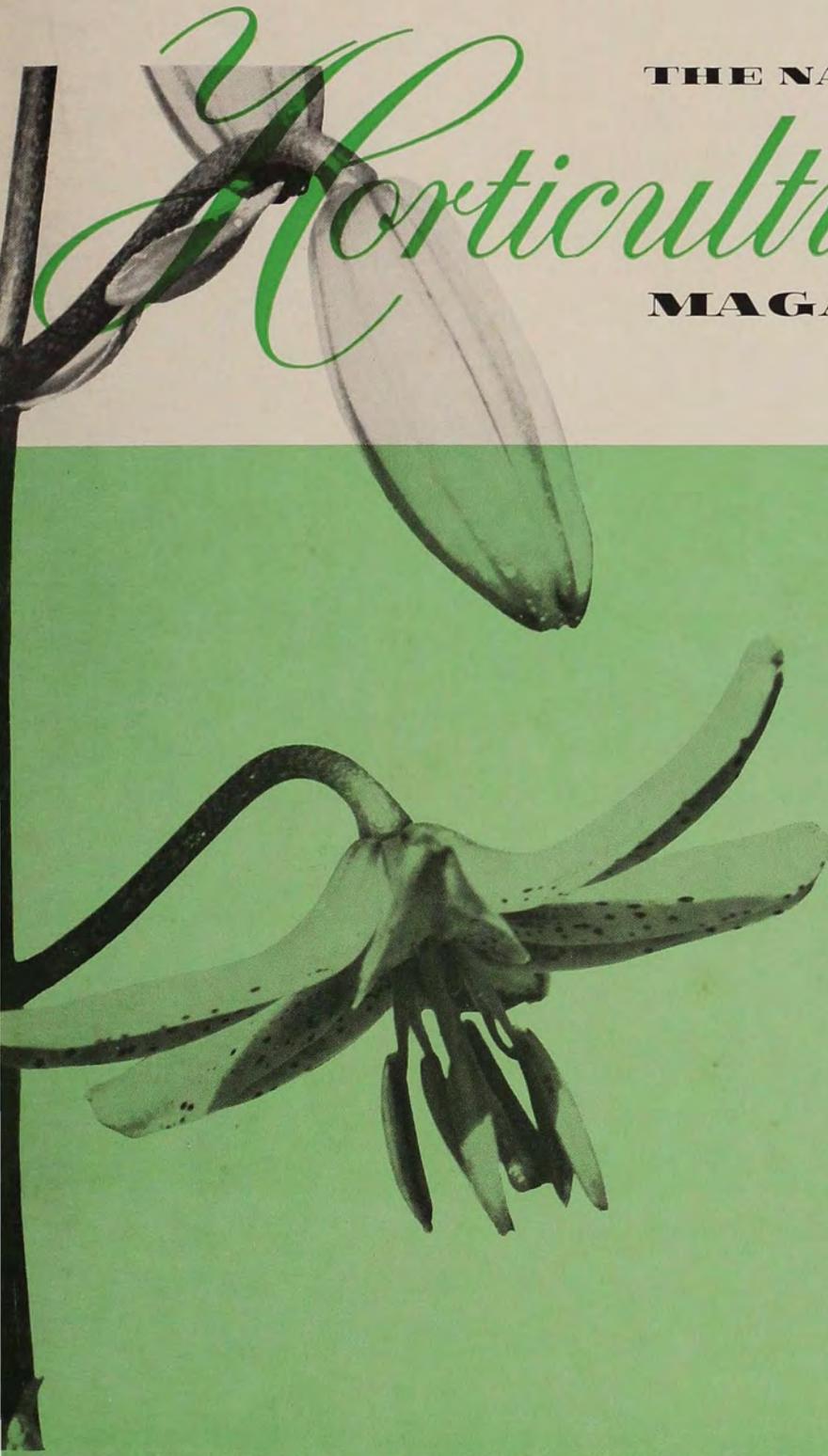


THE NATIONAL

Horticultural

MAGAZINE



AMERICAN HORTICULTURAL SOCIETY
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The National
HORTICULTURAL
Magazine



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The National 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.

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Pfeiffer Lily (L. martagon × L. hansonii) Hybrids

Norma E. Pfeiffer, until her recent retirement, a botanist with the Boyce Thompson Institute for Plant Research at Yonkers, New York, is the breeder of many fine lilies. Her group of the same parentage as the Backhouse Hybrids has stalwart plants with stiff stems, fine foliage, and large flower spikes. The flowers are yellow and pinkish yellow, heavily spotted, with outside of the petals pinkish. Introduced in 1956 by Strawberry Hill Nursery.

Other fine Martagon-Hansonii Hybrids are found in the named clones and the seedling strains of Edgar L. Kline and F. L. Skinner.



G. HAMPFLER, LONGWOOD GARDENS

Nymphaea 'Aviator Pring'

See, "Two New Hybrid Yellow Waterlilies," Page 114

A Portfolio of Lily Portraits

Here are a few suggested lilies for both the beginning lily gardener and the space age specialist desirous of rocketing to lily fame. For the beginner there are shown in this Portfolio: Aurelian and Backhouse Hybrids and hybrids of *Lilium davidi* var. *willmottiae* and *L. × maculatum*; for the specialist, *L. nepalense*, *L. ochraceum*, and *L. bakerianum*, and *Cardocrinum giganteum*. With several of these latter some lily growers of the Northwest Pacific Coast area are already doing well. Intermediate in difficulty of their cultural problems are *L. canadense*, *L. testaceum*, and the *L. auratum* × *L. speciosum* hybrids.

One detail to facilitate understanding of the nomenclature used in a few of the accompanying notes—

Among the dwarf and shorter stemmed lilies there is a group of Japanese garden hybrids and derivatives that now go under the name of Maculatum Hybrids (*L. × maculatum*), probably hybrids of *L. dauricum* and *L. concolor*. The Maculatum Hybrids include such lilies as have been known as *L. elegans* and *L. thunbergianum* and their numerous named varieties; also European crosses of the Japanese garden hybrids with *L. bulbiferum* and its variety *croceum*, sometimes known as Hollandicum Hybrids (*L. × hollandicum*) or Umbellatum Hybrids (*L. × umbellatum*). Here we refer to them all as *L. × maculatum*. They all have erect, upward facing flowers in yellow, orange, and orange red. Some have stoloniferous bulbs running under ground like those of one of the parents, *L. dauricum*.

Many of the photographs used for the Portfolio and much material for the notes have been furnished by A. D. Rothman, proprietor of the Strawberry Hill Nursery, Rhinebeck, New York.

The gardener interested in lilies will find much help in the series of American Lily Yearbooks. Those for 1939, 1940, 1942, and 1946¹ were prepared by the Lily Committee of the American Horticultural Society of which L. H. MacDaniels of Ithaca, New York, was chairman, and published by the Society. The activities of this Committee resulted in the formation of the North American Lily Society in 1947.² Since that time the NALS has issued the Yearbook annually and George L. Slate of Geneva, New York, present president, has edited the series³ throughout its life. Cultural data will be found in the Yearbooks and in the NALS Special Publication No. 3, *Growing Lilies from Seed*.—FREDERIC P. LEE.

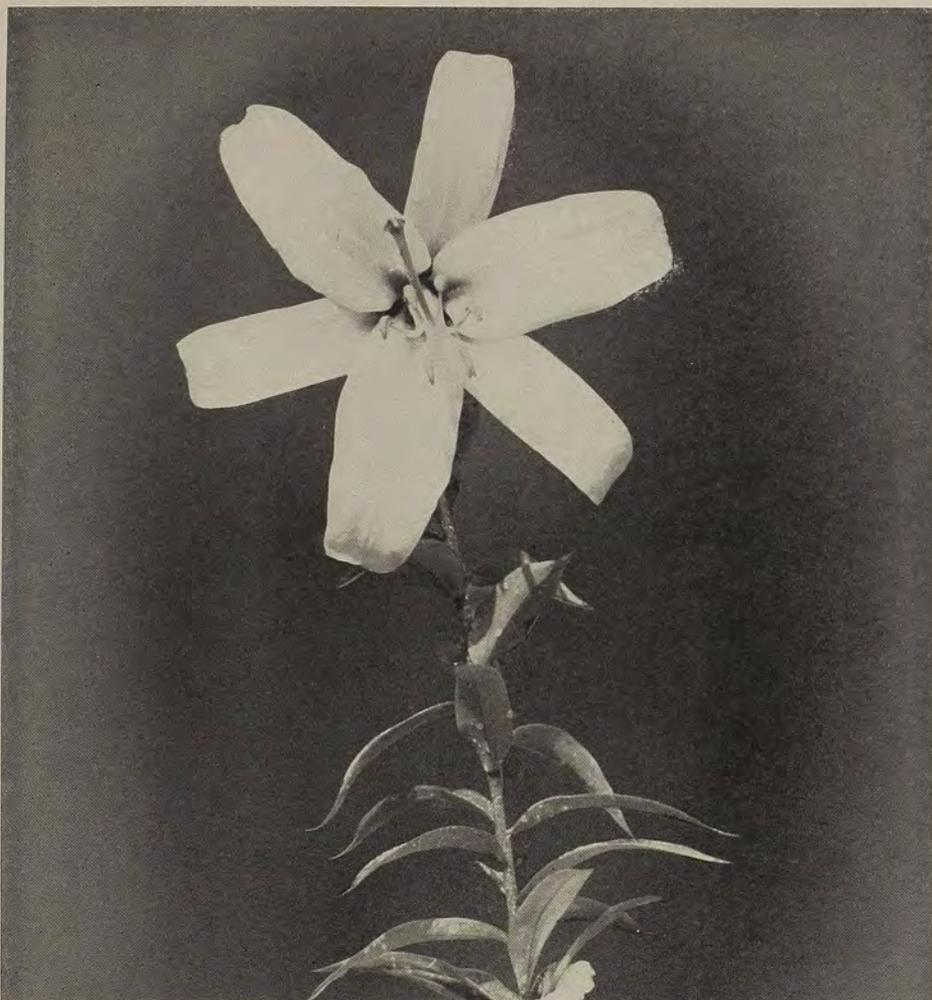
¹Copies of each in AHS Library. ²Organized "to promote interest in the genus *Lilium*, scientific research in its breeding and culture, standardization of its varietal names, the dissemination of information concerning the above, and to promote such other purposes as may advance the culture of lilies." Calendar Year Dues: Regular: \$4. U. S., \$3. Overseas; Sustaining: \$5. or more. Life Membership: \$100. Write to E. F. Stokes, 21 Oakland Street, Lexington 73, Massachusetts. ³Number 1 (1947) through Number 11 (1958), copies of each in AHS Library. Nos. 1-6, \$2. each, 3 for \$5.; Nos. 7-10, \$3. each; No. 11, \$4. Available from Mr. Stokes.



E. L. CRANDALL

Lilium sargentiae

The Aurelian Hybrids are a good group for beginning lily gardeners, combining sturdiness, endurance, and beauty. They are crosses of the Sargent Lily shown above and the Henry Lily (*L. henryi*). The July blooming Sargent Lily from western China grows three to six feet with nodding trumpets white within and reddish purple, brownish, or greenish without. The Henry Lily from central China grows up to ten feet tall but it is floppy. It has nodding turkscap orange flowers that bloom in August. The original Aurelian cross (*L. aurelianense*) by Edouard Debras of France, flowered in 1928.



A. D. ROTHMAN

Aurelian Hybrid of Sunburst Type

Several American hybridizers have recently developed fine Aurelian hybrids of both the trumpet and sunburst (flaring) types. Above illustrated is a new Aurelian from a cross of *L. sargentiae* hybrids and *L. henryi*. The flower is a clear lemon yellow, unspotted, and seven inches across. The plant is five feet tall and blooms in August. Some shade is needed to prevent bleaching.

Among the fine Aurelians (some have *L. centifolium* as well as *L. aurelianense* blood) are the named clones and the seedling strains of Carleton Yerex, Mrs. William T. Wears, Jan de Graaff, Edgar L. Kline, L. N. Freeman, Leslie Woodriff, Tom Barry, and E. F. Palmer.



WALTER B. WILDER

Lilium hansonii

The Backhouse or Martagon-Hansonii Hybrids are another good group for the inexperienced lily enthusiast. The Hanson Lily and a white form of the Martagon Lily (*L. martagon*) were the basic cross.

The Hanson Lily comes from Korea. The height is three to four feet and the nodding turkscap flowers are orange yellow and spotted brown; the petals are very thick. The Martagon Lily ranges across Europe to Siberia except in the far North. The nodding flowers of turkscap form come on three to six feet stems and are a pale to a deep red purple. There are unspotted and white varieties. Both bloom in June.



WALTER B. WILDER

Lilium 'Mrs. R. O. Backhouse'

The first of the Backhouse Hybrids was Mrs. R. O. Backhouse. Flowers are light orange with purple spots. The lily has five foot stems and is both vigorous and floriferous. Blooms in June. Brocade, orange yellow with maroon spots, is one of the best and a strong grower. Other Backhouse Hybrids are Golden Orb, a light yellow with maroon dots; and Sutton Court shown in the succeeding plate.



A. D. ROTHMAN

Lilium 'Sutton Court'

This Backhouse Hybrid is taller than Mrs. R. O. Backhouse but has smaller flowers, yellow and heavily spotted with purple. It is named after the Backhouse home in Herefordshire, England. [Note the raindrops on the lilies in several of the photographs in this Portfolio.] The Backhouse Hybrids were originated by Mrs. Backhouse in the 1890's.



EDWARD VAN ALTENA

Lilium davidi var. *willmottiae*

The Willmott (syn. *L. sutchuenense*) or Szechwan David Lily is four to seven feet tall and requires staking. The flowers are a deep orange, spotted black, and of the nodding turkscap form. The small bulbs are pseudo-stoloniferous (have creeping underground stems) bearing small bulbs at intervals on the underground stems. This lily flowers in July and is vigorous and floriferous. The native habitat of the Willmott Lily is central China. It is a parent of many hybrids.



A. D. ROTHMAN

Lilium 'Lemon Lady'

Dr. F. L. Skinner of Dropmore, Manitoba, breeds lilies particularly for resistance to cold. *Lilium* Lemon Lady is a fine light yellow turkscap lily, three feet tall, and blooms in July. Others from the same cross are Dr. Skinner's Dunkirk, taller and a deep red, and Amaryllis, a pale red. These all come from a cross between two hybrids of *L. davidi* var. *willmottiae* with forms of *L. × maculatum*.



A. D. ROTHMAN

Liliium 'Margaret Johnson'

This is another lily of medium height bred by Dr. Skinner. The stems rise three to three and a half feet. The flowers are orange red with purple spots and erect and facing upwards. Blooms in July. Margaret Johnson is a cross between a yellow lily in the *L. × maculatum* group and the Tiger Lily (*L. tigrinum*). It is vigorous and floriferous.



A. D. ROTHMAN

Tuffery's Dwarf Hybrid

This is a recently introduced and unnamed three foot plant with glistening red orange flowers blooming in late July and early August, erect and facing upwards. The breeder is L. Tuffery of New Plymouth, New Zealand. The parents are said to be *L. umbellatum* × *L. dauricum wilsoni*, both plants in the *L. × maculatum* group.



WALTER B. WILDER

Lilium amabile

The Korean Lily is another low-growing lily but with nodding turkscap, rather than erect, upward facing, flowers. It is a native of Korea growing among grasses and low shrubs. The flowers are bright red to dull orange red to yellow spotted black on one and a half to three foot stems.

Other easy low-growing species are the Morningstar Lily (*L. concolor*) from central China, one to three feet tall, scarlet erect, upward facing flowers; the Orange Lily (*L. croceum*, syn. *L. bulbiferum* var. *croceum*) from Europe, fifteen inches to five feet tall, orange, erect, upward facing flowers; and the Coral Lily (*L. pumilum*, syn. *L. tenuifolium*) from northern China, Korea, and eastern Siberia, with nodding turkscap orange, orange red, and red flowers, up to eighteen inches tall. All bloom in late June.



LILIAN A. GUERNSEY

Lilium nepalense

With the Nepal Lily we enter on the recondite, tender, and plain onery. The fact that it comes from Nepal, United Provinces, and Bhutan in the Himalayas is one explanation. The temperature there goes but little below freezing. There is high average rainfall with very wet summers but dry winters, and high elevation, seventy to eighty-five hundred feet.

The Nepal Lily has a nodding, reflexed funnel shape flower, pale greenish yellow with a striking purple throat. It is two to three feet tall, has stem roots, and the stems wander around underground four to six feet in a few years. Blooms in July.



LILIAN A. GUERNSEY

Lilium primulinum var. *ochraceum*

The Primrose Lily (*L. primulinum*) is close to the Nepal Lily but comes from southwestern China, Upper Burma, and Siam. The Ochre Lily (*L. primulinum* var. *ochraceum*, syn. *L. ochraceum*) has smaller flowers more of the turkscap form. Variety *burmanicum* has larger flowers and is taller.

