora of *A. longiflora* hybrids is a natural result of early recognition by plant breeders of the excellent characteristics of this obliging species. Robert Fortune, before



*Achimenes flava*

*Although widely distributed in Mexico, this species with bright yellow flowers was not introduced commercially until 1962*



he left his position as Superintendent of the R.H.S. Garden to become famous as a plant hunter, wrote the following tribute to *A. longiflora* in the *Transactions of the Royal Horticultural Society* for 1841:

"After twenty years of importation of novelties, here is one which yields to nothing except the *Wistaria (Glycine) sinensis*. More beautiful than the gayest of our stove herbaceous plants, as easy to cultivate as the commonest of perennials, more prodigal of flowers, except during the few months when it sinks into its winter's rest, this *Achimenes longiflora* is an invaluable gift by the Society to everyone who has a warm greenhouse."

### Old Species Reintroduced To Cultivation

During the past ten years, dealers in the United States, in Europe, and in India have listed *A. 'Patens Major,'* which others, noting that the flowers were of only moderate size, have abbreviated to 'Patens.' This was done, apparently, without realizing that the plant in the trade bears little resemblance to the species of that name. Prof. H. E. Moore, Jr., Director of the Liberty Hyde Bailey Hortorium at Cornell University, collected living material of *A. patens* in the Mexican states of Morelos and Michoacan during 1959, so now the true species is available in this country, it would seem for the first time. The real *A. patens* is a far superior plant to the cultivar 'Patens Major.' The distinguishing mark of *A. patens* is the long, slim spur which projects from the calyx, opposite the tube of the flower.

Two years after *A. patens* arrived in England, George U. Skinner sent an *Achimenes* with small white flowers from Guatemala in 1848. Dr. John Lindley diagnosed it and gave it the name *A. misera* and further condemned it in the *Journal of the Horticultural Society of London* in these words: "This plant, though bearing the name of an *Achimenes*, is a mere weed with small dingy whitish flowers speckled with purple in the inside, of no (horticultural) interest whatever."

Recent growers of *A. misera* (material from Kew Gardens) have sometimes won-

dered why Dr. Lindley was so harsh in his judgment of this little plant. The *A. misera* plants in their own collection, far from unattractive, were often admired. Prof. Moore cleared up this mystery in 1962. The plants grown in the United States and in Europe in recent years under the name *A. misera* are really *A. warszewicziana*. The real *A. misera* is, indeed, an insignificant plant and scarcely worth cultivating. This situation came to light when Prof. Moore studied living material of both *A. misera* and *A. warszewicziana* brought back from Mexico in the Fall of 1959. Further investigation showed that, due to a century-old error, Dr. Lindley's "mere weed" and the larger and more attractive plant *A. warszewicziana* have incorrectly been considered synonymous. Prof. Moore pointed out the error in *The Gloxinian*, November-December, 1962 and stated that the description of *A. misera* in his book "*African Violets, Gloxinias, and Their Relatives*" applies to *A. warszewicziana* instead.

### Old Species New to Cultivation

One old species, *A. andrieuxii*, was diagnosed by DeCandolle in 1839 from dried specimens and named for the man who collected the plant near Oaxaca, Mexico. This lovely dwarf plant with a continuous production of bell-shaped violet-colored flowers, seems never to have been cultivated, either in Europe or in the U.S.A., during the past century. Thanks to the Cornell University expedition to Mexico in October 1959, this oversight has been corrected. One dealer predicted in his 1962 price list that *A. andrieuxii* will soon become the most widely grown *Achimenes* on window sills and under fluorescent lights, along with African Violets, because it performs so well in three-inch pots.

Conrad V. Morton of the U. S. National Museum at the Smithsonian Institution, studies New World GESNERIACEAE as a relaxation from his botanical specialty, the fern family. In 1936, Mr. Morton diagnosed from dried material four new species of *Achimenes* that were not to come into cultivation for a quarter of a century. These were: *A. flava*, the only species known to have bright yellow flowers; *A. obscura*, well-named because the small, uninteresting flowers are underneath the leaves; *A. bella*, a rare and

beautiful species resembling the woolly *A. ehrenbergii*; and *A. fimbriata*, a hairless species with white flowers, variously patterned with violet and edged with a fringe from which the name was derived.

Dr. Moore collected live material of all four species in 1961. The yellow flowering *A. flava* was introduced to horticulture by the House of Plants in 1962 and is now offered by several dealers. The buttercup yellow flowers have captured the interest of Lyndon Lyon and other hybridizers and some crosses have been made with *A. flava* at Cornell University. The other three species have not yet been commercially released, since their identity was not established until the Fall of 1962, but material has since been distributed to interested growers and it can be expected that *A. bella* and *A. fimbriata*, which have great horticultural merit, will be offered by both American and European dealers as soon as stocks can be built up.

Another old species, described by C. V. Morton in 1938 from dried material but never introduced to cultivation, is *A. dulcis*. Dr. Moore and Dr. Bunting of the Bailey Hortorium brought back living material of this species in 1961 from the state of Michoacan, Mexico, where they found plants still in flower in September. This is a tall species, with two-foot stems bearing large, milk-white flowers with a pale yellow blotch on the lower side of the inner surface of the tube. People who have seen *A. dulcis* in flower at Cornell University during the late summer of 1962 consider it an attractive plant despite its stature. It, too, has been released to dealers who are now building up stocks prior to commercial release.

### Species New to Science and Cultivation

Two *Achimenes* new to science have recently entered the U.S.A. from Mexico. These are *A. woodii* and *A. cettoana*. The first one has not yet been offered commercially but *A. cettoana* was introduced in 1962 and several dealers are supplying it in 1963.

Although living material of *A. woodii* was not introduced to cultivation until October 1959, dried specimens collected by Dr. Carroll E. Wood, Jr., in August 1948 had been placed in the U. S. National Herbarium. Mr. Morton subsequently determined that this was an un-

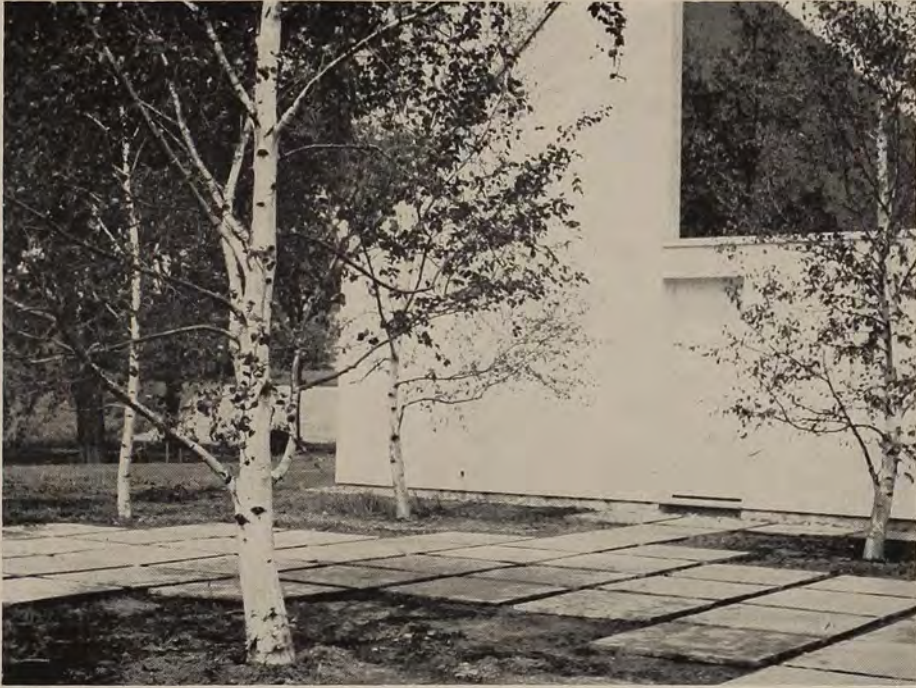
described species but he did not describe it until June 1962 *Baileya* (Vol. 10, No. 2) under stimulation of live material received from the Bailey Hortorium. Because it belongs to the Dicyrta Section of the genus *Achimenes*, *A. woodii* will probably not interest the average grower any more than *A. candida* and *A. misera*, two other members of the section having small white flowers. The one-half inch diameter flowers of *A. woodii* have a tube light violet in color outside, with a yellow stripe on the bottom. Inside the tube is violet with two yellow stripes covered with violet spots.

Collectors and growers consider the new species, *A. cettoana*, the most exciting achimenes discovery of the present century. This is a plant with flowers of more or less typical achimenes shape, but the leaves, occurring in threes, are long, narrow, not very conspicuously notched. They are reminiscent of willow leaves.

Prof. H. E. Moore, Jr., first collected *A. cettoana* in the Mexican state of Chiapas in October 1959. It was discovered in flower long after other species of achimenes had ceased blooming. Introduced to cultivation at Cornell University in Ithaca, New York, this attractive new species produced flowers in profusion from early June 1960 until late autumn, with some flowers still opening in December.

The flowers of *A. cettoana* are amethyst violet (RHS Color Chart 35 and 35/1) to heliotrope (RHS Color Chart 636) with a pale spot at the throat, a color outstanding among other bluish-flowered achimenes. On the A.H.C. (Nickerson) Color Fan, a reading "strong violet" Munsell 2.5P 4/9 has been obtained. The flowers are of medium size, about 1¼ inch across the face and the slightly bent tube is about 1¼ inch long. Although they occur singly in the leaf axils, the flowers of *A. cettoana* are produced in virtually every axil after the plants begin to flower.

Plants of *A. cettoana* grow about ten or twelve inches tall, with a minimum of staking. The scaly rhizomes from which they grow are typical of the average run of *Achimenes*, being about one inch in length. Propagating stocks were released in 1960 and the first commercial offering appeared in 1962. It can be expected that several dealers will offer this splendid new *Achimenes* with its excellent decorative qualities in 1963.



EDWARD L. BARNES, ARCHITECT

White-on-white—in this case birch trunks against wood siding, is always a pleasant color combination. In the illustration, trees have just been planted and the flagstone set. The next move will be to cover the bare ground with turf, making the area usable right away.

## Landscape Architecture—The Invisible Art

JAMES FANNING

An architect friend asked me not long ago if I could tell him why he so seldom saw good photographs of landscape architecture. My immediate reply was to the effect that since most pictures of landscape architecture are actually pictures of buildings to which landscape is incidental, it was no more than natural that landscape should have a minor part in the picture.

This rather superficial explanation made me realize that the question went a good deal deeper than merely photographing buildings; it involved, really, the whole concept of landscape architec-

ture: What does the landscape architect really do? What are the aims and concepts upon which he bases his work? Why should the results of his effort and planning fade away into the mere setting for a building? Must a passion for invisibility be a part of his personality or is invisibility the inevitable result inherent in his work?

These are difficult questions to answer, even for a professional who has spent many years in the business, because, like Moliere's gentleman who had been speaking prose all his life without knowing it, the professional who has mastered

the idiom of any art form operates automatically: He knows what he wants to do and how to do it, but the why behind it all is too thoroughly absorbed into his subconscious mode of thought to be easily explained.

But let's have a try at explaining it.

The landscape architect's primary concern is with land. This may seem like laboring an obvious point, but the basic, rock-bottom quality of this concern is often lost sight of. Because land is basic: It is what we walk on; its produce feeds us; it is, whether clad in living greenery or structures of wood and stone, what we look at through most of our waking hours. It is obvious, too, that wherever man sets his foot something happens to the land, and it is the landscape architect's professional responsibility to make sure that this something is good, true, and beautiful, rather than destructive, unnatural, and ugly.

Avoiding the destructive effects of changing the earth's surface, then, must be one of the landscape architect's basic skills. This calls for a knowledge of soils, not only in connection with growing things, but as materials used in the construction of terraces, embankments, and foundations for roads and buildings. It calls for decisions on where to cut, where to fill, and, most important of all, where to leave the earth alone.

Development of tracts of neglected or wild land is one of the first and most important points on which the training and judgment of the landscape architect comes into play. Unfortunately, it is one of the points at which his services are all too seldom called for, since land development is usually a financial operation, conducted only to get the maximum profit from the sale of the land, and "aesthetic" considerations are given short shrift. The realization is growing, however, that the aesthetic and practical aspect of land use go hand in hand, and there is good reason to believe that in the future more and more developments will be designed to fit people and land together for the best advantage of each.

Every landscape architect is accustomed to being called in to "do" a house after it has been built, the land graded around it, and even, probably, a driveway built. In at least seventy-five per-

cent of such cases, he can immediately spot several things that were done wrongly: grades that do not drain properly; trees "saved" but not worth saving; a driveway wider than necessary or too narrow to be practical. Diplomacy, another of the landscape architect's basic skills, is called for here. You can tell a client that something he *proposes* to do is wrong, but you can't tell him that something he has *already* done is wrong: You can only grit your teeth and think up means of correcting the situation as painlessly as possible.

Builders and building architects often pride themselves on keeping trees that were growing on a particular piece of land before they started work on it, but this usually does nothing more than add to the landscape architect's headaches: Unsuitable species, trees with a short life expectancy or in locations that cause grading or circulation problems—all are liabilities, rather than the assets they are thought to be.

All this is by way of pointing out that, in doing *anything* to a piece of land, the landscape architect is the person whose professional judgment is the *first* that should be brought to bear.

After the basic problems of land use have been settled and design and location of buildings decided upon, the landscape architect's next set of skills comes into play: This is in making the combination of building and land livable. The main problem here is circulation: How to get people into and away from the building or buildings, and how to arrange the outdoor space so that people can move about at work or play or congregate for games and parties. This means establishing areas for terraces and patios and determining elevations and surface materials for them; it means establishing routes and grades for driveways and paths and determining the materials of which they are constructed; it means laying out areas for lawn, flower, and shrub borders and tree planting; it means locating and specifying materials for fences and other types of screens and windbreaks.

The third, and final, step in the landscape design process is what might be called exterior decorating. This grows naturally out of the first two steps, since



HUSON JACKSON, ARCHITECT

*A single tree, carefully placed in greensward, is a many-purpose design element. This plane tree supplies a necessary focal point, reduces sky glare in the rooms on both floors, and throws shade on the open deck during the summer.*

it involves "dressing up" the graded earth, paths, and drives. Here plants play a major part, although sculpture, water features, and other decorative objects have their importance, too.

This final step in the landscape building process is, naturally enough, the one that meets the eye of the homeowner or casual passer-by, and this is why landscape architecture may be called an art of invisibility: the greatest part of the work is, almost literally, underground and unthought of by anyone whose attention may be drawn to a colorful flower bed or a handsome tree.

But landscape architecture is invisible in another, more profound way. This consists of the landscape architect's feeling—call it intuition if you like—for the land. Out of this feeling grows a sense of "rightness": a feeling for what belongs on a particular site and how it relates to its surroundings. This results in an effect that is, to say the least, unobtrusive: the landscape architect's blended skills bring forth a blended result in which no element calls attention to itself. The result is a harmony in which the constituent elements disappear.

This is not to say that style has no place in landscape architecture. Quite the contrary. LeNôtre's tremendous formal gardens at Versailles are at the opposite pole of garden art from the Saihoji

moss garden at Kyoto, yet each seems right in its setting and each is an example of stylistic perfection.

Style and fashion are terms quite often confused in the minds of many people. Style is the manner in which an artist—any artist—uses the materials of his craft. Fashion is simply whatever may have a high value of appeal to the public at large at a particular time. Thus a style, whether that of an individual or of a group of artists, may become fashionable, but as soon as that happens, imitators of the style try to "get on the bandwagon" and that particular style is immediately debased and becomes unfashionable again.

This is another reason for the landscape architect to cultivate invisibility. His work has to last a long time, and if it is a conspicuous example of any particular passing fad it will, with the passage of time, become simply ridiculous—a discredit to the artist and his profession.

All of this, I suppose, makes landscape architecture sound like the most difficult profession known to man. Maybe it is, but, applying the feeling for the continuity of time that is another indispensable part of his equipment, the landscape artist can have the satisfaction of looking to a day in the distant future when someone will look at his handiwork and be happy.

## Tulips For The Home Garden

BARBARA BLACK\*

I cannot remember when I first fell in love with tulips. As a child, we had none on our farm in New Jersey. True, I remember stiff, formal beds in harsh color combinations at my boarding school in Pennsylvania and my college in Ohio, but these had nothing to do with me. It was only after I had my own garden and became personally involved in growing them that I discovered their charm, beauty, versatility, practicality, and ease of culture. Now, it is a lifetime love affair

and I would not want a garden without them.

And yet, I have a confession: Even though I thought I knew quite a bit about tulips, from growing them more than twenty-five years, it was not until the horticultural editor, who encouraged me to write this article, pointed it out to me that I became consciously aware of one of their most remarkable and usable traits:

"The tulip," he said, "is one of the relatively few flowers without a profile."

How significant—and useful—this is when you stop to think about it! They have no faces; they are equally beautiful

\*Garden Editor of the *New York World Telegram and Sun*, and regular contributing writer for *Popular Gardening Magazine*.

from any angle. Nor have they any distorted or unattractive backs. They have no need to turn their faces toward the sun. Consequently, they have no twisted stems, or grotesque shapes, from desperate light-seeking efforts to survive.

Daffodils face only one way. The versatile chrysanthemum twists and bends itself toward the light. Azaleas like a protected back and usually bloom only in a half-circle. Dahlias, annuals, and most perennials face toward the best light. Tuberos begonias point their blooms in the direction the bud was facing when it first poked through the ground, even if it continues to bloom all summer staring humbly at a blank wall! And every rose lover knows that you can *guide* the direction of hybrid tea blooms by skillful pruning, but that a climber will always face its blooms *outward* from the porch trellis.

Tulips, on the other hand, need no such guidance. They stand erect on clean, straight stems, whether they be short three-inch botanical species, laden with heavy double blooms, or thirty-inch Darwins reaching for the sky. The well-rounded flowers have a uniform appearance from all sides. Even when planted on the edge of deep shade, the shady side of each bloom will look exactly like the sunny side.

This desirable trait gives us unparalleled opportunities to plant tulip beds for maximum beauty and effectiveness. Like the bouquet on the dining room table, you can walk *all around* a tulip planting, as opposed to the one-sided arrangements you see at flower shows.

However, don't get the impression that I am going completely overboard and recommending tulips as the one superlative plant for the home garden. They are not appropriate, of course, for all cultural situations, nor for all decorative problems. I emphasize my caution because there has long been a tendency on the part of tulip "promoters" to claim too much. The general public fails to realize how much some of the lurid "releases" on "Where and How to Plant Tulips" are the work of some uninformed young gal Friday in a press agent's office.

I treasure one such release, distributed on behalf of a bulb importer. It said, in part: "Throw great masses of color across your lawn and under your trees. Snuggle tulips beneath your shrubs. Slip them between the crevices in your walk and

flagstone patio. Thread them around your pool, under your mailbox, up the lamp post. Hide the utility area. Fling them with a lavish hand around the children's play area. Decorate Fido's kennel and let gorgeous color come up around the bricks in your barbecue pit."

I happened to meet the girl who wrote this masterpiece and asked her casually where she got her ideas. She replied that she lived in one room, had never grown tulips and had "created" the copy herself. "My boss tells me to think up as many ways to plant tulips as I can, so people will buy more. So I read what they say in magazines about *other* flowers and adapt it to tulips. It's all right, isn't it?"

I murmured, "It all depends on the dog."

### Exceptional Color Range

One of the most intriguing characteristics of the tulip—from the days of the "Tulipomania" in Holland and England in 1634—has always been their wide color range. This includes almost the entire spectrum with the exception of primary blue and its adjacent tints and shades. And even here, the wide range of lavenders, orchids, and purples (which are a mixture of blue and red darkened by black or tinted by white) give us many *bluish* color tones in both strong and muted secondary colors.

Aside from blue, tulips come in the other primary colors, red and yellow, and in all their limitless combinations of orange, green, and purple. (Yes, there are green tulips!)

Also, they have just about the purest white known to horticulture, plus "blacks" that seem darker than any other blossom found in Nature. In fact, some are almost as dark as the berries on many shrubs; *Ilex crenata*, for instance. Unfortunately, many amateurs associate tulips only with harsh, bright primary colors. But they can be readily obtained in an almost complete rainbow of rich, dark shades; delicate tints and pastels; exquisite multi-color combinations with fascinating markings, edgings or shadings and blends of color; vibrant off-beat "jewel" tones which rival real jewels for texture and depth; and in many muted color tones so gentle and soft that you marvel at the awesome palette granted one single flower. Whether dark, rich, blended, vivid, strong, soft, or muted,

there is seldom an *ugly* color in tulips, and then only in man-made propagations or combinations.

### Variety in Form

In recent years, professional horticulturists responsible for massive tulip plantings in parks and in municipal and botanical gardens have been using a wide variety of forms, shapes, heights, and textures to beguile the public. Therefore, it would seem that there is little excuse for amateurs not being *aware* of the wide selection available for their own gardens. The fact that so many of us do not know this is a sad commentary on our powers of observation, or lack of imagination. How can we fail to notice the magnificent extravaganza of the Parrots; the crisp perky Kaufmannianas and Peacocks; the almost needlepoint precision of the lily-flowering types; the sturdy lushness of the doubles; the clean feminine beauty of Cottage tulips, and the tall, stately dignity of the sensational Darwin Hybrids?

Each year, more and more fine varieties come on the market. Any gardener with a streak of pioneering spirit should expand his tulip planting range. Even the conventional status seeker, trying so hard to make his garden "different" from his neighbor's, might well discover this almost endless source of supply for enhancing his prestige!

All of these desirable characteristics, plus the comparatively reasonable price range of top-quality bulbs, add up to one of the most beautiful and most useful garden flowers available to the amateur horticulturist. It is my firm conviction that there is not a garden in the land which would not be greatly improved by at least *some* tulip plantings. This normally applies to all areas of the United States and Canada with at least ten weeks of sufficient cold—about forty degrees Fahrenheit for proper root growth. Even in the Deep South, people are learning how to provide the necessary "cold treatment" in their refrigerators, for a limited supply of tulips, at any rate.

If you happen to be a tulip fan, and perhaps a member of the National Tulip Society, you may think I am over-enthusiastic and belaboring the obvious, namely, that the *vast majority* of amateur home gardeners do not fully appreciate the potentialities of this adaptable flower for their own use. To illustrate this

point and to exemplify my philosophy of the adaptability of tulips, I want to report a recent incident

### A Typical Misconception of Tulips

My phone rang at 9 p.m. A young voice reminded me that she was the daughter of old friends, whose wedding we attended four year ago. Now living fifty miles away, she wanted my advice about a box of tulips just received from Holland. Since their marriage, the young couple had studied in Europe and, having acquired graduate degrees, they had only recently returned, purchased a home and were eagerly starting their first garden. The tulips, purchased last spring, were their first acquisition.

"I was terribly anxious when they didn't come," she said. "This was the only present we gave ourselves—we were living on a shoestring—and when we blew ourselves to a hundred Holland bulbs, it was a big deal for us. Is it too late to plant them?"

I assured her that November was the right time to plant tulips in this area (New York) and asked her what *kinds* she had bought. "Fifty red and fifty yellow," she said happily.

