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MAGAZINE



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The National
HORTICULTURAL
Magazine



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CONTENTS

Winter-flowering Shrubs. WILLIAM J. DRESS	59
Lilium Pfeiffer Hybrids. NORMA E. PFEIFFER	65
Modern Peach Varieties. LEON HAVIS	67
Perpetual Flowering Shrub Roses. GRAHAM STUART THOMAS	71
Exploring Southern Japan for Ornamental Plants. JOHN L. CREECH	75
The Muskmelons. CHARLES W. REYNOLDS	95
A Book or Two	102
The Gardeners' Pocketbook	
Growing a "Knock-away" Tree. LYNN LOWREY	107
Observations on <i>Pentas lanceolata</i> . I. S. NELSON	108
<i>Cuphea micropetala</i> . B.Y.M.	110
A Miniature Holly for Modern Landscape <i>Ilex cornuta</i> 'Dwarf Burford.' W. F. KOSAR	110
<i>Forsythia</i> 'Beatrix Farrand.' KARL SAX	113
<i>Thryallis glauca</i> . B. Y. M.	113
<i>Damnacanthus indicus</i> . JOHN L. CREECH	113
<i>Datura mollis</i> . DONALD G. HUTTLESTON	115
Small Bulbs for Summer Bloom In the Lower South. B.Y.M.	116

FRONT COVER ILLUSTRATION

Rosa rugosa 'Belle Poitevine'—deliciously clove-scented, lilac-rose colour.
See Page 71.

Publications available from the American Horticultural Society

THE AZALEA BOOK

Frederic P. Lee. Published by D. Van Nostrand Company, Inc., Princeton, New Jersey and sponsored by the Society. 1958. 324 pages, 6 pages illustrated in color, 56 black and white illustrations. Cloth bound. \$6.45, postpaid, special price to Society Members; \$8.95, postpaid to non-members.

This handsome and unique book tells everything there is to know about azaleas, from setting out a few plants and keeping them healthy in a backyard garden to identifying rare specimens through a descriptive list of about 70 species and 3,000 varieties.

HANDBOOK OF HOLLIES

Harry William Dengler, Guest Editor and 26 contributors in various fields of holly growing. 1957. 193 pages, 1 color illustration and 61 pages of black and white. Paper bound. \$3.00, postpaid.

Descriptive list of the North American, Oriental, and English species and varieties of hollies with their care and uses—planting, pruning, pests, diseases, propagation, hybridizing, landscape use, hedges, screens, barriers, topiary, bonsai, orcharding and cut arrangements.

ANNIVERSARY ISSUE

A selection of a few of the classical articles that appeared in the previous 34 volumes of *The National Horticultural Magazine*. October 1955. 113 pages. *Franklinia alatamaha* illustrated in full color on the cover, 71 black and white illustrations. Paper bound. \$1.00, postpaid.

Liberty Hyde Bailey's "The Joy of Growing Plants" commences the issue, followed by: The Gentle Art of Weeding, Roscoea, Some Californian Flowering Shrubs, Neglected Native Plants, The Stewartias, Kalanchoes for the Window Garden (19 species illus.), Franklin's Tree, Lewisia, Trilliums (11 species illus.), Notes on Calochortus (14 species illus.), and Erythroniums—all written by prominent names of horticulture.



An interesting bonsai specimen of Pinus thunbergii photographed by Director Creech during his visit to Japan.

Read Dr. Creech's account of his Oriental explorations, commencing on page 75.

Winter-flowering Shrubs

WILLIAM J. DRESS¹

Except for the extreme southwestern and southeastern parts of the United States, the aspect of the American garden in winter is usually a static one. With the advent of cold weather, emphasis shifts from flowering herbs and shrubs to those with evergreen foliage, interesting branching-patterns, colorful twig or fruits. The excitement of anticipation which derives from the continual change so characteristic of the well-planted garden, from earliest spring to the autumnal coloring and falling of the leaves, is then replaced by a kind of available plant materials capable of subtle but long-enduring attractions.

No doubt, the gardener benefits from this enforced period of quiescence as much as the garden itself, for the pleasure with which he welcomes the first blossoms in spring is doubtless enhanced by their absence during the several preceding months. In those regions where winter temperatures are lowest and weather most inclement², there is little alternative to "making do" with whatever hardy flower-substitutes are available in the form of evergreens and berryed shrubs. Elsewhere, the winter garden need not be entirely flowerless, though it is true that the farther north one goes, the more restricted is the range of available plant materials capable of providing winter blooms outdoors.

Some of the numerous bulbous and herbaceous perennials of this class, like the Christmas Rose (*Helleborus niger*), are relatively well known, but they are a subject unto themselves (and published in the past issue of this magazine). Winter-flowering shrubs are less known and even less used, especially in northern gardens. It may be that this neglect is due in part to the modesty of their display, for it is true that most

of the deciduous sorts, at least, could not compete successfully for attention if they were to flower contemporaneously with the usual spring- and summer-blooming shrubs. February is not June, however, and any flower timorous enough to unfold then is to be cherished. Deciduous shrubs which bear their flowers along naked branches should, for best effect, be set against a background of evergreens or a dark-colored wall or fence; shrubs which are evergreen will need no foil for their flowers other than their own foliage.

The actual time of blooming of winter-flowering shrubs may be expected to vary from year to year, according to weather conditions. Where temperatures are low for long periods, flowering will depend on the occurrence of brief spells of milder weather which will encourage the expansion of buds already formed during the preceding summer. Not infrequently an especially severe winter will completely forestall this blooming until early spring.

Because they are so dependably winter-blooming, the witch hazels deserve especial consideration in any plan for a winter garden. Though in summer their habit and foliage are somewhat coarse, this is amply compensated for when the leafless branches are studded with tight little clusters of flowers in midwinter. Usually some tone of yellow, these flowers have four spreading, narrow, strap-shaped petals about one sixteenth of an inch broad, somewhat curled or twisted. The leaves of all are obovate, sometimes ovate, irregularly and shallowly toothed, and vary in length from two to five inches, according to species.

The common witch hazel, (*Hamamelis virginiana*), of our eastern woodlands opens its buds in autumn as its leaves turn to yellow and begin to fall, so it cannot be classified as really winter-blooming, even though an early snow-fall sometimes catches it still flowering. Another American species, native from

¹L. H. Bailey Hortorium, Cornell University, Ithaca, New York.