The Wallich Lily (*L. wallichianum*) comes from the same region as the Nepal Lily but grows at a lower elevation. The allied Nilghiri Lily (*L. neilgherrense*) is from southern India. Flowers of the former have a slender greenish foot long funnel with white throat, the latter white flushed yellow and creamy white outside.



Liliium bakerianum

The Baker Lily from Upper Burma has greenish or creamy white flowers spotted reddish brown, funnel or bell shaped. It is five feet tall. We know little in this country about where and under what conditions this rare "Himalayan Group" of lilies (*L. nepalense*, *L. primulinum* var. *ochraceum*, *L. bakerianum*, and *Cardiocrinum giganteum*) may be grown outdoors, nor have they been used in hybridizing to any substantial extent.



Cardiocrinum giganteum

The Giant Lily, recently placed in a separate genus, *Cardiocrinum*, is another "lily" from the region of the Nepal Lily where it grows in moist, well drained, shady woodlands in leaf mold. This majestic lily is six to twelve feet tall with large heart-shaped leaves and fifteen or more white tubular flowers ten inches long projecting down and away from the hollow stem. Blooms in July. The mature bulbs die leaving several offsets large and small to be replanted. It grows happily in large numbers in British Columbia and alongside ponds in the royal gardens at the Great Park, Windsor, England. Success in the eastern United States has been small.



SILVIA SAUNDERS

Lilium auratum

All lily gardeners wish to grow the Goldband Lily from Japan because of its unique beauty. With only a few does it remain long although it grows in large numbers among rhododendron in Scotland and has been grown successfully on the northwest Pacific coast. The wide open bowl-shaped blooms are six to twelve inches across or larger. The plant is from three to eight feet tall and blooms in August and September.

The Esperanza Auratums developed at one time by Alwyn Buckley have apparently disappeared. A recent seedling strain is the Carmel Auratums of Eric Mayell of Carmel, California, introduced last year by Strawberry Hill Nursery. Selection has been for exceptional vigor, mid-July bloom, and medium height. Some striking reds are included.



Lilium speciosum

The Speciosum Lily, also from Japan, is another with spectacular flowers. The flowers are of the nodding turkscap form, pure white with a pale green stripe and white suffused rose or crimson and spotted with these colors. They are from four to six inches across and the plant three to seven feet tall.

The urge to hybridize the Goldband Lily with the Speciosum Lily is irresistible. It has resulted in the Potomac Hybrids of S. L. Emsweller, with much larger flowers of the *speciosum* type, and the well publicized Jillian Wallace originated by Ray Wallace of Australia. As yet undistributed are other Emsweller lilies of this parentage recently developed that are among the loveliest and most magnificent of lilies.



A. D. ROTHMAN

Lilium × *testaceum*

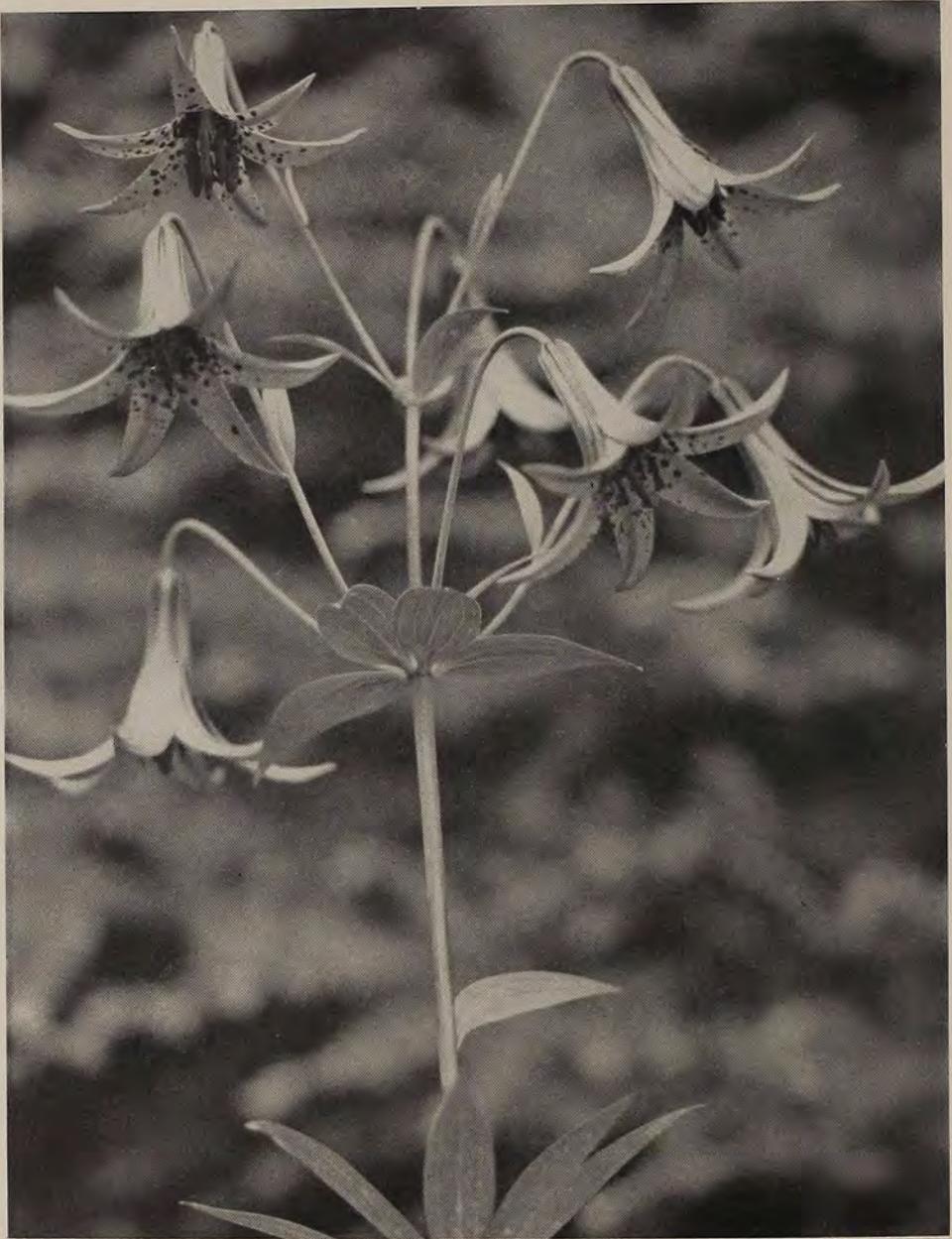
The Nankeen Lily is probably the oldest, and certainly among the best loved, of the known man-made hybrids. The Nankeen Lily is four feet tall and has tawny or biscuit colored flowers blooming in June. Its originator is unknown and it probably came from some continental European nursery about a hundred and fifty years ago. The clone has not only persisted all this time, but has held its place firmly.

S. L. Emsweller and his colleague R. M. Stewart, have determined by cytological study that the Nankeen Lily is genetically a hybrid between *L. chalcedonicum* and *L. candidum*. The hybrid is sterile. "Nearly" like flowers have been obtained by various breeders by repeating the cross, but have not been like enough to replace the Nankeen Lily and for the most part have run out.



Lilium canadense

Our eastern native, the Canada or Meadow Lily, when well grown, is among the most graceful and beautiful of all lilies. It ranges from Quebec to Virginia and prefers acid humus, moist soil, and sun with a covering of ferns, grass, or low shrubs. The nodding, bell-shaped flowers are usually yellow with purple spots (variety *flavum*). Less commonly it has some orange and red. The Canada Lily is two to five feet tall and blooms in July. Bulbs form yearly at the end of a stolon.



A. D. ROTHMAN

Lilium canadense var. *rubrum*

The Canada Lily may be pinkish both inside and outside; brick red on the outside but turning to yellow at the throat on the inside; or red to orange both inside and outside. The red coloring may be due to natural crosses with Gray's Lily (*L. grayi*).

The Red Canada Lily shown above is properly *L. canadense* var. *coccineum* but is usually sold as var. *rubrum*. It has reddish flowers and is found in dry meadows in the Hudson Valley. Variety *editorum* is red with broader leaves and found in the Appalachian Mountains. Gray's Lily found in the southern Alleghany Mountains is closely related. Its flowers are deep crimson outside and inside orange spotted purple.



Lilium washingtonianum var. *purpurascens*

L. washingtonianum var. *purpurascens*, a variety of the Washington Lily, is possibly the most beautiful of our many western native species. It has a loose white trumpet which turns lilac as the flower matures. The Cascade Mountains of Oregon are the center of its range, although the type, *L. washingtonianum*, which closely resembles, is found from the northern Sierra Nevada in California well into Oregon. This variety is among the less difficult of the western species to accommodate in gardens. In California it grows in well drained soils that thoroughly dry out in summer.



Cornus florida

*A closeup view of the greenish-yellow, sessile flowers
and the white petal-like bracts.*

The Flowering Dogwood On Long Island, New York

WILLIAM J. MILLER

A report on the writer's six-year experience on growing the Flowering Dogwood from seed to flowering tree.

Long Island is in one of the many states in the eastern half of the United States in which the hardy and handsome *Cornus florida*, or Flowering Dogwood, enhances the beauty of the landscape.

Well known and loved among the small ornamental trees, *Cornus florida* is picturesque, graceful and has enduring charm. It possesses every quality desired in a small tree. It is best known and cherished for its beautiful mass of white petal-like bracts in the spring. But it is also highly attractive during the remainder of the year; in summer, having full heavily veined foliage, in autumn, wearing crimson and scarlet tinted leaves and bearing scarlet fruits, and in winter, arching its bare branches with their prominent gray, rounded flower buds into an irregular yet pleasing contour.

It is adaptable to and valued for landscape planting, where it affords a most pleasant setting for house and garden. It grows well and flowers best in a sunny location although it is quite suited to use in moderately shady situations. In nature it is commonly found in rich woodlands, generally under the shelter of taller deciduous trees. In woodland facings it is an arresting sight at the height of its bloom in the spring.

Cornus florida flourishes throughout its southern range where natural seedage and ready propagation prevail. These seem to lessen northward.

Interest in this beautiful tree aroused the desire in the writer to propagate it from seed to determine ease of culture, rate of growth and age at which trees commence flowering on the south shore of Long Island. The results of a number of years work on such a project are reported herein.

The program of raising the Flowering Dogwood starts with the collection of seeds in the autumn. The fleshy fruits ripen from about the middle of September to the middle of October and should be collected then. No special equipment such as hooks or ladders is needed for fruit collection since many of the trees are low growing and most of the fruits are within easy hand reach. The intensity of the scarlet coloring of the fruit and softness of its thin pulp increase gradually during this period. Ripe fruits are soft and deep scarlet.

The fruits are borne in clusters in quantities as high as twenty but generally about twelve. They are globular to ovoid drupes, about three-eighths an inch in diameter and about a half inch long. The seeds are bony stones contained within the fruit, ovoid, grooved, about a quarter inch diameter and about three-eighths inch long. Seeds from the lighter colored fruits have been found to be as viable as seeds from the deeper colored, well ripened fruits. Seeds are more difficult to remove from the lighter colored fruit however, because of the hardness of the pulp. For this reason well ripened fruits are preferred, but the fondness of birds for the fruit at times makes it necessary to collect them when they are somewhat hard and before they are fully ripe.



Cornus florida leaves, fruit cluster, and flower buds

(All photographs illustrating this article (except the closeup view of the flowers) were made

by Russell W. Mc Cann.)

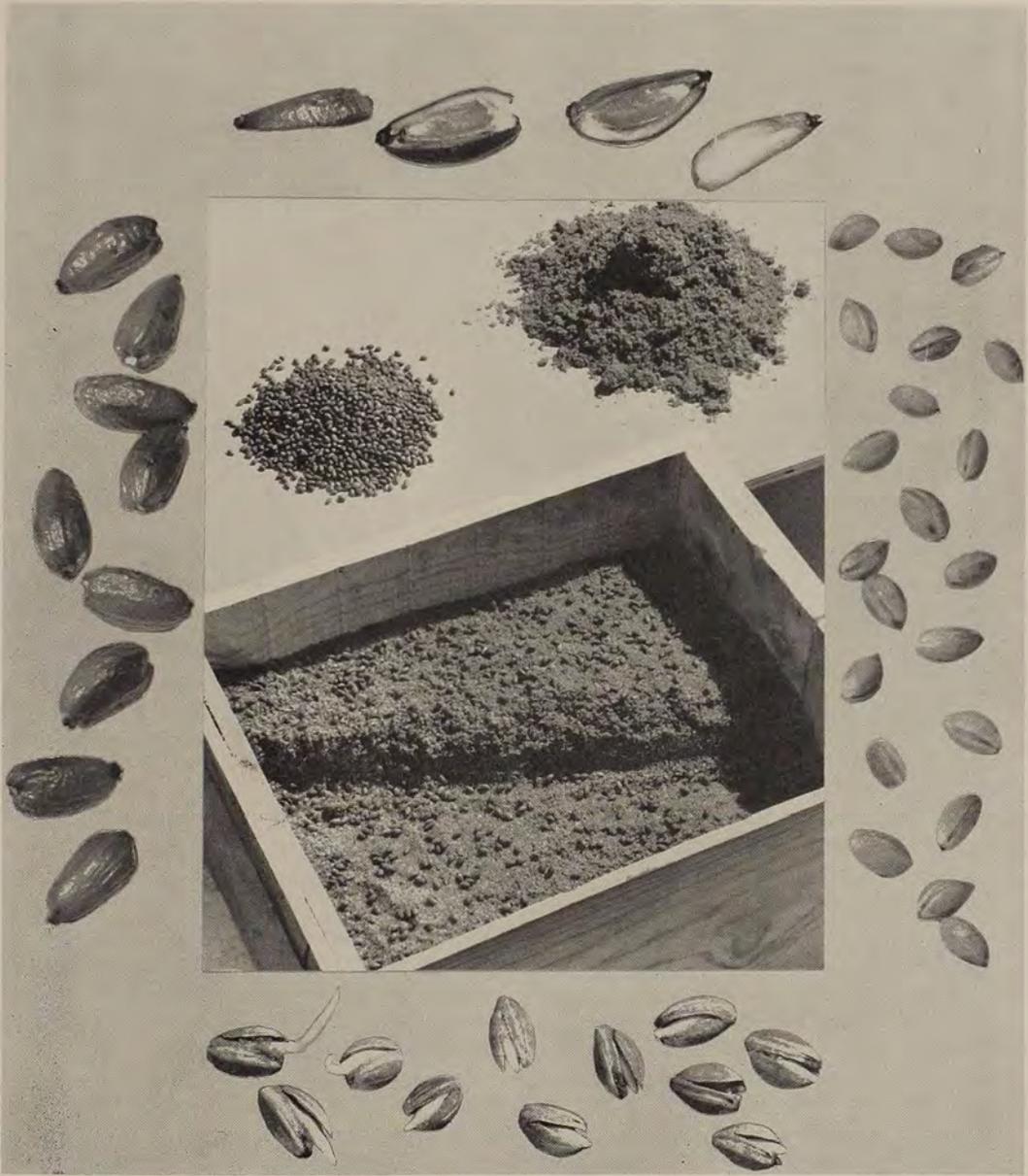
Immediately after collection the seeds should be separated from the fruit. The pulp should be macerated slightly and the fruits then immersed in water for an hour or two. The water is drawn off and the seeds removed from the pulp. The seeds should be thoroughly cleaned, spread out and left to dry for several days, following which they should be placed in jars or containers and stored dry in a cool place until planted.

Like numerous other tree and shrub seeds, the seeds of *Cornus florida* require a period of several months for the complex internal "after-ripening" development before they germinate. Some kinds of seeds complete this process during the winter if planted out-doors in the

autumn, or if kept moist at a temperature a few degrees above freezing, and will then germinate the following spring.

Flowering Dogwood seed can be sown outdoors in the fall, or stratified over winter to overcome dormancy and sown in the spring. Of the two methods, the writer has had decidedly more success with spring sown seed. Many losses of fall sown seed can be attributed to rodents and others to unknown causes. Without the proper conditions for after-ripening, germination either does not occur or is erratic and frequently the seedlings are weak.

In fall sowing, the seeds are sown outdoors in drills or broadcast and covered with a quarter to a half inch of soil.



Cornus florida seeds and stratification

A wooden stratification box exposing the yet uncovered layer of seeds atop a damp sand stratification medium is centered and in the frame: The freshly harvested fruits (left), sections of the pulp cut away to show the seeds (top), the cleaned seeds (right), and the seeds in various stages of germination after 120 days of stratification (bottom).