After considerable tactful probing, she remembered that the man had called them "Darwins"—"The biggest and best they had." During the subsequent conversation she volunteered two other significant facts: (1) "He told us they might live as long as four years, but he recommended discarding them and buying new ones every year. We can't afford to do that, course, but someone told us that if we plant them *very* deep, they will live longer. Is two feet about right?" (2) "The man said to mass them. You should see their fields—acres and acres of tulips. Simply gorgeous and the most intricate patterns, like oriental rugs or church windows. But we thought we'd just plant the fifty red together, with the fifty yellow next to them, rather than trying to work out a design."

I was too fond of her to tell her what I really thought. Before analyzing this brief episode, I'd like to make two remarks: I wish I could select my tulips straight from Holland growers, on the spot. And, in starting a brand-new garden, I envy the opportunity these kids have for challenging fun and adventure. I made plenty of mistakes when I started my first garden.



### Four Unfortunate Amateur Habits in Buying Tulips

This young couple made no startling mistakes, and those they did make were typical of those made by thousands of Americans. They would probably have made the same ones if they had bought their tulips at the corner store, anywhere in America. Millions of far more experienced and knowledgeable gardeners behave in much the same way, as far as tulips are concerned. I mention the incident because it illustrates some very common misconceptions about tulips for private home use. But we must give this couple credit for at least *buying* tulips. They made four mistakes:

*First:* They invested in only *one type* of tulip—the Darwins—which limited their spring garden to a *very brief period of bloom*, probably a maximum of two weeks.

*Second:* They selected a *May bloomer* (New York metropolitan area). Their early “spring fever” in late March, all of April, and early May must go unrewarded with spring color.

*Third:* They chose only *two colors*. I doubt that this attractive girl would top a red dress with a yellow hat, or vice versa. Despite the magnificent color spectrum available at this obviously large nursery, they apparently were pre-conditioned to the idea that “tulips come in harsh bright colors” and made the common error of selecting the two fightingest “hot” colors known to man. As a comment on the apparent lack of advice from the salesman, Dutch salesmen probably *assume* that Americans like primary colors—because so many buy them. (Speaking of the common *faux pas* of planting horrendous color combinations together in tulip beds, have you ever seen a bed of brilliant orange-red Emperor tulips mixed with mustard-colored *Alysum saxatile*, white Candytuft and sheets of mauve-colored *Phlox subulata* growing together in a suburban planting, with a yellow *Forsythia* directly behind? Yet, planted alone, or in the correct color combinations, all of these innocent plants are delightful.)

*Fourth:* The hundred tulips were to be “massed” in the young couple’s best garden for a maximum two-week period of bloom. The couple had no plan for using the same ground the remaining fifty weeks of the year. Nor did they

know *when* to plant other flowers, nor *how* to do it without destroying their initial investment. They were told to plant their tulips “deep” if they wished to preserve them for the four years of life. (Why four?)

They knew nothing of the vital necessity of *ripening* the top foliage so a new bulb could form to replace the bloomed-out bulb, which dies after blooming. They did not have the slightest understanding of the hazards involved in trying to plant over their tulips. Nor did it even occur to them to label their plantings, or mark off the bed’s dimensions accurately. “We know the difference between red and yellow. We won’t need markers.”

To their everlasting credit, however, they did firmly repudiate the suggestion that they dig out the bulbs and discard them for new ones at the end of the first season.

### An Alternative Plan for a Hundred-Tulip Purchase

Here is what I would have done if I had been given the opportunity to purchase a hundred plump, crisp, fresh Dutch tulip bulbs in the growing field of a famous Holland nursery:

In the first place, I would have planned my purchase on the basis of **EIGHT** weeks of continuous bloom. This “Eight-Weeks-of-Bloom” applies to all areas where tulips can be grown and is based on selecting varieties which bloom in early, middle, and late season.

I would start my selection by allocating eighty of the bulbs for this purpose—ten for each week—to give me continuous bloom from late March through all of April and into late May. My selection would not be limited to eight types of tulips, however; it would range through more than a dozen different classifications and, of course, innumerable named varieties in an inexhaustible selection of colors. Thus, my allotment of eighty tulips, for eight consecutive weeks of bloom, would give me much leeway.

Given a persuasive salesman and surrounded by massive displays of solid color, a less determined purchaser might listen as he said, “Ten of each, Madame, is the absolute minimum you will need for massed effect.” But—after many years of being gullible, foolish, susceptible, stupid, and just plain ignorant—I have at last reached the stage where the per-

suasiveness of salesmen cannot influence or change my determination to make up my own mind.

So, on this imaginary spree, unshaken by the overwhelming masses of blooms, I would smile politely and say: "I am not buying for effect. I am buying for pleasure and I wish to extend my pleasures as far as possible. I want as many different kinds of top-grade bulbs as I can possibly afford. So let's start with your earliest botanical species. I want five each, of your two best varieties. Let me see them in bloom, please."

On this basis, I could select—inside my eighty bulb limit—not only two very fine botanical species for late March but also: Early Singles, Early Doubles, Mendels, Triumphs, Late Doubles (peony-flowering), Cottage, Darwins, Breeders, Parrots, Lily-flowering, Darwin Hybrids, Rembrandts, Multiflowering, or various rare new introductions!

This would give me sixteen little bags of bulbs. Some of the bulbs would be larger than eggs, others as fascinating as the turkey-red, inch-across, round bulbs of the white species *Tulipa turkestanica*. All would be crisp, clean, sharp in their vitality and potential life. Each bag would contain five bulbs for a lovely grouping. Each pair of bags (for each of the eight weeks) would contain a combination of colors, textures or forms, which would bloom at the same time for harmony or contrast. (Actually, one of each pair would be planned to start a few days ahead of the other; so first one blooms, then both together, then the second alone, gradually leading into the next pair for the following week's blooms.)

Now, let's return to our daydream. I still have twenty bulbs to buy!

I would set aside ten of these—in groups of five each—to make two pots of bulbs for forcing indoors during the colorless months of January and February. Properly cured, these bulbs will be useful for outdoor planting the following season; although it is not possible to force the same bulbs twice. I would probably select five Mendels and five Triumphs, which are best for forcing, and choose varieties not too tall for flower pots, and which would harmonize in color with other early varieties next season.

This leaves a final ten bulbs and thousands of varieties from which to choose. At this point I would ask my salesman

to take me to his head man. To him, I would frankly admit my ignorance and seek his advice in helping me to decide what unusual varieties to get for my "special gift" to myself—two of each, of five special kinds. I should explain here that—even though I have never been in Holland—I have made it a yearly habit to treat myself to a few rare, new, or unusual bulbs, "for trial." They are also for exhibition if they prove successful. And, if they turn out to be sturdy, practical and beautiful, I buy more each following year until they become "old timers" in my garden.

Each amateur tulip buyer, of course, should also take his own terrain, climate and local conditions into consideration. I like the species, dwarfs, miniatures, and naturalized varieties for my rock garden and also for my half-shaded "wild" garden, near the entrance to our property. It is fun to have tall Red Emperors around the bird bath—they stand almost as high as the basin itself—to watch even before the snow is off the ground. And, near them, at the base, I like Peacocks, those fascinating, multiflowering, multi-colored little beauties. It is well to consider what other flowers will be in bloom during a particular period. In late May, for instance, with iris and lilacs in full flower, the Darwins nearby should harmonize in pastel shades. And, early in April, when the rich-colored hyacinths take over, the tulips should accent their colorings.

Actually, I have more than fifteen hundred tulips at present, not counting a quart of nubbins which I shall plant in trenches to start propagation all over again. I have more than a hundred different varieties for my eight weeks of bloom, to which must be added my six pots of forced bulbs, which give me added weeks of indoor bloom in the winter.

### Tulips Are For Keeping

I do not believe that tulips are "annuals" to be discarded for new ones each year. Nor do I believe they will last "four" years—or for any other arbitrarily determined period. I do not know (on the basis of my own experience) that they last longer if they are planted "deep" in the ground and never dug out. But I do know they will not die if properly dug out and stored.

I somehow manage to accumulate tulips by hoarding—*i.e.* taking care of

them, curing them properly, sorting them intelligently, labelling them carefully, planting them properly, and by giving them as much TLC (Tender Loving Care) as I can. Yet, as you will see when I tell you about my cultural methods, I manage all this with only two big "Do's" each year—one in late spring, the other in the fall—and only ordinary gardening care during their Eight-Weeks-of-Bloom—plus brief potted-plant-care for the forcers in the winter.

From my own experience, the eighty bulbs for the Eight-Weeks-of-Bloom will not all "increase" in the same manner. Some will break down into several smaller bulbs. Some will give back a new bulb that is as big, fat, crisp, and perfect as the original—and they may keep up this amazing feat for a number of years before splitting into two or more. In a few instances, the original bulb, on dying, develops from the foliage a number of bulblets around one good big new bulb. Generally speaking, I get back each year approximately the original number of large-size bulbs, plus a good many "secondary" bulbs and also a considerable number of bulblets.

While any good variety can be expected to develop good "blooming" bulbs for the second or third year, or longer, some varieties seem to do better than others in this respect. I know this because I keep each year's bulbs separately. I am very much attached to the Darwin Hybrid 'Gudoshnik'; in fact, it is my all-time favorite, due to its large flowers, luscious shadings, tall, erect stems, and distinctive coloring. I cherish it also because it does not seem to deteriorate—my 1960, 1961, and 1962 bulbs gave me blooms that were almost equally beautiful.

### How to Have a Year-Round Garden

In rhapsodizing over the value of tulips as a flower for the average home garden, I have neglected one important point. If you want a "year-round" garden, plant tulips. The reason why I have a year-round garden (with the exception of the winter months when color is largely limited to evergreen foliage, berried shrubs, and colored barks) is because I grow so many tulips that it gives me plenty of room for other flowers, for which I would not otherwise have room. This sounds paradoxical but it is the simple truth.

From November until Decoration Day, my tulips hold the ground—planted in every available space in my "digging areas." Then they relinquish their claim, thereby providing plenty of free, diggable land in which I can immediately plant annuals, summer bulbs, roots, and tubers, as well as many other types of plants which might be neglected if I did not have all this "empty" land. Thus, from June to November, my double-duty space enables me to fill the garden with an assortment of blooming plants that help contribute to the "year-round color garden."

### Organization of a Double-Duty Garden

I have found that a housewife with a fulltime job and no gardening help can operate a double-duty garden successfully because it is easier and less complicated than a "mixed" type of garden with—like the three trees—"one plant there, one *there* and one *THERE*."

We live in suburban Westchester County, New York, in a colonial house on about an acre of land. About half of this space is taken up by the house, driveway and my husband's vegetables, asparagus, strawberries, raspberries, apple trees, compost piles, woodpile, and his double-duty bean-patch, where his boat rests all winter. Our property is shaped like a broad hairpin, with 684 feet of road frontage on two roads which join at the closed, corner end. The house is in the middle, with my husband's territory at the open-end of the hairpin, toward our next door neighbor. My garden, on the opposite side of the house, is at the closed-end of the hairpin. Behind the house, a high road runs along, twenty feet above our ground level, and is visible only from our second floor windows. A steep bank, covered with ivy, slopes down from the road to our ground level and is topped at road level by a stone dry wall. In front of the house, a quiet suburban road curves around our lawn and my garden in a big sweep, joining the high road at the end of the hairpin, where a huge black oak marks the junction and the narrow end of our property.

It was natural, therefore, for me to dig a horseshoe garden, averaging twenty feet in width around this hairpin curve, with a five-by-eight-foot lily pool at the apex as a focal point. Shrubs and trees

line most of the low road for privacy. On the other side, beneath the steep bank, is the sheltered rose garden which we dug four feet deep (for drainage) the year we moved in, in 1938.

A few years ago, I gave myself a fifty-foot-long digging bed between the roses and the steep useless bank, with a waist-high building-block wall in front, to contain the soil. The digging area is from three to four feet wide and I can sit on the wall to plant, walk along its top to rake, or work comfortably while standing on the ground in front. It saves many a backache, is protected by the bank behind, and gets sun in front. An ideal tulip bed!

The roses still live in their original bed. The peonies, which circle the entire horseshoe in the middle, have never been moved, separated, or even dug up. The entire fifty-seven peonies still bloom happily every year, although, of course, the plants have broadened and their blooms tripled. The lily bed is still in the same place, on its bed of wood ashes; although the bulbs are dug up and replanted every few years. And the oriental poppies have never left their first home; or been disturbed in any way.

The high-shade area beneath the giant black oak belongs to the columbines, lupines, canterbury bells, foxgloves, sweet william, and day lilies. Naturalized daffodils and other spring bulbs bloom behind the half-circle of peonies, later hiding the dying foliage of bulbs. The latter are dug up, when necessary, and replanted in the same half-shade area. The day lilies behind the peonies send their tall, slender stems and beautiful flowers above the peony foliage in July and August, but otherwise are hidden from view.

The open digging areas, including the new fifty-foot wall bed, takes up a large part of the long horseshoe in front of the peonies and also one large, wide area behind them where we dug out an old twenty-foot hedge of lilacs a few years ago. And another digging area is adjacent to the poppies, near the roses. All told, I have five large digging areas, which I keep free of perennials and other permanent plants for the purpose of having a year-round garden! Since tulips should not be planted more than three or four years in the same soil, I "rest" one of these areas each year, by planting it to young pansies and sweet william in the fall, using it for other plants next

June, then back to tulips the following fall.

The remaining digging areas are jam-packed with tulips each November. Since the perennials are in clearly defined areas, and all the flowering shrubs, lilacs, azaleas, grandiflora roses, astilbe, hosta, and other sizable "permanent treasures" also have their well-defined positions, I have no fear of disturbing a forgotten plant when I get out the digging fork and turn over the soil. "Dig we must" is my slogan when plantings tulips—and also in planting the summer garden which follows in the same soil. This is the secret of my easy system. Instead of slipping bulbs and summer plants in between various perennials, as is so often recommended, I plant them **ONLY** in freshly-dug, uncluttered soil.

### **The Second Half of the Double-Duty Digging Garden**

The culture of tulips is only part of a double-duty digging garden. Laying out the garden properly in the first place to allow for rotation, varied cultural needs, and for changing decorative effects, is all part of the same picture. The plants that follow the tulips include many tender bulbs, roots, tubers, and all the annuals which can be in the ground only part of the year. Dahlias, for instance, must be dug out each fall at frost time and replanted each spring. Why waste all winter long the land they use only in the summer?

Annuals are a natural for the year-round garden; they fill in the color scheme during late summer and early fall, and are good for cutting and for outdoor living. Since chrysanthemums must either be separated each year, or grown fresh from cuttings, I plant my best ones in the freshly dug digging garden, vacated by the tulips around Decoration Day. Come November, the tender mum varieties (spoons, quills, spiders, etc.) are dug up intact and moved to the cold frame, while the hardy ones are moved any old place until spring. This clears the land for tulips. Some chrysanthemums are in the perennial area as well, but once the tulips are gone, early in June, it is a temptation to plant them there.

So you see why I never underplant my tulips. I don't need to. I've got a better way.

### Spring Care for a Tulip Garden

So now, let's get to work: Assume that it is April—a good starting point for a spring flower. Every inch of my tulip ground will be bursting with little green shoots, except that the earliest of my Eight-Weeks-of-Bloom will already be in bloom, beguiling the neighbors with spring's return. From this point on, here is the procedure I recommend:

Clean off the tulip bed as early as possible. (It should have been raked clean in the fall.) Your bulbs may be up several inches before the ground settles, so be careful. The crisp leaves and flower stems are fragile and easily broken. Push back (with gloved hands) any heaved-out bulbs. Pick up twigs and leaves by hand. Pull out over-wintered weeds and lightly loosen caked soil around the bulbs with a hand cultivator, if you can do it without harm.

Fertilize all tulips as early as possible. I do this when they are a few inches high, using liquid fertilizer with the sprinkler nozzle on the watering can. I stand over the bulbs and drench the leaves and soil. (A good general soluble fertilizer, not too high in nitrogen, is best, although the standard 5-10-5, or 6-10-4 soluble types work fine.)

As your bulbs come into bloom, pick and enjoy them. I am diabolically opposed to precise, single rows of tulips which no one dares pick for fear of spoiling the "soldiers-on-parade" effect. Tulips do lend themselves to mathematical patterns and formal plantings in geometric designs, but the single file method, so frequently used, can look very sad—like a child with a tooth missing!

Whatever your type of planting—geometric, or in swoops or groups—plant them close enough so that it won't be noticed if one is missing. I pick mine constantly—bouquets for the office, for neighbors, for guests, for the house. Little blooms from five to eight-year old bulbs are perfect for making nursing home bouquets in quantity.

Tips in picking tulips: (1) Cut above the first (top) leaf, if possible. But never cut lower than below this one top leaf, even for the flower shows. Let the leaves stay on the plant to help promote growth of the new bulb for the following year. (2) Always "condition" your blooms overnight. The best method—if you plan to exhibit—is to place the selected flower

stems in water from the tap as hot as it will run, and set the bucket in a cool, shady place, where it will not freeze. Then cover the entire bucket with a large plastic bag and hold it in place by tucking the ends under the bucket. If you prefer, you can place bulbs for exhibition in tall milk bottles, or similar narrow-necked containers, and tie plastic bags over them. The bags should not touch the petals. I sometimes carry my exhibits straight to the flower show in such containers.

For ordinary enjoyment of well-conditioned tulips, however, the newspaper method works beautifully: Lay your blooms diagonally across a few sheets of opened newspaper. Turn up the bottom over the stems, and roll the paper into a cone shape. Set the bottom of the cone, rolled in a pail to hold the stems straight, in a few inches of water with the blooms exposed and untouched. The water will soak up through the paper. Or—for exhibiting—wrap each separate bloom in Saran wrap, or a similar "cling-ing" wrap, before you make your cone. Gently curve the blooms inward, with your hands, to close them almost into buds, as you apply the wrap. Then roll the full length of the stem in the newspaper and carry your bucket to the show.

(3) Tulips open their buds by day and close them by night for five days. Thereafter, they stay open and continue blooming for various lengths of time, depending on the variety, weather, age of the bulb, and other conditions. For exhibits, select those which are opening for the first or second day, so they won't open too wide and be floppy. Although tulips cut shortly after opening will usually last a week in a vase, they often bloom for a much longer period in the garden. Despite this, pick them freely and enjoy them.

Police your tulip bed regularly. Collect spent blooms carefully. Break off seed pods at once. If faded blooms have fallen, gather up the petals as you do with roses to prevent Black Spot, and burn.

Don't cultivate or disturb tulip beds. Other than to clean up dead blossoms, don't cultivate the bed until after the tulips have finished blooming—in this area this is about the third week in May. Above all, don't attempt to "underplant" early, whether or not you plan to remove the bulbs.

Generally speaking, the third week in May is the time to begin-to-get-ready-to-start-to-commence getting your tulips out of the ground! But "wait-on-the-weather." Suit your own convenience, letting the leaves ripen. You can afford to wait a few days. But don't procrastinate too long, for your earliest tulips are quite yellow by now and you will soon not be able to find them. Some of the late ones may be finishing their final burst of glory. But about Decoration Day, get going. *This is the time to dig out tulips!*

Before you protest, "But the man told me . . ." let me hastily explain that I am now ready to put in my annuals, dahlias, tuberous begonias, chrysanthemum cuttings, etc., and I want that land back for the summer. I'm grim about it. Mother's Day is our "last frost date" and I have now waited two weeks past this deadline. So it's TIME!

Furthermore, I have kept records over the years and I have found that the longer I put off this chore after Decoration Day, the higher percentage of lost tulips I will have. I mean LOST. From now on, it becomes increasingly difficult to find the bulbs, or to dig them out intact. If they remain in the soil, they will be endangered by my digging operations for the "summer" garden. I have been through this gruesome business of deep planting, too. Once I went down eighteen inches and lost nearly all the bulbs—and those that did come up again had such long, spindly white pipestems the following year, with inferior blooms, that they weren't worth saving. My bulbs go in trowel-deep and are easily removed by the first heave of my trusty digging fork. Sometimes I miss a tulip bulb and have found it again in the fall, when replanting the bulbs which have been dormant all summer. The one found in the ground is sodden, heavy, dark, and old-looking.

Collect supplies first. A digging fork, stacks of old newspapers, indelible or grease pencil, bushel baskets or grocery cartons in your wheelbarrow or wagon. And gloves!

Starting with the earliest blooms, fork out each group or variety. (This is a picayune distinction: If you have three "groups" of the same variety, purchased the same year, store them in *one* bunch. But I have four years worth of 'Gudoshnik,' so I store them for each year, even though it's all the same variety.)

Work gently, carefully. Leave a bit of soil clinging to the roots, shaking off the surplus. Lay the bulbs of the same variety, age, and color on several thicknesses of newspaper. Roll it up, label with a large, clear number (as explained later) and stand the bundle upright—with *all green leaves intact*—in a basket or carton, *bulbs down*. The newspaper should not cover the green tops entirely, but should hold them firmly, in their normal position. A dozen bulbs can be easily wrapped in this manner in each bundle of newspaper and stood upright without fear of breaking apart. Wrap them as you wrap the cornucopias for conditioning cut flowers, but be careful to double wrap the entire root system at the bottom. One good trick is to slip a vegetable bag over the bulb end for added protection at the bottom.

*Set the filled baskets in the shade.* Keep them off the ground by resting them on sticks, stones or bricks, with an inch of air space beneath; this prevents visitations by slugs. Leave the bulbs undisturbed for two or three weeks, until all the foliage turns yellow.

In the meantime, prepare the digging garden and replant. Rake and break up soil that was not turned over by the removal of the bulbs. I do not dig over the beds at this time, since soil-conditioners, fertilizers, and humus are turned under in the fall, when it is cooler. Now utilize the freshened land for your annuals—gladiolus plantings at two-week intervals, dahlias, and all your little summer treasures, tender plants and, possibly, even to sink potted house plants. If the bed consists of good fertilized, friable soil in full sun, set out your seedlings and cuttings without fear of cutting into spring bulbs. Your tulips are safe!

Use a work table, bench, or wheelbarrow to clean up the ripened bulbs. Keep varieties separate by handling each rolled-up bundle separately. Keep track of the label number. Remove all dried tops and destroy by burning. These are not for the compost pile. Leave "clumps" of new bulbs *intact* for now, shaking off the loose soil only. Now transfer each bunch of bulbs to a clean paper bag, or plastic vegetable bag with holes. Transfer the label number carefully, with indelible pencil. Old nylon hose may also be used.

I have found it good practice to protect my bulbs from disease by putting a

few grains of *Spergon* at this time, or less than  $\frac{1}{8}$  teaspoonful of sulfur dust, in each storage bag to prevent disease. Tulips do not need constant spraying, but this one annual preventive is excellent.

Store the bags loosely in a carton on a high shelf in the garage, or other cool place, out of the sun, where they will be safe from rodents, excessive humidity and moisture. The temperature of the storage place need not be controlled. If your cellar or basement is cool in summer, that is satisfactory provided it is not humid. The idea is that your tulip bulbs are now resting. By letting them remain dormant, they last longer.