²Zones II and III of the map of climatic zones in Alfred Rehder's well-known *Manual of Cultivated Trees and Shrubs*—roughly, in the United States, the region including the northern Rocky Mountains and extending eastward to the western Great Lakes, and the northernmost parts of New York and New England.

Missouri to Louisiana and Alabama, is later-flowering. This is *H. vernalis*, a six to eight foot many-stemmed shrub that carries a profusion of light-yellow flowers from January to April. The dull red of the interior of the calyx tinges the petals also, and this and their smaller size make the flowers less showy than those of the Asiatic species. The subtle bronzy effect and fragrance of its flowers, however, give the branches special value for indoor arrangements.

The two Asiatics are larger shrubs or small trees, sometimes reaching a height of twenty feet. The Japanese species, *H. japonica*, is typically shrubby and has bright yellow crumpled petals from a purplish calyx. Cultivars 'Arborea' and 'Zuccariniana' are tree-like forms of it, the former with deeper-colored, the latter with paler, flowers.

Hamamelis mollis, from central China, is the finest of the witch hazels. Its flowers are the largest and most brightly colored, and are fragrant also. The golden-yellow petals, tinged with red basally, are not very crinkled and are over one-half inch long, and so appear larger than those of the Japanese species. The inside of the calyx is reddish-purple. Unfortunately, this species is not quite so hardy as the others.

Hamamelis × *intermedia*, occasionally offered in the trade, is a hybrid between the Chinese and Japanese witch hazels and is intermediate in character, though somewhat variably so, between its parents.

Of the related genus *Corylopsis*, at least six species are today available in the American trade, but they are not very often seen or grown. They are all Asiatic in origin. The flowers are light yellow, carried in dangling short racemes from the leafless branches during late winter or early spring, and are frequently pleasantly scented. The orange, brown, or reddish anthers protruding from the somewhat bell-like, five-petaled corollas help to enliven their effect at close range. The foliage of all the species is rather similar, resembling that of the hazels or genus *Corylus*, but without the latter's coarseness. *Corylopsis glabrescens* (*C. gotoana*) is the hardiest sort, cultivable in Massachusetts, but it is not the showiest, the flower-tassels being rather short. *Corylopsis spicata*, *C. sinensis*, and *C. veitchiana* are almost as hardy and

have longer racemes, the last being especially ornamental but, regrettably, also the most difficult to find in American nurseries. *C. spicata* is especially early-flowering, as is *C. pauciflora*. The latter, however, is less showy than the other species, for there are only two or three, albeit largish, flowers in a raceme. This and the more floriferous *C. platypetala* and *C. willmottiae* are less hardy than the preceding species.

Chimonanthus praecox, a Chinese shrub known in the recent past as *C. fragrans* and *Meratia praecox*, is also yellow-flowered, and deciduous. Long before the leaves appear, the growth of the previous summer is strung with the inch-wide bell-like flowers which, like those of its American cousins, the sweet-shrubs (*Calycanthus*), are sweetly and pervasively fragrant. Wintersweet is its common name. The longer, outer perianth-parts are green-yellow, the shorter inner ones suffused with purplish-brown. The typical sort makes a bushy shrub six or eight feet high, but the cultivar 'Grandiflorus' is larger in every respect—in habit, leaf, and flowers. The last are also of a purer and stronger yellow, but these visible advantages are counterbalanced by a diminution in fragrance. The leaves are opposite, lanceolate, thin in texture and scabrous—unpleasantly rough to the touch—on the upper surface. Thin woodland is the ideal spot for the wintersweet, so a deep rich soil and a lightly shaded position suit it best elsewhere. It is not reliably hardy north of Virginia in the East.

The forsythias need have but scant mention here, firstly because they are so familiar everywhere, and secondly, because one feels that winter is already over and that spring has definitely arrived when these shrubs burst into bloom. *Forsythia giraladiana* and *F. ovata* are the earliest to flower, and might be planted where the desire is to advance the spring as much as possible. Neither is so good, however, for general planting as the other somewhat later-flowering species, hybrids, and their varieties. *F. giraladiana*, with light-yellow flowers, is little known in this country; the fairly well-known *F. ovata* has bright-yellow flowers, smaller than those of other kinds, but in addition to being early it can be recommended as bud hardier than any of the others, and therefore capable

of presenting its spring show of bloom in regions where other species have their flower-buds blasted by winter cold.

Not so hardy as any of the forsythias, but grown in a rather tentative way as far north as New York and Boston, is one of their relatives, the winter jasmine, *Jasminum nudiflorum*. A common shrub in the South, where it sometimes "goes wild," it resembles the forsythias in some respects. The inch-long yellow flowers are salver-form and six-lobed rather than campanulate and four-lobed, however, and may be seen at almost any time during the winter, appearing singly or in pairs at the nodes of the naked green twigs. The summer foliage is finer in texture, also, for the leaves are made up of three small leaflets like a small laburnum leaf, and are mostly under one and one-half inches long. Since the winter jasmine may grow to a height of twelve to fifteen feet in areas where it is quite hardy and never frozen back, and since the stems are arching and tend to flop, it must be given considerable room or else be pruned judiciously after flowering.

Of the daphnes, *Daphne mezereum* can usually be counted on to flower in the North as March turns into April, but farther south and on the West Coast it will flower as early as February. This rather stiff little shrub from Europe reaches a height of three feet or a little more. The somewhat grayed-green leaves, oblanceolate, smooth, and about three inches long, are deciduous. The flowers are one-half inch across, with a short tube and four spreading lobes, and are borne in twos and threes at the nodes of the bare, stout, upright branches. Their pervasive sweet fragrance does even more than their color to dispel the gloom of a winter day. A white-flowered form, 'Alba,' has yellow fruits, whereas the more common and typical rosy-purple form has red fruits. Forms with lighter- or darker-colored flowers are occasionally available, too. A garden form called 'Grandiflora' (also known as 'Autumnalis'), with larger flowers and capable of blooming off-and-on from late fall until the typical form begins to bloom, unaccountably is not now available in the American trade, though it should be. *Daphne mezereum* has the reputation of sometimes dying off suddenly without apparent cause. It has become natural-

ized in some places in the Eastern United States, usually at the edges of woodland, and this sort of situation or an approximation of it no doubt suits it best.