The seed beds are usually given a mulch of leaves or straw which is removed at the first sign of germination in the spring. After the seedlings reach several inches in height they are transplanted to stand about four inches apart in rows with six inches between rows.

Stratification is a method of handling seed to provide satisfactory conditions for breaking dormancy. A suitable moisture retaining medium such as granulated peat moss, sand, or soil is used for stratification. The writer prefers to use clean, sharp builder's sand as uniformity of moisture can be more easily maintained than with other media. Several thousand seeds can be stratified in a fruit box and small quantities can readily be stratified in jars. The procedure followed is to first place one or two inches of sand in the box, then scatter seeds on the sand and cover with about a half inch layer of sand. This process is repeated until the box is filled. An alternate method is to intermix the seeds throughout all of the sand in the box.

The stratification medium is kept moist throughout the stratification period. Thorough saturation of the medium at the start and then light watering of the medium about every ten days, or less frequently in very cold weather, is ample.

The preferred temperature range during stratification is just above freezing to about fifty degrees. Many propagators make use of a cool cellar or refrigerated storage room to insure maintenance of temperature within this range. Small quantities of seeds can be stored in jars or polyethylene bags on the lower shelf of a refrigerator where the temperature is about ideal at forty degrees. While this temperature is recommended as the best the writer has not found it essential to maintain it and has had good results with storage of the stratification box in an unheated shed throughout the winter and early spring where the temperature range was ten to sixty degrees. Under shed storage, an eight to twelve inch light pane and airy covering such as salt hay or excelsior surrounding the box has helped towards maintaining a narrower temperature range. It is not desirable to employ any covering around the box which would be air tight.

Seed of the Flowering Dogwood need about four months stratification. With the desired date of sowing of April 15, seeds are placed in stratification December 15. Near the end of the stratification period the seed should be examined. It will generally be found that the seeds have cracked or perhaps even started to sprout. Seeds are immediately sown in four inch deep flats filled with garden soil and covered with about a quarter inch of soil. Germination is epigeous, the seed coat usually sloughing off and remaining in the soil.

Initial growth is rapid and by the end of May or early June seedlings reach several inches in height with development of two pairs of leaves. Commencing then and continuing through June, seedlings are transplanted to the nursery bed about four inches apart in rows about six inches apart.

The mortality rate during the first year of growth is very high if seedlings are not shaded. They are very sensitive to rapid drying of the soil. The soil in which the writer's seedlings have been grown in sandy loam not conducive to moisture retention and a heavier soil would seem to be more suited for minimum attention and the least losses due to drought. Shade protection in the form of a lath covering combined with a peat moss or leafmold mulch and frequent systematic watering afford the most ideal growing conditions. After the first year of growth trees are extremely hardy and need no shade protection.

By late summer or early fall a goodly portion of the leaves on these seedlings reach the size of the leaves on mature trees. The same change in coloring of the leaves from green to attractive hues of maroon, crimson, and red takes place during the fall. Leaf drop occurs with the colder weather of November although a few grudgingly adhere to some through the winter. By winter the unbranched seedlings have semi-hardened, but the trunk is very smooth, pliable, vigorous in appearance, and a deep maroon. There are several lateral leafbuds and one terminal bud. The buds are slender, pointed and redish. The lateral or axillary buds are minute, covered by the persistent bases of leaf stalks, and closely adhere to the trunk. Nodes are



*Balled and burlapped seedlings of *Cornus florida* at the ages of two, three, four, and five years.*

slightly raised and there are generally five to six on each seedling with pairs of opposite buds at most nodes. No protection has been given my seedlings during the winter and they have proved perfectly hardy in this area.

Observations of the trees at the end of their second to fifth years of growth have shown the following progress.

On the two year old trees the trunks are hardened, tan or light brown, slightly roughened. The current year's growth is maroon with grayish cast, silky smooth, pliable. About one-half of the sets of axillary buds remains latent. Customary development of branches is in pairs, each branch opposite the other on the trunk. Commonly each set of branches extends in directions alternate to those of the set that has formed directly below. Infrequently the lowermost foundation branches occur in a set of four with growth uniform in four different directions. Branch ends curve somewhat to hold terminal leafbuds upward. During

this year there has been foundation branch, trunk leader and trunk development.

Three, four and five year old trees have the same characteristic appearance of trunk, current years' growth, branch and leafbuds as described above. On the three year old trees two to three sets of laterals are developed on branches. During this year there has been lateral development on foundation branches, extension of foundation branches, formation of upper strata branches, extension growth of trunk leader and trunk expansion.

In the fourth year lateral branches develop on the lateral branches produced the previous year. These are generally short lengths about six inches long, slightly curved with leafbuds pointing upward. This habit of forming short length lateral branches incurved to a small degree is a trait of the adult tree where both leafbuds and flower buds are held in this fashion. During this

year there has been lateral growth on laterals, formation of further laterals on foundation branches, establishment of laterals on upper strata branches, formation of additional upper strata branches, extension growth on all branches and trunk and trunk expansion.

On the five year old trees flower buds appear at the apices of branches and laterals. Most times, on laterals three or more short spurs or twigs gently bent upward occur, each holding a flower bud at its terminal. The first evidence of flower bud formation is found in August. At their inception at that time flower buds are minute. They develop progressively to full size by late fall or early winter. The fully developed flower buds have a rounded base about a quarter inch in diameter, encased by bud scales joining in a point at the top of the bud. The bud scales which enfold the true flower—itsself rather inconspicuous—are the bracts which in the spring expand and open to put on their brilliant display. The underside of the base of the bud is green while the remainder of the bud envelope is light maroon with grayish cast.

Foundation branches hold to a more or less horizontal line with slight ascendancy. Upper strata branches are consistent in their ascendancy at about a forty-five degree angle.

Great variations in extent of growth occur among seedlings and young trees with distinct differences in growth sometimes prevailing in subsequent years. The following table records measurement data taken during the past six years:

The annual period of full active growth occurs from April into November. In the young trees, leaf, branch, trunk and root development take place during this time and in the older trees flower bud formation, flowering and fruit and seed production in addition. While the remaining months are considered the trees' dormant period, there is evidence of increase, or secondary thickening, in trunk diameter. Undoubtedly activity occurs in late winter or early spring in the cambium in preparation for the oncoming seasonal growth cycle.

A gratifying attribute of the flowering dogwood is its ability to endure and flourish in crowded planting conditions. Many times it is seen planted too close to a house so that its growth is entirely out of balance, almost all of the branches being on the sides that are not obstructed. The Flowering Dogwood is a small tree and in the wild must compete with the predominately taller trees of the woods where again this same condition of lopsided growth frequently occurs. Often they are found on the fringes of the woods where they reach out in the clearings for the sunlight. Even under these conditions the trees are perpetual producers of prolific bloom and abundant foliage. In such locations they fill in the lower unbranched areas of the taller trees which adds an attractive billowing effect to the marginal zone, a feature particularly effective when viewed from a distance.

In nursery grown stock planted in full sunlight and given ample room, the trees branch uniformly, most often bearing

Growth Measurements of 1953 Seedling Cornus florida

End of Year	Height		Trunk Diameter		Branch Spread Overall (Feet)
	Range (Feet)	Average (Feet)	Range (Inches)	Average (Inches)	
1953	1/3—1	2/3	1/16—1/8	1/8	Unbranched
1954	1-1/2—3	2	1/2—5/8	7/16	2-1/2
1955	2-1/4—4-1/4	3-1/2	5/8—1-1/8	7/8	4
1956	4-2/3—6-1/3	5-1/2	1—2	1-3/8	6
1957	6—8-1/6	6-1/2	1-7/8—2-1/2	2-1/8	7
1958	7—10	8-1/2	2-1/2—3-1/2	3	9

their branches low. Eventually they develop into a tree with a short trunk with little taper that breaks abruptly six to ten feet above the ground into a number of stout, elongated, wide spreading limbs with many short branch laterals with upturned ends which form a broad, low, dense crown. The distinctly identifying feature of the adult tree in the wintertime is the fine line tracery of the numerous short upturned lateral branches holding rounded flower buds and slender leafbuds.

Very little need for pruning arises in the young trees as in their natural style of growth they are most satisfactory. On some young trees sprouts develop below the foundation branches. These are recognizable by their weak appearance and should be removed at the end of the season's growth.

The young trees take many attractive forms which are more clearly defined and perhaps best evaluated during the winter when they are without leaves. The general formative shape of the trees becomes evident in the third year and in blocks of trees the propagator finds a few that are outstanding for their diverse appeal; sometimes it being a salient feature of the form such as a bifurcated trunk or gracefully spreading and ascending foundation branches; at other times it may be excellent overall conformation of the tree giving it a dignified bearing or dominant appearance. Hand-picking young trees to suit one's taste provides much of the satisfaction in propagation of the dogwood.

The writer has transplanted two year old and older dogwood with bare roots and with root ball exclusively in the early spring with practically a hundred per cent success. There has been little retardation of growth following transplanting. Transplanting of the trees at other times during the year involves considerable risk. Although such transplantings have proved successful, the trees are very sensitive to being moved at such times and transplanting more often results in losses than success. With the extra surety it affords, root ball transplanting is to be preferred over bare root transplanting. On Long Island the trees were transplanted about April 1, just before the start of each of their

first three or four years of growth. The response was excellent and steady vigorous growth continued for the season after each transplanting. A hole about one-third larger in diameter than the root ball was provided. The hole was made just deep enough to maintain the trees at the same ground level as in the previous years' growth. Liberal portions of peat moss were intermixed with good soil and placed under and around the root ball following which the area was given a thorough watering. Several more waterings were given in the next few weeks following transplanting. In May a moderate application of five to seven trowels-full of a mixture of cottonseed meal and superphosphate were lightly cultivated into the soil around the base of the second year and older trees.

Providing liberal space between trees is insurance for unrestricted development. Single stem seedlings entering their second year were transplanted eighteen inches apart. Trees entering their third year were spaced three feet apart. The writer considers trees entering their third year quite suited for planting in permanent locations. These are in the range of two to three feet in height and can be readily dug with a ball of reasonable size without greatly disturbing the root system which insures unchecked growth after transplanting.

Trees scheduled to be transplanted on entering their fourth and later years were root pruned the previous fall. This practice encourages development of a compact root system, lessens shock of transplanting and keeps the size of the root ball small so that it is easily handled in transplanting.

All trees of the writer's stock flowered in the spring of their sixth year. The blossom development cycle began in early April when the bud scales commenced separation. The bracts continued their steady expansion and unfolding, initially green in color, then with tinges of pink and finally turning white. Bracts took about six weeks from the beginning of expansion to the fully opened stage. Bracts were fully opened and white by May 10 and remained in good condition until May 20, and measured three and a half inches across. The bracts



Cornus florida, a young flowering tree raised from seed.

are made up of four equal segments. The very tip at the center of each of these segments is the only part of the bract that does not expand. This brown tinged tip forms a peculiar notch and gives the segment a slight and rather irregular twist.

Because of limitations on space only five trees were carried into their sixth year. The flower show on four of the trees was excellent with bud count on individual trees ranging from over three hundred to almost six hundred. On the remaining tree the bud count was fifty. This tree was transplanted a month before flowering and while all flower buds opened, the blossoms were only about half normal size.

Flower bud loss due to winter injury was in the very low range of two to three per cent. The lowest winter temperature experienced was zero in February and the mean winter temperature was thirty-five. It was observed that the bud envelope of frozen buds prematurely loosened at its apex during the early winter.

The season prior to the flowering of these trees was exceptionally dry and sunny. This seemed to have a decided influence on the development of flower buds. That inordinate dryness and sun-

light appear to have radical influence on flower bud formation is evidenced by the fact that the season the oldest trees set buds a small percentage of trees one year younger also set a limited number of buds.

Good care, proper transplanting and spacing of the trees are all important steps that were followed in bringing a tree to the flowering state. Although it is agreed that these items cannot be compromised, seasonal weather conditions had foremost effect on tree growth and flowering. If weather conditions were ideal for the trees' requirements each year, trees in this area entering their fifth year should bloom, but if the weather is not the optimum in all years of the cycle, which on the average it is not, trees will generally flower starting in their sixth year.

Whether it occurs in the fifth, sixth, or later years of growth, the blossoming of *Cornus florida* in its ethereal spring glory is well worth waiting for and is alone ample recompense to the propagator. But the further many splendid attributes of this tree during the remainder of the year, at all times interesting and ornamentally pleasing, make ultimate the reward to the one whose efforts are spent in its culture.



H. F. LOOMIS

Syzygium jambos

The Rose Apple

The Cultivated Eugenias In American Gardens

PART I

EDWIN A. MENNINGER¹

Eugenia was once considered the largest genus of trees and shrubs in the world, comprising more than two thousand species of myrtaceous evergreens in the tropics. Most of the standard reference books in print still cling to this genus as a catch-all, but its complexities have induced taxonomists in recent years to break it into two main groups, plus a score or more smaller genera. Broadly speaking, the genus *Eugenia* is now understood to include most of the New World species, and the genus *Syzygium* comprises most of the Old World plants, with a few of these allocated to *Acmena* or *Cleistocalyx*.

This split was suggested by Merrill and Perry twenty years ago and is now generally accepted, but unfortunately horticulturists have been slow to pick up such switches in nomenclature and have a tendency to cling to *Eugenia* as a generic name for all the plants of the group. In this they are abetted by some of the not-too-modern reference books. They are encouraged too by publications like M. R. Henderson's revision of "The Genus *Eugenia* in Malaya" in which all genera kept separate by Merrill & Perry, and by Bailey, are thrown back into *Eugenia*. They are confused when outstanding botanists like Bullock and Harrison, in a recent issue of the *Kew Bulletin*, refuse to accept *Syzygium* as generically distinct from *Eugenia*.

It is a troublesome group of plants, and the existing confusion is increased by the fact that there continue to be a few "true Eugenias" in the Old World

(their special floral arrangements agree with New World species rather than *Syzygium*, etc.) and also because many species are still imperfectly known or as one botanist wrote, "they are separable with difficulty or uncertainty."

Consequently, horticulturists in the United States, are looking forward with keen anticipation to the forthcoming *Hortus III* with a revision to date of accepted nomenclature for the everyday gardener.

In the proposed edition of *Hortus*, these species of *Syzygium* are recognized:

<i>aromaticum</i>	<i>jambos</i>
<i>buxifolium</i>	<i>malaccense</i>
<i>cumini</i>	<i>oblatum</i>
<i>grande</i>	<i>pycnanthum</i>

and these species of *Eugenia* are accepted:

<i>alternifolia</i>	<i>longipes</i>
<i>axillaris</i>	<i>mato</i>
<i>brasiliensis</i>	<i>monticola</i>
<i>buxifolia</i>	<i>natilitia</i>
<i>condensata</i>	<i>oblanceolata</i>
<i>confusa</i>	<i>paniculata</i>
<i>coronata</i>	<i>pitanga</i>
<i>currani</i>	<i>polycephaloides</i>
<i>cyanocarpa</i>	<i>pungens</i>
<i>eucalyptoides</i>	<i>rubicunda</i>
<i>klotzschiana</i>	<i>simpsoni</i>
<i>ligustrina</i>	<i>uniflora</i>
<i>luschnathiana</i>	<i>uvalha</i>

The editors of *Hortus III*, however, warn that although these species of *Syzygium* and *Eugenia* are thus listed in the manuscript for the revised edition, they feel free to make changes before publication if they see fit.

The author hopes they amend their lists, because 12 of the species named are not in cultivation in the United States; at one time they may have been, cer-

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The author acknowledges his indebtedness to R. Bruce Ledin, George H. M. Lawrence, Julia Morton, D. J. McSwiney, George W. Kosel, Jr., Nixon Smiley and last but not least Paul Root of Cam-Art Studios, who died during the course of photographing *Eugenia* species for this article.

tainly a few were introduced by the USDA but failed to become established. And, on the other hand, several Florida natives and half-a-dozen species grown commercially in Florida and California are not listed in *Hortus III*. (The species *S. buxifolium* and *E. buxifolia* are not synonyms—they are different plants, and the latter is confusing because according to the Index Kewensis, four quite different plants scattered over the world have been described by different botanists and called *Eugenia buxifolia*.)

We, in the Temperate Zone, have only one basic contact with the Eugenias—this is through the spice we call cloves, which are the dried flower buds of a Moluccan species. It has never been established in cultivation in this country.

But many Eugenias bear delightful, edible fruits and millions of people living in warm countries are very familiar with plants quite unknown to us. In fact, except for fewer than a dozen species indigenous to South Florida, the genus is almost entirely tropical. The greatest concentration of species is in Malaysia, (North Borneo alone has 150 species of *Syzygium*) and some parts of Brazil, although Cuba with 125 species, Australia with perhaps 50, Central America and Mexico with 50 or more, Africa with probably 40, indicate the pantropic spread. [There are no Eugenias in Europe.]