If you have the room, you can let the baskets of bulbs ripen in your garage, or shed, rather than under a tree. Never dry them in direct sun, or in relative darkness, or the ripening green leaves will not have time to mature and send their nutrients downward to form the new bulb. In case early June is excessively wet, and your baskets are completely soaked, dry the bulbs off on flats or trays for a few hours before storing. Light rains will do no harm and the bulbs will ripen naturally. Just don't put your bulbs away sodden wet.

This ends the spring care of your bulbs. They now should be in complete dormancy.

### Autumn Care of Tulip Bulbs

I won 150 bulbs, as an award from the National Tulip Society, seven years ago, and they arrived at Thanksgiving, in a huge box decorated with overseas stamps. A note inside said, "We did not send these sooner because we were afraid you'd plant them too early." This is a good point to remember.

Plant Madonna lilies as soon as received, daffodils as early as you can get delivery, along with hyacinths and little bulbs. Leave the tulips until the last, although any time during November will do. I wait until frost has killed all the annuals, and the chrysanthemums have had a chance to complete their best blooms. Then I clean up the whole garden and prepare for winter.

Prepare the digging garden thoroughly in the fall, before planting tulips. This is the time for your once-a-year digging-up, turning-over and reconditioning of the soil. Since a tulip bed maintains two gardens a year, such conditioning is essential. Remove and burn all annuals,

pulling out by the roots. Fork out and store all dahlias and other summer bulbs, roots, or tubers. Rake the garden clean.

I find it simplest to apply my reconditioning material immediately after this raking, even though I may not get to the digging until later. First, I mix equal amounts of bone meal with dried cow manure and spread it over the raked land. Then I throw on many wheelbarrow loads of our thoroughly seasoned, two-year old, sifted compost. My entire digging garden gets at least two inches of this rich, black, homemade humus every autumn.

When weather permits and the ground is not too wet, I turn the soil over with my digging fork and rake it smooth. This should be done, preferably, a couple of weeks before one is ready to plant—to give the ground a chance to settle and the conditioners time to be thoroughly assimilated. However, no harm's done if you must plant immediately after digging.

Sort and clean the bulbs. Your bulbs, remember, were stored "intact," without taking off roots, husks, bulblets, etc. Now, working with one bag at a time to keep your varieties separate, rub off the dead roots, husks, and soil. Place all tiny bulblets no larger than a fingernail in a can, or throw them away if you cannot carry out my suggestions on that. But keep the small bulbs; they will make wonderful sources for cut flowers, massive displays, garden therapy, etc., for many more years.

With good varieties, I place the larger bulbs back in the bag, complete with label, ready to plant. The second size may go in another bag for a less conspicuous place; or may be planted right with the large ones, in the same grouping, for a more colorful effect. If I plant them separately, I number these, too, to keep track of older bulbs.

Prepare a bucket of rooting mixture. If you have a great many bulbs, you will need more than a bucket—but it is a simple matter to prepare more when you run out. I use three types: (1) Ordinary builder's sand, (2) half-and-half sand and sphagnum peat-moss, and (3) sphagnum peat-moss. All are equally good, easy to use, readily available, and satisfactory.

For many years, sand was my standby. I like it because a small handful clings to the newly-formed roots and helps them to take hold before a hard freeze. It also

has a certain sterilizing effect in the soil, to discourage bugs and grubs, as well as rot. Also, when I dig the bulbs out, the sand helps the bulb "break free" more easily. Then I discovered that peat moss is an excellent soil conditioner and very useful in setting out seedlings, cuttings, and tender plants, because it creates desirable conditions for root growth. It is not a fertilizer, but it is a good starting medium, and adds organic material to the soil. Therefore, when I am lucky enough to have a bale of peat, I mix it half-and-half with the sand.

Some of my less countrified friends insist they cannot get ordinary builder's sand, or have no place to store it. For such friends, I recommend that they use straight sphagnum peat-moss as a tulip planting medium, even though I insist that, horticulturally speaking, sand is a basic requisite for success with tulips.

Starting with your Number One digging area, take wheelbarrow, light shovel, rake, trowel, bags of your best bulbs, and the sand, peat or sand-and-peat mixture. Don't forget a pillow or old rug for one's knee and gloves. I suggest you use either one of two planting methods: (1) Shovel out the loose soil about trowel deep, from an area about the size of your opened arms. (Or a section of a border, if you are planning a straight border.) Spread an even one-inch layer of the planting mixture over this area. Kneel on your pillow and press the bulbs into the layer so that they stand upright about five inches apart. Shovel the soil back over them and continue your next "grouping"—after marking the bed with a wood or metal label. (2) Lay out in the ground an "arm-circle-full" of bulbs in one variety, grouping them attractively in a formal, or informal arrangement. Kneel on your pad, take a bulb in your *left* hand, and dig a hole trowel-deep in the soft earth with the trowel in your *right* hand. Now, pour a trowelful of the rooting mixture into the hole with each bulb. This sounds like petty detail, but it is important. The protective planting medium should be *under and around* the bulb, for faster root development, protection from disease and easier digging-out next spring. Also it holds the bulb *erect* while you throw soil back over it. It also promotes aeration and helps the bulb start a good, strong root system.

Drive a stake, or label marker, to mark the group, and fill in the hole.

Work around the digging areas, planting in your most desired locations first, with the best bulbs. Remember, however, to plant your earliest varieties in areas near the house, driveway, or patio where they can be seen and enjoyed from your windows. As with crocus and other early bulbs, you will enjoy having your first spring flowers where you can reach them readily; or where visitors can see them while your "main" garden is still snow-covered, or too muddy to visit.

Speed up the planting operation by planting grade-three bulbs in wide, open trenches. Using a string and stakes, spade out straight trenches, trowel-deep and about seven inches wide. Put about an inch of planting mixture on the bottom, then set in three rows of bulbs, two to five inches apart, in two-inch rows. This gives you a massed display of smaller flowers, wonderful for cutting. And the bulbs will be found readily in the spring.

Chart and label all your plantings. Perhaps I have been repetitious about the need for labeling varieties? But if you wish to exhibit, accurate identification is mandatory; and even if you don't, you'll want to know what is planted where, for your own satisfaction, and to be able to answer the questions that will be asked! Some chart and record system is necessary and the simpler the better. I chart each garden section, (for all my plants), on laundry shirt cardboards. I outline each group in ink and give it a number, then list the correct name of each variety opposite the number.

The stake in the garden may say only: "6 I A, '62," but when I look at the chart, I see that I bought six each, of ten varieties in 1962, and labelled them I A, '62 through X A, '62. The chart reminds me where I located them. When I cut for exhibiting, I merely look up my "I A," on my 1962 bill, and find that these six bulbs happen to be 'Eros', late, rose-colored doubles, which I hope will bloom in time for our May tulip show!

My system is very Rube Goldberg. I have twenty-four new bulbs now which I call "2 SP 1, '62" through "2 SP 12, '62," for instance, because I have the amateur collector's habit of buying only two of a kind when I cannot afford more. The "SP," of course, means "Special"—two bulbs, in 12 varieties, (numbered on my chart with their correct names), in 1962!

Last year, I bought several hundred white, plastic, permanent labels, which



can be written on with a soft pencil and which will not disappear all winter. Next spring, when I dig the bulbs out, I plan to place these little white stakes right *into* the newspapers, while the bulbs are ripening; and hence into the plastic bags for the summer with a far more systematic (and easier) labeling system than I have had heretofore.

### Eight Weeks of Progressive Bloom

I owe a great deal—both in acquired knowledge and in my collection of tulips—to Dr. and Mrs. Louis Kacmarynski of New Rochelle, New York; both are active members of the National Tulip Society and tulip hobbyist par excellence. They prepared the following table of bloom, although I have added my own favorites within the categories they originated and developed over these many years.

Although, technically, there are sixteen classifications of tulips, we have combined the last four to simplify this discussion. These twelve major types will provide approximately eight weeks of progressive and continuous color in the tulip garden. I say approximately because tulips, being a work of Nature, are not subject to production line scheduling—they do not bloom “every hour, on the hour,” or anything like it, in the average amateur garden.

The time of blooming of each type is affected by local conditions—terrain, the kind of spring, the kind of winter, and a dozen other factors. Furthermore, conditions that will hurry up one type will hold back another type. So the approximate blooming dates shown below for the New York area, may vary by a week or two. The wonder is that so many types so often hit these dates right on the nose.

#### *Type, Approximate Bloom Date*

1. Botanical Species and Species Hybrids; Late March, Early April
2. Early Singles and Early Doubles; Mid-April
3. Mendel; About April 20th
4. Triumph; About April 25
5. Late Doubles (peony-flowering); Early May
6. Cottage; May-flowering
7. Darwins; May-flowering
8. Breeders; May-flowering
9. Parrots; May-flowering

10. Lily Flowering; May-flowering
11. Darwin Hybrids; May-flowering
12. Rembrandts (Broken Tulips), Multiflowering, Viridiflora, and Greigii; May-flowering

### Description of Typical Tulip Varieties in Each Type

#### FORCERS:

Before describing the tulips I like best, in each category, here is a list of varieties—selected from the 12 types—which are suitable for forcing indoors. This extends the bloom period from January (and even Mid-December) through March. The varieties named have strong, erect stems, are not over-tall and are recommended by experts for forcing:

Mendel: ‘Her Grace,’ 19” white, widely-edged with pink; ‘Pink Gem,’ 16”, pure white edged with soft pink; ‘John Gay’ (new), orange-red; ‘Beauty of Volendam,’ 16”, feathered and flamed violet on a white ground; ‘Weber,’ white and pink; ‘Mirjoram,’ 21”, red with yellow edge; ‘White Sail,’ 16”, opens creamy-white, changes to pure white quickly, (can be forced to bloom by Dec. 25th.)

Triumph: ‘Bandoeng,’ 18”, dark mahogany-red, faintly-edged with yellow, (can be forced to bloom from Jan. 15th on); ‘Preludian,’ pink; ‘Rhineland,’ orange yellow.

Early doubles: ‘Maréchal Niel,’ 12”, canary yellow; ‘Scarlet Cardinal,’ 11”, good orange scarlet (can be forced to bloom by Dec. 15); ‘Peach Blossom,’ 12”, good rosy-pink, very erect with full double flowers (can be forced to bloom by end of February); ‘Orange Nassau,’ 12”, orange; ‘Murillo Max,’ 12”, delicate rose,

All of these are suitable for the garden, too. I have found it interesting to buy 8 (5 for forcing, 3 for the garden) to compare the blooms. The second year, the five forcers are added to the garden group for outdoor planting. (Care of forcers at end of article.)

### Twelve Classes of Tulips

#### *Botanical Species and Species Hybrids*

*T. kaufmanniana* selections: These short-stemmed beauties bloom very early in a wide range of colors and forms, frequently multi-colored, and/or multi-flowering, with stripes, spotted or mottled effects. I have always planted mine

in the regular digging garden; but recently I learned that these may be a type of tulip I could safely leave undisturbed in the ground for many years. So, next year, I shall experiment and plant half of each variety in my "perennial" garden—probably the rock garden—and the other half will be dug out as usual. Should be interesting to compare the blooms the next spring. Favorite varieties include: 'Stresa', 10", golden yellow, with orange-red bands on outside of segments, interior yellow, with red markings at base; 'Johann Strauss', 8" white flower with cream center, exterior flushed with red; 'Waterlily', 6", creamy-white marked with slight carmine-red centers, opening with points like a waterlily.

*Peacock* (dwarf) These are really an "Elite Mixture" raised from crossing *T. greigii* with *T. kaufmanniana*. They are very short with sturdy stems, and come in an incredible range of colors, forms and markings, with several blooms to a bulb and all making a gay rainbow pattern in a low bed, in early spring.

*T. fosteriana*: These are the incomparable Bokhara tulips, found growing wild on the mountain slopes of the Asiatic desert, tall, with large flowers and brilliant colors. Best known are: 'Red Emperor', 16"-20", with colossal blooms on erect stems, orange-scarlet, base black, bordered yellow, sturdy grower, one of earliest to bloom; 'White Emperor' (Purissima) as large in stem and bloom as 'Red Emperor,' but with a feeling of more delicate loveliness. I plant them together, as they bloom at the same time.

*T. clusiana*, 9", (The Lady Tulip), often called the Peppermint Stick, outer petals cherry-red, inner petals white, violet base.

*T. acuminata* (*T. cornuta*, *T. stenopetala*), 18", called a "spider" due to its unusual shape, primrose-yellow suffused scarlet, very hardy.

*T. marjolettii* 18", creamy-white flushed pink, edged rosy-red (late flowering and long-lasting, one of several botanical species which flower in late April and early May.)

*T. praestans* 'Fusilier', 10", multi-flowering, orange-scarlet dwarf, producing several flowers on each scape.

*T. turkestanica*, 8", multiflowering, with 5 to 9 flowers on a scape, creamy-white with green and bronzy flush on exterior.

### **Early Singles and Early Doubles**

Early Single: These are useful for bedding purposes, or for garden borders. They do not have the size of bloom and length of stem of the May flowering types, so may be effectively planted in front of the late types. *Varieties*: 'Couleur Cardinal', 12", cardinal-red, erect habit, lasting qualities good, in cultivation since 1815; 'Keizerskroon', 15", scarlet and yellow; 'Prince Carnival', 15", fragrant, red and yellow.

Early Double: Discussed under *forced* bulbs.

### **Mendel**

These, too, are discussed under forced tulips. But I have found that 'Her Grace' is particularly lovely in the garden and is good for garden-show exhibition. In the garden, Mendel tulips bridge the season between the Early Singles and the Triumphs.

### **Triumph**

These tulips are admired for their strong, tall stems and vigorous habit. They flower immediately after the Mendels in self-colors, bicolors, flushes, stripes and margins. In addition to the Triumphs discussed under forced tulips, 'Bruno Walter', 18" deep brownish-orange, is a lovely garden variety, which blends well with other muted colors.

### **Late Doubles (Peony Flowered)**

Some authorities indicate that the Late Doubles are really Double Triumphs and their characteristics are similar. They include new colors, sturdy habit, strong stems, and very beautiful flowers. They will not object to some shade. *Varieties*: 'Eros', 22", a clear old-rose and a good thick double; 'Mount Tacoma', 22", looks like a large, double Chinese peony, lasts well when cut, peerless white; 'Clara Garder', 18", clear pink with light lilac-purple inside, white base, double flowers and great substance; 'Gold Medal', 18", deep golden-yellow, good cut flower.

### **Cottage**

I am very fond of Cottage tulips, because of their clean, crisp blooms, tall, straight stems and long period of bloom, both in the garden and for cutting. They are good for exhibiting, with many fine varieties from which to choose. Among my favorite varieties are: 'Mrs. John T. Scheepers', 34", pure yellow, truly a

giant, with long oval-shaped blooms, highly recommended; 'Dreaming Maid', 26", deep lilac-mauve merging into silvery-white at margin of petals; 'Princess Margaret Rose', 21", yellow-edged with bright scarlet; 'Rosy Wings', 24", a luscious salmon-pink, changing to pink, flowers long and open to great size; 'Henry Ford', 20", deep pink changing to cherry red on white base; 'Advance', 24", orange-scarlet, overlaid with a dusty shade, fine grower.

### **Darwins**

Darwin tulips are May-flowering and fill a great need in the garden, when the early spring flowers are gone and early perennials not yet in bloom. Self-colored, with long upright stems, they are showy and long-lasting in the garden and when cut. Here are a few I like out of the hundreds of varieties on the market: 'Aristocrat', 30", violet-rose with lighter edge, splendid carriage, bulbs last over well; 'Clara Butt', 25", soft pink, flushed with salmon-rose, base white, with small blue-gray markings; 'Niphetos', 29", soft lemon yellow; 'Smiling Queen', 28", satiny-pink with flush of rose-pink on outer petals; 'Sweet Harmony', 26", lemon yellow, edged with ivory-white and yellow anthers, very beautiful; 'Insurpassable', 28", large lilac flowers on tall stems; 'Magier,' (Sky), 26", white, splashed with soft purple at edges of petals.

### **Breeders**

These are large tulips, with huge flowers, in rich shades and tints of autumnal purple, gold, bronze-orange, yellow, soft copper and combinations of such colors. Of vigorous growth, and perfect proportion, they are not enough used in the garden. Varieties: 'Georges Grappe', 34", soft mauve with a clear blue base, recommended for exhibition because of huge flowers and long stems; 'Dillenburg', 26", salmon-orange, shaded with rose, of great beauty and substance, blooms late; 'Papago', 32", deep brownish-red and rich scarlet-red inside with a yellow base; 'Chappaqua', 32", cherry-pink flower of perfect form; 'Indian Chief' (Meyerbee), 34", reddish-mahogany flushed with purple; 'Louis XIV', 32", rich purple, heavily flushed, golden-bronze at margin of petals, inside bronze, shading to bronzy-purple and lilac, globular flowers of gigantic size.

### **Parrots**

I find these gorgeous flowers with their heavily lacinated petals very fascinating to grow. They are effective in the garden and for arrangements as well. They last well in water. Parrot tulips with lacinated petal segments are sports having risen from various groups of cultivated tulip. *Varieties:* 'Fantasy', 22", soft rose with gaint stripes and featherings of apple-green on outer petals, a sport of the Darwin 'Clara Butt', free flowering; 'Texas Gold', 16", a sport of 'Inglescombe Yellow', with the same golden yellow color; 'Blue Parrot', 24", flushed steel-blue, large flowers; 'Orange Favorite', 22", orange-scarlet tinged with old rose with faint featherings of apple-green on outer petals with yellow base.

### **Lily-Flowering**

These I love with their elegant, slender stems, topped by pointed, reflexed petals. *Varieties:* 'Captain Fryatt', 24", (an old favorite) dark ruby-violet with violet-blue base, they look maroon-red in the garden; 'White Triumphator', 30", pure white longish-shaped, lofty height; 'Maytime', 20", purplish-violet broadly-edged white; 'Queen of Sheba', 20", deep scarlet-brown broadly margined yellow, long shaped flowers; 'Marianne', 26", delicate salmon pink, beautiful texture, noble bearing; 'Marcellina', 24", rich salmon-pink overlaid with rosy sheen.

### **Darwin Hybrids**

As I mentioned earlier regarding 'Gudoshnik', I have discovered from experience that my Darwin Hybrids are good keepers and hold up year after year. They have strong stems, cut well and never droop in the garden. My favorites are: 'Gudoshnik', 26", creamy-peach faintly streaked and dusted with rosy-red on outer petals; 'Holland's Glory', 22", a warm scarlet; 'Empire State', a huge, tall, clear red; 'Ballet', new, yellow; 'Orange Sun', 22", orange, new; 'Dover', orange red, new.

### **Rembrandts and Other Special Types**

Rembrandts: In the early days, as far back as 1554, the most desirable tulips were those called "broken." The more this type was provided with a feathered, flaked color scheme and an ornate pattern of the flower, the more expensive were the bulbs. Those which were

"Broken Darwins" were called Rembrandts, with stripes of lilac, purple, or red on a white ground. The Bizarres and Bybloemens were "Broken Breeders." For many years, I grew Rembrandt tulips without knowing the variety name—in lilac-purple tones on a white ground. They eventually deteriorated and I did not replace them, although I loved their great, rich beauty and size (short stems, large flowers). But I found that flower show judges were antagonistic to all broken tulips! In fact, there is considerable controversy about all broken tulips having a virus. I am not competent to judge. At present, I am trying out one new Rembrandt variety, 'American Flag', 28", brilliant deep red with broad marbled white lines and markings and am looking forward to starting a new collection!

*T. greigii*. This is a magnificent red, or scarlet tulip of the same series as *T. fosteriana* from Central Asia, but easily distinguished from all other species by the prominent dark, mauvish-purple mottled and streaky markings on the broad leaves. The stems are stout, up to 2 feet tall. The flowers are large, opening to a wide cup, with the tips of the segments reflexed, but they are not in plentiful supply and varieties are limited, 'Pandour', 10", is of short height, with large wine-red flowers of fine poise and with the characteristic marked and mottled leaves. I am growing them as an experiment.

*T. viridiflora*. I have grown these "green" tulips from many years and am very enthusiastic about them, except for one thing. Sometimes judges have turned down my most exquisite and perfect blooms and written on the back of my entry card, "This flower is diseased," which makes visitors look at me as though I had leprosy. I have been told on high authority that viridiflora tulips do not have a virus; but the controversy goes on. The variety 'Greenland', 20", has luminous deep old rose petals with a broad green central band, diffused creamy-yellow edging, the interior a 'Mother of Pearl' sheen. Long lasting, the bulbs keep for years and I like them, not only for their rare beauty and long-lasting qualities in the garden and in the house, but also because they are usually the very last tulips to bloom. Although the National Tulip Society recommends that Tulip Shows in this area be held

"not later than the middle of May," I have competed in many so-called "tulip" shows during the 3rd and 4th weeks of May, missing full classifications of long-since departed tulips at which my viridifloras were the only tulips exhibited. On one such occasion, the judges refused to give me any award, whatsoever, although my blooms were in perfect condition. My "virus" was the talk of the show! I might add that I have never had any of my other tulips "catch" any disease, or virus, from my beloved viridifloras. Another excellent variety, incidentally, is 'Artist', 10", in color combinations of terra cotta and green.

### How to Plant and Force Tulips

Tulips are forced to bloom ahead of their regular schedule by planting them in ordinary clay pots and subjecting them to a prolonged period of cold, then bringing them into indoor temperatures and light.

Allow a *MINIMUM* of ten weeks of cold (at least 40° F.) before pots containing bulbs are brought indoors. Pots may be brought indoors successively after that. Allow an additional five weeks until full bloom. I have six pots and bring them in at two-week intervals, which give me continuous bloom from the time the first bursts into bloom. If you start your ten weeks in early October, you will have bulbs in bloom for Christmas. However, since we usually have plenty of gay holiday color, I plant my forcers in November and aim for blooms by mid-January. You can continue forcing until Easter.

Plant five bulbs per "bulb pan," about 7" across the top. Provide usual crockery or pebbles for bottom drainage in clay pots. Make enough soil mixture for all the pots you plan to use: Bone meal, dried cow manure, peat moss, compost and garden loam in a rich humus mixture. Set the bulbs upright, flat side towards the outside of the pot, so that the tips are just below the soil surface, at the same distance. Leave one-half inch space for watering. Water thoroughly. (I water twice again, in the next few weeks.)

Sink the pots in a protected place. Dig a trench below frost level, and cover with sand topped by leaves. Or sink in the cold frame. Or place the pots in cartons or bushel baskets, filled with leaves and covered with burlap or canvas on an un-

heated sunporch or garage. The idea is to let the bulbs get cold, but *not to freeze*.

My method is to place the pots in a clockwise circle (numbered on a chart, matching grease pencil numbers on the clay pots) in a window well outside the kitchen window. They rest on a bed of loose, fluffy leaves, with more dry leaves over them. I cover the leaves with an old piece of sturdy canvas to prevent excessive wetness, or matting, and to keep out heavy snows; rhododendrons shelter them from above. Another possible place is under thick evergreen shrubs, or trees, with heavy foliage to protect them from deep snow, in boxes or baskets, filled with leaves to prevent freezing.