The Asiatic *Daphne odora*, a favorite on the street-corner flower stands of San Francisco in February, is unfortunately not hardy except on the Pacific Coast and in the southernmost Eastern States. It is an evergreen shrub, usually much lower than the six feet it sometimes attains. The shiny, leathery, deep-green leaves cluster at the tips of the twigs, setting off perfectly the terminal clusters of flowers, which open in mid-winter and are larger than those of *D. mezereum*, deep purple externally, paler within, and deliciously fragrant. There is a white-flowered form of this species, also, as well as variants of the purple, and cv. 'Variegata' has yellow-margined leaves, if one prefers that sort of thing. A spot sheltered from full sun, with a cool, moist, deep root-run is necessary for this shrub's best development. It is well worth growing in the cool greenhouse, wherever it is not hardy outdoors.

Two Chinese honeysuckles are rather precocious in flowering and are desirable for the fragrance of their dainty though not very conspicuous creamy-white flowers. They are so similar that it is not likely that one would want both, unless one had a very large garden or were an inveterate collector. *Lonicera fragrantissima* has the more fragrant flowers, but *L. standishii* is neater in habit and has somewhat more attractive foliage. Both grow to a height of six or eight feet, tend to be semi-evergreen in milder climates and milder winters, and will bloom from December to spring where climate and weather permit. The leaves of *L. fragrantissima* are broadly elliptic, between one and two inches long, dull green above and paler, somewhat bluish-green on the underside. Those of *L. standishii* are larger, more pointed, to four and one-half inches long, green above, a lighter green below. The two-lipped flowers are about a half inch long, paired on short peduncles and borne in the axils of the opposite leaves. Both species are hardy except in the severest winters in New York State, (an old plant of *L. fragrantissima* in a rather sheltered location in Ithaca did not survive the winter of 1956-1957), but are deciduous and April-flowering at the

northern limits of their hardiness. The two species are sometimes confused in nurseries and gardens, but can be readily distinguished by the blackish, downward-directed pubescence on the twigs and on the peduncles of the flowers in *L. standishii*, as well as by its larger, more pointed leaves. In *L. fragrantissima* the twigs and peduncles are smooth and hairless. Neither of these shrubs, out of flower, is particularly ornamental and so does not deserve a really prominent or choice place in the garden.

The related genus *Viburnum* also furnishes two species willing to brighten the winter months in some regions. *Viburnum fragrans* is a twiggy deciduous shrub growing seven or eight feet high, hardy into the lower New England States (but there, like the honeysuckles and most other "winter-flowering" shrubs, not blooming until April). The half-inch long-tubed flowers, pink on the outside, white inside, are carried in roundish headlike clusters at the tips of the twigs, anytime from late September to April, depending on conditions. As the name suggests, these are spicily fragrant, and therefore especially enjoyable when forced for use indoors. The summer appearance of the plant, though not unpleasing, is rather nondescript. The other species, *V. tinus*, is the familiar laurustinus of the South, and Pacific Coast, reliably hardy only as far north as southern New Jersey on the Atlantic Coast, and to a line drawn from there to central Texas. Unlike the preceding species, the laurustinus provides its own foil of glossy evergreen foliage for its flat-topped cymes of pink-tinted white flowers, borne throughout the winter. Often used as a hedge plant, clipped or unclipped, the laurustinus eventually becomes twelve feet or more high.

The heath family offers several shrubs which will flower in midwinter in much of the area in which they are hardy. *Erica carnea* is one of the hardier members of its genus, doing well as far north as Ohio and southern New England. It is a dwarf evergreen shrublet usually less than one foot high, with spreading branches and half-inch needle-like leaves. The little egg-shaped rosy-red flowers are produced in abundance along the ends of the branches, anywhere from early winter till spring, depending on the mildness of the weather. A number of

named cultivars are available, differing from the typical sort in the color of the flowers or foliage or in height. Noteworthy among them are 'Springwood White,' 'Springwood Pink,' and 'Ruby Glow,' which, respectively, have white, rose-pink and crimson flowers, the last being dwarfer, also. A hybrid of *E. carnea* and the taller *E. mediterranea*, *E. × darlayensis*, is more vigorous and may grow twice as tall or taller. The flowers are paler and not quite so pleasing in color (a pale lilac-pink), but are produced over an even longer period.

The rhododendrons, of the same family, are numerous, but not many can be expected to bloom in the winter. Of those that do, *R. dauricum*, *R. mucronulatum*, and *R. parvifolium*, all from eastern Asia, are the hardiest. Unfortunately, here again flowers cannot be expected before April in New England, or late March in New Jersey, but from Washington, D.C., south, and on the Pacific Coast these shrubs may begin to bloom in January or February. The first two are rather similar, and, in fact, *R. mucronulatum* is sometimes treated as a variety of *R. dauricum*. Both are shrubs to six feet high. *R. dauricum* is semi-evergreen, with glossy green leaves one to two inches long, and a few rose-purple flowers one to one and one-half inches across in terminal groups of three to six at the end of each twig. The hardier, deciduous *R. mucronulatum* is usually considered a finer plant, having larger, thinner leaves, to three inches long (taking on good color in fall) and larger, paler rose-purple flowers. The less well-known *R. parvifolium* is a lower, evergreen shrub, only two or three feet high, with conspicuously brown-dotted leaves an inch long, and tight clusters of brighter rose-purple flowers less than an inch across. It is distinct from the other two species, but cannot compete with them in showiness. Not quite so hardy as these is the hybrid *R. × praecox*, offspring of *R. ciliatum* and *R. dauricum*, a semi-evergreen shrub three or four feet high, with dark glossy green leaves, and bright rosy-purple flowers almost two inches across, freely produced in February or even earlier. Even less hardy, but usable south of Maryland, are the hybrid *R. × cilpinense* and one of its parents, *R. moupinense*, both evergreen types. The latter is relatively

dwarf, two to three feet high. Its flowers appear singly or only a few at the twig tips, and are white or tinged with pink, often dotted with purple in the upper half of the throat, slightly ruffled, and two and one-half inches across. The thick leathery dark-green leaves, mostly under two inches long, are a perfect foil for these waxy blossoms. *R. × cilpinense* is a slightly larger plant, blooming a little later, with pink flowers. The blooms of any of the rhododendrons are likely to be injured or destroyed by heavy frosts, snow, or sleet occurring while they are in actual flower, unfortunately. A spot sheltered from the early morning sun is said often to prevent serious damage from a previous night's freeze by permitting the flowers to thaw slowly. The need of most members of the ERICACEAE for an acid, peaty soil is so generally understood that it is almost superfluous to make that reminder here, in reference to the ericas and rhododendrons.