E. J. H. Corner served twelve years at the Botanic Garden in Singapore and made special study of *Eugenia* in that hotbed of species. He wrote:

"*Eugenia* is one of those big groups of tropical plants to which there is no introduction in general botany and which discover themselves as a new idea when we approach the study of a tropical flora.

"Except the dwarfed and shrubby tree-lets of mountain tops, the Malayan Eugenias are trees of considerable size. Unfortunately it is not possible to distinguish most kinds by a short description, though they may be recognized at a glance, for where one may seem distinctive there are always several related to it and differing only in details of flower, fruit, leaf-shape, or veins of the leaf, and as there has been much error

in identification it is not yet certain which are really common. Still, it is easy to recognize a *Eugenia* by its simple, opposite, leathery, shortly-stalked leaves that generally point down and have up-curved sides, from the absence of stipules (so that there is no line or scar connecting the stalks of a pair of leaves across the twig, as there is in the Mangrove and *Ixora* families), from the clusters of white (or pink) fluffy and sickly sweet flowers and the inferior ovary which ripens into a berry with 1-2 large seeds, but has no stone.

"Malayan Eugenias are evergreen, shedding their leaves gradually throughout the year, but new leaves and flowers they develop at seasonal intervals. Some flower once a year after pronounced dry weather; most seem to flower twice a year after each dry spell; and not a few flower three or more times. Of these last, the Sea Apple (*S. grande*) is the best example. In the south of the Peninsula where it is a common roadside tree, it flowers about the middle of March to the middle of April, from the end of July to the middle of August and about the end of December to the middle of January. Sometimes it has small flowerings, too, about the middle of June, the end of September and the end of November. As the flowering is gregarious, many trees being affected at the same time over a wide area, it must be a climatic phenomenon that is dependent, perhaps, on some alternation of dry and wet, or hot and cool, weather too subtle to be detected by ordinary meteorological records. Some years, the trees flower earlier or later than is their wont, exactly as the change of the monsoon is unpredictable, and some flowerings are poor: indeed, two good flowerings are seldom consecutive. The March flowering is the most regular and, generally, the most striking. Every tree will then flower for 10-20 days, although the height of flowering, when the crown is whitened as with snow, lasts in each case only 4-5 days or a week. The fruits take a little over 2 months to ripen, which is the same for clove-fruits. Unfortunately, we have no exact records for other species, not even for the fruit trees, but we are certain that among the other species there are very marked differences that are worth investigating."

The few *Eugenias* that are distinguished as pretty flowering trees, are from the Old World (Malaysia). The fruits of a few Old World species are attractive to the eye but most insipid to the taste, or at least of doubtful interest. Contrariwise, many of the New World species bear delightful edible fruits that are in great demand where available. But the flowers of the New World plants are not pretty and draw no special interest.

So much for an introduction to the complexities of this group with a thousand children, whose peculiarities are difficult to separate because often not well defined, whose behavior is different in different environments and whose possibilities have only been sketchily investigated. A starting point for our discussion can at least be made from the species actually in cultivation in Florida or southern California. Separating these into Old World (*Syzygium*, etc.) and New World (*Eugenia*, etc.) groups makes the relationships easier to understand. Nomenclature is based on Bailey's *Manual of Cultivated Plants* and the manuscript of *Hortus III* with synonyms given for the convenience of interested persons.

Old World Species

Syzygium jambos (L.) Alston. Rose Apple.

(Syn. *Eugenia jambos* L.; *Caryophyllus jambos* Stokes; *Eugenia malaccensis* Blanco but not L.; *Jambosa vulgaris* DC; *Jambosa jambos* Millsp.)

This dense evergreen Malayan shade tree of 30 or rarely 40 feet high, and trunk diameter of 15 to 18 inches, has spread to every warm country in the world and reproduces so prolifically that in some areas it threatens to become a pest. Yet it is much cultivated for its handsome form, bushy spreading top, rose-fragrant 3-inch greenish-white "powderpuff" flowers and attractive 2-inch fruits that really smell and taste like a rose.

The flowers in March and April in Florida, lasting only a few days, are quickly followed by quantities of fruits, each containing 1 (rarely 2) seeds that rattle around in the yellow to pinkish-white fruits. One reason the Rose Apple spreads so rapidly is that the seeds are polyembryonic (like those of the mango) and one seed frequently produces 3 to 8 plants. The flesh of the fruit is dry and crisp. It is not particularly good eating, rather insipid with a rose-water flavor, but candied, preserved or made into jelly,

it is highly prized as a delicacy. The ripe fruit is so pretty it is often used for table decoration.

The Rose Apple is much planted in Florida where it seems to thrive on poor soil and neglect. It has been found useful too for its resistance to salt spray. The fruits are not sold in Florida markets as they are in Malaya.

Syzygium aqueum Alston. Water Rose Apple.

(Syn. *Eugenia aquea* Burm.)

Burkill reports this is "a small, crooked fruit tree, wild in southern India and eastern Malaysia, cultivated widely in southeastern Asia for the sake of its slightly aromatic, white or rose-pink fruits, which are eaten to relieve thirst." He explains the fruit is like that of the common Rose Apple (*Syzygium jambos*) except it is less elongated and lacks the rose flavor.

Wm. F. Whitman of the Rare Fruit Council (Miami) is growing a Taiwan (Formosa) marcot of this tree at Miami Beach but it has not fruited yet.

Syzygium pycnanthum Merrill & Perry. Wild Rose Apple.

(Syn. *Eugenia densiflora* (Blume) Duthie.)

A Malayan slender evergreen tree to 30 feet with oblong leaves 4 to 10 inches long and 3 inches wide, superficially similar to those of *Syzygium malaccense* and *E. curranii*. Occasionally the tree develops a bushy crown and massive trunk. Corner says this and its variety *angustifolia* are among "the most beautiful flowering *Eugenias*." The blossoms are white or pink or clear rose-colored, each 1½ to 2 inches wide, clustered in dense 6-inch heads in the leaf axils. *E. densiflora* var. *angustifolia* has quite dissimilar, long, narrow leaves, usually 1x6 inches or larger. The flowers are smaller than the type, white or cream colored, very fragrant, and the 30-foot bushy tree is whitened when in flower. The variety sustained less damage than did the type by 30 degree temperatures in Florida in January 1958. The round black fruits are about ½ inch in diameter. This is commonly called the River Rose Apple.

Syzygium grande Wall. Sea Apple.

(Syn. *Eugenia grandis* Wight.)

A very large evergreen Malayan tree, in its native land reaching 80 feet in the open, and 100 feet or more in the coastal forest canopy. It develops a dense, heavy crown with massive wide-spread limbs.

The glossy leaves, up to 9 inches long and 5 inches wide, with a distinctly down-turned tip, are thickly set on the branches which seem to droop with the weight of foliage.

David Fairchild in 1926 brought the first seed to Florida from Singapore and some of the original introductions are now big trees in the old Miami City Cemetery. Because it grows fast



Syzygium malaccense, the Malay Apple

Photographed from the painting of Bernard and Harriet Pertchik which appeared in *Flowering Trees of the Caribbean*, through the courtesy of the publishers.

and because the thick bark is fire-resistant, the trees have long been planted as avenues in Malaya where they are uninjured by grass fires.

The 1-1½" white, fluffy ball flowers with a strong, rather sickly fragrance, come in dense clusters to 6 inches wide, and the tree with its glittering green foliage, when covered with a heavy mantle of white flowers, is very showy. The natural range extends to northern Australia.

The fruits ½x1", oblong, have a green leathery rind when ripe, dry but edible.

A common name for it in Australia is White Apple.

Syzygium malaccense (L.) Storr. Malay Apple.

(Syn. *Eugenia malaccensis* L.; *Syzygium malaccense* (L.) Merr. and Perry; *Eugenia bauaguica* Blanco; *Jambosa malaccensis* DC.)

One of the world tropics' most beautiful flowering trees, this dense evergreen from Malaya reaching 30 to 40 feet, bears magenta or red-purple brushes that come bursting very abundantly from trunk and branches on short stems. These are succeeded by crimson-colored, egg shaped fruits 2 to 3 inches long which have a soft, juicy, edible pulp.

Neal: *In Gardens of Hawaii* writes: "The tree is very handsome. Smooth, mottled gray bark clothes the trunk and the foliage consists of dark-green, shiny, oval leaves. In March and April when flowering, a grove of mountain apples is especially beautiful. As the cerise pompons fall a bright red carpet is laid on the ground below. The trees grow rapidly, prefer moisture to dryness." They are recommended as a windbreak.

The fruit is either white splashed or striped with pink or wholly crimson to purplish, and slightly shiny, and contains 1 or sometimes 2 seeds; Quisumbing reports that in the Philippines it is sometimes seedless. Some varieties of the fruit have a pleasant flavor but mostly the taste is insipid. Freeman & Williams (Trinidad) suggest that "stewed with sugar and some flavoring, e.g. cloves, they are a moderate substitute for pears."

The flowers of the Malay Apple are seen at their best only when one is standing directly under the tree, wrote David Fairchild, "at which time they appear to form a fairy haze of enchanting loveliness." "For a perfect blaze of color, nothing exceeds the Malaya apple in flower," wrote Burkill.

In Hawaii this tree is called *Ohia ai*, (*ai* means edible) to distinguish it from *Ohia Chua* (*Metrosideros polymorpha* and relatives) and *Ohia ha* (other species of *Eugenia*). Another common name is Pomerac.

One reason the Malay Apple is not better known in South Florida is that it is quite sensitive to frost damage. An 8-foot tree in my garden at Stuart was hard hit by 30 degree temperature in December 1957, losing all leaves. New growth started within two weeks, and when this was an inch long, further 30 degree weather struck, killing the whole top of the tree except one branch which is now recovering.

Syzygium samarangense (Blume) Merr. & Perry. Java Apple.

(Syn. *Eugenia javanica* Lam.; *Eugenia alba* Roxb.)

A Malayan tree of 20 to 30 feet, its evergreen leaves 4-10x2-3½" rounded at the base, blunt at the tip. The flowers 1-1½" wide, white, from the leafy twigs, much less conspicuous than those of *S. jambos*, are followed by waxy, green or whitish, pear-shaped fruits, few to many, 1-1½" long by 2-2½" wide, or larger.

Except for flower and fruit colors, the tree much resembles *S. malaccense*.

Benthall says the tree is unusually handsome and is much planted in India for ornament, rather than for its fruits which are almost tasteless and not much eaten except by poor people. In the Philippines, Brown "Useful Plants of the Philippines" says the fruits are pink; he calls the tree "very pretty, top shaped."

Syzygium cumini (L.) Skeels. Java Plum.

(Syn. *Eugenia jambolana* Lam.; *Myrtus cumini* L.; *Syzygium jambolana* DC.; *Eugenia djouat* Perr.; *Calyptranthes jambolana* Willd.; *Eugenia cuminii* (L.) Druce.; *Eugenia cumini* Merr.)

The extensive synonymy shown here might well be explained by the exceedingly complex behavior of this big East Indian tree, sometimes to 50 feet, with smooth, glossy, somewhat leathery, evergreen leaves, 3 to 15 inches long and 1 to 3 inches wide, which are a lighter green below than above. The tree grows naturally from India to the Philippines and Hawaii and has been extensively planted in other warm lands, including Florida and southern California, chiefly for shade but also because it is highly wind-resistant.

The confusing variation in Jambolan trees begins with the leaves. In Malaya, Corner found two distinct kinds; in the south end of the peninsula the leaves are 2.5x1-2" and the small flower clusters 1-2½" long; in the north around Penang the trees have leaves so large (6" or more) they are hard to tell from *Syzygium grande* and the flower clusters are 2-4" long.

In Malaya the fruit is ¾-1" long, oblong, deep purple to black, juicy, with one green seed. In

Florida the fruits are somewhat larger up to 1½" long, dark maroon or purple in color, more or less the size and shape of an olive. There is wide variation in fruit taste and desirability.

Watt's *Dictionary of the Economic Products of India*, reported: "It is chiefly found along river beds and is specially cultivated for its fruit in gardens and in avenues. There are several varieties that yield much better flavored fruit than others, but as a rule it is astringent, and only serviceable when cooked."

Popenoe; *Manual of Tropical and Sub-Tropical Fruits* reflects this with his observation: "It is said that forms with large fruits of good quality are known in the Orient, but those which have been grown in the United States are scarcely worth cultivating." It should be noted that Popenoe was writing of varieties with fruits only ½ inch long.

Quisumbing calls the fruits growing in the Philippines "luscious, fleshy and edible."

Burkill quoted K. Heyne as enumerating several races of Jambolan in Java, including one that is seedless. Burkill adds: "Improved races may bear fruits as large as pigeon's eggs, and one exists in the Philippine Islands which may bear seedless but small fruits."

Miller, Bazole & Bartow; *Fruits of Hawaii* discuss this variation: "There are at least two varieties in Hawaii, one with small somewhat irregular-shaped fruit and one with slightly larger symmetrical olive-shaped fruit. The smaller variety has purple flesh and the larger type has whitish flesh. Some trees produce better quality fruit, both in size and flavor, than others. The white-fleshed Java plum is sweeter and less astringent than the purple-fleshed variety. . . .

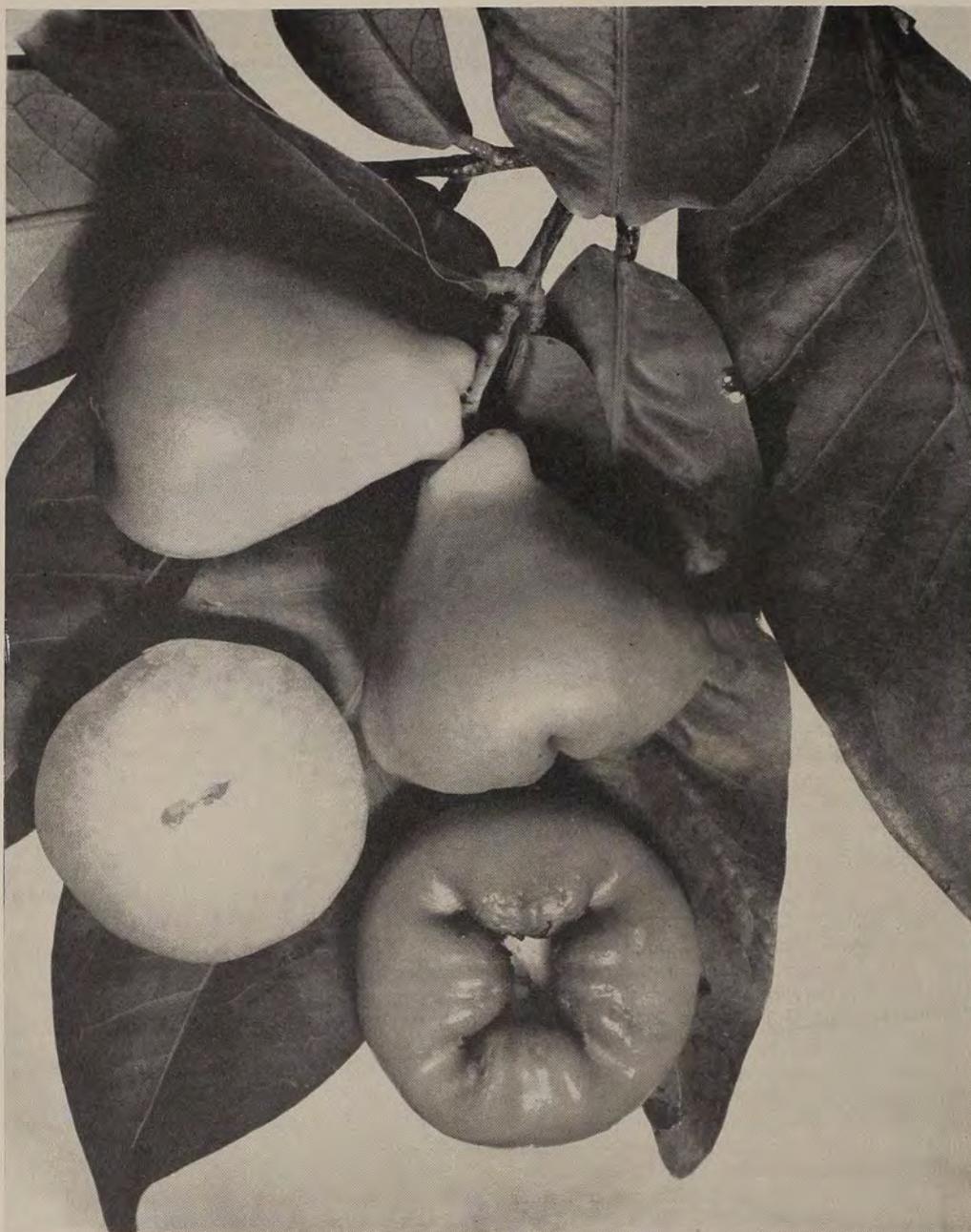
"The Java plum tree . . . produces a large quantity of fruit which fall to the ground and stain everything with which they come in contact. It is often considered an undesirable tree in Hawaiian gardens and along roadways and streets because of the unsightly litter produced beneath the trees.