*At the end of ten weeks of cold, bring in the first pot.* Place in a dark, cool closet for a week or so, watering enough to keep the soil damp (this time may be shortened in late winter when the bulbs are already sprouting). When the shoots are up about 2 inches, bring into sunlight and warmth. Water regularly. While blooming, keep out of direct sunlight. After blooming, cut off seed pods and leave all the foliage intact. Set the pot in a light, inconspicuous place and keep on watering until the leaves die down naturally. If you let them dry out at once, no new bulbs will be formed. Then, remove dried foliage and store pot and bulbs until fall planting time. Plant bulbs in garden thereafter, since bulbs for forcing can be used only once for that purpose.

#### **How to Develop Small Bulblets Into Big Bulbs**

When bulbs are left in the ground, they deteriorate and eventually disap-

pear. But when they are permitted to go dormant *out of the ground*, they can be used again for many years. Sort them into various sizes. The large bulbs and secondary size can then be planted again straight into the garden. But there will always be a sizable collection of small bulbs and/or bulblets, which are too small for planting immediately. Although some of them might bloom, others will develop only one leaf and no flowers, giving a spotty effect in the garden. But you can save them by trying the following methods:

1. Plant them in a wide trench, about 4 inches deep, which has had superphosphate added during the soil preparation, in addition to the usual bonemeal, dried cow manure and compost. Spread an inch of your planting mixture (sand or peatmoss) in the bottom of the trench and place the bulblets upright in it, quite close together. Fill in trench with earth.

2. If flower buds appear, break them off directly beneath the bud. Allow no buds to mature into flowers. Permit the foliage to mature naturally.

3. Feed in early spring with complete fertilizer; nitrogen, phosphorus, and potash.

4. Leave the bulbs in your propagating bed all summer and repeat the treatment a second year, including superphosphate in the fall, the fertilizer in spring and nipping buds.

5. The NEXT year, let the flower buds form. These will be big blooms, from big bulbs. Dig out, in June, dry and store, as you do with your regular beds and start over in your propagating trench with another set of bulblets.



U. S. DEPARTMENT OF AGRICULTURE

*Carissa grandiflora*

# The Natal Plum

HAROLD F. WINTERS\*

Of the many tropical and subtropical fruits called "plums" by English-speaking residents of the tropics, the Natal Plum or Carissa, *Carissa grandiflora* A. DC., is most striking in appearance. Although grown for the edible fruits, it is valued as a hedge plant and is fruitful even when kept trimmed. It is useful as a landscape subject on properties close to the ocean because of its tolerance to salt spray and resistance to damage by wind.

The glossy dark-green opposite leaves are broadly ovate and obtuse to mucronate tipped, thick, and leathery, 1 to 2 inches long. Each flush of growth is terminated by two forked spines,  $\frac{1}{2}$  to 2 inches in length. The white tubular flowers are born in cymes or singly at the ends of the main branches and on the short laterals. They are delightfully fragrant with the odor of jasmine. The 2-inch corolla is composed of five ovate lobes twisted to the left in bud. Five stamens are inserted inside the slender inch-long tube. A clavate stigma surmounts the superior two-celled ovary.

The nearly spherical to ovoid fruits may obtain a diameter of  $1\frac{1}{2}$  inches and a length of nearly 2 inches. They are of an attractive cerise-red color when ripe. A smooth soft skin encloses the reddish pulp in which are embedded a few to several thin circular seeds. The pulp exudes a white milky latex when cut or bruised. Flavor of the fruit varies from sweetish to tart depending upon maturity and variety. The partly ripe fruits make excellent jelly and fully ripe ones delicious sauce, tasting very much like that made from cranberries. Fresh fruits usually are too tart to eat out of hand or for dessert unless sprinkled with sugar. As a component for fruit salads they add a sprightly flavor and color accent.

Although the Natal Plum belongs to the Apocynaceae, a family containing

many poisonous plants, the fruits are edible and by some described as delicious. It is native to the coastal region of Natal where it is called "amatungula," but is also found far inland even in the Transvaal (12), where it was probably introduced as a hedge plant and for the fruit. Although normally a bush, the plant may reach a height of 15 to 18 feet.

The Natal Plum is said to have been introduced into Florida by Theodore L. Mead in 1886, but David Fairchild (1) of the former Office of Foreign Seed and Plant Introduction (now New Crops Research Branch) of the United States Department of Agriculture gave the greatest stimulus to growing it in this country by importing a large quantity of seeds from the Botanical Garden at Durban, Natal, where he had seen the plants growing and tasted the fruit for the first time in 1903. From this importation, P.I. No. 11734, several thousand plants were grown and distributed by the Plant Introduction Garden located at Miami, Florida. Plants of this and subsequent introductions were distributed for testing in Florida, the Gulf Coast area, and California. Reports from several of the cooperators indicated considerable interest in the plant from 1910 to 1915 (5, 6, 8). The greatest success in its cultivation was obtained in southern Florida and in the warmer parts of California. In this country the plants tolerate temperatures as low as  $25^{\circ}$  to  $27^{\circ}$  F., with an occasional report of survival after a low of  $22^{\circ}$ . Much of the credit for the popularity of the Natal Plum is due to Edward Simmonds, Superintendent of the Miami Plant Introduction Garden when it was introduced. Mr. Simmonds not only tested and propagated the introductions but carried on an extensive correspondence about the plants distributed. His reports constituted an extensive file on the subject. Departmental officials also contributed in other ways to the information concerning the subject. The discussion about the genus *Carissa* included

\* Horticulturist, New Crops Research Branch, Crops Research Division, Agricultural Research Service, U. S. Department of Agriculture, Beltsville, Maryland.

by L. H. Bailey in *The Standard Cyclopaedia of Horticulture* was prepared by S. C. Stuntz (11), Botanical Assistant, and the separate article on "Natal Plum" by F. W. Popenoe (7), Agricultural Explorer, both with the former Office of Foreign Seed and Plant Introduction, Washington, D. C.

At present perhaps more use is made of the plants as ornamental shrubs than for fruit production and dwarf forms with shorter spines have been selected. The dark green foliage, dense bushy habit, attractive flowers, and fruits make it ideally adapted for planting as hedges. In addition, the spiny branches form an impenetrable barrier to trespassers. Specimen plants are included in botanical collections throughout southern Florida and California and in the Bahamas (4) and West Indies (2).

In a study of composition of tropical and subtropical fruits, Stahl (10) found fruits of the Natal Plum to average 23.4 grams in weight with a specific gravity of 0.96. They also averaged 7.0% seed, 6.5% skin, 86.5% edible pulp, 81.4% moisture, 1.8% citric acid, 1.6% oil, 0.5% protein, 0.3% ash, and a total of 6.0% sugars. The acid value, 1.8 per cent, was greater than in most of the fruits tested other than citrus.

Although little horticultural attention has been given the Natal Plum in comparison with many other plant introductions, a few superior varieties have been selected in California and Florida. Usually selections were made for superior size of fruit and ability to bear. One of the most prolific bearers in Florida was named 'Gifford' for Dr. John C. Gifford of Coconut Grove. An "extra sweet" variety is presently being advertised for sale by a Florida nurseryman. The 'Alles' (Chesley) variety is mentioned by Schroeder (9) as a shy bearer in California. Irregular fruiting behavior is thought to be the reason the Natal Plum has not been more widely planted as a commercial fruit in this country. Seedling populations are extremely variable in fruiting. Many of the seedlings will not fruit at all and usually only a few in a given population will fruit well.

Unfruitfulness of *Carissa* seedlings has received the attention of botanists in South Africa, where the Natal Plum is of commercial importance. Wood and Evans (13) reported observing two kinds

of flowers borne on different plants. One form, which was said to be functionally male and never to bear fruits, was generally larger and structurally different in having larger anthers and stamens much longer than the style. In the functionally female form, the stamens were of the same length as the style but the anthers were smaller and never seemed to contain pollen. In a study of seedling populations made in California, Schroeder confirmed the occurrence of heterostyly. His experiments indicated that distinct benefits result from cross-pollination in nearly all cases. The 'Frank' variety was mentioned as being a poor cropper at times, although it produces pollen. This partial self-sterility was thought to be of a genetical or physiological nature. 'Torrey Pines,' a very fruitful type, was found to bear abundant pollen. Most of the other individuals lacking pollen were found to produce fruit when cross-pollinated by hand.

In their native habitats, species of *Carissa* are thought to be pollinated by species of night-flying insects, especially hawk-moths and by tiny beetles the size of thrips (3), but in this country little attention is paid to the flowers by insects.

The Natal Plum may be propagated by seeds, cuttings, or grafting. The seeds are removed from the fruits and planted in pots or flats of a well-drained compost mixture. As the seedlings develop they are transplanted to other pots or flats. When well established they are moved to field nurseries. Seedlings often start to produce fruit during the second year. Propagation by soft-wood cuttings is possible with bottom heat, but a more satisfactory method was developed by Edward Simmonds at the old Plant Introduction Garden on Bricknell Avenue in Miami. The terminals of young branches were sliced and broken over, but left attached to the parent plant. In about two months, when callus had formed at the break, the cuttings were removed and rooted readily in ordinary outdoor sand beds with light artificial shade. The Natal Plum may be propagated by layering and this method is used where only a few propagations are needed. Propagation is also possible by shield budding on seedlings during the spring. The plants are not particular as to soil type but perform equally well on the sand or limestone soil of southern



Florida or the adobe soils of southern California. Excessive soil moisture is detrimental to growth of the plants.

Several species of *Carissa* have been introduced for trial in the United States besides *C. grandiflora*. Of these, one of the most interesting is *C. edulis* Vahl, a straggling evergreen shrub native to tropical Africa. It bears dark-green leaves 3 inches in length and white or purple flowers, also jasmine scented but smaller than those of the Natal Plum on axillary or terminal inflorescences containing five to ten flowers each. The fruits are globose or oblong in shape, 0.5 to 0.75 inch in diameter, and dark purple to black at maturity. The Karanda, *C. carandas* L. a dense spiny shrub of India, has fruited in southern Florida. It forms an evergreen thorny shrub smaller than *C. edulis*. The small dark-green leaves are elliptical to ovate and the fragrant white flowers are produced terminally on branchlets. The globose fruits are about 1 inch in diameter and red or purple-black when mature. In India the fruits are picked green for pickling and are considered the best of all Indian fruits for tarts and puddings, when ripe. They can be eaten as dessert fruits or used to make jellies and preserves. Each fruit contains two or three small seeds embedded in the reddish pulp. Propagation is the same as for *C. grandiflora*.

## References

1. Fairchild, D. *The World Was My Garden*. 494 pp. illus. New York, 1938.
2. Kennard, W. C., and H. F. Winters. *Some Fruits and Nuts for the Tropics*. Misc. Pub. No. 801, Agr. Res. Service, U.S.D.A., 135 pp., illus. 1960.
3. Marloth, R. *The Flora of South Africa*. Vol. 3, Sect. 1 (1932) p. 61. London. 1932.
4. Morton, K. and J. Morton. *Fifty Tropical Fruits of Nassau*. 118 pp., illus. Coral Gables, Fla. 1946.
5. Mowry, H., L. R. Toy, and H. S. Wolfe. (Revised by G. D. Ruehle) *Miscellaneous Tropical and Subtropical Florida Fruits*. Fla. Agr. Ext. Serv. Bul. 156-A, 116 pp., illus. 1958.
6. Popenoe, F. W. *Tropical and Subtropical Fruits in California*. Journal of the Royal Horticultural Society 39, Part 2:332-337. 1914.
7. Popenoe, F. W. Natal Plum. P. 2114 in *The Standard Cyclopaedia of Horticulture*, 3 v., edited by L. H. Bailey. New York. 1935.
8. Popenoe, F. W. *Manual of Tropical and Subtropical Fruits*. 474 pp., illus., New York. 1920.
9. Schroeder, C. A. *Heterostyly and sterility in Carissa grandiflora*. Proc. Am. Soc. Hort. Science 57:419-422. 1951.
10. Stahl, A. L. *Composition of miscellaneous tropical and sub-tropical Florida fruits*. Fla. Agr. Expt. Sta. Bul. 283, 20 pp. 1935.
11. Stuntz, S. C. *Carissa*. p. 664 in *The Standard Cyclopaedia of Horticulture*, 3 v., edited by L. H. Bailey. New York. 1935.
12. Verdoorn, I. C. *Edible wild fruits of the Transvaal*. Bul. No. 185, Dept. of Agr. and Forestry, Plant Industry Series No. 29, Union of South Africa. 1938.
13. Wood, J. M. and M. S. Evans. *Natal plants*. V. 1, Part 1, pp. 14-15 and Plate 14. Durban, 1898.

# Rooting and Night-Lighting Trials with Deciduous Azaleas and Dwarf Rhododendrons

C. J. WEISER<sup>1</sup> and L. T. BLANEY<sup>2</sup>

Rhododendrons and azaleas are among the most spectacular and magnificent of our flowering shrubs. They are especially so on the Pacific Coast from San Francisco northwards through Oregon into British Columbia. Blessed by the moderating influences of the prevailing winds off the adjacent Pacific and sheltered by high mountains to the

east, gardeners in this sheltered region can grow successfully many of the tender species and an almost innumerable list of cultivars.

Until fairly recently nurserymen propagated rhododendrons by layerage or by graftage upon a seedling rootstock. Since the first method is slow and the number of plants obtainable from a mother plant is small, and the second method requires a supply of rootstock plants and skillful handling, nurserymen must

<sup>1</sup> Assistant Professor, Department of Horticulture, University of Minnesota, St. Paul 1, Minnesota.

<sup>2</sup> Associate Professor, Department of Horticulture, Oregon State University, Corvallis, Oregon.

perforce charge prices which are often prohibitive to people with limited budgets. Consequently, many gardeners who would like to grow these beautiful plants either do not, or accede to an extent much more limited than would otherwise be. This is especially true of the magnificent new deciduous azaleas which are more difficult to increase by cuttage and to grow into a saleable plant than are most rhododendrons.

Since the advent of root-inducing chemicals and mist propagation, the rooting of cuttings of rhododendrons has become a commercial commonplace. Deciduous azaleas, on the other hand, still defy attempts to propagate cheaply and easily by cuttage. If the cuttings are taken at the proper time, are treated with rooting hormone, and placed under mist, deciduous azaleas will root satisfactorily within a reasonable time. The stumbling block has been that the rooted cutting generally failed to grow and eventually died. Kraus (3) in 1953 reported in this journal his observations that deciduous azalea cuttings, when taken early in the growing season, rooted readily and grew if the terminal buds were pinched out. Then the lateral buds sprouted and the rooted cuttings successfully established themselves. Not long afterwards, Doorenbos (1) reported that seedling rhododendrons under constant illumination grew continuously and came to flower in about half the usual time than when grown under the natural prevailing daylengths. Since then we have reported (7) on experiments in which deciduous azalea cuttings were grown to a marketable size in less than a year from the time of taking the cutting. This was accomplished by taking the cuttings in June when the flowers were fading, treating with indolebutyric acid, rooting under mist, pinching out the terminal buds after the cuttings had rooted, and maintaining them under constant illumination.

Hemberg (2), a Swedish plant physiologist, first reported in 1951 that boron greatly stimulated the growth of roots on bean cuttings. Canadian workers (4) subsequently reported that the rooting of softwood cuttings of black currant and geranium was stimulated by boric acid. We have also shown that clematis (5) and English holly cuttings (6) rooted in greater numbers and with

more and longer roots in a shorter time when treated with boric acid in combination with indolebutyric acid.

In the light of these favorable experiences, the trials whose results are discussed here were carried out. Trials were conducted at Oregon State University in 1958-59 for the purpose of (a) finding out if deciduous azaleas and dwarf rhododendrons could be rooted in appreciable numbers from cuttings and (b) testing the effects of several supposedly stimulating treatments on the subsequent growth of the rooted cuttings.

### Deciduous Azalea Rooting Trial

Cuttings of 14 cultivars and four species of deciduous azalea were used in rooting tests in the spring of 1958. A total of 467 softwood cuttings were taken during the first week of June after the flowers had faded but before the new growth became too woody. The basal leaves were removed and the three- to four-inch long tip cuttings were soaked overnight with their bases immersed in one of four water solutions before "sticking" in the sand rooting medium. The solutions were (a) water (control), (b) 50 parts per million indolebutyric acid (IBA), (c) 50 parts per million boric acid (B), and (d) 50 parts per million IBA + 50 parts per million B. The cuttings were rooted under intermittent mist with 75° F. bottom heat for a total of four months. The mist was on 15 seconds out of every three minutes during the daylight hours. At the end of five weeks some cultivars had rooted appreciably; others took twice as long. Table 1 summarizes the rooting percentages for all cultivars after four months.

Table 1: Summary of rooting response of deciduous azaleas

Treatment	Average per cent rooting
Water	48
IBA	78
Boron	56
IBA plus Boron	74

Under the conditions of these tests, the highest percentage of cuttings rooted after treatment with IBA. Boron did not enhance the effectiveness of IBA. Boron when used alone was more effective than water alone but it was much less effective than was IBA alone. The responses

of the various cultivars and species are shown in Table 2. It is to be seen that the cultivars and species varied widely in their rooting response and ease of rooting. But the results certainly suggest that many of these plants root readily enough to make propagation by cuttage practical. 'Bullfinch,' *R. austrinum*, 'Avocet,' 'Irene Koster,' and 'Kraus 55-8,' which rooted quickly and in high percentages, are particularly well adapted to this method of propagation.

### Dwarf Rhododendron Rooting Trial

In July of 1958, 1240 softwood cuttings were taken from 11 cultivars and two species of dwarf rhododendrons. At this time, following flowering, the new

vegetative growth for the season had reached its full length and the new leaves were expanded to almost mature size. Following the removal of several basal leaves, the tip cuttings were given the same four treatments as the deciduous azaleas except the concentrations of both the indolebutyric and boric acid were 100 parts per million instead of 50 parts per million as before. After treatment the cuttings were rooted in flats containing a mixture of acid peat, perlite, and sand at a ratio of 1:1:1. Mist and bottom heat were supplied as for the azaleas.

A summary of the percentage of rooted cuttings after 110 days is shown in Table 3.

Table 2. Effect of Treatments on Rooting of Deciduous Azaleas

General Category	Cultivar or Species	Per Cent Rooting				Average
		Water	IBA	B	IBA + B	
Mollis Hybrids	C. B. Van Nes	0	75	40	60	42
	Kraus 55-8*	100	86	100	100	96
	Mrs. Oliver Slocock	67	83	67	83	75
	Alice de Steurs	17	33	0	33	21
Ghent Hybrids	Altaclarensis	100	100	89	89	94
	Nancy Waterer	50	62	13	75	50
	Unique	40	75	20	33	41
	Sang de Gentbrugge	57	71	0	43	43
Occidentale Hybrids	Kraus 55-12*	0	100	100	100	78
	Irene Koster*	0	80	0	100	53
Knap Hill or Exbury Hybrids	Aurora	0	40	0	40	20
	Bullfinch*	56	100	89	100	86
	Avocet*	0	100	75	100	69
	Satan	0	67	44	44	40
Miscellaneous Species and Selections	<i>R. occidentale</i> selection*	71	100	100	100	93
	<i>R. serrulatum</i>	100	100	71	100	93
	<i>R. schlippenbachii</i>	0	17	17	0	9
	<i>R. austrinum</i> *	100	100	100	100	100

\* Indicates varieties which had rooted appreciably after five weeks.

Table 3. Effect of Treatments on Rooting of Dwarf Rhododendrons

Cultivar or Species	Per Cent Rooting				Average
	Water	IBA	B	IBA + B	
Thom Williams	67	57	80	43	59
Temple Belle	21	66	90	57	57
Wilbar	77	75	80	88	80
Blue Diamond	80	85	85	90	85
Royal Flush	40	67	17	50	43
Blue Tit	59	78	94	90	81
Bowbells	100	79	90	94	90
Jock	71	87	95	97	88
Elizabeth	80	100	88	85	88
Unique	68	70	67	80	71
Fabia	48	67	88	79	71
<i>R. racemosum</i>	30	0	7	26	3
<i>R. augustinii</i>	38	20	11	22	23
Treatment Averages	55	66	72	70	

Table 4. Shoot Growth of Deciduous Azaleas Under Prevailing Daylengths and Constant Illumination

Cultivar	Under Prevailing Daylengths				Under Constant Illumination			
	Av. Stem Length	Av. No. Shoots	Av. No. Main Shoots	Number of Plants*	Av. Stem Length	Av. No. Shoots	Av. No. Main Shoots	Number of Plants*
	(inches)				(inches)			
Kraus 55-8	11.9	4.1	1.6	10	67.1	13.3	3.2	10
Bullfinch	0.9	1.3	1.2	11	36.1	5.2	2.8	13
Altaclarensis	0.1	1.0	1.0	4	27.3	4.3	2.4	8
Kraus 55-12	11.5	2.3	1.5	6	26.5	2.0	1.9	7
<i>R. occidentale</i>	16.0	7.1	2.2	9	41.5	7.4	3.0	10
<i>R. serrulatum</i>	6.6	3.5	2.0	4	22.2	5.0	2.3	3
Average	8.4	3.4	1.6	T. 44	39.5	6.5	2.7	T. 51

\* At end of experiment.

Table 5. Shoot Growth of Dwarf Rhododendrons Under Prevailing Daylengths and Constant Illumination

	Under Prevailing Daylengths				Under Constant Illumination			
	Av. Stem Length	Av. No. Shoots	Av. No. Main Shoots	Number of Plants*	Av. Stem Length	Av. No. Shoots	Av. No. Main Shoots	Number of Plants*
	(inches)				(inches)			
Blue Diamond	9.7	4.3	1.9	15	26.3	6.7	1.9	24
Jock	7.9	3.4	1.8	30	19.3	2.7	2.0	27
Blue Tit	14.5	6.9	2.6	18	25.8	5.8	2.3	19
Unique	1.6	1.3	1.3	20	7.6	1.6	1.6	20
Average	8.1	3.8	1.9	T. 83	19.9	4.2	1.9	T. 90

\* At end of experiment.

All of the cultivars rooted quite well, while the two species, *R. racemosum* and *A. augustinii*, were shy rooters. Boric acid alone appeared to be the best overall treatment with a combination of IBA and boric acid running a close second. Some evidence of basal injury on the rhododendrons suggested that the concentration of the rooting treatments at 100 parts per million was too high. But, in spite of the possible injury, all three chemical treatments were considerably better than the water control for both azaleas and rhododendrons.