In the South and far West, camellias are well-known and practically standard garden shrubs, but trials by a number of amateur growers indicate that they may be grown experimentally, at least, as far north as eastern Tennessee and southernmost New Jersey. Certainly, the plants themselves stand brief spells of temperatures as low as zero when they are hardened to it. In regions so far north, however, the camellia out of doors probably will not bloom until spring, no matter what its proclivities may be in milder climates. Where really cold weather is of short duration, farther south, camellias may be had in bloom over most of the period from late fall until midspring, for various varieties come into flower at different times. During the coldest part of the winter, flowering may cease, and open flowers and buds which have started to show color are liable to be injured or completely destroyed by sudden freezes, though smaller buds often continue to develop and open later. The early-flowering varieties can be used to provide bloom in early winter, up until freezing weather begins, and the so-called mid-season sorts will begin blooming in late winter, after the coldest weather has past. The duration of bloom for either period will depend, naturally, on the climate and weather of each particular geographical area.

Camellia japonica is the species most commonly grown and has the greatest number of cultivars. The plants vary in habit, but the evergreen foliage is always a beautiful glossy dark green, the individual leaves leathery, elliptic, bluntly pointed and closely crenulate-serrate along the margins, two to four inches long. The flowers are too familiar everywhere, even if only in corsages from the florist, to need much description. According to variety, they may be single (with only five to seven petals), semi-double, or fully double, and range in color from pure white through pinks to shades of red, often variegated, and not infrequently appearing in two color forms on one plant. In size they are usually three to five inches across, but may be even larger. Fancy-named varieties available in the American trade now number in the hundreds, so almost any desired combination of blooming season, flower color, and flower form may be had. Selections to suit individual tastes and requirements can be made from descriptions and illustrations in the catalogs of camellia specialists or in the many horticultural articles and books on the subject which have appeared in recent years. *Camellia sasanqua* and its cultivars, though not so commonly grown as the *C. japonica* types, are at least as hardy, and generally some begin to flower a little earlier in the season, from September to December. The number of cultivars available is smaller, perhaps two hundred or so, and the flowers are mostly single or of the informal semi-double type, tending to be a bit smaller than those of *C. japonica*, but having about the same color range and the advantage of fragrance. *C. japonica* does best and looks its best if given a somewhat shaded location; *C. sasanqua* can stand considerably more sun. Both should have a moisture-retentive soil rich in organic matter and on the acid side, and a permanent mulch over the roots.

A shrub that might be considered an evergreen because of its densely green-twiggy growth, even though it is at all times practically leafless, is the European gorse or furze, *Ulex europaeus*. The leaves are reduced to short spine-like petioles which can scarcely be distinguished from the stiff, crowded, and equally spine-like twigs, the whole plant

becoming thereby virtually untouchable. The bright yellow pea-flower corollas are enclosed in a yellow two-lipped calyx of the same length (about one-half inch) and color, and are profusely borne at the ends of the branches in early spring (and often in late summer also), or, where and when the winter is mild, anytime from December on. On the East Coast it is hardy north to southern Massachusetts and Washington. It has never had too much recommendation as a garden plant, but is useful and beautiful in dry, sandy, difficult spots, and is exceptionally resistant to damage by sea-spray. The debris it drops on the ground and accumulates in its interior is very flammable in dry weather, so this shrub is often regarded as a fire hazard where it has become naturalized near forests.

Many other species seldom to be found in flower before April in the North,

where they are subjected to "deep freeze" treatment for several months on end, will come into flower during breaks in the weather in late winter in milder climates where their natural tendencies are not so completely restrained. *Cornus mas* (the cornelian cherry) and the similar *C. officinalis*, *Garrya elliptica*, *Lindera benzoin* (spicebush), *Magnolia kobus* var. *stellata* (the star magnolia), *Mahonia bealei*, *Parrotia persica*, *Salix caprea* (pussywillow), *Stachyurus chinensis* and *S. praecox* have such tendencies and all are readily available from American commercial sources.

For California and Florida, of course, the list of winter-flowering plants is extensive and varied, and is lengthened by many with an ever-blooming habit. The usefulness of these is too restricted geographically, however, to warrant particular mention here.

Original hybrid of Lilium auratum × Lilium japonicum
Face and side view—July 9, 1941

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Lilium Pfeiffer Hybrid, pink-flowered, July 8, 1954

Lilium Pfeiffer Hybrids

NORMA E. PFEIFFER

When the golden-rayed lily, *Lilium auratum* Lindley, was first crossed with the pink bamboo lily of Japan, *L. japonicum* Thunberg, it was only one of a number of attempts to produce a new pink lily. Various strong white forms were pollinated in 1936 with pollen of either the bamboo lily or *L. rubellum*

Baker, a May-flowering pink species also from Japan. Some of these crosses failed to set seed. Others produced seed which either germinated but failed to reach maturity or gave seedlings which upon flowering appeared to be duplicates of the seed parent. Two exceptional populations, however, developed different plants.

The interval before flowering was largely dependent on the habit of the seed parent in regard to seed germination. Some lilies grow readily from seed, producing seedlings within three to six weeks which will sometimes flower within 13 to 18 months. Other species present a challenge in the longer interval and the varied treatment required to reach the flowering stage. The pollen parents here used, as well as *L. auratum*, fall into this class in which the root is produced and bulb growth starts under the same germinating conditions used for the quick-growing forms, although often more slowly (three to six months). The shoot bud, however, is dormant at ordinary room temperature except in sporadic individuals, so that no aerial parts appear without a subsequent exposure to a lower temperature such as 32 to 40 degrees Fahrenheit for two or three months. These plants require months instead of weeks to develop the leaf-bearing seedling and years instead of months to achieve flowering size. In our experience, the interval from seed production to blooming time, with the possibility of first evaluation of the hybrid formed usually varies from 3-6 years.