"Birds have scattered the seeds far and wide. . . .

"Because of their astringent qualities, fresh fruits of both the purple- and white-fleshed varieties pucker the mouth and are undesirable to eat out of hand . . . The purple-fleshed fruits contain little or no pectin. In contrast, the white-fleshed Java plum contains relatively large amounts of pectin."

Alex Korsakoff with an exceptional opportunity to observe two Java plum trees in the old Miami City Cemetery where he has been superintendent more than 30 years, pursues the subject of variability. He keeps his trees separate by calling one "cumini" and the other "Jambolana." He writes:

"If you want *jambolana* plums, you can have some right now (October) with viability guaranteed. If you want *cumini* plums, you will have to wait till early next summer. My taste pref-



JOHN NOONAN

Syzygium samarangense

Beautiful wax jambo fruits



NIXON SMILEY

Syzygium cumini

Java or Jambolan plum



JULIA MORTON

Eugenia currani

Square stems and eight-inch leaves are characteristic.

erence as fresh fruit is *cumini*, as to the jelly—*jambolana*.

"The trees are different, the leaves, the flowers and the fruit are different, though all these things resemble one another very, very much. Time of flowering is also different. All my years in Miami I never saw more than one crop of *Syzygium cumini*, while *Eugenia jambolana* has sometimes as many as three crops during the late spring, summer and early fall period. While *E. jambolana* is almost constantly covered with scale, *S. cumini* is clean."

The flowers of the Java plum are numerous, scented, pink or nearly white, without stalks, and borne in crowded clusters from the axils of fallen leaves on old wood near the branch tips. The petals cohere and fall all together as a small disc. The stamens are very numerous. Chittenden in error calls the flowers red.

The bark of the Java plum tree is smooth, light gray with broad patches of darker color. Fruit is also called Jambolan or Jambolan Plum.

Eugenia currani C. B. Rob.

This attractive Philippine shade tree, sometimes to 30 feet, has a gnarled trunk, tortuous branches and quadrangulate young growth. It is rare in cultivation in Florida, represented only by specimens in special collections, possibly because viable seeds are not available.

Young and older twigs are conspicuously 4-angled or winged as the leaves are decurrent. Leaves opposite, simple, entire, or undulate, very short petioled; blade large, to 6 inches or more, sometimes to 12 inches long, and $2\frac{3}{4}$ inches wide, thick and leathery, mostly obovate or oblanceolate, apex bluntly acuminate, base cordate, glabrous, midvein prominent and yel-



SUBTROPICAL EXPERIMENT STATION, UNIVERSITY OF FLORIDA

Eugenia currani

Fruit and eight-inch leaf.



Eugenia paniculata

Spectacular old specimen in Carpinteria, California. Measurements ten years ago were 75 feet high, branch spread 50 feet. No recent figures available. Engraving from "Trees of Santa Barbara" by courtesy of Santa Barbara Botanic Garden.

low, lateral veins also prominent. New leaves a beautiful bright red color.

Flowers begin to appear 2 to 3 months before they open, gradually increasing in size. The inflorescence is a tight branching cyme or panicle, 2 to 4 inches long and up to 4 inches in diameter, the flowers produced tightly together on the branches among the leaves. Flowers $\frac{5}{8}$ inch wide; calyx of 4 or 5 small sepals, papery, often rose-tinged. Petals pinkish, 4 or 5, overlapping and they fall off in one piece, so they are cup-like and do not unfold; stamens numerous, white, erect, to $1\frac{1}{8}$ inch long; sepals, petals, and stamens borne on the thick rim or edge of the cup or hypanthium. Ovary is embedded at the base of the cup; style white, elongated but shorter than the stamens.

The fruit is a berry, nearly sessile, produced 20 to 50 in a tight cluster, each fruit the size

of a small grape, to $1\frac{1}{2}$ in. wide, globose, apex crowned with calyx ring and small sepal points, at first white, then gradually turning pink, red, and then dark purple-red or almost black. The fruit clusters, up to 3 inches long and $2\frac{1}{2}$ inches wide, are on the bare branches or between the leaves on the more mature twigs. The flesh is red near the skin, otherwise white, rather dry and crisp, and pronouncedly acid with a pleasant flavor not unlike that of a crab apple. The flowers on the tree appear in May or June and the fruit ripens in July or August. The relatively large seed which clings to the flesh is sometimes absent. The fruit from the trees at the Sub-Tropical Experiment Station at Homestead, Florida, is seedless. The fruit is too acid for use as a dessert, but would in all probability make an excellent jelly and is used in the Philippines for making preserves, wine and pickles. The 20-year-old trees at Homestead are only 20 feet high. In some years the leaves are attacked by red spider, causing defoliation. A Philippine farm journal says the tree is of "vigorous growth, succeeds well where the wet and dry seasons are strongly accentuated, and requires well-drained land for the best results. In productiveness it is apparently exceeded by no other species of the genus."

Acmena smithi (Poir.) Merr. & L. M. Perry. Lilly Pilly.

Eugenia smithi Poir. *Syzygium smithi* (Poir.) Niedenzu; *S. brachynemum* F. v. M.; *Acmena floribunda* var. 2 DC).

An evergreen Australian tree found near water courses, occasionally to 30 feet but more often a tall shrub or bushy tree of half that height. The ovate or lanceolate leaves are 2 to 3 inches long. T.N.R. Lothian, director of the Adelaide Botanical Garden writes: "It is freely grown here, particularly in coastal districts, as it may be touched by frosts further inland. In summer the snow-white clusters of fringed flowers are quite showy, and are followed, maturing in winter, by great masses of berries, $\frac{1}{4}$ to $\frac{1}{2}$ inch diameter, varying in color from lightest to deepest mauve-purple. They are edible, incidentally, but few know it among those of mischievous age. Lilly Pilly forms a magnificent windbreak hedge."

Ernest E. Lord of Melbourne writes: "The bloom does not last long but the berries remain for 6 months; highly ornamental."

Eugenia paniculata Banks. Brush Cherry.

(Syn. *E. myrtifolia* Sims not of Roxburgh. *E. paniculata* Banks & Sol. var. *australis* Wendl.; *E. australis* Wendl.; *Syzygium paniculatum* Gaertn. 1. c.; *Myrtus paniculata* J. F. Gmel.; *Jambosa australis* DC.; *J. thozetiana* F. v. M.)

The correct name of this Australian evergreen tree has been much discussed by botanists. Undoubtedly there is wide variation in the species. Not only are the leaves attractive, glossy, bronze when young, but the flowers are striking, fluffy,



Eugenia coronata

pure white, in summer, and the oval deep red berries of good size, hang on all fall and winter. It is a cone-shaped tree to 50 feet, holding its foliage to the ground, often growing near water courses. Kajewski in northern Queensland found the white flowers "very showy." In California this tree is much planted for accent and for wind screens. Its columnar form is very effective on the landscape.

Half a century ago the Reasoner brothers at Oneco, Florida introduced what botanists call a horticultural form of this Australian tree under the unpublished name *Eugenia hookeriana* and they used it for windbreaks and salt-resistant hedges. It is still occasionally seen in south Florida, but because it acts as a host to white fly and is usually covered with sooty mold, careful nurserymen avoid its use. In appearance it much resembles *E. paniculata* but it is not so bushy, not as handsome, does not prune as well. The rose-purple fruits are much larger than those of *E. paniculata* and are often used in Florida for making jelly. *E. paniculata* does not seem to attract sooty mold.

Two distinct dwarf forms of *E. paniculata* have been developed in California. One is reported to be a hybrid. For all practical purposes it is a small-leaved, compact edition of *E. paniculata*, and is much used for tubs, pot plants, etc. The other takes a stumpy, pyramidal character, small leaves, distinctly reddish-brown tinted, with definite decorative attributes where a dwarf form is needed. This plant is used to excellent advantage in Disneyland miniature settings to simulate full-grown trees at about 1/10 scale.

Eugenia cyanocarpa F. Muell. Blue Lilly-Pilly.

This lovely shrub or sometimes a small tree to 12 or 15 feet, has a semi-drooping habit not unlike a weeping birch. The elliptic, slender-pointed leaves are 2 to 4 inches long. The creamy white flowers, quite inconspicuous, are followed by loose clusters of round fruits 1/2-inch in diameter that are a beautiful metallic blue in color and most attractive. This plant has been sparingly cultivated in California for many years but is not offered in the trade.

Eugenia coronata Schum. and Thorn. Utowana.

This shrub, native to West Tropical Africa, was introduced in 1932 by David Fairchild of the USDA under (P. I. 73117). It is an attractive, slow-growing evergreen to 10 or 12 feet high that could be used for foundation planting, though it is not known to be carried in the nursery trade. It forms a thick, dense, compact growth.

Bark rough, grayish-brown. Leaves opposite, simple, thick and leathery, dark green above, pale below, resembling privet. Petiole short, thick and cord-like, often curved. Blade to 2 inches long and 1/4 inch wide, oval or oval-elliptic, obtuse, entire, veins obscure. Lower surface of blade glandular dotted.

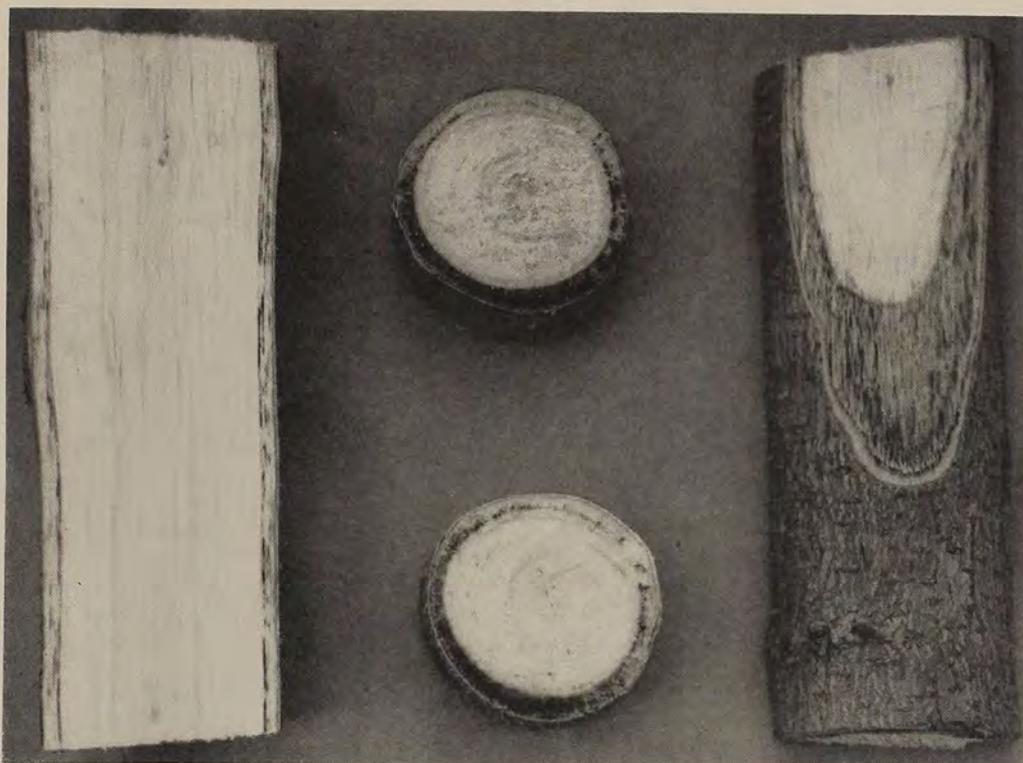
Flowers white, 1 to 3 together, in axils of leaves, 1/2 to 3/4 inch diameter; calyx of 4 sepals, pale green, resin dotted, obtuse, to 1/8 inch long, cap-like. Petals 4, spreading or in some forms cup-like, white, obtuse, to 1 inch long. Stamens numerous, not longer than the petals. Two very small persistent bracts at base of each flower. Sepals, petals, and stamens borne on a cup or hypanthium, the ovary inferior. Fruit solitary on short stalks to 3/8 inch long; odd-shaped, mainly elliptical, but also obovate or oval to 5/8 inch long and 3/8 inch wide, with 4 small, pointed sepals at apex; when mature dark purplish-black; flesh juicy, purplish-black. One large seed, oval in shape, to 3/8 inch long or less.

The inconspicuous flowers are produced off and on all year except in December and January, and the fruit matures in 3 to 4 weeks. It is edible but not especially desirable. Some forms of this shrub in cultivation are more vigorous and should be selected for propagation. Some forms have flowers that do not expand and the pistil is abortive so no fruit is produced.

Eugenia eucalyptoides F. Muell.

This tree with rather large white flowers in sparse compact terminal clusters, is native of Northern Queensland. It was introduced in Florida 50 years ago by the USDA as P.I. 36043. It is a dense, bushy tree with landscaping possibilities, holding its evergreen foliage clear to the ground, but it is not widely cultivated in Florida.

[The New World species of *Eugenia* will be described in the next issue of the Magazine. Ed.]



Sections of wilted mimosa tree trunk showing the brown discoloration characteristic of the wilt disease in the current season's wood.

Wilt-Resistant Mimosa Trees

D. L. GILL*

The mimosa tree (*Albizzia julibrissin* Duraz.) is widely grown in the southern part of the United States because of its graceful, fern-like foliage; its mass of striking, tassel-like flowers; its rapidity of growth; and its ability to grow under unfavorable soil conditions. The plant,

a native of Asia from Iran to Japan, was introduced into this country about 1745. It is now widely naturalized.

A rapid wilting of mimosa trees growing at Tryon, North Carolina, was called to the attention of George Hepting, Forest Pathologist of the United States Department of Agriculture, in 1935. The disease was said to have been present there for five years. Within a short time the disease appeared in other areas and

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has since spread as far south as Mississippi and Florida, and as far north as Maryland. It occurs on trees growing on a variety of soils and under various climatic conditions. Rapid loss of most of the trees in an infested area in the South is common. An apparently identical disease was reported from Russia in 1920 and from Argentina in 1943.

The first symptom of the disease is wilting of the foliage on one or more branches. The affected leaves become yellow, hang downward, and soon fall. Wilting of the other branches follows, and the main branches die although short-lived sprouts may come from the trunk. By the time the tree wilts a brown discoloration can be found within the trunk. The discoloration is usually in the current season's growth and is more evident in the lower part of the trunk and the roots than in the upper part of the tree. Exudates, which attract insects, may appear on the trunk at the time of first wilting.

The causal fungus, *Fusarium oxysporum* f. *perniciosum* (Hepting) Toole, can live in the soil for several years. It is commonly spread in soil, carried from place to place by man, or by various means of nature. Spore-bearing structures of the fungus may be produced on the trunk of wilted trees during very humid weather.

Doctor Hepting and his associates began search for wilt-resistant trees soon after the disease was discovered. Seedlings from a large number of widely separated sources were inoculated by dipping the roots in a suspension of spores of the wilt fungus and then planting them. Seedlings surviving the first test were inoculated repeatedly by this method or by adding the fungus to the soil in which the plants were growing, and finally by transplanting to naturally infested soil. A few of the seedlings from the various sources resisted the disease under these severe tests.

Seed from trees found resistant by re-

peated inoculations produce only a small percentage of seedlings which are wilt-resistant. Thus, the resistant trees must be propagated vegetatively. Research demonstrated that root cuttings give better results than stem cuttings although stem cuttings coming directly from roots will root easily. Root cuttings three to four inches long are planted upright in the rooting medium with about a quarter of an inch extending above the medium. The exposed end may be covered with paraffin.

Selections of the wilt-resistant seedlings were grown in a number of naturally infested locations without evidence of the disease for a number of years. Two wilt-resistant clones were selected. One of these, named Tryon, has deep pink flowers; the other, named Charlotte, has light pink flowers. In 1949 stocks of Tryon and Charlotte were distributed to nurserymen who now offer them to the trade.

Two kinds of root-knot nematodes, *Meloidogyne javanica* (Treub) Chitwood and *M. incognita* (Kofoid & White) Chitwood, increased the number of seedlings wilting from the disease after one season's growth but the nematodes were not necessary for infection by the wilt-fungus. Since mimosas live for a long period, it is probable that after several years the number of trees wilting in soil infested with root knot nematodes plus the *Fusarium* would not differ from the number wilting in soil infested with the *Fusarium* alone.