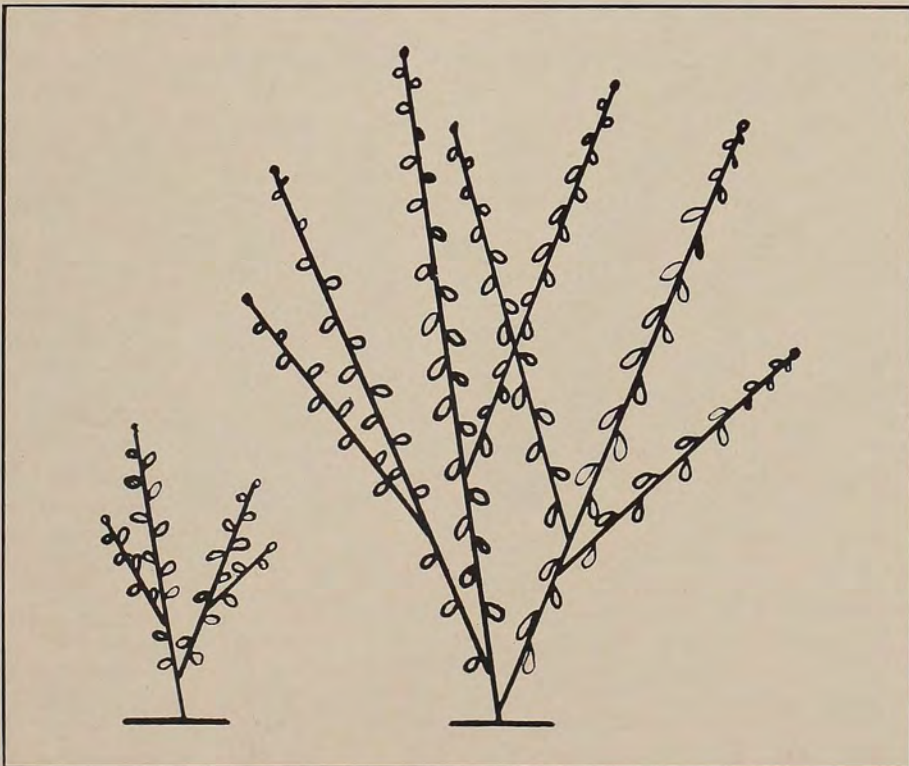
These results demonstrate that a wide range of the deciduous azaleas and dwarf rhododendrons root very successfully from cuttings. With further refinement of rooting techniques, it is likely that the success indicated by these limited trials could be improved considerably. It also appears that boric acid which is much cheaper and more readily available than indolebutyric acid, may have application as a rooting agent for these plants.

The preceding results have shown that softwood cuttings of deciduous

azaleas and dwarf rhododendrons taken in June and July can be rooted by October, but there still are problems to consider further. For example, these small rooted cuttings often grow very little during the fall and winter months even under favorable greenhouse conditions. Besides delay in getting specimens to a marketable size, this lack of growth contributes to high mortality when the small plants are set out in the field the following spring. In the interest of finding some way to stimulate growth in the greenhouse during the winter to overcome these disadvantages, rooted cuttings were taken from the rooting trials on November 1, 1958, and subjected to several treatments calculated to stimulate their growth. The small rooted plants of selected cultivars were grown in a soil and peat mixture (1:1) in three-inch clay pots and were given one of the following treatments: (a) removal of the dormant terminal buds, (b) 30 days or (c) 60 days of chilling at 40° F., (d) two soil applications one month apart of 200 parts per million potassium gibberellate, and (e) no



*Figure 1 (above) shows Azaleas and Figure 2 (below) shows Rhododendrons grown at prevailing daylengths (left) and at prevailing daylengths plus low intensity light all night (right).*



treatment. Half of the plants of each cultivar in the preceding treatments were grown under the prevailing day-lengths and the other half were given constant illumination by extending the day from sundown to sunup with low intensity (150 foot-candle) fluorescent light. These treatments were the same for both the azaleas and rhododendrons.

The plants were treated and grown in the greenhouse at 65° to 70° F. They were supplied with nitrogen fertilizer and sprayed periodically for aphid control throughout the growing period. On May 22, 1959, 204 days after the start of the experiment, growth response data were recorded to evaluate the effects of the various treatments. It was found that only the constant illumination stimulated growth, all other treatments were ineffective. As shown in Tables 4 and 5, however, night lighting was a very effective growth stimulant, especially for the azaleas.

A graphic illustration of the growth response to night lighting is shown in Figures 1 and 2 which were drawn from the averages presented in Tables 4 and 5, respectively.

The hobbyist or professional interested in azalea or rhododendron culture could make good use of the striking growth response of these plants to night lighting. Inasmuch as the response is basically a photoperiodic one and not photosynthetic, it is likely that light of lower intensity and shorter duration than that used in this trial would be just as effective. For example, either incandescent or fluorescent light of 30 to 50 foot-candles intensity for a few hours in the middle of the night would perhaps give growth comparable to the 150 foot-candle all-night exposure used in this trial. More work is required to establish these minimum limits. As an example of the usefulness of this technique, Doorenbos (1) has used low intensity night-lighting on seedling aza-

leas, rhododendrons, and their hybrids to shorten the breeding cycle to about half of the time normally required.

In summary, it has been shown that softwood cuttings of many of the cultivars of azaleas and rhododendron tested rooted very well. Indolebutyric acid enhanced this rooting in most cases. Boric acid, which is much cheaper and more readily available than the former, was also an effective rooting agent and deserves further testing. There is considerable variation between cultivars in the time required for rooting and the percentage rooting. Of the various treatments tested as growth stimulants, night-lighting only was effective. Azaleas grown with night-lighting produced almost five times the length of new growth as those grown at prevailing day-lengths while the increase with rhododendron was almost 2½ times. A combination of adapted cultivars, proper rooting treatments, and night-lighting makes it possible to root and grow deciduous azaleas and dwarf rhododendrons from cuttings to good sized plants in one year.

### References

1. Doorenbos, J. Shortening the breeding cycle of Rhododendron. *Euphytica* 4:141-146, 1955.
2. Hemberg, T. Rooting experiments with hypocotyls of *Phaseolus vulgaris* L. *Physiologia Plantarum* 4:358-369, 1951.
3. Kraus, C. J. Rooting azalea cuttings. *The National Horticultural Magazine*. 32:163-164, 1953.
4. Murray, H. R., C. D. Taper, T. Pickup, and A. N. Nussey. Boron nutrition of softwood cuttings of geranium and currant in relation to root development. *Proceedings of the American Society for Horticultural Science* 69:498-501, 1957.
5. Weiser, C. J. Effect of boron on the rooting of clematis cuttings. *Nature* 183:559-560, 1959.
6. Weiser, C. J. and L. T. Blaney. The effects of boron on the rooting of English holly cuttings. *Proceedings of the American Society for Horticultural Science* 75: 704-710, 1960.
7. Weiser, C. J. and L. T. Blaney. Constant illumination stimulates growth of softwood azalea cuttings. *Oregon Ornamental and Nursery Digest* 4(2):1, 4, 1960.



*A view from the newer section of the Arboretum Center*

## The Morton Arboretum

E. LOWELL KAMMERER\*

In 1874, a young man of nineteen, while accompanying his father on a visit to the Arnold Arboretum in Boston, became so impressed by that newly founded tree collection that he voiced a dream to some day establish a similar arboretum in the middle-west.

Joy Morton, eldest son of J. Sterling Morton, Nebraska pioneer and statesman, and the founder of Arbor Day, lived to see his youthful aspirations come true. For, in the fall of 1921, he founded the Morton Arboretum near Lisle (suburban Chicago), setting aside and endowing two hundred acres of his country estate as the first unit of an arboretum bearing the family name. Thus was created, to quote from the original declaration of trust, "a foundation to be known

as the Morton Arboretum, for practical, scientific research work in horticulture, and agriculture particularly in the growth and culture of trees, shrubs, and vines by means of a great outdoor museum arranged for convenient study of every species, variety, and hybrid of the woody plants of the world able to support the climate of Illinois . . . in order to increase the general knowledge and love of trees and shrubs, and to bring about an increase and improvement in their growth and culture."

Mr. Morton could scarcely have visualized at the time the growth, both in size and prestige, which was to follow. Today, forty-one years later, The Morton Arboretum covers an area of 1375 acres, has a living woody plant collection of approximately five thousand species, hybrids, and varieties, and is served by a

\*E. Lowell Kammerer, horticulturist, Curator of Collections, Morton Arboretum, Lisle, Illinois.

physical plant consisting of three modern buildings, a new greenhouse, and a unique staff residential development which not only provides living quarters for employees, but serves as a landscape demonstration area as well.

### **The Site**

Favored by an exceptionally choice site, not only from the standpoint of existing native woodland, varied topography, and soils, but also with regard to accessibility to the entire Chicago region, the Arboretum affords ideal conditions for growing, testing, and displaying ornamental plants. The limitations of the collection are climatic rather than geographical, with the objective being to grow representative specimens of all the woody plants of the world which will tolerate the climate of northern Illinois.

Four major "soil types" are represented in the Arboretum, upland prairie, upland timber, terrace, and late swamp and bottom-land. The pH range represented varies from 5.0 to 7.0, indicating a circumneutral classification.

### **Climate**

A continental climate prevails in the Chicago area, one noted for its warm humid summers, cold winters, and its sudden and wide extremes. Temperature records kept since the late 1920's show a range from  $-30^{\circ}\text{F.}$  to  $105^{\circ}\text{F.}$  Hot summer winds, predominantly of south-westerly direction, have an adverse effect upon many plants, as do cold west, northwest, and northeast winter winds. Deep frost penetration, resulting from the frequent absence of snow covering during periods of severe cold, is also injurious.

Although twenty-five miles west of Lake Michigan, the Arboretum nevertheless lies within the range of its influence. This shows up in several ways; in its moderating effect upon temperatures, as in winter when it often prevents excessive and prolonged cold, and in summer, when it frequently depresses high temperatures. It may also prolong the frost-free growing season, which in this area is normally 160 days, extended occasionally to 180. The lake exerts a slightly negative total influence on precipitation, somewhat decreasing the amount of rainfall in summer, increasing it in late autumn and winter. Snowfall is increased appreciably, although a

regular snow cover cannot be depended upon. Total annual precipitation averages about thirty-four inches, occurring mostly as showers in May, June, and September. There is an approximate thirty percent variation from year to year above and below the average, however. Very wet and very dry periods are also experienced from time to time. The average relative humidity ranges from 72 to 75 percent in winter, and from 64 to 68 percent in summer.

According to the new Plant Hardiness Zone Map published in 1960 by the U. S. National Arboretum, in cooperation with the American Horticultural Society, the Morton Arboretum lies in Climatic Zone 5b. This designation is based on the approximate range of average annual minimum temperatures, which for this zone vary from  $-20$  to  $-10$  degrees Fahrenheit.

### **General Plan**

The system of plant arrangement within the Arboretum is planned to be practicable and useful. Trees and shrubs are planted in generic groups with no attempt at strict taxonomic sequence; in geographical groups according to native habitats; and where potential forest value exists, in test forestry plots. There are also landscape plantings to demonstrate the aesthetic uses of woody plants.

Visitors to the Arboretum will sense the natural beauty of the grounds and the pleasing way in which introduced plantings have been blended into the natural background. The native woodlands have been left largely undisturbed, and the characteristic oak openings and sunlit meadows, so typical of northern Illinois, kept intact.

### **Buildings**

#### ***The Arboretum Center***

The Arboretum Center, located adjacent to the east entrance into the grounds, is a two-story structure of Lannon stone housing the administrative offices, information center, library, and herbarium, in addition to the facilities of the new wing.

The newer section of the Center includes the offices and laboratories of the Research Wing, class rooms, and the Jean Morton Cudahy Memorial Auditorium and Rotunda. This semi-circular glass pavilion centered on the Hedge Garden



is the focal point of the curved hallway connecting the old building and the new. Opening off the Rotunda is an auditorium seating one hundred people.

### ***The Thornhill Building***

The Thornhill Building, located on the west side of Route 53, a half mile from the west entrance, was erected from funds willed to the Arboretum by Margaret Gray Morton. Opened in 1942, it is largely devoted to the Arboretum educational program. The building occupies the site of "Thornhill," the original Morton residence, whose library it incorporates. This room, panelled in bleached English Oak, is furnished much as it was when occupied by the founder.

The large lecture room with full length windows looking out into the Arboretum and to the valley beyond is furnished as a lounge, but may be converted to seat two hundred and fifty people.

The lower floor is devoted entirely to educational use, with class rooms, a botanical laboratory, and an exhibition hall.

### ***The Redwood Building***

In an oak grove northeast of the Thornhill Building is the Redwood Lodge, a rustic structure providing facilities for nature study and craft work, including dining and dormitory accommodations for students attending the Nature Seminars. An adjoining outdoor classroom supplements the indoor facilities.

### ***Greenhouse and Propagating Units***

A new three-range greenhouse serving the propagating, research, and educational departments is located south of the Research Wing, convenient to the nursery beds, propagating frames and lath house.

## **Special Planting Features**

### ***The Hedge Garden***

The only formal planting within the Arboretum grounds is in the tree-enclosed Hedge Garden, extending along a half mile axis to the east of the Rotunda of the Arboretum Center. Two levels are devoted to hedges with the Garden of Old Fashioned Roses occupying the section between them, and representatives of the various Coniferae outlining the upper extension.

This demonstration planting, practical in concept and of pleasing landscape appearance, is arranged to show the hedge potentialities of various woody plant materials. These trial hedges are twenty-five feet in length, and at present over a hundred and twenty-five examples of clipped hedges and more than fifty informal (unclipped) materials are included. The formally sheared trees along the central axis are Washington Hawthorns (*Crataegus phaenopyrum*).

### ***The Garden of Old-Fashioned Roses***

Cabbage, Damask, Moss, French, and various rose species are the predominant feature of the Rose Garden located between the upper and lower levels of the Hedge Collection. This garden was inspired by the plan of the Holly Garden of the Governor's Palace at Williamsburg.

### ***The Ground Cover Collection***

Ground Cover plantings consisting of seventy-five materials adaptable to various soil and moisture conditions, and to different degrees of shade or sun, line the pathway bordering the north side of the Hedge Garden. Anyone with ground cover problems will find this outdoor exhibit a valuable source of information.

### ***The Flowering Crabapples***

A collection of more than a hundred and sixty species, cultivars and hybrids of Flowering Crabapples provides a profusion of varicolored blossoms in spring and a colorful fruit display in autumn and winter. The original collection on Simonds Road, having outgrown its location, has been supplemented by an entirely new group on Forest Road east of the Frost Hill Loop.

### ***The Lilac Collection***

Although there is lilac bloom in the Arboretum from late April until early July, the major display occurs in mid-May when the so-called French hybrids are at their peak. There are more than five hundred varieties in the present collection, with new ones being added as they become available. Following the hybrids, the species types and the Prestonae hybrids carry on until the Japanese Tree-Lilac concludes the display in early July. The hybrid lilacs are planted in color groups adjoining the Hedge



*The Old Fashioned Rose Garden*

Garden axis on the north and along an extension of the Ground Cover Path. The species border Forest Road.

### ***The Nature Trails***

Three well marked Nature Trails, the Forest Trail (featuring wild flowers, trees, rocks, etc.), the Evergreen Trail, and the Thornhill Trail (emphasizing plant identification), offer pleasing lessons in natural history at all seasons of the year. Each trail has its work sheet, and guide books are available for the Forest and Evergreen Trails.

### **Research**

In a research program much expanded by the new laboratory and greenhouse facilities, the Arboretum is concerned primarily with plant problems encountered by the layman. The effects of filling and grade changes on established trees, as well as investigations to determine how trees can be made to live under resulting conditions, are typical projects. Of special interest at the present time is a study being made to determine the cultural techniques necessary for the successful cultivation of rhododendrons and

other Ericaceae in this area. A breeding program to develop lime tolerance is contemplated.

### **Education**

#### ***Aims***

The aim of the Educational Program has been, not mere accumulation of information, but rather the sharpening of perception and the deepening of understanding. This aim has been furthered by the unique character of a student body of which the only entrance requirement is interest.

In order to better serve teachers, group leaders, and camp counsellors, constant efforts have been made to perfect new techniques, tools, and teaching methods, utilizing original ideas in charts, work sheets, games, and so forth.

#### ***Courses of Instruction***

The Educational Program of the Morton Arboretum, carefully planned and divided to fit adults and children, works through several media. Organized courses throughout the year cultivate a knowledge of nature. Life histories, habits, associations, folklore, and identi-

fication are all considered, with special emphasis placed upon trees, shrubs, and wild flowers. Birds, mammals, rocks, and ferns are not neglected. Courses in adult and junior leadership help teachers, parents, Girl Scouts, Boy Scouts, junior foresters and others to become proficient in nature study and teaching. A series of gardening classes is offered twice a year, and in winter there are two five weeks' courses devoted to Landscaping the Home Grounds.

### **Plant Information**

At the Reception desk in the Arboretum Center information may be obtained about woody plants (trees, shrubs, and vines), ground covers and hedges—their selection, culture, and uses. Questions pertaining to care and maintenance, hardiness, and adaptability, pests and their control, sources of supply, and other problems are also answered.

### **Library**

Plans have just been completed for the addition of a new library wing to the Arboretum Center. To be known as the "Sterling Morton Memorial Library," it will provide facilities for housing the entire library in one centralized location.

A walled outdoor reading garden is to be an unusual feature of the plan. Dedication is set for September 1963.

### **Herbarium**

The Herbarium, with its insect-proof, steel storage cases will eventually house pressed specimens of all woody plants hardy in northern Illinois. At present, the collection has fifteen thousand sheets. These are filed systematically according to botanical families. In addition, there is the nucleus of a collection of indigenous flora, including grasses, herbaceous, and ligneous plants.

### **Location**

The Arboretum is located in suburban DuPage County twenty-four miles west of the Chicago Loop, one mile north of U.S. Highway in Lisle and three miles south of Roosevelt Road (alternate U.S. 30) in Glen Ellyn. Both entrances are on State Highway 53 one quarter mile north of the Route 53 exit of the East-West Tollway.

By rail the Arboretum may be easily reached by the suburban service of the Burlington R.R. (Union Station) to Lisle. Cab service is available to the Arboretum from the station.

## A Book or Two

### **Month by Month in the Greenhouse**

Gomen Richards. *Published by* Pageant Press, Inc., 101 Fifth Avenue, New York 3, New York. 1962. xiv + 239 pages. Illustrated. \$4.95. (Library).

The author has taken the months of the year and outlined regular work to be done that month plus specific directions on many plants. The plants are discussed in several groups as those for greenhouse, the bulbous types and the culture of plants that would be started indoors but used in the garden.

The book is based on conditions as would be found in the Northeastern states so that persons

in other sections would adjust schedules accordingly. The names of plants are given as a common name and/or a scientific name—interchangeably and not correctly designated by the type used in printing. Some names are not accurate.

The description of the pests is rather casual and such that they could not be identified easily or accurately.

Because of the organization of the book, a reader would need to check the 12 chapters to learn the culture of a specific plant. The month to month calendar idea may interest some beginners with a greenhouse but for persons with experience this arrangement does not offer much help.

C. B. L.

*(Books available for loan to the Membership are designated: (Library). Those not so designated are in private collections and are not available for loan. Books available for sale to the Membership are designated with the special reduced price and are subject to the usual change of price without notice. Orders must be sent through the American Horticultural Society accompanied by the proper payment. Please allow two to three weeks for delivery. Those not designated for sale to the Membership at reduced prices can be purchased through the Society, however, at the retail prices given. In these instances the full profit is received by the Society to be used for increased services and benefits of the Membership.)*

### **André LeNôtre, Garden Architect to Kings**

Helen M. Fox. Crown Publishers, Inc., New York, 1962. 176 pages. Illustrated in black-and-white and color. \$7.50.

All students of landscape architecture are aware of the changes in style that developed as the influence of the Italian designers of formal gardens moved north to other parts of the continent and was modified by the men who worked on somewhat different terrains and for "clients" of far different character than those of the Italian beginnings.

This book is essentially biographical, as related to Le Nôtre himself, and historical, as it describes his life and times, as well as the series of really stupendous gardens he was privileged to create. The times were perilous enough and came ahead of revolutions; the "clients" were enormously wealthy and prodigal, but human enough to suffer from pangs of envy in displays, and living in a social atmosphere that called for entertainments on such prodigal levels that only huge gardens could permit them.

Mrs. Fox, who has loved the work of LeNôtre for many years, and has dwelt on his accomplishments for many more years before she undertook any task of writing, has brought together in her present book a magnificent series of pictures of the old gardens as illustrated in their own times, a vivid text to recreate the atmosphere of the time and of the social activities, but has also given a warm and intriguing picture of the man himself.

From a family that was essentially a family of gardeners and living in a circle that included many of the principal gardeners of the time, André grew up within all the knowledge of his time. Early in life he showed skills in drawing with the result that for a time he thought of becoming a painter. All learned during his training periods in the studios became an inherent part of his thought and mind. Later when he had decided to follow his father's profession, for although not so called, it was in fact a profession with all the rules and tenets of such a form, he went to work under the most skillful of auspices, and with men who carried the traditions of the time.

His marriage was within the circle and was most felicitous. His own mature life continued in growth in every sense of the word and his eventual opportunities for royal patronage came when he was truly "ready." His character seems to have been such that he could deal with any problem in his field and at the same time win the confidence and approval of his patrons. From them as well as from his own sensibilities, he built up a home that was well filled with the treasures of his time.

Although it is almost improbable that any time will ever come again when work of the style then dominant will find a place in our living, the study of his work and plans shows basic principles that are as vital today as then. Possibly the one that is most important was his sense of scale. For any artist who must work on the grand scale, the capacity to make the finished work seem grand in the overall aspects and yet not lack in minor charms to be seen and enjoyed close at hand, is paramount. Le Nôtre had this superbly. In this time when mainte-

nance is often a deciding factor in design of home or other properties, the basic plan that will be eternally fine, enlivened seasonally, is as important as in the grand style. How often do we achieve it?

Mrs. Fox gives a warm picture of the man and his times, not glossing over the factors that are now considered as evil socially and describes his works chronologically, showing various degrees of development and growth. For this we are grateful, but we must add a word of appreciation for the way in which the book itself is produced, a lovely thing, that is far more than a mere ornament for the library table.

B. Y. M.

### **Meet Flora Mexicana**

#### ***An Easy Way to Recognize Some of the More Frequently Met Plants of Mexico as Seen from the Main Highways***

M. Walter Pesman. Dale S. King, Publisher. 6 Shooter Canyon, Globe Arizona. 1962. 288 pages. Illustrated. \$4.00 and \$5.00 paperbacks. \$6.00 cloth. (Library).

Mr. Pesman has produced a delightful and original book about the roadside flora of Mexico. *Meet Flora Mexicana* is a non-technical work with a scope that covers some of the showiest and most unusual plants to be found as one travels along the principal roadways of the country. In the words of the author, "We realized that many other tourists would want information about the very plants that attracted our attention, mainly those along the highways," and so the present volume was born. The role of the author's enthusiastic wife in the project is aptly expressed by an appreciative husband in the accolade "Blessings on a wife who is a front-seat driver!" On three trips to Mexico, Mrs. Pesman was chauffeur and catalyst to her husband in various ways.

Two hundred and seventy (270) original line drawings illustrate the work, all made on the spot by the author. The book might be criticised for incompleteness, but this is not a comprehensive technical flora. As the title indicates, readers are only introduced to the Mexican flora and, in this way, the author hopes to whet appetites and stimulate curiosities. Perhaps this will encourage others to do better, since this is the first popular book of the area to be published.

The author divides Mexico into 11 floral zones, i.e. desert, mesquite and grassland, thorn forest, tropical evergreen forest, etc. Once a person locates his location on the colored fold-out map, he determines an unknown plant by reading the short descriptions for the appropriate floral zone, and then compares it against the illustrations. Each plant is provided with a Spanish and English vernacular name, as well as a Latin binomial name. A bibliography of literature, plus an index of plant names, and a printed rule in inches and centimeters for use in the field, are useful features of the book.