It required patience to carry along the seedlings resulting from the use of *L. japonicum* pollen on *L. auratum* in 1936.

The reward came in 1941 when a few hybrid plants appeared at flowering time in the midst of typical *L. auratum* forms. Also in the first year of blooming, a single hybrid appeared in the progeny of *L. auratum* × *L. rubellum*. In both cases, hybridism was first evinced by early flowering, June 16 for the *L. rubellum* hybrid and July 3 to 10 for the *L. japonicum* progeny. During all the early years of our work with the latter group, Fourth of July was a busy day with its peak of flowering.

With the opening of the flowers, further evidence came in the beautiful delicate pink color in all but one of the original hybrids with *L. japonicum* pollen. This was white like the *L. auratum* parent, with more prominent papillae than in most of the pink flowers. In all of these the golden ray was relatively short. The fragrance was lighter and more pleasing than that of the golden-rayed seed parent.

In further breeding, advantage was taken of the variability in flower markings and ray coloring of both *L. auratum* and its more robust variety *platyphylum*, among them flowers with rays flushed with red. Not only was there backcrossing on the original parents but intercrossing of sister seedlings of the hybrids. Each generation requires several years for development to the flowering stage; in each population desirable plants for further breeding were selected until we were ready for propagation of clones. The result in present hybrids is a very wide range in flower markings, from heavy papillate to immaculate, from short to prominent golden rays, clear or rose-suffused, on either pink or white perianths. Further variation in color appears in the large stamens. Pollen color varies from orange shades to dark red-brown.

A large full flower with wide perianth parts and crisped margins has been emphasized, in our selections, rather than the form of the short trumpet of the pink parents. Breeding for an extension of the flowering season has also been carried on, so that clones can be selected for blooming in this region from early July through August.

In selection, too, we have been especially concerned with constitution of the plant; weaker forms, although often very beautiful, have been discarded in favor of more vigorous plants. That a good measure of success has been achieved here, is attested by the experience of one expert horticulturist, who flowered three of these pink hybrids in Newburyport, Massachusetts, in mid-July. Because he moved to California, the bulbs were dug in August, 1956, transported in a closed van for a week before careful transplanting on arrival—admittedly harsh treatment for any lily bulb. Yet in late June of 1957, one of these produced a flower stalk with ten buds. On July 1, the first flower had dropped its petals, but nine others were open on a stem measuring 46 inches from the ground to the first flower. With stock of this caliber in the hands of a skillful propagator, excellent clones are assured for gardens wherever *L. auratum* can be grown successfully for any interval of flowering from late June through August.

Modern Peach Varieties

LEON HAVIS¹

The development of new and improved peach varieties by both publicly supported agencies and private breeders has greatly increased those available to both small and commercial growers. Still no variety is perfect, and much yet needs to be done for further improvement. For the small grower the development of more disease and insect resistance in varieties would be a great advantage. At present, it is imperative that he follow a carefully planned spray schedule and, in addition, maintain a constant vigil for the unexpected. Often, from the standpoint of economy, the home gardener will be ahead if he buys peaches from the market or commercial grower rather than grows his own.

Recent developments in improvement in peach varieties have changed the home-gardening as well as the commercial orchard picture. As recently as a dozen years ago 'Elberta' dominated the market so completely that the season for 'Elberta' in different districts was the main factor to consider in the markets. The picture is changing rapidly because of the long succession of good varieties now available to all areas. Growers in all areas except the most southern ones find strong competition for fruit of all varieties from good earlier ripening varieties grown in the same or similar areas and from later ripening varieties grown farther south. The trend in varieties may be summarized as toward equally attractive, firm, high-quality freestone varieties to ripen throughout a long peach season. Because there is now a need for superior varieties to ripen even after the 'Elberta' season, some recent peach-breeding efforts have this goal. The most popular new varieties are now the ones best suited to the fresh market trade and for freezing.

A primary prerequisite to development of a new variety is a knowledge of what is most desired or more accurately of what will be the most desired characteristics. What is wanted in any peach variety depends largely on its purpose and the requirements of the grower. Trees of a peach variety desirable for any purpose must be vigorous and productive. For most purposes, the fruit should be large, smooth, attractive, and of good flavor. The consumer of fresh peaches prefers that part of the surface be bright red and the remainder be bright, attractive yellow when ripe. Yellow flesh is preferred by most consumers in this country. A freestone is preferable for fresh consumption, but early in the season when freestones are not available, a cling or a semi-cling is acceptable and often brings a high price.

DEVELOPING NEW VARIETIES

A firm-fleshed peach is essential for long-distance shipment and is desirable even for local markets and roadside stands. The relatively new varieties 'Dix-ired,' 'Redhaven,' 'Triogem,' and 'Sun-high' all have rather firm flesh and this characteristic helped make them popular. They mature to good quality before harvest time, resist bruising and rapid softening after harvest. Of course, firmness is an outstanding characteristic of the old varieties 'Elberta' and 'J. H. Hale,' also.

Since freeness at the stone is desirable, peach breeders are trying to get completely freestone fruits for every ripening period. Some recent results are encouraging, but we are still far from obtaining a perfect freestone for the season 5 to 7 weeks before 'Elberta.' This is about the ripening season between 'Mayflower' and 'Redhaven.' Such early yellow va-

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rieties as 'Cardinal' and 'Dixired' do not have the same type of non-melting flesh and clingstones as do the canning clingstone peaches commonly grown in California. Nevertheless, they must be considered clingstone varieties since the flesh does not separate from the stone when the fruit is ready for harvest. The flesh is of the melting type, (but is relatively firm and clings to the stone). Actually, the fruits of 'Cardinal' and 'Dixired,' as well as of several of the other early ripening, melting-fleshed clings, are genetic freestones. This means they act as freestones when used for breeding. The only reason they are clings seems to be that they ripen so early in the season; at any rate their genetic construction is not the reason. Some early-ripening varieties are freer than others, however. The 'Early-Red-Fre,' ripening almost with 'Dixired,' is usually much freer at the stone. As already mentioned, it is not so essential to have complete freedom of stone early in the season. Later, it is more necessary, but even then stones of some of the better varieties such as 'Goldeneast' and 'Sunhigh' cling occasionally when they are grown in heavy soils. One reason for many tests of promising selections in a peach-breeding program is to determine stone freeness under different growing conditions and for several years.