Research on the disease is now partly concerned with selfing and crossing second generation resistant trees and with attempts to induce polyploidy. The purposes are to obtain wilt-resistant trees with seed that will produce only wilt-resistant seedlings and to obtain trees with better and larger flowers, and other desirable characteristics. Search is being made also for good flowering trees that do not produce seed and the resultant litter.

Wilting mimosa branch showing drooping
and absence of leaves (top) →

Normal branch of the mimosa tree (bottom)



A Book or Two

The Book of Cacti and Other Succulents.

Claude Chidamian. The American Garden Guild and Doubleday & Company, Inc., 575 Madison Avenue, New York 22, New York. 1958. 243 pages, 22 pages of drawings, 14 pages of halftones, 2 pages of color illustrations. \$4.50. (Library).

A one-volume guide that is very appealing and comprehensive, enough so, that anyone wavering as to whether to grow succulents or not, would plunge into the project with the able aid of this book on a 'do-it-yourself' basis and achieve success.

This is a well printed book with clear comparative line-drawings by Shirlea Hatcher. She has captured the necessary detail in the various plants which make the drawings quite refreshing and eye-catching.

This popular reading book explains the development of succulents (Cactus and other Succulents) from the beginning to the present time. Care is taken not to use too many scientific names and phrases thus lending an informative yet not boring detail to the layman and beginner.

The pronunciation 'break-down,' as shown after the generic names, will appeal to the many persons who wish to know the correct pronunciation of the various genera.

The section on cultivation is rather sketchy but good. It is a hard subject to cover thoroughly due to the climate extremes of our continent. "How to Pot Succulents," Page 141, is a 'must' and the bold type of "DO NOT WATER AFTER PLANTING. Wait a week or two for roots to become established" should be observed by all growers of succulents. Too many succulents are lost due to premature watering before injured or trimmed roots are healed or new roots begin to develop.

This fine book gives you many good suggestions on how to grow your plants in either an indoor or outdoor garden and also how to make them blossom and what controls to use to rid your garden and plants of insect pests.

Every year new books are published about plants and it is delightful to find one, such as this book, that is easy to read and assimilate and also gives you the desire and encouragement to either begin growing succulents or to improve your own plantings.

Credit is due this author, horticulturist, and lecturer who for many years has spoken to garden clubs, civic organizations and nurserymen along the Pacific Coast to further the use of the proper plants in their plantings.

W. HUBERT EARLE, *Director*
Desert Botanical Garden,
Tempe, Arizona

Trees and Shrubs for the Small Place.

P. J. van Melle. Edited by Montague Free. The American Garden Guild and Doubleday & Company, Inc., 575 Madison Avenue, New York 22, New York. 1955. 246 pages. Illustrated \$3.00. (Library).

This book has two particular merits. It comes from the pen and experience of an excellent plantsman, who never feared to express his opinions, and it reports from an area that has no recent literature, the Hudson River Valley. This area has some difficulties in climate that have worked to bring some outstanding successes, and some records of failure. Mr. van Melle's comments re success and failure are positive, and pertinent. His scoring system has some drawbacks as pointed out by Mr. Free in the foreword, but again, it is of value as an indication of the care with which the author approached his subject. All opinions are worth considering both from the majority and the minority, and neither is embraced of necessity. They sharpen the wits, if wit exists!

This is not a book that will be damned with the faint praise of the adjective "inspirational." It probably will be hard reading for the beginner, but it will repay study.

The other merit, and one that is almost unique, is that the writer defines a "small place" as one "not exceeding, and mostly below, the equivalent of 100 x 150 feet." This is a precise definition, or limitation that is rarely met with in most modern writing, and even less frequently in periodical literature. It is indicative of the clarity with which the author has defined or outlined all his terms.

B. Y. M.

Plants of Woodland and Wayside.

Su Zan Noguchi Swain, Doubleday & Company, 575 Madison Avenue, New York 22, New York. 1958. 57 pages. Copiously illustrated by the author. \$2.95. (Library).

On first thumbing through this book I was impressed by the attractiveness and fidelity of the illustrations. I was, however, due for a big disappointment when I read the text. It is another example of a book done by an artist who apparently did not submit the text to a botanist for editing. The shortcomings of the text range from inconsequential inaccuracies to glaring errors which together nullify the excellent illustrations.

The book purports to introduce beginners to the field of botany and to enable them to identify common wild flowers. Though the author states that the plants represented are those

(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.)

which can be seen in the United States and southern Canada, the illustrations are almost exclusively of Eastern flowers.

The author states that plants possess "green cells called chlorophyll" when actually chlorophyll is a green pigment which is contained in chloroplasts which in turn are contained in cells. She characterizes thallophytes and bryophytes as lacking roots, stems and leaves, and then writes of the stems of mushrooms and the roots, stems and leaves of mosses. The seed of a plant contains an embryo or young plant (though sometimes undifferentiated) and not as stated a "fertilized cell." In a group of drawings of compound leaves is a ternate or trifoliolate leaf labeled 'trilobe.' The yucca moth does not, as stated, push the pollen down the tube of the pistil. These are but a few of the inaccuracies to be found in the text. If these do not discourage you, the fact remains that the book is very attractively illustrated.

D. G. HITTLESTON

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The Hemerocallis Journal. 1958 Yearbook Issue.

Peggie Schulz, Editor. American Hemerocallis Society, 7714 Fairfield Road, North, Minneapolis 12, Minnesota. 1958 (being the April-May-June issue of the Journal, Vol. 12, No. 2). 216 pages. Illustrated. Available to members only, and included in the membership dues, which are \$3.50 a calendar year. Extra copies may be purchased by members for \$3.00 a copy. (Library).

Some 216 pages encased in neat white cardboard covers with the Popularity Poll Winner 'Evelyn Claar' in color on the front—presents the 1957 story of the hemerocallis in this country.

About fifty per cent of the book is devoted to what an old friend of mine calls "general house-keeping" items—the President's Message, special reports, current awards and honors, chatty regional reports, ecstatic digests of the Society's last convention in Houston, Texas, and a lot of folksy gossip excerpts about personal experiences with daylilies that are summed up under "Round Robin Department."

The remaining fifty per cent of the Yearbook is devoted to a reasonable quota of well done summations having to do with the culture and breeding of hemerocallis (better known as day-lilies). The article on The Role of Plant Nutrients in the Growth of Hemerocallis by C. E. Hutton is both easy to read and soundly objective. Everett C. Myers lays down a fascinating prognosis in the field of research and Philip G. Corliss presents a scholarly study in genetics that I read twice even though I do no breeding. Frederick W. Coe gives the story about hemerocallis species, and Walter C. Hava gives a simple outline for handling "pollin" for hybridizers that is downright appealing. Apparently a lot of "Doctors" go in for the daylilies.

Yes, this is a well planned, well balanced book that seems to give a living mass picture of both the people who grow daylilies all over this country and the problems and the objectives of these same people with respect to the same. There is a certain amateurish repose in it I like.

CAREY E. QUINN

Small Fruits for Your Home Garden.

J. Harold Clarke. American Garden Guild and Doubleday & Company, 575 Madison Avenue, New York 22, New York. 1958. 372 pages. Illustrated. \$4.95. (Library).

This is a book that will interest all gardeners. Although it is especially valuable for those who are particularly interested in small fruits for both home garden and commercial growing, the information has a general appeal for all gardeners.

The first ten chapters are devoted to general principles involved in growing plants, including such things as the effect of climate, length of day, soils, soil acidity, moisture, nutrition, weed control, and disease and insect control. Dr. Clarke has done an excellent job of presenting in a very readable and authoritative manner the specific information on growing the different small-fruit crops.

Anyone reading this book immediately realizes that Dr. Clarke has a first-hand knowledge of small-fruit growing and that small fruits are his favorite topic. The information is accurate, complete, and fully up-to-date with frequent references to recent research results. Chapters eleven through eighteen give specific instructions on the growing of the different small-fruit crops.

The last three chapters are bonuses that will be enjoyed by all small-fruit gardeners: Chapter 19 is an account of what plant breeding holds forth for the future in the way of new varieties of small fruits and the prospects are indeed exciting. Included in this chapter is a discussion of inheritance and how plant breeders deal with hereditary characters to mold new varieties. Chapter 20 discusses the use of fresh and processed fruit for year-round enjoyment and Chapter 21 is a thoughtful discussion of how to convert a hobby into a successful commercial venture.

The book is prime reading for home gardeners and a fine reference for small-fruit specialists.

D. H. SCOTT, *Head,*

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U. S. Department of Agriculture,
Beltsville, Maryland.*

A Hive of Bees.

John Crompton. Doubleday & Company, Inc., 575 Madison Avenue, New York 22, New York. 1958. 180 pages. Illustrated. \$3.75.

The name of John Crompton, associated with the book's title, is just about enough said for this notice. He is certainly a most readable author, and is too well known from his writings on nature's subjects for a general public's consumption, to need further recommendations for this latest book. His stories of *The Living Sea*, *The Hunting Wasp*, *The Hive*, *Ways of the Ant*, and *The Spider*, have gained an enthusiastic and permanent audience, and this title will probably add scores more readers.

The present study begins with his actual hate for the bees, then a conversion, a curiosity, then an acquisition of a hive, then two, more and more, and on to final admiration for the bees through his constant observations and study.

Along the way he gives the most fascinating descriptions of his vigil and its reward. Of this watch, and of his style: "I was forever standing there. But they showed no consciousness of it. I can imagine a young bee, out for the first time, spotting me and saying to another, 'I say! Look! There's a great animal standing by the hive!' and the other, 'Oh, that! Don't take any notice of it. It's always been there.'"

Symbolism in Flower Arrangement.

Ervin S. Ferry. The Macmillan Company, 60 Fifth Avenue, New York 11, New York, 1958. 149 pages. Illustrated. \$4.95. (Library). (AHS Members' price \$4.21).

The author, a retired college professor, became interested in arrangements while in Japan and remained there for study, obtained a certificate (the title-page illustration) from the Saga School of Flower Arrangements, and is a member of Dai-Nippon Kado Kyokai (The Flower Arrangement Association of Japan). In Appendix B, he has outlined the exhaustive study and practice required to obtain the degree of Flower Master. The majority of the thirty photographs are Mr. Ferry's compositions, with three symbolic arrangements by Mrs. Makoto Kajiwara of New York.

The purpose of the book is to "reveal the conditions under which a plant or flower composition may evoke an idea, convey a message or arouse an emotion in the mind of the viewer." The bases of flower symbolism are explained by the traditions, myths and folk tales from West and East. The literatures of Greece and the Orient are rich in plant symbolism; you will recall the well-known Greek myth of Narcissus and the flower named for him. The author explains the various principles of flower composition, according to Chinese art and the "styles" of the Japanese schools, stressing the extreme importance of line rather than mass, and asymmetric balance rather than symmetrical balance, and the relationship of line to plant symbolism. For hundreds of years flower masters have taught how to express emotion simply and directly by means of branches and flowers as they might be in Nature, allowing forms and directions of line to suggest definite emotions.

One chapter covers the symbolic significance of some eighty-three plants in many different cultures, from almond flowers to yew; another includes an extensive reference list of thoughts with plants to express them, one plant frequently expressing a multitude of thoughts. The use of bamboo, for instance, could express devotion, fidelity, filial piety, refinement, strength through yielding or uprightness! In ecclesiastical art some particular flower, animal or other object commonly forms an integral part in representation of countries, deities or personages; the object defines the figure; thus, the so-called attribute is accepted as a symbol of some idea or quality possessed by that figure. The familiar British Lion, the Russian Bear or Imperial Dragon suggests to the viewer (or designer) Great Britain, Russia or China.

Compositions using certain flowers should express to the viewer that they are for special occasions or holidays or for good wishes and congratulations. Some plants are accepted as

symbols of a country, like the maple, of Canada, the thistle, of Scotland. Then, too, the national flowers are of symbolic importance—the fleur de lis of France, the lotus of Egypt, flowering plum of China, shamrock of Ireland; these and many others are listed as commonly accepted symbols of various countries. Another list gives countries and their national colors for use of arrangers and viewers alike.

Appendix A, which might well have appeared as a Foreword, describes the growth of floral decoration study for use in temple altars and the home in the early history of China and Japan, so that we can better understand the "styles" of the different Japanese schools.

This book could well supplement the complex study of Ikebana and its various schools in use of particular plant material for symbolic importance. However, if the arranger is not skillful or the idea of the composition, too subtle, and if the viewer lacks knowledge of the symbolic use of plants, then, according to Mr. Ferry, "... the message which an art work was designed to transmit may evoke no response in the mind of the viewer." Alas and alack!

M. C. L.

Fruits for Southern Florida.

David Sturrock. Southeastern Printing Company, Inc., Stuart, Florida. 1959. 196 pages. Illustrated. \$4.00. (Library).

This is essentially a hardback edition—rewritten and illustrated—of an earlier volume, *Tropical Fruits for Southern Florida and Cuba*, by the same author published in 1940 by the Arnold Arboretum of Harvard University. As such it is essentially a descriptive account, alphabetically arranged by families of the numerous kinds of tropical and subtropical fruits that can be grown in southern Florida with pertinent remarks on culture. The Jaboticaba (*Myrciaria cauliflora*) in fruit is beautifully illustrated in full color as a fold-out frontispiece. Mrs. Sturrock prepared the many and fine line drawings.

New chapters appearing in the present volume are "Commercial Plantings" and "Home Yard Plantings." In this new form the book should be useful to the new home owner who wishes to become acquainted with the fascinating group of fruits which can be grown in his backyard in southern Florida.

W. H. H.

The International Rhododendron Register.

Compiled by H. R. Fletcher. The Royal Horticultural Society, London, England. 1958. 290 pages. \$3.85.

The International Horticultural Congress at Scheveningen, Holland, in 1955 designated The Royal Horticultural Society of Great Britain as the International Registration Authority for rhododendrons, including azaleas. Dr. H. R. Fletcher, director of the Royal Botanic Garden at Edinburgh, Scotland, and a distinguished rhododendron authority, is International Registrar of Rhododendron Names for the Society. In furtherance of the Society's registration functions Dr. Fletcher has compiled this list of

around eight thousand old and new rhododendron and azalea names. Many of these varieties are no longer in the trade or otherwise available.

Each name is accompanied, so far as data are available, with parentage, introducer and date, and a brief description of the flower. The names in *The Azalea Handbook* published in 1952 by the American Horticultural Society are all included but not, of course, the many additional names in its new *The Azalea Book* published this past year after the manuscript for the Register was completed. The classification of azaleas in *The Azalea Book* is, however, followed. There is a list of rhododendron and azalea breeders. Particular assistance is acknowledged from five Americans and one Hollander. Dr. Henry T. Skinner, director of the United States National Arboretum and first vice-president of the American Horticultural Society, contributed extensively to the work.

The Register well illustrates the almost hopeless situation created by duplication of names and the inadequacy of present descriptive data. Names given groups of variable seedlings of the same parentage are, where known, distinguished from those given to clones. Species and botanical varieties are not listed, perhaps because they appear in Volume 1 of the *Rhododendron Handbook* of the Royal Horticultural Society.

Compilation of the Register is a difficult job well done. New editions will be issued from time to time. Commercial growers and breeders of rhododendrons or azaleas and serious amateurs interested in either of these groups will find great use for the Register.

Probably all compilers of such lists die early and Dr. Fletcher deserves some sort of medal in a hurry for completing this arduous task.

FREDERIC P. LEE

A Tentative List of Hyacinths and Other Bulbous and Tuberous-rooted Plants.

The Royal General Bulb Growers Society, Wilhelminastraat 45, Haarlem, The Netherlands. 1958. 181 pages. \$1.00.

A Classified List of Tulip Names.

Same. 143 pages. \$1.00.

These Lists give the amateur gardener the names of the available species and horticultural varieties of many kinds of bulbous, tuberous-rooted, and similar plants, the name of the raiser or other source, and a brief description of the flower color. For most genera these data heretofore were likely to be scattered widely and not readily found. The specialist or collector and the breeder and commercial grower are particular beneficiaries of these Lists.

The tulip List has around three thousand names of tulip species and varieties, each placed in one of the twenty-three categories that compose the present tulip classification scheme. Its comprehensiveness reflects the work over the last forty years on earlier lists for this particular genus. The general List is newly born. It has around two thousand names in seventy-one genera. By far the greatest listings are to be found under *Colchicum*, *Crocus*, *Freesia*, *Scilla*, *Hyacinth*, bulbous iris, *Ixia*, *Montbretia*, and

Ranunculus. The late, tall scillas (*S. campanula* and *S. nutans*) and their varieties are placed under *Endymion*, a genus not familiar to many American gardeners.