While the work is written for the layman, the professional botanist and others will find it highly useful, especially those who prefer to travel to Mexico by car. The publishers are to be highly commended for the pleasing format, the very attractive cover, and the relatively modest cost of the book.

The author comes from Denver, where he is widely known as a landscape architect. As a public-spirited citizen of the community, he has been a prime mover in public landscape projects in the schools and colleges of the state. His earlier book, "Meet the Natives," now in the 6th edition, is about Colorado plants. Laurels to M. Walter Pesman for being the first to write a handbook about the plants of our good neighbor south of the border.

FREDERICK G. MEYER

### **Success With Clematis**

J. Fisk. Thomas Nelson and Sons, 18 East Forty-first Street, New York 17, New York. 1962. xiv + 82 + 8 colored plates. \$4.00. (Library).

A book for the amateur gardener written in a simple direct manner on the culture of clematis. Planting is discussed first, then the care, pruning, training and pests. Propagation and hybridization are included as well as a description of the species and varieties. Since it is a book written for gardening conditions in England, some adjustments will be necessary in adapting recommendations.

C. B. L.

### **You Can Grow Camellias**

Mary Noble and Blanche Graham. Harper and Row, New York. 1962. 257 pages (65 black and white photographs, 6 colored plates, and line drawings). \$7.50. (Library).

This is a good, readable text on camellias, written in a lucid manner. The contents are brought together in Parts, of which there are five. Particularly good are the Parts on Culture of Camellias and How To Use Camellias, for they have useful information devoid of unnecessary complicated methodology. Not too much space is devoted to species or the history of camellias. This is good, for the information on the former is constantly enlarging and has been thoroughly examined in more basic texts and the latter has been fairly well exhausted by now. A listing of cultivars restricted to a sampling of the various flower types rounds out the book. In all it is a desirable book for the AHS member to read.

J. L. C.

### **The Ageless Relicts**

Norman Taylor, St. Martin's Press, 175 Fifth Avenue, New York 10, New York. 1962. 109 pages, illustrated. \$3.95. (Library).

This is by no means the first book written by Mr. Taylor. His guides to garden flowers, wild flowers and other gardening books are well known to the gardening public, as is his recently revised *Encyclopedia of Gardening*.

In this slim volume, *The Ageless Relicts*, he covers the history of *Sequoiadendron gigantea* and *Sequoia sempervirens*. The text is easy to read and should appeal to the general reader with an interest in trees.

The discovery of California gold also brought national attention to A. T. Dowd's find, namely, the largest tree in the world. Promoters, quick to see the profit to be made from exhibiting the trees, helped in the destruction of the giants which appeared on display in New York, London, and other cities. Later, through the efforts of conservationists, protected areas were set up.

This volume lists the protected areas, tree sizes and locations, and there are some nice drawings and photographs scattered through the book.

F. P. K.

### **Wild Flowers of the Transvaal**

Cythna Letty. Wild Flowers of the Transvaal Book Fund. Text by R. A. Ryer, Inez C. Verdoorn and L. E. Codd, Division of Botany, Department of Agricultural Technical Services. Distributed by Central News Agency, Limited, South Africa. 1961. xiv + 362 pages. Illustrated. \$11.20. (Library).

This reviewer never ceases to wonder at the series of beautifully printed volumes of flowers that continue to emanate from South Africa. That country, with a population scarcely larger than that of New York City, has produced a half dozen outstanding flower books, which easily surpass in quality and authoritativeness anything of a comparable nature printed in our country. "Wild Flowers of the Transvaal" is just such a volume and a rare bargain at the price. It contains colored reproductions of over 400 species of native plants in 174 full plates drawn by Cythna Letty (Cythna Lindenberg Forssman), not only South Africa's greatest botanical artist but certainly one of the world's outstanding delineators of the beauty of plants. Her good fortune has been to live in a country noted for its floral wealth, and down through the years her colored illustrations have appeared in the technical serial *Flowering Plants of South Africa*, the *Curtis's Botanical Magazine* of South Africa. Now, the more attractive species of the Transvaal (in all, 82 families, 282 genera and 423 species) have been gathered into this gem of a volume primarily for the pleasure of fellow flower lovers. Casual leafing through this volume will point out many of South Africa's contributions to world horticulture including among others such familiar generic friends as *Gerbera* and *Gladiolus*, *Moraea*, *Clivia*, *Gloriosa*, *Nerine*, *Kniphofia*, *Aloe*, and *Zantedeschia*. Cythna Letty's colleagues (in the Division of Botany of the Department of Agriculture)—and in particular the well-known South African botanists R. A. Dyer, Inez C. Verdoorn and L. E. Codd—have supplied precise information concerning the subject of each plate.

W. H. HODGE

### **Handbuch der Laubgehölze (Handbook of trees and shrubs)**

G. Krussman. Paul Parey Press, Berlin. 1959-62. 1120 pages, with 384 photographs, plus numerous text-figures, 2 vols., roy. 8vo. \$93.80.

Publication of Krussmann's 2 volume descriptive work on cultivated trees and shrubs (exclusive of conifers) is an outstanding accomplishment of the Paul Parey Press in Berlin. This is

the most significant modern work available on the subject. For American users, the scope of the work is enticing, since it includes not only the hardy species grown in eastern United States but also a host of warm-temperate plants, such as *Drimys winteri*, *Camellia*, *Raphiolepis*, the less hardy Chinese species of *Rhododendron*, *Pittosporum*, *Phytolacca dioica*, the hardy palms, and other plants of this class. Of special interest and one of the most attractive features of the work is the inclusion of cultivars or garden varieties, new and old, listed under the species. This is the first major European work that treats cultivars in accordance with the new International Code of Nomenclature for Cultivated Plants.

This work is quite timely in the inclusion of the newer introductions, for example *Pieris* 'Forest Flame', introduced first in 1952 and maples (*Acer*) from nurseries in the United States. The standard cultivars also are described. For example, we find listed 40 cultivars of *A. palmatum*, the Japanese maple, 43 of *A. platanoides*, the Norway maple, 53 of the heather, *Calluna vulgaris*, and 68 cultivars of the large-flowered hybrids of *Clematis*. The book is a storehouse of information of this kind.

Unfortunately, a book of this scope quickly goes out of date, inasmuch as many new plants with fancy or cultivar names are introduced into cultivation each year. But this shortcoming is inescapable and not an objection. Although the text is written in German, the plant names and illustrations are intelligible enough for most gardeners and horticulturists with little or no knowledge of the German language. It is surprising how quickly one is able to translate fairly fluently the short descriptions after a little practice in recognizing cognates and learning a few key nouns and adjectives. The rather excessive cost of the work is the only major objection. To offset this, the 2 volumes are handsomely produced on excellent heavy-weight paper, and the photographs invariably are a superior feature of the work. Photographs of plants in their native habitat give an impression of some well-known species in a way not possible by any other means. The leaf imprints are a unique feature of the book. These were prepared by the author from dried leaves covered with a special ink and then pressed upon paper by an ordinary hand laundry wringer. Specialized literature is cited at the end of each genus. The work was issued in 14 parts, each with a separate cover, and the publishers supply cloth binders for each volume.

With the present work, plus the author's earlier book on the conifers, *Die Nadelgehölze*, published in 1960, and Fritz Encke's *Blumengartnerei*, published in 1958-60, we have a useful triumvirate of modern works covering the entire field of ornamental horticulture in the temperate zones, in and out of the greenhouse, all published by the Paul Parey Press.

FREDERICK G. MEYER

### Caribbean Seashells

Germaine L. Warmke and R. Tucker Abbott, Livingston Publishing Company, August, 1962. Illustrated, \$8.95. (Library).

Despite the modest disclaimer of the authors that this guide is by no means a definitive work

on the subject, it may well serve as such for all but the most academic conchologist.

Covering the major islands of the Caribbean, distribution maps serve as a guide to the most productive spots for the collector. For the less proficient linguist, a list of useful Spanish phrases is included.

Profuse illustrations, both in color and black-and-white simplify shell identification, and serve to point out that to the horticulturist who occasionally has a fling at arranging flowers, there can scarcely be a more colorful or appropriate accessory than some of the shells here shown.

This beautiful book may well open the door to a fascinating new companion hobby which can be enjoyed by the plant explorer who finds himself in the islands of the Caribbean.

M. FISHER

### Manual for Floral Decoration in the Home

Seymour Carren. Orange Judd Publishing Company, 15 East Twenty-sixth Street, New York, New York. 1962. xiii + 194 pages. Illustrated. \$6.95. (Library).

A book on flower arranging and the use of flowers in the home. Many kinds of arrangements and uses are given with sketches showing how each arrangement is made or used. In many cases, step-by-step sketches show how the arrangement is put together. Separate chapters are included to show winter arrangements, holiday decorations, and flowers to wear as corsages.

### The American Camellia Yearbook, 1962-63

Edited by Joseph H. Pyron. American Camellia Society. Tifton, Georgia. 1962. xiii + 302 pages. Illustrated, in color and black and white. \$5.00 with Membership. (Library).

While every yearbook must contain certain sections that are in the nature of annual reports, on new clones, new shows, new personal reports, new comments on expert's activities, each annual presents certain new materials of great interest not only to the general reader, but to specialists in several lines of interest with camellias.

In the present volume is an extended report on the researches conducted in Japan by Japanese botanists on the extent of the natural distribution of the plant currently known as The Snow Camellia. For any future investigation of this plant whether it be a true and distinct species or not, the records here given will be invaluable. Of interest to the garden reader, however, is the statement that in the area there are to be found not only many variants in nature but many specimens that have been brought into cultivation by persons living in the area, many recorded in such a way that it would appear that in Japan, this plant is more often found in cultivation than *Camellia japonica* itself. Only a more extended comparison based on closer studies will determine the nature of its differences, and its possible value to growers in this country.

There is also an interesting report on the value of *Camellia saluenensis* as a seed parent, and a brief report from the Glenn Dale Station, Maryland, on the work of hybridizing carried on there under glass with species other than *C. japonica*.

Whether or not these articles are to provoke interest in other types of camellia than *C. japonica* itself, is perhaps an editorial secret, but certainly any one reading the descriptions given of new *japonica* seedlings as registered, wonder how soon there may be a glut of somewhat similar kinds, the sort of state that sometimes works against the total popularity.

Two interesting articles are presented on the use of camellias in the landscape plan. Professor Owen's strictures are well taken and should provoke some serious thought among those who plan to accumulate large collections. Since the plant is a beautiful thing in itself, it is worthy of careful placing, not just for its optimum growth for the production of blooms to carry off prizes in shows, but for the joy of the gardener who sees it daily throughout the year.

History is served with two long pieces, one from Plymouth, England, and a much longer one from New Zealand.

The article on Strains of the Color Breaking Virus is of great interest, now that so many sports are being developed and maintained. The difference between a virus-induced sport and a somatic variation are important and this paper that shows data related to several patterns from different virus strains is important.

This, in no way, is an adequate indication of the value of this issue. All camellia growers who are not members should consider its purchase, unless they solve matters by joining the Society.

B. Y. M.

### Garden Shrubs and Trees

S. G. Harrison. St. Martin's Press, Incorporated, 175 Fifth Avenue, New York, 10, New York, 1960. 318 pages. Illustrated. \$4.95. (Library).

This title is a contribution to *The Kew Series*—a set of five volumes planned, edited and written by members of the botanical staff of the Royal Botanic Gardens, Kew. It is a selected listing, arranged by family, of those garden plants which the author considers are of real horticultural merit. A brief horticultural description is given for each species and a short discussion or comment on origin, use, or cultural observations of the author. It perhaps is somewhat akin to Dr. Wyman's series on trees and shrubs for American gardens but from the British viewpoint. Varieties are not discussed, however, and since it contains a key to the genera as well as a discussion on the plant structure, it probably is best classed as a reference work.

It is always good to see the range of plants which merit discussion because each of us has different ideas as to what constitutes such a plant. For example, for *Ilex*, only English holly is described and with it the comment that hollies are not so often planted nowadays. *Taxus baccata* is the only yew in the book, so one can easily see that the approach is slanted toward the British use of plants.

J. L. C.

### The Daffodil and Tulip Yearbook, 1963

Edited for the Royal Horticultural Society of Great Britain by Patrick M. Syngé and J. W. O. Platt. 187 pages. Illustrated in color and black and white. London, 1963.

Like all of its predecessors, this follows somewhat the same annual pattern. This issue is of sad interest to us in this country as we are reminded by excellent articles our loss, through the deaths of Guy L. Wilson and Lionel Richardson, from whose work so many wonderful new daffodils have come to us.

There are excellent reports on shows, abroad and in this country as well as the group of reports on shows "down under" in New Zealand, Australia and Tasmania. Reports are given also on Wisley tests and the usual summaries of the results of voting.

Of special interest to this reviewer since the papers take notice of certain phases of the daffodil world, not too often reported are: Double Daffodils, Past and Present by Matthew Zandbergen, with illustrations from old books and current photographs of modern sorts; Daffodils in a Cold House, by Alec Gray, which is of more than current interest to this reviewer who has lost all his best Tazetta blooms this season by "unusual" cold; and a thought provoking article by J. W. Blanchard, called Thoughts and Species.

Of interest to members in this country were the reports written by Michael Jefferson-Brown who came to the States as guest speaker and judge for our National Show. He saw many things of keen interest to him as well as having a chance to meet some of the most excellent growers and exhibitors in the American Society.

While perhaps it is not seemly that the reviewer should mention the fact that he appears among those reported, he breaks the proprieties to take the opportunity to say that nothing he has ever accomplished, little enough, could have been done without the continued aid of a great variety of persons all of whom are as essential to the whole and more, than anything he himself might have done or hoped to do. This could not be said in the text, but it is important for the record!

B. Y. M.

### Other Books Added to the Library

#### Tropical Plants and Their Cultivation

L. Bruggeman. The Viking Press, Inc., 625 Madison Avenue, New York 22, New York, 1962 (Reprinted). 228 pages. Illustrated. \$12.00. (Library)

#### Carnations for Everyman

Montagu C. Allwood. St. Martin's Press, Inc., 175 Fifth Avenue, New York 10, New York, 1962 (Revised and reset, Fifth Edition). 120 pages. Illustrated. \$3.95. (Library).

#### American Tomato Yearbook, 1962

John W. Carncross, Editor. American Tomato Yearbook, 8 Elm Street, Westfield, New Jersey, 1962. 44 pages. Illustrated. \$2.00. (Library).

# The Gardeners' Pocketbook

## *Montanoa*—An Attractive Genus

In late 1961, I acquired through Fairchild Tropical Garden a plant of an unusual tropical composite, labelled *Montanoa grandiflora*. I had previously seen this plant in the Garden's collections, and had admired its impressive dimensions, unusual foliage, and large heads of showy white blossoms.

Because her property was less cluttered than my own, I gave the plant to my mother, who had it placed near her boundary-line, in good rich soil which had been added to the rocky native materials which are characteristic of our South Florida gardens.

With only normal attention, this *Montanoa* has now attained a height in excess of 9 feet, this after only about 9 months' growing time. Its spread is almost as great, and I suspect that an eventual height and breadth of upwards of fourteen feet may be reached. It is now (October 1962) in full bloom—and a startlingly handsome object it is!

The softly-hairy big leaves, sometimes almost 6 inches in length, are variously cut and toothed into interesting patterns; these are set in opposite pairs at intervals up the rather stout stems. The flower-heads measure up to 3 inches across, are pure white (sometimes with a faint touch of yellow toward the center), and very much resemble chrysanthemums, though they are borne in profusion at the tip of each elongate branch. The flower-heads give off a delicate scent much like that of chrysanthemums during certain hours of the day. Unfortunately, the blossoms do not last well when cut, but they retain their form for upwards of a week when allowed to remain on the plant, and since additional flower-heads continue to be produced for some time, the show is not a short one.

Upon checking the available literature, I have found that my plant is not *M. grandiflora*, as it was labelled when received, but another species, *Montanoa bipinnatifida* (pronounced mon-tan-yó-ah bye-pin-ah-tif-i-dah), a native of Mexico. The genus is named for Don Luis Montano, a Mexican naturalist and statesman; because of the use of the tilde over the "n" in his name, the pronunciation utilized above, rather than mon-tah-nó-ah, should be adopted.

There are upwards of 25 species of *Montanoa*, these dispersed from Mexico to Colombia. As is so often the case in the immense Daisy Family (Compositae), the taxonomy of the group is very confused, and through our handsome plant here seems to be accurately identified now as *M. bipinnatifida*, it is not the same thing as *M. grandiflora*, which may also be present in cultivation in this area, though as yet I have not encountered it. It is noted as having very roughly scabrous leaves which are brown-hairy underneath, and flower-heads with distinct ray- and disc-heads, the rays white, the discs yellow.

*Montanoa grandiflora* is, therefore, closer in appearance to *M. mollissima* (pronounced mo-liss-i-ma) than to the present *M. bipinnatifida*, in which the disc-flowers are not evident to the casual viewer. *M. mollissima* is again Mexican in origin, and is vegetatively similar to *M. bipinnatifida*, though more copiously branched, and with the branches becoming smooth with age, and more stiffly erect. The 6-inch leaves are stalkless, lanceolate or ovate-lanceolate, toothed, white-fuzzy underneath, and very soft to the touch. The long-stalked flower-heads measure about 1½ inches in diameter, and are comprised of about 9 white ray-flowers, these set around the vivid yellow disc-flowers.

*Montanoa hibiscifolia* (pronounced hibiss-ki-fóe-lee-ah), ranging from Guatemala to Costa Rica, is one of the tree-like species, often reaching a height of 20 feet. Menninger<sup>1</sup> calls this a "Hibiscus Treedaisy," an appropriate vernacular, since its foliage is much like that of certain kinds of *Hibiscus*—to 10 inches long and often more in breadth, usually deeply incised almost to the middle, green above and pale and very hairy underneath—sufficiently attractive to warrant cultivation of the species. When blooming-time arrives, tremendous flattened masses of flower-heads—the rays pure white, the disc-flowers bright yellow—virtually cover the entire tree! These heads measure up to 1½ inches across, and remain in good condition for several weeks. In its native haunts, this species is often kept trimmed to shrubby size, so that the production of the handsome flowers is even more profuse than in the wild specimens.



I have seen *M. hibiscifolia* on many occasions in Nicaragua, most often in the mountains near Santa Maria de Ostuma,<sup>2</sup> at elevations of about 4000 feet. In this region the trees are gregarious, often covering steep wooded slopes with endless ranks of attractive foliage and the impressive flower-clusters, these sometimes a yard across!

Menninger<sup>1</sup> mentions that in California, several species of *Montanoa* are grown, usually as shrubs, but does not indicate what they are, unfortunately, since they would be of interest.

Montanoas, as a group, are readily propagated, either from seed, or from cuttings of the mature woody branches. Bottom heat is recommended in both instances. Though they are tropical composites, they are rapid growing, and can be utilized outdoors in cooler areas as showy mass-plantings, if only for the unique large foliage, whose form varies markedly often within the same species. Seeds of *M. bipinnatifida* are available from at least one commercial establishment in this country. I would be interested to learn of the availability of other montanoas in cultivation in the United States and abroad, particularly the shrubby species which seem unknown outside of California gardens.—ALEX D. HAWKES, Post Office Box 435, Coconut Grove 33, Florida.

<sup>1</sup>Menninger, Edwin A., *Flowering Trees of the World*, Hearthside Press, New York, 1962, page 106.

<sup>2</sup>See "Notes on the Vegetation of Santa Maria de Ostuma, Nicaragua," by the author, in *Tropics Magazine* 1: 8-14, figs. 6-8. June 1962.

### *Ipomoea wolcottiana*, A Tree Morningglory

One of the lesser known winter-flowering species introduced by the U. S. Department of Agriculture's Plant Introduction Station at Miami, Florida, has in recent years provided an impressive floral display that is without equal during December and January. The trees, *Ipomoea wolcottiana*, now fifteen feet tall, are better known as Tree Morningglories.

The clustered flowers open each morning to almost four inches exposing a pure white trumpet in which a dark red spot is visible deep inside the throat. Only a single flower in each cluster opens each day and this closes and falls by evening, yet the large size of the flowers and the great number of clusters produce the effect of a great mass of bloom. Flowering occurs over a period of four to five weeks

with the quantity of flowers which open each day diminishing as the period of bloom advances into the third or fourth week.

In 1933 seeds of Plant Introduction 103932 were received as *I. arborescens* from Atkins Institution of the Arnold Arboretum, Soledad, Cienfuegos, Cuba. Nine years later seeds of another accession, P. I. 144004 were received as *I. murucoides* from Mexico through Edwin A. Menninger, Stuart, Florida. Several specimens of both introductions were set in the field where they received the maintenance and care given the ornamental introductions in general. One plant of each introduction became established, and as a result of a recent study of these plants both have been re-identified as *I. wolcottiana*.

Much can be found in the literature concerning the better known Tree Morningglory, *I. arborescens*, but little mention is made of its close relative, *I. wolcottiana*. Rose [1] describes the latter species as "a tree 30 feet high, sometimes 1 foot in diameter; branches slender, somewhat drooping; leaves ovate to ovate-lanceolate, 3 to 5 inches long, and 1½ to 3½ inches broad, rounded or truncate at the base, acuminate, glabrous, on petioles 2 to 4 inches long; flowers in numerous short racemes or corymbs mostly naked; pedicels jointed near the base, little if at all thickened upward, 4 to 6 lines long; calyx 5 to 6 lines long, glabrous, sepals nearly equal, oblong or oval, rounded at apex; corolla white, broadly campanulate, 2½ inches broad, with short thick tube 1 inch long; capsule oblong, 9 lines long, glabrous, 2-valved, 4-seeded, separating into 4 carpels; seeds oblong, 4 lines long with the margins covered with a long reflex coma longer than the seed."

One mature plant of the Tree Morningglory is known to be growing near Boynton Beach, Florida, but it has flowered only sparingly, and this only in recent years, according to reports.

Riedel [2] described a plant of P. I. 103932 growing in Hope Ranch Park, California, in 1954. This presumably was planted in 1938 or later, for in that year plants bearing the above Plant Introduction number were offered in the Los Angeles area. These probably were of the same seed lot as the earliest introduction received at the Plant Introduction Station, Miami.



*Ipomoea wolcottiana*

*I. wolcottiana* is native of southern Mexico from Colima to Chiapas and Morelos [3]. There it is called "acote" or "pajaro bobo." The bark is said to be used locally in the preparation of medicines.

The Tree Morningglories at the U. S. Plant Introduction Station have produced a few flowers each season for a

number of years, but not until the winter of 1960-1961 did they produce the vast bloom with which the species is credited in its native habitat. Perhaps the hurricane which struck south Florida in September, 1960 was instrumental in bringing about the bloom, for during the storm several large adjacent trees were blown over, thus eliminating a dense

canopy which had long overshadowed these trees. That season and the two seasons since, the trees have produced a lavish display which has attracted considerable attention.

The branches of the Tree Morningglory, upon coming in contact with each other, will often entwine and extend vinelike, producing a specimen which is a curious combination of tree and vine. Several of these vine-like branches have become entwined on the limbs of a small neighboring tree and have extended twelve feet or more upon this living trellis. An annual light pruning has been found to effectively control this tendency, producing a plant of moderately compact form. This peculiar growth habit of the species suggests that it would lend itself ideally to the handiwork of the espalier enthusiast.