Fine flesh texture in a peach is surely desirable; in fact, the fine texture usually found in a non-melting cling variety would be desirable in a melting-fleshed freestone. Often, when eating a ripe peach, one is not conscious of the parts that texture, firmness of flesh, and lack of stringiness play in its overall desirability. One reason the 'Redhaven' has increased in demand as a fresh-market peach, as well as for freezing, is its flesh texture. Peach flavor and texture are closely allied and sometimes hardly distinguishable. People vary, of course, in their reactions, but usually they like peaches with a moderate blend of acid and sugar. Aroma also plays a part in the general reaction of the consumer to a ripe peach. The aroma during and just after eating will help one decide whether he wants more. This desirable combination we try to get in new peach varieties. 'Coronet,' 'Triogem,' 'Sunhigh' and 'Belle' are usually considered high-quality peaches, but none of them is perfect.

Large peaches are often the most popular, but a variety producing them may not be the most profitable unless it yields well also. The 'J. H. Hale' peaches, with their large size, command a high price per bushel, but the low yield per tree, especially in many eastern sections, often makes them unprofitable. We want varieties that will produce a large number of uniformly large fruits per tree.

'Halehaven' has been good in that respect and 'Elberta' has long been outstanding in that important characteristic.

Another important character wanted in peach variety is dependability of crop. Some varieties are relatively dependable in one area but not in others. Varieties that will grow well following a small amount of winter cold, such as 'Springtime,' 'Maygold,' 'Redcap,' and 'Meadow Lark,' are more dependable producers in the southernmost peach sections than varieties that require a longer period of moderate cold. The varieties which require little cold, however, tend to bloom relatively early and thus are subject to injury by frost. Therefore, they are among the least dependable varieties where spring frost damage is common. They are often also tender to low winter temperatures. Varieties requiring a long period of cold for satisfactory flower and leaf bud development, such as 'Cardinal,' 'Ranger,' 'Goldeneast,' and 'Veteran,' are more dependable where there is enough winter cold but where there is danger of spring frost. Some varieties, such as 'Belle,' 'Raritan Rose,' and 'Ranger,' seem to have a wide range of winter cold requirements. Perhaps this may be explained partly by their habit of very heavy bud set, since only a small percentage of the flower-buds are necessary for a good crop. Buds of such varieties as 'Redhaven' and 'Halehaven' are intermediate in their cold requirements and in their time of bloom. From those standpoints, they are fairly dependable throughout a wide range of peach areas. Varieties such as 'Rochester,' 'Greensboro,' and 'Champion' are noted for their flower-bud hardiness to winter cold. 'Golden Jubilee' and 'Halehaven' also are fairly bud hardy. Such varieties are among the more dependable in sections where low winter temperature often destroys the crop.

A series of peach varieties with resistance to such diseases as bacterial spot

and brown rot would be of advantage to many growers, especially in several important eastern and central peach sections. Little progress has been made in obtaining peaches resistant to the common brown rot. Some encouraging progress has been made, however, in obtaining bacterial-spot-resistant varieties. Such white varieties as 'Hiley,' 'Belle,' 'Raritan Rose,' and 'Cumberland' have long been known to be practically free from this disease even in orchards where 'Elberta' is almost defoliated and most of the fruit is worthless. The recently introduced 'Ranger' variety, a yellow peach ripening in the 'Golden Jubilee' season, seems just as free from bacterial spot as its parent, 'Raritan Rose.' 'Prairie Dawn,' a yellow semi-freestone, ripening just before 'Redhaven' also seems resistant to this disease.

Improvement of peach varieties for the entire season is well under way. State, federal, and private breeders are all making encouraging progress. The characters most improved so far are attractiveness, firmness, quality and dependability of crop. In the future, the grower in each area, the processor, and the consumer will all be more able than ever before to select varieties to suit their requirements.

PRESENT POPULAR VARIETIES

In the earliest peach season only clingstones or semi-clingstones are now available. Only limited tests of the white varieties 'Springtime,' 'Duke of Georgia,' and 'Redwin,' which ripen about seven weeks before 'Elberta,' have been made. About 6 weeks before the 'Elberta' ripening season the 'Dixired' is the most popular variety now for many areas. It is a firm, yellow clingstone with melting flesh. Other promising new varieties for approximately that season are 'Sunrise,' 'Cardinal,' 'Sunhaven,' and 'Blazing Gold.' In the southernmost commercial peach areas, where lack of sufficient winter cold often causes difficulty in peach production, the 'Maygold,' 'Hiland,' and 'Redcap' have been popular. These, too, are yellow clingstone varieties. The 'Hiland' starts ripening a few days before 'Redcap,' but is not as attractive. The 'Maygold' requires so little cold that it is being tested as far south as northern Florida.

Among the earliest freestone peaches, which start to ripen about 4 weeks before 'Elberta,' is the increasingly popular 'Redhaven.' Because of its attractiveness, firmness, and dependability 'Redhaven' plantings have increased in all peach sections except the southernmost ones. There, 'Coronet,' which requires less winter cold than 'Redhaven,' is promising. On most terminal and local markets both have become known and appreciated for their attractiveness, firmness and quality. Two new U.S. Department of Agriculture varieties, 'Ranger' and 'Keystone,' start ripening during the latter part of the 'Redhaven' season or just following it. The 'Keystone' is a short-chilling, early-blooming variety, whereas the 'Ranger' is a long-chilling, late-blooming one resistant to bacterial spot. Slightly later is the increasingly popular 'Triogen' with attractive skin color and dependable production throughout a wide range of conditions.