Publication of these Lists at this time, and the similar narcissus and rhododendron lists of the Royal Horticultural Society of Great Britain, is inspired largely by the *International Code of Nomenclature for Cultivated Plants*. The Code in its latest form was formulated and adopted in 1957 by the International Commission for the Nomenclature of Cultivated Plants and approved for horticulture by the Fifteenth International Horticultural Congress at Nice, France, in 1958. The Code contemplates that in special plant areas an old name (one given before January 1, 1959) to be legitimate must be accepted by a designated International Registration Authority for inclusion in its register. Hence publication of lists of accepted names.

The Royal General Dutch Bulb Growers Society was designated by the Fourteenth International Horticultural Congress at Scheveningen, Holland, in 1956 as International Registration Authority for (1) tulips, and (2) hardy bulbous and tuberous-rooted plants excluding dahlia, gladiolus, lily, and narcissus. Obviously "hardy bulbous and tuberous-rooted plants" is vague. The seventy-one genera selected by the Dutch Society reflect primarily the offerings of the Dutch and British bulb trade and Dutch and British experience. The Dutch have construed "hardy" in their authorization as including plants that may be "grown in the open in the milder climates of other countries," even though not grown in the open in Holland; also, as including only plants known by, and "recorded in the files" of, the Society. The results are surprising. It is difficult to see the logic of including *Crinum* (tender bulb), *Freesia* (tender corm), *Hymenocallis* (tender bulb), *Montbretia* (semi-hardy corm), *Sprekelia* (tender bulb), *Sternbergia* (hardy bulb), *Tigridia* (tender bulb), and *Zantedeschia* (tender rhizome), but not, for example, *Alstroemeria*, *Arisaema*, *Trillium*, *Liriope*, *Clivia*, *Hedychium*, *Paeonia*, and rhizomatous iris. Probably it is contemplated that the last two will be dealt with by other registration authorities. Examples could be multiplied at considerable length. Obviously distinctions between hardiness and tenderness or between bulbs and tuberous roots on the one hand and corms and rhizomes on the other do not necessarily govern the choice of included genera. Listings of names for some of the genera that are included, as *Lycoris* and *Zephyranthes*, would benefit from use of American data.

Such lists will lose much of their value if the international registration authorities sit back and rely solely on what is recorded in their files and wait for someone in San Anselmo, California, or Christ Church, New Zealand, to take the trouble of writing Haarlem or London and enclosing two and sixpence for registration of a new or omitted name. Preparation and maintenance of such lists would be difficult enough were the international registration authorities working in close cooperation with various related national organizations in other countries. It is more difficult when such authorities fail so to do.

The publication of any extensive list of names of species and varieties in genera of plants with

bulbs, tubers, corms, and rhizomes is an important step forward. Perfecting the list will come with time if the Dutch Society has not bitten off more than it can chew. A voracious appetite is required to masticate and swallow all bulbs, etc., "grown in the open in countries milder than Holland," in addition to all those hardy or that would be hardy in Holland. Nor is it a satisfactory solution for the Society to shut its eyes to genera, species, and varieties not recorded in its files, but readily visible to others.

Typography and format are excellent. Hard board covers would aid in withstanding the rough field usage that the Lists are likely to suffer.

FREDERIC P. LEE,

Bethesda, Maryland

Evergreen and Flowering Shrubs for Your Garden.

Katharine M-P. Cloud. Chilton Company, 56th and Chestnut Streets, Philadelphia 39, Pennsylvania. 1958. 235 pages. Illustrated. \$4.95. (Library).

Landscape Consultant Cloud has, from her life's work—her hobby and her graduate work at the Pennsylvania School of Horticulture for Women, planned this book for the "average" home owner wishing to make an attractive landscape around his home keeping within a limited budget.

She has done an admirable job of furnishing the complete details for a successful, useful, as well as a beautiful surrounding of evergreens, broad-leaved mostly, and flowering shrubs, deciduous and semi-evergreen—beautiful and serviceable in flower, foliage, and in fruit. Miss Cloud considers what you may have to begin with—purpose, location, soil preparation, and the like—what is available—how and what you may select to serve these requirements—and how to maintain these selections in a useful and healthful condition.

Check Lists for Ornamental Plants of Sub-Tropical Regions, Second Edition.

Roland Stewart Hoyt. Livingston Press, San Diego, California, 1958. 507 pages. Illustrated. \$8.00.

Most authors of books about plants, are content to describe the material and suggest where it is most often found. Roland Hoyt, landscape architect who lives and breathes the beauty created by the San Diego parks administration over many years, begins at the other end of the problem. His book is a study of situations that need landscaping, then an examination of the plants that could or should be used there. He is more concerned with the structural form of trees than he is in the color of their flowers. He is more interested in examining the soil before deciding what plants to put in it. He tackles fills, banks and sand dunes, in terms of planting them. For a seaside garden he thinks in terms of seaside plants. For fragrance, he talks about plants that produce it. Fortunately Hoyt knows his plants by long experience, and in a glossary he described those he uses in painting pictures. The book is invaluable in landscaping with exotic plants.

E. A. MENNINGER

Grounds Maintenance Handbook, Second Edition.

Herbert S. Conover. F. W. Dodge Corporation, 119 West 40th Street, New York 18, New York. 1958. 538 pages. Illustrated. \$10.75. (Library).

Interest behind publication of the first (and now the second) edition of the *Grounds Maintenance Handbook* springs from author Conover's knowledge and experience of the subject gained in dealing with the public and the vast area included in the Tennessee Valley Authority. From a collection of thoughtfully prepared field notes intended to direct the work of grounds' keepers within the Authority, has come this informative book.

The author's purpose in publishing the *Handbook* is perhaps best explained in his own words as described in the preface "... primarily for use by those responsible for the maintenance of large acreages such as public parks on the national, state, county, and metropolitan scale, large industrial and institutional grounds, semi-public lands such as Boy Scout and YMCA camps, large estates, country clubs and similar grounds." Obviously the book is intended as a guide to help those individuals who are blessed (or cursed as the case may be) with the complex and too often discouraging problems that arise while attempting to prepare and maintain public or private grounds on a high level of acceptance.

Ten detailed chapters pretty well run the full gamut of maintenance including public relations, turf building, planting and care of trees and shrubs, selection, use and maintenance of equipment, disease and insect control, weeds and their eradication, soil erosion, construction of roads and parking areas, general specifications covering materials and structures as well as a treatise on picnic areas.

The *Handbook* is modern, well illustrated and charted. It serves a quite useful purpose within the professional area it is intended to cover and is also well fitted to answer many questions of the less experienced grounds' keeper. Especially helpful is the list of trees and shrubs with descriptive treatment of individual species, illustrations of insects and weeds, and specification standards which are acceptable for most public development programs.

F. P. E.

Principles of Horticulture.

Ervin L. Denisen. The Macmillan Company, 60 Fifth Avenue, New York 11, New York. 1958. 509 pages. Illustrated. \$6.95. (Library).

This reviewer always enjoys a book in which the author's preface outlines and defines precisely what he intends doing. This has been done with great care by Dr. Denisen and it is a pleasure to record that he has been most successful in the development of his aims and purposes.

The book is organized as a text book, in two parts—one is really an expanded definition of "horticulture," the larger and following portion is a description of the skills and techniques that are needed in the practice of horticulture.

The style is clear and the writing always lucid. If one were to quibble about any point,

it could only be that there are no provisos. The affirmative mood is the mood of the book. This gives, at times, a somewhat staccato style, but the student can have no possible doubt about what is being presented.

The illustrations vary considerably in the excellence of the subjects and there are a few pictures of examples that one hopes will never be copied; others, that have only an historical value as of styles now outmoded; and others, that are open to differences of opinion, but none that is unlikely to hold the attention.

There is a very full index, and in addition, a very useful glossary, so that no one need hunt for a dictionary.

Although presumably this is intended as a book for college use, it will certainly answer many questions that the intelligent amateur, working alone, will have hoped to have answered before this. If he reads he will have a greater understanding of what horticulture is all about, even if he should never pursue it, even as a "hobby."

The background of all the treatment is in Iowa, but there are enough references to materials that are more common elsewhere, to keep the reader who lives elsewhere alert, even if he may regret that no example cited grows in his territory.

B. Y. M.

American Rose Annual, 1958. *43rd Edition.*

Frank H. Abrahamson, Editor. American Rose Society, 4048 Roselea Place, Columbus 14, Ohio. (Distributed by Doubleday & Company, 575 Madison Avenue, New York 22, New York.) 1958. 266 pages. Illustrated (16 in color). \$4.50. (Library).

The Rose Annual, 1958.

Bertram Park, Editor. The National Rose Society, 177 Victoria Street, London, S. W. 1, England. 1958. 166 pages. Illustrated (16 in color).

Year Book of the *Canadian Rose Society, 1958.*

A. J. Webster, Editor. The Canadian Rose Society, Streetsville, Ontario. 1958. 163 pages. Illustrated (4 in color).

Rose annuals must perforce appear annually, but it is a tribute to editorial acumen and persistence that something new on so venerable a subject as rose culture can be found to present each year. To be sure, there are always society affairs to record, rose exhibitions to report, and new rose varieties to appraise. And also to illustrate in glowing colors, now that color printing has attained not only a high art but also a cost within the means of even nonprofit organizations. The British and Canadian rose annuals particularly excel in the quality of their color plates.

Aside from mere visual gratification there is education for even the rose specialist in these

volumes, the increasing production of the partnership of art and science in rose culture. A few titles from each: In the American: Foliar fertilization of garden roses; Fungicide-insecticide combinations (report of studies conducted at Cornell University); Winter hardy roses for the Great Plains (new breeding methods applied to roses and some successful hybrids of garden roses and the native *Rosa suffulta*); Rose classification revised; Winter protection of roses in severe climates with demountable plywood frames; Spring frost protection with polyethylene covers supported on garment hangers! In the British: four articles on foliar feeding, Roses and their chromosomes; Ground covers for roses and roses for ground cover. And in the Canadian: a helpful article on budding roses and the selection of understocks, and one quite out of the ordinary in a garden publication on "Beneficial Insects" (the praying mantis does not rate as such—the commonest prey is the honey bee!).

F. A. W.

Other Books Added to the Library

Chromosome Botany.

C. D. Darlington. George Allen & Unwin, Limited, London, England. (Distributed through The Macmillan Company, 60 Fifth Avenue, New York 11, New York). 1956. 186 pages. Illustrated. \$2.75. (Library).

ABC of Driftwood for Flower Arrangers.

Florence M. Schaffer. Hearthsides Press, Inc., 118 East 28th Street, New York 16, New York. 1957. 128 pages. 154 illustrations. \$3.95. (Library). (AHS Members' Price \$3.36).

The Swimming Pool Book.

Robert Scharff. M. Barrows and Company, 425 Fourth Avenue, New York 16, New York. 1958. 214 pages. Illustrated. \$3.50. (Library).

A Treasury of Christmas Decorations.

Zelda Wyatt Schulke. Hearthsides Press, Inc., 118 East 28th Street, New York 16, New York. 1957. 128 pages. 116 illustrations. \$3.95. (Library). (AHS Members' Price \$3.36).

The Hemerocallis Journal. 1957 Year-book Issue.

Peggie Schulz, Editor. American Hemerocallis Society, 7714 Fairfield Road, North, Minneapolis 12, Minnesota. 1957. (being the April-May-June issue of the Journal, Vol. 11, No. 2). 208 pages. Illustrated. \$3.50 (with membership). (Library).

Land, the Yearbook of Agriculture. 1958.

Alfred Stefferud, Editor. U. S. Department of Agriculture, Washington 25, D. C. (available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.). 1958. 605 pages. Illustrated. \$2.25. (Library).



G. HAMPLER, LONGWOOD GARDENS

Nymphaea 'Saint Louis Gold'

The Gardeners' Pocketbook

Two New Hybrid Yellow Waterlilies

During the past two years, two new hybrid tropical waterlilies have been made available to the general public as a result of the breeding program carried out at the Missouri Botanical Garden. They are *Nymphaea* 'Aviator Pring' and *Nymphaea* 'St. Louis Gold.' Both are especially suited for the small pool.

These new hybrid waterlilies have resulted from crosses made utilizing the blood of *Nymphaea sulfurea*, a native African pygmy species with flowers and leaves two to three inches in diameter. A tuber of this species was received in 1949 from Robert Trickett of Kew who obtained the material from P. J. Greenway in Northern Rhodesia.

Nymphaea sulfurea crossed with *N.* 'African Gold' (a derivative of *N. burtti*) produced a medium-sized dark yellow hybrid in *N.* 'St. Louis Gold' with all the floral characteristics of *N. sulfurea*. With several seasons' testing, this new hybrid has proven to be desirable for small pools and is, as well, a free-flowering waterlily during the early Spring in the greenhouse, particularly when planted in small pots. The citron-yellow flowers (Ridgway Color Standard used) are seven to eight inches across. The leaves are ten to twelve inches across and are dark green flushed with chocolate brown fading green with age.

A cross between *N. sulfurea* and *N.* 'St. Louis' (the latter also a derivative of *N. burtti*), which satisfies the connoisseur and is now available in the trade, is called *Nymphaea* 'Aviator Pring.' It is named in memory of Lt. Bradford Pring, a pilot in World War II. It possesses hybrid vigor, is an excellent propagator from bulbs (a characteristic from its ancestor, *N.* 'St. Louis') and it is viviparous and very fertile. *N. sulfurea* has influenced both its color and fertility. *N.* 'Aviator Pring' is a very good indoor winter-flowering hybrid. This primrose yellow hybrid has exceeded all expectations regarding size of flower.—GEORGE H. PRING, *Missouri Botanical Garden, St. Louis, Missouri.*

A Black Leaf Turflily

The plant that comes under the name of *Ophiopogon arabicum* has black leaves, not just a very deep purple or brown, but a black to the eyes of those gardeners who have seen my plant. Plants of genus *Ophiopogon* (syn. *Mondo*) and the closely related genus *Liriope* (both are sometimes called Turflilies) have narrow grass-like leaves coming up from the ground without any stem (acaulous) and racemes or loose spikes of white to violet blue flowers. The leaves in this Washington, D. C., climate turn brown, die down in late winter and are then cut off. The new leaves in the spring of *O. arabicum* are green as they emerge but rapidly turn black so that only close to the crown does any green appear.

The leaves of my young plant of *O. arabicum* are three-sixteenth inch wide and ten inches long. They make a mound eight inches tall and a foot wide. The small flowers are white flushed pink, changing to white. They bloomed this past year in June, perhaps later another year for most turflilies bloom in July or August. Black leaf plants are exceedingly rare. No other ophiopogon or liriope with which I am familiar, has black leaves.

The turflilies are excellent for small accents and edgings and all are hardy here. The rapidly spreading *Liriope muscari* may be used as a substitute for grass if confined. It is the only one deserving of the name, turflily.

Ophiopogon arabicum is not a botanical name that I have found in *Index Kewensis* or other books. J. N. Giridlian of Oakhurst Gardens, Arcadia, California, from whom the plant was obtained, says he first saw it at Goleta, California, where it had been brought in from Japan. Giridlian described the plant to his collector in Japan who called it *Ophiopogon arabicum*. It is not plentiful in Japan. Whether "arabicum" is descriptive of the habitat in the wild is not known. The familiar turflilies are natives of Korea, Japan, China, and India.

Anyone who has information about

the habitat and the name of the plant would confer a favor by writing Dr. H. Harold Hume, 1103 Southwest Second Avenue, Gainesville, Florida, or the writer of this note.—FREDERIC P. LEE, 7401 Glenbrook Road, Bethesda 14, Maryland.

Zephyranthes atamasco

This native bulb, reportedly the hardiest of the tribe and growing further north than any, has been one of the last to be added to the collection here. No good reason was involved, just the common form of garden procrastination. In 1957 bulbs were bought that were fine but that did not put up foliage that looked as vigorous as the growth from other zephyranthes. It grew rather better toward autumn and then disappeared. Last spring, however, good foliage came back after the cold of the winter and in March flower buds showed from practically every bulb crown. They rose rapidly, with enough color evident through the sheath to show a pinkish nose on a white bloom. When they opened, the blooms were much larger than had been anticipated, and of a charming lily-like shape, with a wider tube than in most species, giving a vase-like carriage. Now the only regret is that I had not bought one hundred bulbs instead of ten, even if at the moment, I have no idea where I might find that many.

Apparently the loss of such leaves as it had in autumn did not hurt the vigor, as has been the case with many of the more southern species in the past. These are not yet showing what they may have in mind. *Z. rosea* which usually suffers most now has excellent flat rosettes of leaves, but some of the others, *simpsoni*, *grandiflora*, *citrina* and so on, are in various stages of return. A few others newly planted have still to show.

When will some one in this country really settle down and raise these charming bulbs by the thousand so that one need not buy them at prices that should be reserved for exotics. We have pots and pots of seedlings coming on here, but I had much rather turn the task over to some one else.—B. Y. M., *Pass Christian, Mississippi*.