Not only are these specimens attractive in flower, but also when devoid of flowers and leaves. Then the light gray bark causes the trunk and twisted limbs to stand out in interesting patterns, especially against a dark green background of closely assembled neighboring shrubs or trees.

Perhaps the reason this species appears so well adapted to south Florida is that the seasons coincide almost identically with those in its native habitat. In both areas a wet season occurs from May until the end of October, with a very definite dry season prevailing the rest of the year. At the onset of the dry season, the leaves fall and the already swollen buds open before the last of the leaves have fallen. The trees then remain leafless until the Spring rains urge them into growth again.

No seeds have been known to develop naturally on the trees at the Plant Introduction Station and thus far all attempts at hand pollination, including selfing and crossing with other species, have failed. Numerous attempts to root cuttings and air-layering have also failed, giving rise to a challenge which it is hoped will be met successfully as work progresses on this most interesting species of the Morningglory family.

### References

1. Rose, J. N. Report on a Collection of Plants made in the States of Sonora and Colima, Mexico, by Dr. Edward Palmer, in the years 1890 and 1891. *Cont. U. S. Nat. Herb.*, 1 (9): 343. 1895.
2. Riedel, P. *Plants for Extra-tropical Regions*. Calif. Arboretum Foundations, Inc., 1957.

3. Standley, P. C. *Trees and Shrubs of Mexico*. *Cont. U. S. Nat. Herb.*, 23 (4): 1203-05. 1924.

—P. K. SODERHOLM and M. H. GASKINS, *Horticulturists, Crops Research Division, Agricultural Research Service, U. S. Department of Agriculture, Miami, Florida.*

### *Two Dissimilar Members of the Aristolochia Family, native of California*

This family was given its name by Linnaeus from the Greek *aristo-locheia*, an herb promoting childbirth, like our own word, birthwort. Our Greek lexicon, however, says also of *locheia* that when childbirth is used in connection with flowers, it becomes a botanical childbirth, which is "bursting with buds," a truly delightful nomenclature, arranged by Linnaeus.

Many writers mention the medicinal qualities of this family in leaf and root, but probably there is much less in our California species than in the larger more succulent plants of the tropics.

The Aristolochiaceae, some two hundred species of shrubs and climbers are distributed over the entire temperate and tropical worlds. The largest climbers, most of them inhabiting the jungles of South America and the tropics are unusual and striking. Often they show deep velvety colorings and large curiously shaped flowers; but our own *Aristolochia californica* Torr., growing on lightly wooded hillsides, on stream banks and borders of lakes, is more modest in growth, size, and coloring.

John Torrey (1798-1873), who named it, must have had a plant submitted to him from California, for although he was a pioneer in botany and other natural sciences, taught in various colleges, and wrote "A Flora of North America" with the assistance of his pupil, Asa Gray, yet he himself neither botanized nor visited California.

For many years a plant of *Aristolochia californica* has been growing in the Blake Gardens near Berkeley. At the base of an elderberry tree, it sends up long thin, light green, somewhat pubescent shoots with only an occasional sideshoot, climbing to ten, even to sixteen feet, often draping over the tree's branches. The alternate light green leaves with petioles one or two inches long, are ovate-cordate, one to three inches and even five inches long when a

good rainy winter temporarily fills the hollow basin in which it grows.

The solitary, very irregular flower hangs over on a slender peduncle subtended by one or two leafy bracts. True petals are not present. The calyx-tube bends on itself near the middle, below which is a greenish and purple-veined pouch, that narrows sharply forming a tube which again bends back on itself, opening its lips like a small mouth, the under lip holding out or folding down, the upper lip divided in two.

When an insect lands on the lower lip, it climbs up toward the odor from the open mouth, drops in and the two appendages of the upper lip fold over, trapping it within. Its frantic efforts to escape distributes the bundles of pollen thoroughly over the lobed stigma, and then, but not until then when fertilization is completed, is the tube opened and the captive insect released.

One day as our wagon began its dusty climb up Howell Mountain, in a small stream that trickled along the inner side, we found our Pipe Vine rooted in the moist soil. It twisted and scrambled over the bushes of the hillside and on an old barbed wire fence, and was covered with its many little pouches. Again, for a long distance on the banks of Putah Creek we found it climbing over *Cercis occidentalis*, the redbud which gave color that contrasted delightfully with the purplish pouches.

Jepson's Manual states that its blossoming period is March and April. In the Blake garden we happened to record its bloom in February in 1934; February in 1945; April in 1928 and in 1948 (beginning to pass) and in March, 1953.

The Blake plant came from Mr. Edmunds, who has dealt in native plants, mostly raised from seed. California now forbids, except with permit on public lands, and in private lands only with the owner's permission, the collecting of any plant or seed of any kind of plant growing wild.

Our Pipe Vine is native of the Coast Ranges from Monterey to Shasta County, and in the Sierra Nevada foothills to Sacramento County, according to Jepson's Manual.

Its native habitat indicates where it can be used best, which would be in gar-

dens of the foothills of the Sacramento Valley region, but only if adequate water can be supplied. Give it deep, loose, leafy soil, light shade with plenty of moisture in season and it should be happy.

No leaves show in our picture; it is deciduous and some people say that for them, it dies to the ground each season.

It can be propagated by division and by its copious seeds.

The greenish flowers washed or lined with purple are not strikingly beautiful but have a sprightliness and charm of their own.

*Asarum* is the only other genus of the Aristolochiaceae used in gardens. Of the three species in California, *Asarum caudatum* Lindl., the Long-tailed Wild Ginger, is also in the Blake Garden; it is a creeper.

Not flaunting large flowers like its big sisters of the jungles, *Asarum* is recognized as belonging to the same family, only by botanists.

The leaves, large cordate-reniform sometimes six inches broad, completely hide the small dark brown-purple flowers, which lie close to the ground. They are not pouched as in *Aristolochia*, but regular and as you look directly down, the center looks like a small thimble-sized cup from which come the three calyx lobes, at first oblong then gradually developing into a tail of one or even two inches long.

*Asarum* is native in moist shaded woods, especially of the Redwood Belt in the Coast Ranges down into the Santa Cruz Mountains. It ranges north to British Columbia and Idaho.

In the Blake Garden, there is a patch growing as a ground cover in the north canyon under redwood trees, and also a small bit of it is planted at the foot of the entrance steps where an attached hose often gives it drips of moisture. It fills the corner with fresh rich green foliage and has the added value of taking care of itself.

Wild ginger is valuable not only as a ground cover for any rather dark shaded area in gardens, large or small, but for the fact that it will increase there, making more than was originally planted in a fair time.—MABEL SYMMES, *Berkeley, California.*



PIRPLE JONES

*Aristolochia californica*

### Delayed Appearances

After the very cold winter of 1962 (January) with the more or less immediate showing of damage to many plants, one became cautious about non-appearance of various herbaceous things, hoping for the best.

*Gloriosa* all through this area showed no sign of coming up, although on careful investigation the roots seemed intact. Only a few species showed up at approximately normal times, *G. rothschildiana*, *G. virescens*, and *G. plantii*, which we keep separately as they differ in garden values, even if the last two may be synonyms. *G. superba*, was the slowest with *G. verschuuri* coming just ahead of it. *Littonia*, a close relative, nearby came up promptly, and almost normal in size and vigor. After a month's delay, with careful watering, repeated long duration soakings, *G. superba* came up *en masse* as if all had been normal, for although it is always the last to show, it was late this year.

In several places in the garden we have out-door plantings of *Achimenes*. These, too, are plants that come up with hot weather but this year it was apparently dryness that held them back and not lack of heat nor winter injury. The clone usually sold as 'Maduna' came up first and most vigorously, but all the rest in all places except where there has been a heavy leaf fall from camellias and azaleas. It is still too soon (July 11) to know if some are missing, but some usually are, in part, so all one can report with safety, is that *gloriosa* and *achimenes* will endure temperatures as low as 10 in the middle of a period of low temperatures with no appreciable losses.

Since southern gardens need all the bulbs and comparable plants possible, this is good news.

For quite other reasons, there was conspicuous delay in leafing out on a variety of woody plants that may not be really suited to our climate. The Higan Cherry which had made excellent growth the summer before, with fine drooping branches even at the top, was very slow to start and leaves appeared from the lower branches upwards with the very tip the last to show. It is now in good leaf, though not making much growth. The other cherries, 'Yoshino' and 'Taiwan' came out normally, with

quite good flowering on the 'Taiwan.'

*Styrax obassia* varied among the individuals, some coming promptly and some slowly, but all are now normal. *S. japonica* which had been fairly uniform in growth the year before, is the most variable, some completely normal, and others so slow as to appear stunted. The plants of *S. dasyantha* were equally reluctant to start growth, so much so that examinations were made to be sure they had not died. By this time, July 11, all are in growth, but only a portion of the new side shoots seem to be normal. As the supposedly most tender of the trio, we had expected it to be the best suited to our use.

*Styrax americana*, the native, was slow to come, after the fashion of all *styrax*, but came out evenly and well. The only mishap with it was that it was allowed to dry one day, and many of its leaves dried off as if burned. Regular watering has prevented any further loss. This same type of loss has occurred with *Magnolia obovata*, and plants of *Metasequoia* have been so injured by the heat and the sun, that even with watering, they will lose part of their tops. It is not a happy plant in our locations, all too sunny.—B. Y. MORRISON, *Pass Christian, Mississippi*.

### *Poncirus Trifoliata*, the Trifoliolate Orange—A "Dividend" Tree

Gardeners are always searching for small trees that fit into the restricted areas of suburban plots. The number of such trees is quite limited. The trifoliolate orange (*Poncirus trifoliata*) has so many attractive points that it deserves much wider use than it now has. The four drawings depict the "dividends" that *Poncirus* declares during each quarter of the year.

In *winter* it is a handsomely branched specimen with flattened branchlets studded with thorns from one to one and one-half inches long. All but the main, woody stems retain a dark green color through the cold season. *Spring* brings a gay display of white flowers all along the branches and their display is all the more prominent, since the leaves do not appear until the end of the flowering period. During *summer*, *Poncirus* is adorned with three-lobed leaves on a winged



### *Summer Characteristics of the Trifoliate Orange*

petiole which presents an unusually attractive picture. *Fall* brings a mass of golden fruit. These small "oranges" are not edible but occasionally have been used for preserves. Being quite sour and bitter and with a strong, attractive aroma, they provide a very decorative effect rather than a culinary treat. Fine hairs cover the fruit giving it a velvety feel.

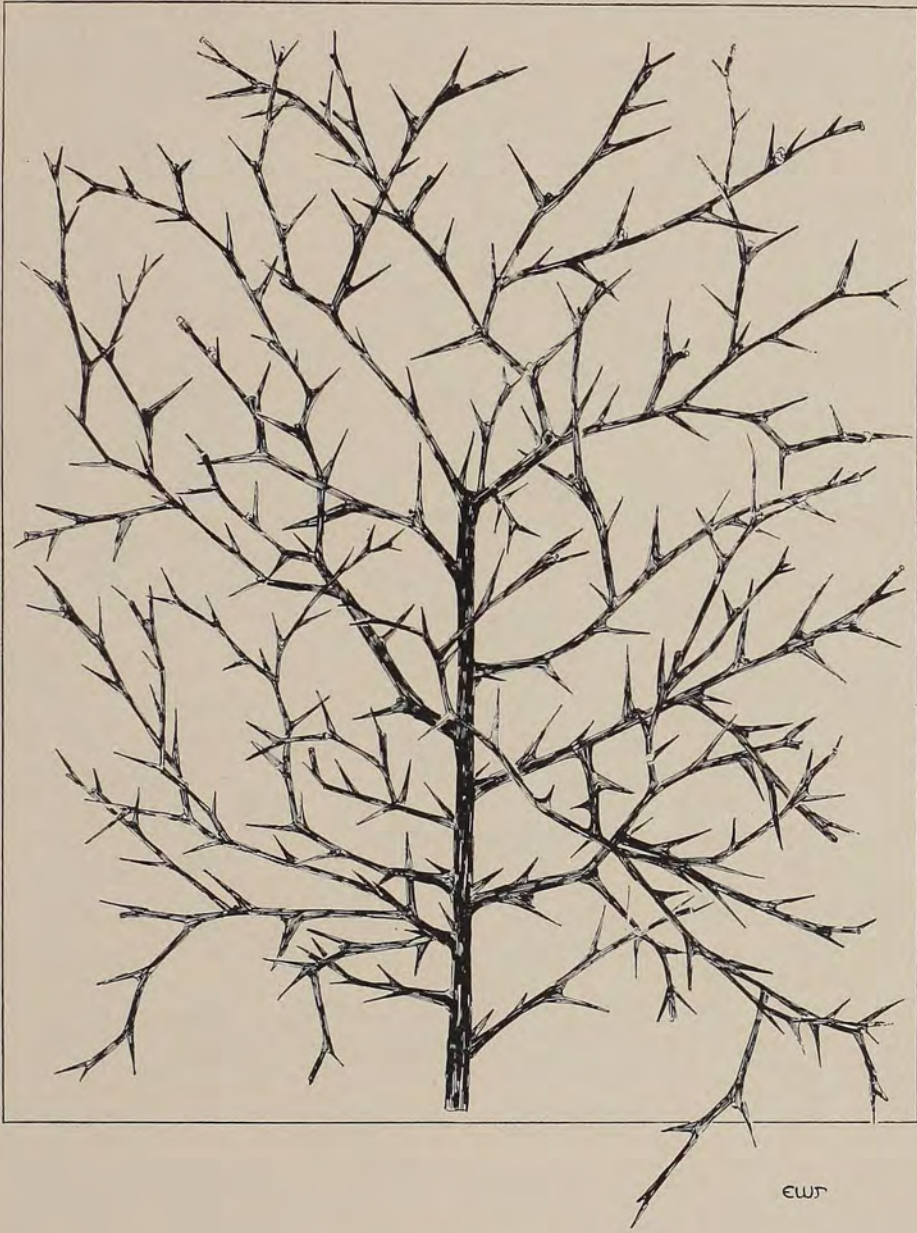
Preferred uses of *Poncirus*: (1) As a small specimen tree, and (2) as a hedge. The fleshy spines are so formidable that no living creature would tangle with

them. The plant can easily be grown from seed and self-seeding from fallen fruit is quite common. Propagation from cuttings of half-ripened wood is also practiced. Cuttings should be made in late June or during July.

Botanically, *Poncirus trifoliata* belongs to the Rutaceae or Citrus Family which includes 140 genera and 1,300 species. It differs from other kinds of citrus—lime, lemon, orange, grapefruit—in being deciduous, the leaves are trifoliate, and the flower has a slightly different structure from its closest citrus relatives. Its







*Poncirus trifoliata*

Characteristics of the fall (top, left) appearance and winter configuration of the branches (above). Illustration (bottom, left) from a photograph taken by Dr. F. N. Meyer, January 26, 1914, shows "A hedge of the well known, hardy trifoliolate orange as seen around a field near and old temple [near Sianfu, Shensi, China]. Of great value as a very effective hedge plant for mild wintered, semi-arid climates."

home is central and northern China and it has been cultivated for centuries in Japan. The plant was brought to England only in 1850.

The trifoliolate orange is hardy as far north as northern New Jersey and it is found occasionally in the Boston area. It is more common south of New York and Philadelphia. Distribution in midwestern United States is quite spotty, but it would make a valuable addition to gardens in this region once its hardiness is established, since it is easy to propagate and is free from insect pests and fungus diseases.

The flower buds are formed in early summer and through the winter are protected by bud-scales. The flowers open about the same time as those of the apple tree.

In addition to its ornamental value as an impenetrable hedge and specimen plant, the trifoliolate orange has one important horticultural use in subtropical climates. It is often used as a root-stock for grafting named varieties of the mandarin orange in Japan and in some other areas. The hybrid of *Fortunella japonica*, the Kumquat, and *Poncirus trifoliata* is called the Citrumquat, but the hybrid is rare and difficult to grow.

Cultural directions: A deep, loamy nearly neutral soil is best; some watering is helpful during prolonged dry spells. In the northern limits of its range one should provide a location somewhat protected from the prevailing winter winds. Pruning to achieve a dense hedge is indicated and can be done in a moderate way continuously throughout the growing season.—EDGAR DENISON, *Kirkwood, Missouri*.

From the editorial committee:

Frank N. Meyer, the famous agricultural explorer sent seeds of the trifoliolate orange to the United States Department of Agriculture in 1914 under P.I. 37809 from Sianfu, Shensi, China, and his field notes, we believe, will be of interest to all who know this plant: "(No. 2009a, January 26, 1914.) The well-known hardy trifoliolate orange, quite common on the Sainfu plain on Chinese burial grounds. Sparingly used as a hedge plant, especially around old temple gardens. The plant

is much used by Chinese gardeners in pot culture upon which to graft various citrus fruits and keep them dwarfed. Locally the fruits are used as fuel after having them roughly crushed and partly dried. The wood occasionally is employed in carpentering work and for tool handles and carrying poles, but it is not much thought of. The plant seems to be able to stand a great amount of drought and some alkali also, and it might prove to be of great value as a hedge plant for sections of the semiarid United States where the winters are not too severe. The fruits of this orange are often quite large and elongated near the peduncle. May possibly be a different and perhaps hardier variety than the ordinary Japanese form. Chinese name Ch'ou ch'eng zü."

### *Two White Petunias for Greenhouse Display*

For nearly thirty years two outstanding white petunias have contributed to Longwood Gardens' spring conservatory display. They were originally selected from plants raised by Mrs. W. K. duPont, sister of Longwood's founder. Mrs. duPont obtained the mixed seeds from Sutton & Sons Ltd., Reading, England, in about 1934. It is felt that, because of their value for display, they are deserving of names.

*Petunia* × *hybrida* 'Longwood' reaches a height of five feet with support. The single flowers, which are borne in profusion, are over 10 inches across, slightly rugose and ruffled, and are white with yellow-green veins, especially in the throats.

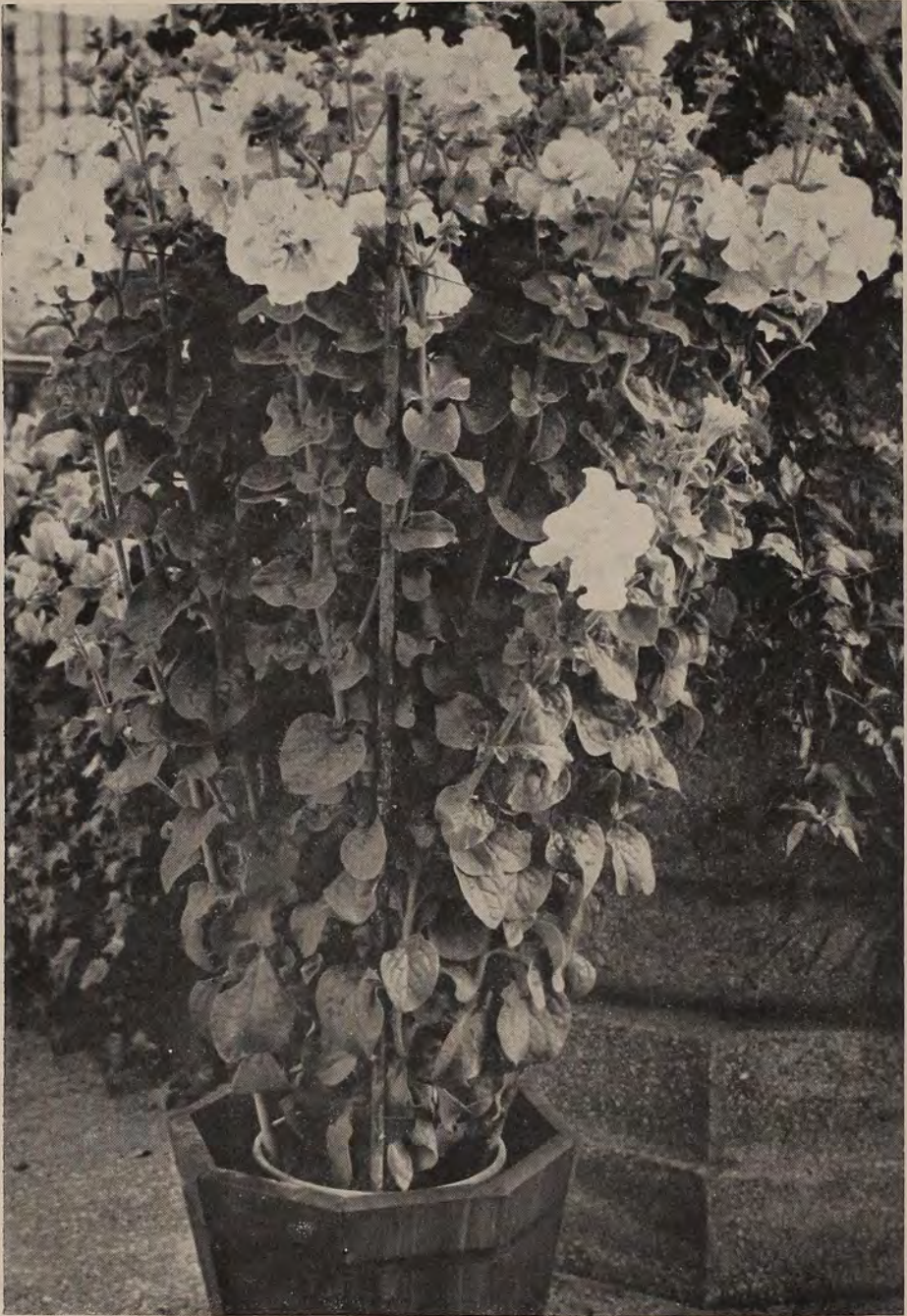
*Petunia* × *hybrida* 'DuPont' reaches a height of four and a half feet with support and bears strongly rugose leaves. The much ruffled, abundant flowers are double, eight to ten inches in diameter, and are white with green to dark purple veining in the throats.

The plants are propagated from young cuttings taken in July. In December the plants are ultimately potted, one to an 8-inch pot. By April they are in flower and are on display through April, May and June. In July the plants are cut back severely and cuttings are taken from resultant new growth.—DONALD G. HUTTLESTON, *Longwood Gardens, Kennett Square, Pennsylvania*.



LONGWOOD GARDENS PHOTOGRAPH

*Petunia* × *hybrida* 'Longwood' displayed at Longwood Gardens



LONGWOOD GARDENS PHOTOGRAPH

*The ruffled, double flowers of *Petunia* × *hybrida* 'Du Pont' show to advantage as displayed against a pillar in the conservatory at Longwood Gardens, Kennett Square, Pennsylvania*

### **Plants and Abnormal Weather Conditions Houston Area, 1961-1962**

The serial story of adverse weather conditions and their effect upon plants has another month to run in the Houston area. The sad tale opened last September with hurricane Carla in the stellar role. Gale winds up to eighty miles an hour uprooted trees of all sizes and seriously disturbed the root systems of others. The strong winds completely defoliated many trees and shrubs. The result was an abnormal fall bloom and the emergence of new, spring like growth.