In the ripening season about 2 weeks before 'Elberta,' the 'Halehaven' and 'July Elberta' are still standard varieties. New promising varieties for that season now include the 'Richhaven' and 'Redglobe.' They have not been in commercial production long enough to evaluate their relative merits. They both seem firmer than 'Halehaven' and 'July Elberta' and have brighter skin color. As grown in the central, southern and eastern states the 'Sunhigh' is usually one of the best peaches available from the standpoint of buyers and consumers. It has been firm, well-colored and of high quality. In certain sections and during certain years the flesh may cling slightly to the stone. Furthermore, the foliage and fruit are both susceptible to bacterial spot. In some of the irrigated western areas the fruit has not colored satisfactorily. In the East, however, principally because of its higher market value, the 'Sunhigh' has become popular in the last few years.

We have no very satisfactory variety that ripens about a week before 'Elberta.' The 'Sullivan Elberta' is still a standard, but it lacks color, firmness and dependability. The 'Loring,' which starts ripening at Beltsville, Maryland, during the latter part of the 'Halehaven' season, is promising because of its size, attractiveness and high quality. The 'Poppy,' which, like 'Loring,' originated at

the Mountain Grove, Missouri, fruit station, ripens at the 'Sullivan Elberta' season and fills up the gap often found just before the 'Elberta' season. It is large and moderately firm, but the skin color is often dull unless the trees are young or extremely vigorous. The 'M. A. Blake' is attractive, firm, and moderately large, but often it starts to ripen only a few days before 'Elberta.' Peach breeders have had difficulty in obtaining improved varieties for this season.

For the 'Elberta' season in eastern United States the 'Redskin' is promising. It is well colored, round and of high quality. The 'Redskin' fruits evidently require more thinning, however, than those of 'Elberta' to reach satisfactory size. The 'Hale Harrison Brilliant' variety is an Elberta-type peach which has more yellow and often less red color than the 'Elberta.' When well grown and harvested when mature, peaches of

this variety are attractive.

The season after 'Elberta' is one for which there is still need for highly colored and highly flavored varieties. The satisfactory control of the Oriental fruit moth on fruits of late varieties makes them more valuable than a few years ago. Peach breeders at several locations are trying with only moderate success to improve the color and quality of late-ripening varieties. In the season a week to 10 days after 'Elberta,' 'Rio Oso Gem' is maintaining its popularity because of its firmness and attractiveness. It is believed, however, that there would be a moderate demand especially on the local markets for varieties ripening up to at least a month after the 'Elberta' season, especially in the central and southern areas. This demand would be considerably greater than at present if more attractive and highly flavored late varieties were available.

'Penelope,' a Hybrid Musk Rose, used as a hedge in the Royal Botanic Garden, Kew, Surrey, England



Perpetual Flowering Shrub Roses

GRAHAM STUART THOMAS¹

When walking through one's own garden, or those belonging to other people, lack of colour at certain times of the year is always apparent. We all want all our shrubs and plants to flower for the whole season, but very few of them do. Potentillas of the fruticosa group, hydrangeas, fuchsias, some ceanothus and *Syringa microphylla superba* all have long periods of colour, and, indeed, the first provides colour from May to October, inclusive.

Floribunda roses, Hybrid Teas, and a few other roses inheriting the perpetual flowering habit from the China Rose, also stand up nobly to criticism, providing us with brilliant colour from the end of May to the end of October. But these are mostly smaller plants and bushes; they are, moreover, usually given special areas in the garden, and not mixed with other plants, though there is little reason why this should be so. Lusty growers like 'Peace,' 'Queen Elizabeth,' 'Mme. Butterfly,' 'Frau Karl Druschki,' 'Joanna Bridge,' and 'Frensham,' are magnificent in strong soil in an unpruned state; 'President Hoover' and 'Texas Centennial' are less bushy but are a wonderful sight when allowed to grow to 6 or 7 feet.

Looking at the matter in a historical light, it becomes apparent that the vigour of the old and loved roses of the last century, still happily available for those who cherish such things, has been lost in the search for continuous flower production, as the China Rose was, comparatively, a weakling. Some of the old Bourbon Roses, such as the striped mauve-and-white 'Honorine de Brabant' which is a fine leafy bush up to 6 feet high and wide, and 'Louise Odier,' slightly less bushy but with exquisite flowers in mid-pink as good as any that a 'Gallica' ever produced, do give us just what we want, providing we are content with the soft colourings of the old roses. And here I might mention 'Reine des

Violettes,' a Hybrid Perpetual with all the refinement of the Bourbons in the shape of its flowers, whose colouring, a rich soft lilac-purple or parma-violet, puts to shame all the new so-called "blue" Hybrid Teas and Floribundas. And, of course, the scent of these old-timers is sweeter and stronger than anything produced during the last 50 years.

The China Rose itself has given us one amazing rose that is far more lusty than the Old Blush China and will make, in milder climates, great bushes up to 7 feet high and wide, with a production of bloom so continuous from April or early May until the frosts stop it that no other rose can compete with it. It is called *Rosa chinensis mutabilis* — the changeful China Rose. The colouring again is so extraordinary that it makes 'Masquerade' and 'Circus' appear dull and unpleasant. From pointed buds of flame the petals open to a soft chamois yellow, turning, on the next day or two, to soft coppery pink and gradually deepening with age to coppery crimson. They are single, and their colours harmonize with the dark red-tinted foliage and stems. It is also known as 'Tipo Ideale' and *Rosa turkestanica*, and I have been unable so far to trace its origin.

One more of these older roses should be mentioned, 'Boule de Neige,' raised in 1867, whose ivory-white blooms of camellia-like perfection have never been surpassed. On good soils it makes a bush to 5 feet and is always flowering.

'Adam Messerich' has given many good blooms with me this summer (1957); it is a comparatively new Bourbon, raised in 1920, with silky loose blooms of rich light crimson with a refreshing scent of raspberries; and turning back again 'Frau Karl Druschki,' still the strongest and finest white rose in spite of its lack of scent, was hybridized with *Rosa spinosissima*, with 'Karl Foerster' resulting: a hardy rose, scentless, but shapely and attractive in pure white, and fairly continuous. Both of these reach to 6 feet in height.