Extremely Dwarf Apple Trees

Most gardeners interested in dwarfed apple trees know of the dwarfing effect of the various numbered East Malling understocks. Only a few have seen the extremely dwarfed apple trees produced at LaRochette Nursery in San Francisco. The story of the understock used by Victor Rieter, Jr. in dwarfing these trees is interesting.

In 1928, H. Walton Clark, who at that time was curator of ichthyology at the California Academy of Science was visiting his old home in Indiana. One day while hiking he found a small seedling crab apple. This appeared to differ from the native crab (*Malus ioensis*) and he felt that it was a hybrid between this species and an edible apple. In any case, he took some suckers from the base of the tree and used these later as an understock for grafting scions of edible apples.

Rieter has continued this work which produces a very marked dwarfing effect when used with scions from selected apple varieties. Used with scions from Golden Delicious, Alexander, and Cox's Orange Pippin, the dwarfing is maximal. Red Delicious is only moderately dwarfed—about as much as on a Malling IX rootstock. The dwarfing effect is so marked in the first three varieties, that plants seventeen years old are only eighteen to twenty-four inches tall, yet they bloom heavily and produce six to twelve normal size apples.

The dwarf understock roots quite readily, and has only one drawback. It is susceptible to die back, but when used as an understock is unaffected. Old, mature and picturesque scions are used in grafting, never vigorous young wood. In this way a more artistic miniature tree and dwarfing are produced. Covered with blossoms in the spring or with several enormous apples in the fall, these little trees are very attractive.

Rieter has grown these trees in both containers and in the open soil. In the latter case, only slightly more vigorous growth is seen. The graft union is kept just above ground level as with other grafting stock to prevent rooting of the scion and vigorous growth. When grown in containers a starvation diet still further limits the size.—FREDERICK W. COE, *San Anselmo, California*.



FREDERICK W. COE

*A fifteen year old Yellow Delicious Apple grafted
on dwarfing crab apple understock.*

Experiences With One Pre-Emergence Herbicide

A number of pre-emergence herbicides are on the market, and these comments do not imply that one is better than others. The particular granular form used by this amateur gardener was selected because it seemed that it should be easy to apply. Also, the manufacturer provided exhaustive data indicating the material should be safe and effective.

Material used: Dry, Granular 5% Chloro I. P. C. (Isopropyl N (3-Chlorophenyl) Carmamate . . . 5.00%).

Why it was tried: In March and April, 1957, shrubs and ground cover were planted near three large elm trees. By mid-May, elm seedlings carpeted much of the area. Furthermore, top soil used in the planting came liberally supplied with assorted weed seeds—so elm seedlings and weeds competed to take over.

From the last week of May on into September one man spent eight hour days, five day weeks, chopping, digging, plucking elm seedlings and weeds.

The planting was reasonably free of unwanted vegetation in the spring of 1958. But elms again produced a heavy crop of seeds—and most of them dropped by May 1.

On May 8—without special preliminary cultivation—Granular 5% Chloro I. P. C. was applied to the entire area *by hand*, at rate of approximately 4 pounds per 1,000 square feet. The material, somewhat resembling builders' sand, is easy to handle.

These notes are being written the first week of December, 1959—and practically NO elm seedlings or annual weeds have appeared during this seven month period. The few which did sprout, probably escaped because of the irregularity of hand application.

As far as can be determined, no damage was suffered by any of these plants:

Ilex crenata f. *helleri*
Ilex crenata f. *convexa*
Ilex cornuta
Ilex cornuta Rotunda
Viburnum carlcephalum
 Azaleas—Glenn Dale Hybrids
Mahonia bealei
Mahonia aquifolium
Photinia serrulata
Camellia japonica

Juniperus—prostrate varieties
Vinca minor
Hedera helix
Liriope spicata

Rarely being able to let well enough alone, your reporter went a bit further with his trial of G.C.I.P.C.—and used the material in a bed where his wife was growing some nice, deep purple petunias. "Nut grass", which for years had resisted chemical and physical attacks, was growing among the petunias.

Granular 5% Chloro I.P.C. did not appreciably bother the nut grass. It ruined the petunias.—STUART M. ARMSTRONG, *Silver Spring, Maryland*.

As a general practice contact of insecticides, fungicides, and herbicides with skin or eyes should be avoided. The Food and Drug Administration has not yet established tolerances for residues of Chloro I.P.C. on food plants.—Ed.

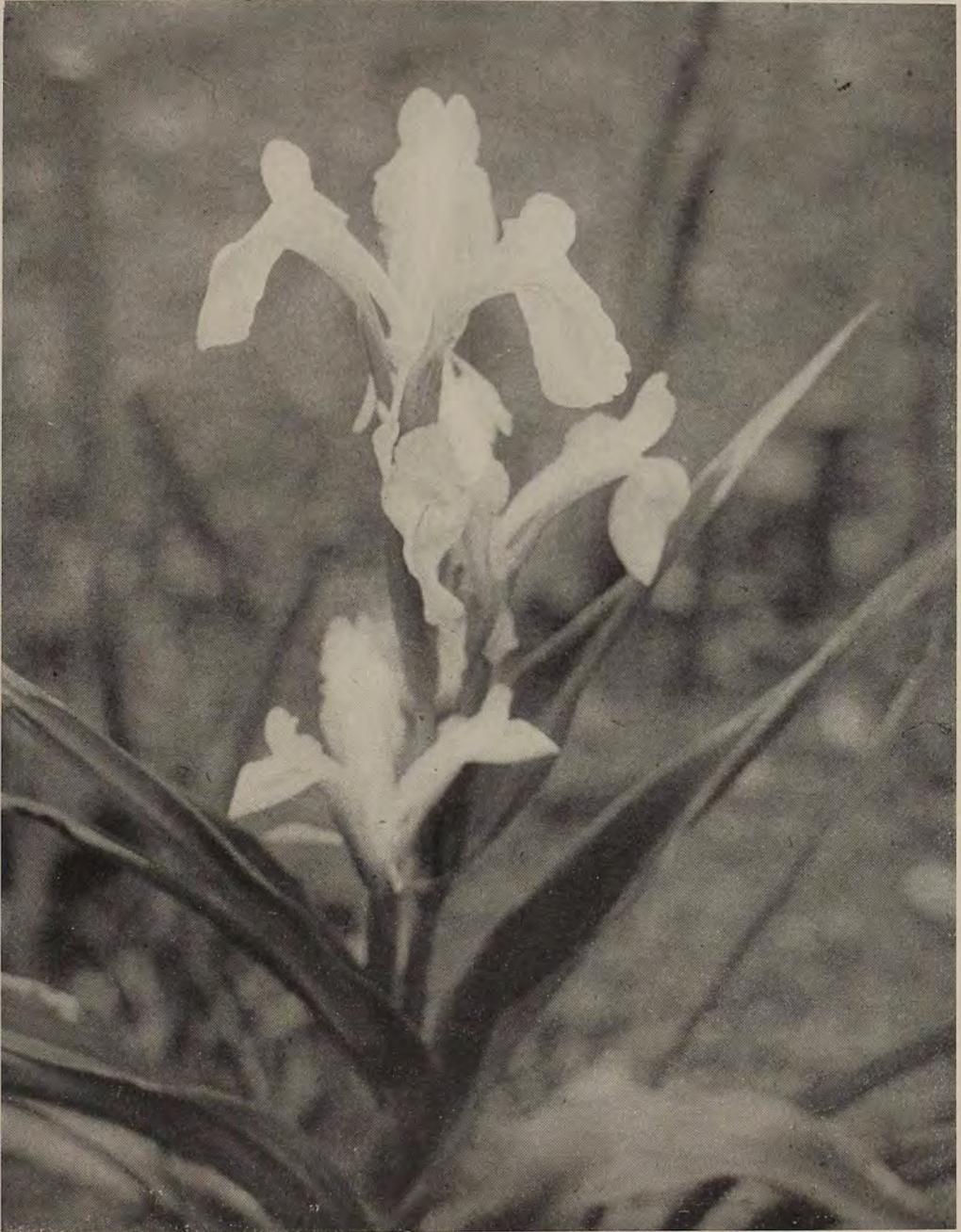
Juno Iris

This bulbous type of iris has two interesting characteristics. It gives early blooms, soon after the reticulatas in mid-April here in northeastern New Jersey, and the flowers occur at the axils of the leaves.

When differentiating to iris novices—so many know only the "tall-bearded"—I have used "the cornstalk iris" as the descriptive phrase. As Dr. Coe expresses it, in *the Gardeners' Pocketbook*, (January 1958) the Juno Iris form "a small replica of a corn plant."

The Iris Garden in Cedar Brook Park, Plainfield, New Jersey, has the varieties of which he writes. For years, even in this region, *Iris bucharica* and *I. vicaria* have persisted. In addition, there is *I. graeberiana*, *I. orchoides*, *I. willmottiana* and, this year, *I. sulphurea* (syn. *I. orchoides* var. *sulphurea*). Yes, and also *I. sindpers*, *I. sinjarensis*, and *I. warlsind*—these last three not so hardy.

Even if they are winter killed, what of it? They are not too expensive to replace. Furthermore, as someone said, "You don't hesitate to buy annuals for your garden." These charming early flowers are well worth replacing as "annuals."—HARRIETTE R. HALLOWAY, *Plainfield, New Jersey*.



Iris vicaria, "the cornstalk iris" in mid-April flower.



SAM CALDWELL

The "Perry" Lycoris

The correct name for this Lycoris is yet to be determined. From the garden of Miss Aileen Bishop, Nashville, Tennessee.

Additional Notes on *Lycoris*

In the note on *Lycoris* in the October 1957 issue of *The National Horticultural Magazine*, there was mentioned and illustrated a new hardy lycoris (P. I. 162443). This had been obtained in 1948 by B. Y. Morrison, head of the Plant Introduction Section, United States Department of Agriculture, from the Botanic Garden, Sun-Yat-Sen's Memorial Park Commission, Nanking, China. It is similar to *Lycoris aurea* and *L. traubi* but earlier blooming and much hardier than either. Recently the plant has been assigned species rank by Hamilton P. Traub, both because it blooms earlier (late July and early August) than *L. aurea* and *L. traubi* and because the foliage appears in early spring instead of fall and winter. The name given is *L. chinensis*.

Sam Caldwell of Nashville, Tennessee, has a somewhat similar lycoris that has deep golden flowers. It is twenty-five to thirty inches tall and each umbel has six flowers three and one-half to four inches across. Flower segments measure three-eighth to one-half inches in width when flattened out. Leaves appear in early spring. Caldwell leaves for future determination the question whether this lycoris is of the same species as the new *L. chinensis*. The bulbs were originally brought from the Huchow, China, area in 1925 by Mrs. Henry Sperry of Nashville, and have been growing in Nashville gardens since that time.

Also in the same October 1957 issue of *The National Horticultural Magazine* mention was made of an earlier (August) blooming form of *L. radiata*. The common form is an infertile triploid blooming in September. The new form is a fertile diploid as well as earlier blooming. It still goes under the name of *L. radiata* and has not been constituted a new species.

Traub has named, however, another new lycoris species this past year, *L. elsiae*, in honor of Elsie Quarterman, director of the herbarium of Vanderbilt University. It is close to *L. houdysheli*. *L. elsiae* blooms in late August or early September (instead of late July and early August) and has salmon tinted flowers with a pink stripe down center of each segment (instead of white flowers). The flower scapes are about eight

teen inches tall. It is hardier than *L. aurea* but less hardy than *L. radiata*. Leaves are above ground in winter and early spring. Caldwell believes that in the past this bulb has in some instances been distributed under such names as *L. radiata carnea*, *radiata alba*, *alba*, and *albiflora carnea*.

Herbertia for 1958 published a new key for the subgenus of lycoris that is typified by *L. radiata*. The key places in this subgenus ten species: *L. radiata*, *rosea*, *straminea*, *albiflora*, *houdysheli*, *elsiae*, *caldwelli*, *chinensis*, *traubi*, and *aurea*, all mentioned in the earlier note in this magazine save for the new species *L. elsiae* and the new species name *L. chinensis*.

By reason of their spectacular flowers, their late summer and early fall blooming period, and the variety in color, form, and height of flower, lycoris is likely to become an outstanding genus of bulbs for this country. This will be especially true if species in addition to *L. squamigera* and *L. sprengeri* are found to be hardy in New England and equivalent climatic zones. Most lycoris species increase rapidly enough to make all those introduced readily available before long. *L. radiata*, *squamigera*, *aurea*, *traubi*, *sanguinea*, and "albiflora carnea" are plentiful today. —FREDERIC P. LEE, Bethesda, Maryland.

Gloriosas

There have been many notes about these plants from time to time, but now with the flowers of *G. rothschildiana* just about finished for the season and those of *G. erecta* coming on to replace them, and small buds in sight on plants of *G. virescens* and *G. planti*, and something in sight on the plant purchased under the name of *G. verschuuri*, one need not regret that the growing shoots of the autumn flowering *G. superbum* are just emerging. According to the books, *virescens* and *planti* are synonyms and yet it is the practice here to buy "any new name" on the off chance that the plant will turn out to be something other than either of the names assigned. As the roots of *planti* and *virescens* are new here, their identity will have to be seen when flowers open.

Seedlings of *superbum* here mature or

develop more rapidly than those of *rothschildiana* but it is so easy to have them coming on that one would be foolish not to sow them. Seeds of *rothschildiana* which mature early have been sown at once, and germination has been irregular but good; those of *superbum* are sometimes caught by autumn frost before maturity, but usually there are enough to make a sowing. The pods turn brown, split open and show the dull orange-coated seeds which, as far as this writer, knows, have not yet been discovered by the omniverous lady flower arrangers. Why not, for other less striking things have been used again and again.—B. Y. M., *Pass Christian, Mississippi*.

Concerning the Incidence of Tree Seedlings

My hilltop white pine has towered over the landscape for much more than a century, broadcasting seeds to a considerable distance, yet it had no descendant on the place when I bought it twenty-nine years ago. While during the years since it has never, so far as I remember, failed to bear a crop of seeds, nevertheless seedlings have come up only one year out of the twenty-nine. That year there were more than a dozen, widely scattered seedlings. Now, perhaps twelve or thirteen years later, two are alive. Three others got through six years only to be eaten then by rabbits. Most of the others disappeared without trace during their second year, probably as rabbit food.

My beech trees have had both bumper crops and scanty crops of nuts over the years but there have been few years without several pecks. Yet only one year has my place been thickly sprinkled with the creamy large seed leaves of beech seedlings. That year seedlings covered the lawn and came up in paths, along the roadside, in the garden, and in the borders. The lawn mower took hundreds of that year's seedlings; other enemies took most of the others. A half dozen still survive, several of them after repeatedly being cut back by rabbits. There have been two other years during the twenty-nine when there was a noticeable growth of seedlings but most years there seems to be none.

A few years after I bought the place a friend wanted some first year redbud seedlings. I dug a hundred for her from under one redbud tree without robbing the spot. I assumed redbuds always came up that way and set forth confidently a few years later to dig a quantity for another friend. That year there was not a first year seedling to be found on the place. Such young redbuds as could be found seemed all of an age, presumably all from the year of many seedlings. There have been two years since then when redbud seedlings have come up in borders, along the roadside, and even in the lawn. Most years, however, in spite of large crops of seed, there will be only an occasional seedling.

It is indeed an exceptional year when no elm seedlings come up for me. Some years, of course, there are more than others, but during the twenty-nine year period there has been only one year of fabulous germination. That time seedlings came up not only wherever there was any soil but also on old shingle roofs, between the floor boards of the rowboat, and even on the gunwales of the boat. My wild elms include American elm, slippery elm, and winged elm. Unfortunately it did not occur to me to check to see whether the seedlings were all of one species. Subsequent observation of oak seedlings has inclined me to believe that species vary as much in their seeding as genera do.

Other kinds of trees on my place have produced unusually large numbers of seedlings only once during the period. There has been just one year when seedlings of hard maple came up everywhere. There has been just one year when it was possible to find patches of gleditsia seedlings although they came up scatteringly every year in places where they are least wanted. I recall just one year when red cedar came up in profusion, although I cannot remember a time when I could not find it in assorted sizes and in sizable numbers.

I have no reason to suppose my experience unusual. Wherever I have noted tree growth along roadsides the individuals of a given kind tend to be of an age instead of various ages. A similar thing seems true of brush-grown land.—MAUD R. JACOBS, *South Carrollton, Kentucky*.

AMERICAN HORTICULTURAL SOCIETY

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- American Begonia Society
- American Begonia Society, San Francisco Branch
- American Camellia Society
- American Daffodil Society
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- American Peony Society
- American Rhododendron Society
- American Rhododendron Society, Middle Atlantic Chapter
- American Rose Society
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