December was warm with sufficient rainfall to maintain continuing growth. This situation set up the second installment of our story. In January there were almost three consecutive days of below freezing temperatures with the lows for the three nights ranging from 11 to 18 degrees. The weather bureau predicted a low of 18 degrees the first night and gave the usual warning, "Protect exposed water pipes and tender vegetation." No one paid much attention to the warning. The severe damage done by the heavy freezes of 1950 and 1951 was forgotten. The end result was a heavy loss of trees and shrubs in all parts of Houston. The nurseries were particularly hard hit.

The final chapter of weather and plants continues at this time—we won't mention such tribulations as the heavy infestations of pine beetles and chinch bugs. In common with the rest of the Gulf Coast, we have had a summer with below normal rainfall, and with temperatures running from 8 to 16 degrees above normal. Daily highs have been consistently over the 100 degree mark, ranging from 103 to 108 degrees. Plants unharmed by heat in normal summers are showing substantial burn. Some of these plants are; *Ilex cornuta* 'Burfordii,' *Distylium racemosum*, *Styrax obassia*, *Hovenia dulcis*, *Viburnum wrightii*, and most East Texas and Louisiana natives such as, *Lyonia*, *Lindera*, *Hydrangea* and the native azaleas.

The writer's observations of plant damage caused by weather in the past 12 months are generally restricted to plants we have in the ground in the Sharpstown area of Houston. The complete list of casualties, successful recoveries and the unscathed is much too long to write about in detail. A listing, in rough form covering some 85 to 90 plants is attached.

It was particularly gratifying to us that a number of USDA plant introductions with outstanding characteristics have shown a surprising ability to take extremes of heat, drought, and cold. Included in this category are: *Gardenia lucida*, P. I. 249466; *Abelia* 'Dwarf Purple,' P. I. 201092; *Lagerstroemia fauriei* from Japan, P. I. 237884; *Ilex rotunda* from Japan, P. I. 237879; *Eugenia* sp. from Japan, P. I. 237870; *Pyrus pashia* from India, P. I. 165664; *Raphiolepis* sp., from Japan, P. I. 237897; *Ternstroemia gymnanthera* from Japan, P. I. 235436; and an evergreen *Vaccinium* sp. from Japan, P. I. 237911. Other weather hardy plants which we believe have a high potential for this area are; *Citrus taiwanica*, P. I. 71238; *C. ichangensis*, P. I. 71186; "Changsha" tangerine; *Esenbeckia runyonii*; *Schinus dependens* (Brazilian and California pepper trees both froze to the ground), and the Mexican cypress, *Taxodium mucronatum*. The success of the two last named trees has been particularly gratifying.

Major disappointments were *Araucaria bidwillii*, *Pinus roxburghii*, *Cordia boissieri*, and the Satsuma orange.

Our experience here should not deter others from trying many of the plants that we lost. These factors must be considered: the very small sample of each species; the small size of most of our plants; the weakening effect of the September hurricane; only minimum mulching; and the unseasonably warm December weather which preceded the freeze.

It was disheartening to lose many tropical and sub-tropical plants. We will continue to use them for pleasure and ornamental effect. Who knows, it might be 10 years before the next hard freeze.

Some one who is better qualified should write about the many native Texas plants, not commonly used, which have proved to be interesting, attractive, and completely able to hold up under extremes of weather.—FRANK PIERATT, 6810 Hendon Lane, Houston 36, Texas.

The following is a list of plants grown and grouped according to the amount of injury they received during the 1961-1962 winter at Houston, Texas:

#### **Uninjured**

*Abelia* 'Dwarf Purple' (P.I. 201092)  
*Amyris texana*  
*Arbutus unedo*

*Corylopsis spicata*  
*Cryptomeria japonica* (P.I. 239487)  
*Distylium racemosum*  
*Eugenia* sp. (P.I. 237870)  
*Gardenia lucida* (P.I. 249466)  
*Hovenia edulis*  
*Ilex mutchagara* (P.I. 237878)  
*Ilex rotunda* (P.I. 237879)  
*Itea japonica*  
*Juniperus procera*  
*Lagerstroemia fauriei* (P.I. 237884)  
*Mahonia fortunei*  
*Mahonia japonica*  
*Metasequoia glyptostroboides*  
*Petteria ramentacea* (P.I. 79039)  
*Philadelphus coronarius* ×  
*P. microphyllus*  
*Pinus griffithii*  
*Pyrus pashia* (P.I. 165664)  
*Raphiolepis* sp. (P.I. 237897)  
*Sabal louisiana*  
*Sabal texana*  
*Taxodium mucronatum*  
*Ternstroemia gymnanthera* (P.I. 235436)  
*Vaccinium* sp. (P.I. 237911)  
*Vinca major* 'Pubescens' (P.I. 239252)

### Minor Damage

*Agave victoriae-reginae*  
*Citrus Chansha* tangerine  
*Citrus ichangensis* (P.I. 71186)  
*Citrus taiwanica* (P.I. 71238)  
*Esenbeckia runyonii*  
*Leptospermum scoparium*  
*Sasa* sp. (dwarf)  
*Schinus dependens*

### Serious Damage (1/2 or more top killed)

*Cinnamomum daphnoides*  
*Cordia boissieri*  
*Neolitsia* sp.  
*Severinia buxifolia*  
*Viburnum awabuki*

### Killed to Ground but Sprouting

*Adina* sp.  
*Aloe* sp. (P.I. 249090)  
*Bauhinia mexicana*  
*Bauhinia pruinosa* (P.I. 249291)  
*Bilbergia nutans*  
*Boehmeria biloba* (P.I. 239076)  
*Callistemon* sp.  
*Fortunella* sp.  
*Hedychium* sp. (India)  
*Hypericum patulum* (P.I. 247782)  
*Solanum* sp. (P.I. 249359)  
*Teucrium betonicum* (P.I. 238783)

### Plant Killed

*Araucaria bidwillii*  
*Araucaria cunninghamii*  
*Brachychiton populneum*  
*Butia capitata*  
*Caesalpinia leiostachya* (P.I. 249298)  
*Callistemon* sp. (P.I. 254993)  
*Calothamnus chrysantherus*  
*Ceratozamia mexicana*  
*Chamaerops humilis*  
*Citrangequat*  
*Citrange* Thomasville  
*Citrus hystrix*  
*Citrus hystrix* 'Kalpii'  
*Citrus satsuma*  
*Citrus Siam* Shaddock  
*Gordonia axillaris* (one survivor hurt  
 from summer heat)  
*Grevillea banksii*  
*Jussiaea bullata* (P.I. 249327)  
*Leptospermum luehmannii*  
 (P.I. 255006)  
*Livistona chinensis*  
*Oncoba routledgei* (P.I. 244612)  
*Pentapterygium 'Lugdvan'* (P.I. 242359)  
*Pinus longifolia*  
*Podocarpus gracilior*  
*Psidium cattleianum*  
*Salmea scandens* (P.I. 240077)  
*Strobilanthus* sp.  
*Tabebuia palmeri*  
*Trachycarpus fortunei*  
*Zamia floridana*

### *Ornithogalum saundersiae*

In a very fruitful correspondence with Dr. Peery of Hayward, California, my attention was brought to the subject of this note, with the sending of a packet of seed that I did not plant promptly and so lost. Later, when it was listed in one of the better bulb lists of this country a half dozen bulbs were ordered to hide my failure.

When they finally arrived, some were in rather poor condition with what appeared to be large areas of rot. Remembering that some ornithogalums propagated easily from leaf cuttings, and so on, a chance was taken with the seemingly defective bulbs. They were cleaned off and left on the greenhouse bench in sunlight, so that the cleaned areas dried off quickly and thoroughly. When it appeared that there was even something

that looked almost like scar tissue over the surfaces, the bulbs were turned into the proper position on the sandy soil in the bench. Little watering.

In a short time it was evident that the bulbs would grow. So they were set, almost on top of a very sandy soil mix in eight-inch pans. The larger bulb almost immediately began sending up not only the central fascicle of leaves, but many side shoots. The other bulb showed a mass of small bulbs forming along each cut edge of the bulb scales, no roots as yet and little indication of top growth. Soon, however, there were signs of top growth and it has now, a month or so later, almost caught up with the other larger bulb.

The sound bulbs planted in the open, were slow to put in an appearance, due probably to the unusual weather of the season, too dry, too hot, too everything undesirable. In time, however, a strong central shoot appeared and that now, August first, has unfolded into a great sheaf of broad glaucous gray leaves, quite unlike any other plant here and showy in their own right. From near the center has risen a naked scape, now about four feet tall, bearing at the top a head of flowers, conspicuous at once for the large bracts that subtend each bloom and extend well away from the scape with a curling upward stance, that makes the whole look like a fanciful cone.

The flowers open from the base upwards in this head. The pedicels grow as the flowers age, so that the blooms stand well away from the whole. The flowers face upwards, are quite flat, six-petalled stars of faintly creamy-white, set off by the ovary that is a dark olive-green, almost black, with a tiny white stigma atop, and surrounded by the circle of stamens, one over each segment, the filaments tinted, but the open anthers showing a mass of light green pollen that adds to the total pattern.

It is said that the flowers last long in good condition and by the total number of flowers per inflorescence, the blooming must be of long duration as well. keep a tidy appearance as the flowers develop remains to be proven.

The catalogue from which the bulbs were ordered indicates that the bulbs should be lifted and stored over winter as for large gladiolus. The writer will

plan to leave out at least one to see!—  
B. Y. MORRISON, *Pass Christian, Mississippi.*

### ***Butcher's Broom—Ruscus aculeatus***

I suppose it is because it takes forever to grow to any size that the Butcher's Broom, *Ruscus aculeatus* is not in the trade. The only nursery that I know of that lists it is Monrovia, in Azusa, California. There used to be a lot of it in our Raleigh garden. It was there when the garden became ours in 1916, but the plants were so small that no one paid any attention to them until, suddenly, not long before we left Raleigh in 1948, we realized what nice clumps they had become, and how very useful they were under the big oak trees that surrounded the garden. By that time the clumps had reached a height of at least three feet, or it seems to me a little more, and were still increasing in width.

Butcher's Broom is a native of the Mediterranean region, but also it occurs in the south of England where it goes by a number of country names, though commonly called Butcher's Broom. Parkinson says butchers used the stiff branches to sweep out their stalls, and I have read elsewhere that they tied them up with the meat to discourage rats and bats. Names such as Knee Holly and Prickly Box are derived from the needle-pointed cladodes that serve as leaves, and the plant is called Jew's Myrtle because it is supposed to have provided material for the Crown of Thorns.

Butcher's Broom is not a true shrub, because the stiff green stalks that shoot up from the roots are never truly woody. When young and tender they are even edible, which is not surprising, because the genus belongs to the asparagus branch of the Lily Family. The flower's on the cladodes are so tiny that no one not looking for them would know that the plant is in bloom; the berries are the size of small marbles, and very conspicuous as they turn from shining green to shining red. The plants we had in Raleigh must have been all male, for they never fruited in all those years. *Ruscus* is mostly dioecious, but in his book "My Garden in Autumn and Winter," E. A. Bowles describes a monoecious form of *R. aculeatus*, with both male and female flowers on the same plant,

and a hermaphrodite form, with perfect flowers. Seeds of the latter come true. Plants grown from seed sent from England by Clarence Elliott are now fruiting in my garden in Charlotte. They were sown at least six years ago, maybe more, and now the plants are still less than a foot tall, but they have been bearing for three seasons. I even found two little seedlings under one of them. Last fall I sent a slice of the biggest plant to Mr. Freeland, for his garden in Columbia, South Carolina, and he sent me a slice of the variety 'Angustifolia,' which had come to him from the U.S. Department of Agriculture. The linear cladodes, mostly less than an eighth of an inch across, and less than three quarters of an inch long, are well-budded, and I hope—with the aid of Mr. Bowles, who goes into the matter thoroughly—that in the spring I can determine the sex of the flowers.\* Whether it berries or not, the narrow-leaved form is a distinctive and utterly charming plant. I shall be interested to see whether it gets to be as big as the type—that is if I live long enough, which is doubtful if it grows as slowly as the others have done.

I am equally charmed with *Ruscus hypoglossum*, recently acquired from the Oakhurst nursery.\*\*\* This is a much smaller plant than the Butcher's Broom and new to me, though known to English gardeners since the sixteenth century. Bean gives it a height of between eight and eighteen inches. The leaves are much larger, to an inch and a half wide, and more than 4 inches long, but the berries are smaller. Bean says it rarely fruits, but even so it is one of the nicest low evergreens that I have found.

Both species are among the best ground covers for growing under trees and in the densest shade. I have read that Butcher's Broom will grow in full sun. It may, but I have a feeling that in sun the stems and foliage would lack the quality that makes them so pleasing throughout the year, the myrtle green coloring.—ELIZABETH LAWRENCE, Charlotte, North Carolina.

\*The var. 'Angustifolia' is male. The mother plant at the Chenault Nursery, Orleans, France is about 3 feet tall and was procured from the neighboring forest. [FGM]

\*\*\**Ruscus hypoglossum* is also available from Merry Gardens, Camden, Maine.

### *Arisaema serratum*

Introductions from Japan continue to enrich American gardens with plants of merit. Among the herbaceous plants introduced by John L. Creech from his second trip to Japan in 1956, were several collections of *Arisaema*, Jack-in-the-Pulpit and Indian turnip, as these plants are most commonly called in eastern United States. In number of species, the Japanese flora is richly endowed with members of this assemblage of plants that belong to the Aroid Family [Araceae]. We note that J. Ohwi in his *Flora of Japan*, published in 1953, accounts for forty-two species of *Arisaema* for this island country. Two collections, both forms of *A. serratum* (Thunb.) Schott, successfully grown and distributed from Dr. Creech's original introductions, are the subjects of the present note.

The second season after seeds of *A. serratum* were sown at the Plant Introduction Station, Glenn Dale, Maryland, young plants flowered for the first time. The reward was a group of plants with the usual compound leaves of Jack-in-the-Pulpit but with bizarre striped greenish purple spathes resembling fire-spitting dragons on pseudostems 8 to 10 inches tall. The flowers lacked a foetid carrion odor sometimes associated with some other hardy aroids grown in gardens.

We can recommend the aforementioned Jack-in-the-Pulpits from Japan as plants of distinction worthy of a place in American gardens. They should be hardy with us in all areas where the native American species, *A. dracontium* and *A. triphyllum*, are grown successfully. We urge cooperators who earlier received material of *A. serratum* to propagate and distribute plants as widely as possible.—FREDERICK G. MEYER, Crops Research Division, Agricultural Research Service, U. S. Department of Agriculture, Beltsville, Maryland.

### Notes on *Hymenocallis*, the Spider Lilies

Of the numerous genera comprising the Amaryllis Family (Amaryllidaceae), few contain as many spectacular species





G. HAMPFLER, LONGWOOD GARDENS

*Arisaema serratum* var. *atropurpureum*



G. HAMPFLER, LONGWOOD GARDENS

*Arisaema serratum f. thunbergii*

as *Hymenocallis*, the so-called "Spider Lilies." Upwards of forty species have been described, but few of these are today present in our collections, seemingly having passed out of vogue during the past decade or two.

*Hymenocallis* (pronounced hy-men-oh-kál-iss) was established by the English plantsman Richard Anthony Salisbury in the Eighteenth Century, the name being derived from two Greek words meaning "beautiful membrane," this given in allusion to the unique and handsome webbing of the flowers' filaments. All of the species are natives of the Americas, except for one found, peculiarly enough, in West Africa. In this Hemisphere, the species range from North Carolina, Missouri, and Texas southward to Peru and Bolivia. As is so often the case in bulbous plants of horticultural importance, considerable confusion exists in the precise identity of the various species and hybrid forms. Erroneous determinations are frequently perpetuated in contemporary horticultural literature, notably in catalogues, price lists, and the like.

Doubtless the most common member of the genus in cultivation today is the splendid *Hymenocallis calathina* (kal-ah-thée-nah), a native of Peru and Bolivia which has been given the common name of "Basket Flower." It is often seen under its synonym of *Ismene calathina*. Its large bulbs are typically long-necked, and bear upwards of ten somewhat 2-ranked, thick leaves to about 2 feet in length and several inches in breadth. Normally, the foliage is deciduous during the cool months. The flower-scapes, produced during the summer months for the most part, attain heights slightly in excess of 2 feet, and bear a generally tight umbel of up to six handsome blossoms as much as five inches in diameter when fully expanded. Considerable variation exists in floral coloration (some very fine horticultural selections have been developed), though generally the basal tube is rich green, the cup formed by the filament-membranes is white with a green median stripe, and the free tepals are pure white. These tepals are often one-half inch wide, thus giving more substance to the blossom than is often the case in this genus. The lobes of the cup are usually prettily fringed or scalloped.

*Hymenocallis calathina* is moderately

hardy in this country, being grown outside without any particular protection in many parts of the Southern states. In more northerly climes, it is lifted in late fall, and replanted in early spring. Like most members of the genus, it benefits by a rich, rather moist soil, which needs to be well-drained for best results. A bright situation in the garden is required for optimum production of the spectacular blossoms. Seed is rarely produced, so propagation is largely by periodic offsets from the mature bulbs.

John Kunkel Small lists eleven species of *Hymenocallis* as indigenes of the Southeastern United States, but not all of these are well-marked as separate entities. Here in Florida we have several different kinds, including a few rare endemics which are little-known even by plantsmen in this state. Among the most unusual of these is *Hymenocallis palmeri* (pal'-mer-eye), the so-called "Alligator Lily." Described long ago by Sereno Watson, peculiarly enough this attractive plant was rather well-known in English conservatories many years ago, though I do not believe it has ever been available in the American trade.

I have found *H. palmeri* to be extremely common near the southern shores of Lake Okeechobee, near Clewiston and Belle Glade, where during the spring flowering season literally hundreds of the flowering plants are evident. Here they grow amidst grasses and sedges, in very heavy mucky soil which never dries out appreciably, fully exposed to the hot sun. This species is virtually unique in the entire genus, in that it produces but a solitary flower per scape. The blossom is erect, on a somewhat glaucous, flattened scape about one foot in height, and measures almost 5 inches in overall length. The tube is a pleasant yellow-green shade, the cup is delicately membranous-white (with three conspicuous marginal teeth, two long and narrow ones alongside a short broad median one, in each division), and the tepals are white from a greenish base. The subterranean bulb is often found 12 or more inches deep in the muck, with a slender neck extending to the surface. The few leaves are about a foot long, only  $\frac{3}{8}$  inch wide, dull glaucous-green, and conspicuously channelled on the frontal surface, with an angle on the reverse side. I have kept *H. palmeri* in my garden here in Coconut Grove for several years,

in large well-drained pots, and it never fails to produce its cheery fragrant blossoms for me, usually in April.

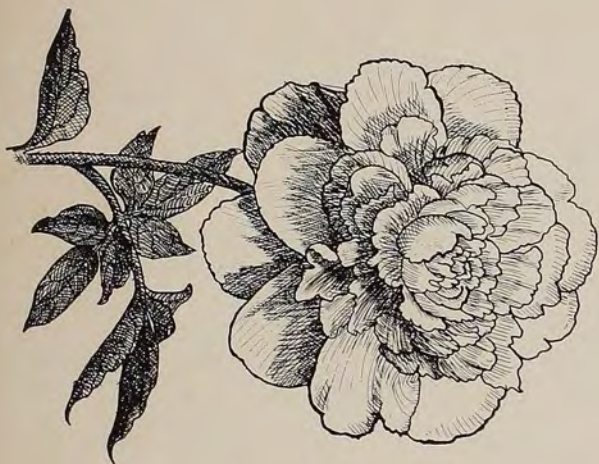
A number of different Spider Lilies are known in the literature as *H. caribaea*, and I am not at all sure that it is presently in cultivation in this country in its true guise, though it is supposedly widespread from the Bahamas to Puerto Rico. A plant sold on occasion here in South Florida as *H. caribaea* has proven to be the attractive endemic *H. keyensis* (*kee-yen'-siss*), of the southeastern part of Peninsular Florida and the adjacent Florida Keys.

In this portion of the state, this is a common and widespread plant, being found in considerable numbers on the margins of mangrove swamps, and especially in sandy dune areas adjacent to the sea. Flowering profusely over a period of several months during the spring and summer, hundreds of clumps of its attractive foliage and striking heads of blossoms can be seen in many spots on the islands along the fascinating Overseas Highway to Key West.

The very large and heavy bulbs of *H. keyensis* are often buried a foot or more in the soil, with the stout neck reaching to the surface. The bright green, fleshy

leaves attain a length of 2½ feet, and are more often than not badly mutilated by the grasshoppers and other pests which find them so succulent. The flower-scapes are about as long as the longest leaves, glaucous, very flattened, and with conspicuous sharp edges. From 10 to 16 flowers are borne per umbel, these opening in succession over a period of about three weeks—the individual blossoms mostly expanding at night, and fading late the following evening. With a heady scent, they are entirely pure white in color, except for the slender 6-inch apple-green tube, and the vivid yellow (almost orange-yellow) anthers. The slender, down-curving tepals are set around the amazingly fragile membranous filament-cup. This species is now seen in choice landscape planting in the vicinity of Miami, and I have grown it with considerable success as a showy pot-plant in my own garden for many years.

The most extensive listing of *Hymenocallis* known to me at this writing is in the latest catalogue of Wyndham Hayward's Lakemont Gardens, Winter Park, Florida, in which eleven different kinds are offered, some of them unidentified as to species.—ALEX D. HAWKES, *Post Office Box 435, Coconut Grove 33, Florida.*



# the PEONIES

Amateur, professional grower, or scientist: *Here is a book* you will enjoy reading, profit from reading. Authoritative, truly comprehensive, yet with interest maintained—you explore this family of superb plants about which so little is generally known.

You may, or may not be familiar with names of the men and women who wrote this book. We only can say: You would search far to find people *who know more* about Peonies—who are better able to share with others, *interestingly*, the results of their experiences, the findings of their research.

EDITORS—John C. Wister, Director, Arthur Hoyt Scott Horticultural Foundation, Swarthmore College; Gertrude S. Wister.

CONTRIBUTORS—Silvia Saunders; P. P. Pirone; William H. Kreckler; Harold E. Wolfe.

Getting down to *specifications of this book*: It, of course, deals with both *TREE PEONIES* (*Suffruticosa* or *Moutan*, *Delavayi*, *lutea*, *potanini*) and the more familiar *HERBACEOUS PEONIES*.

For *both*, there are chapters on culture. Descriptions. Propagation. Check lists of varieties. Lists of growers. Botanical classifications. Pests and diseases. History. Breeding. Bibliography.

This 200+ page book is illustrated with over 60 expertly done photographs and line drawings. Published by the American Horticultural Society, it is being offered to Members at 20% discount.

---

American Horticultural Society—1600 Bladensburg Road, N.E.—Washington 2, D. C.

Please send me one copy of *The Peonies*.

I inclose \$ \_\_\_\_\_ for the

		Members Price
<input type="checkbox"/> Cloth-bound Edition	\$5.50	<input type="checkbox"/> \$4.40
<input type="checkbox"/> Paper-bound Edition	\$3.50	<input type="checkbox"/> \$2.80

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



IVAN N. ANDERSON

*Ornithogalum saundersiae*

[See page 124]