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Leaving these roses that in the main give us the charm of the older roses coupled with a long flowering season, we may well look at the race of hybrids raised by Pemberton mainly during the second and third decades of this century. Though known as "Hybrid Musks," these roses are a mixed lot owing but very little of their parentage to *Rosa moschata*. Yet they retain an extraordinary and far-carrying fragrance, undoubtedly derived from this species. Several well known modern roses contributed to their characters, and they are mostly shrubs of some 6 feet high and wide bearing bunches of double or semi-double blooms through summer and autumn. One of the most striking is also one of the originals, 'Moonlight,' with dark foliage and masses of white flowers. 'Prosperity' is nearly as good; 'Penelope,' a superb plant in stance, foliage, flower, scent and hips, is of soft blushing creamy tint; 'Vanity' is supreme when planted three together, a yard apart, when its giant shoots bearing dozens of bright rich pink blooms grow into one another and create as brilliant a display as can be obtained from any rose through the season and into late autumn; 'Felicia,' in "Albertine" pink, remains one of the best compact roses for bedding and hedging; and, I cannot omit from the dozen or more varieties 'Buff Beauty,' whose apricot yellow and tea-scent are of special appeal.

This group has later additions: one, 'Wilhelm,' is a back-slider with no scent, but its sport, 'Will Scarlet,' which arose among plants under my care, has restored this with an even brighter tone of crimson scarlet. Both are really splendid shrubs with good hips held through the winter. The latest variety is the mis-named 'Magenta,' possibly not so stalwart as the above, but unique among all roses in its soft coppery lilac colourings, of ineffable softness, and a wonderful blend for many schemes.

Another group of roses is in part derived from *Rosa wichuraiana*, and inherits its glossy foliage. These are 'Honorable Lady Lindsay,' 'Reveil Dijonnais,' and 'Dream Girl.' The last two are frequently classed as climbers but they are admirable when slightly restricted and pruned into bushes. 'Honorable Lady Lindsay' brings a perfect Hybrid Tea shape to our collection in "Butterfly"

pink; 'Dream Girl' has a piercingly fresh scent to add to its glorious salmon-rose colouring, while 'Reveil Dijonnais' gives us an orange-cerise colouring backed with yellow, inherited from the Austrian Briar. 'Erfurt' links 'Reveil Dijonnais' with the Hybrid Musks, having good leaves and pink and white blooms of a charming freshness, but I have not yet had this long enough to gauge its business and eventual growth. Of course, these later hybrids and some like the dusky red 'Muenchen,' flamboyant coral-red 'Bonn,' leathery scarlet 'Berlin' and others, link us to the Floribundas; and, indeed, is it not the rose we are all looking for—one that combines the colouring of the Floribundas with the scent and vigour of the Hybrid Musks, coupled with good foliage and bushy growth? Such a rose is undoubtedly on the way; if it also brings us the exquisite shape of the Hybrid Teas so much the better, although I should personally be quite satisfied with the older, flatter floral style which is beginning to make itself apparent again in the new double Floribundas.

It will be seen, therefore, that while there is much that is new in hybrid roses it is seldom that a floral style or character emerges that has no example in roses of earlier breeding. The cinnabar-red colouring which recently arrived is an exception, but as my earlier remarks show, 'Masquerade' is not unique, nor is 'Pigalle.' In fact just as the doubling of the Floribundas causes them to resemble the older roses, so the fuller, newer Hybrid Teas remind us in their style and colouring of the noted Hybrid Perpetuals of the past.

The one rose that has so much to give towards our ideal is *Rosa rugosa*, but in general, while this rose has produced a number of good hybrids, its progeny have never been absorbed into modern rose strains to any great degree. Occasionally, as in 'Mme. Jules Bouché,' almost a Hybrid Tea, one may find the rough leaf and delicious clove-fragrance of this very hardy Japanese species; another, 'Sarah Van Fleet,' is constant in its production of semi-double blooms of bright pink on a lusty prickly shrub the season through.

But in the main, the Rugosa Hybrids cannot compare with the variations of the species itself, for *Rosa rugosa* is undoubtedly the hardiest and most re-



'Nevada'—measuring 7 feet wide and 7 feet high

'Sarah Van Fleet'—a clear light pink





'Boule de Neige'—a Bourbon of perfect shape

liable of all perpetual flowering roses, in fact no shrub does quite so much for us. The splendid foliage gets no diseases, and turns to bright yellow in the autumn; a constant display of flowers from early May till October goes hand in hand with showy hips in the single forms, and the clove scent is rich and full. The colours range from white through mallow-pink to dark crimson purple, both in the singles and in the doubles. In addition to all these worthy attributes, we have an ideal growth; the plants without pruning form rounded well-filled bushes, of a lively and interesting quality. Apart from their prickles they form the answer to our prayer for perpetual flowering shrubs, and, if only *R. rugosa* were not so short-lived in its influence on other species no doubt a dynasty of Rugosa Hybrids would have formed, to rank among the great rose groups of today.

So far only one perpetual flowering bush comparable in stature to the rugosas has been evolved, and that is 'Nevada.' This is reputedly a hybrid between *R. moyesii* and a white Hybrid Tea, and it is, I suppose, what one might expect from such a combination. The big arching branches eventually thicken and create a rounded bush, dense and nearly thornless, with light green leaves. Every branch is studded with large semi-double creamy flowers, bluish-tinted in hot weather, which make an unrivalled display in June, and the plants carry on in a quieter way through summer and autumn. But here again we come to a full stop, for 'Nevada' is sterile. It does at the moment, however, share with the forms of *R. rugosa* the honoured place among roses of giving us the most satisfying growth and longest display of flowers, and is therefore unsurpassed in any genus for garden value.

Exploring Southern Japan for Ornamental Plants

JOHN L. CREECH

A plant exploration to investigate wild and cultivated ornamental plants was conducted in Japan by the United States Department of Agriculture from September 30 to December 23, 1956. This work was the first of a proposed series of ornamental plant explorations undertaken cooperatively by the Agricultural Research Service, U.S.D.A. and Longwood Gardens of the Longwood Foundation, Inc., Kennett Square, Pennsylvania.

The major collecting areas chosen for investigation were determined from experiences gained during a previous exploration in Japan during May-September 1955. The 1956 exploration permitted a concentrated investigation of remote regions of southern Japan where extensive broadleaved forests are under Imperial control. The recent exploration also concluded the observations begun in 1955 of the subalpine forests in the Yatsugatake Mountains, Nagano Prefecture. Many of the localities had not been explored by foreign plant collectors since the journeys of E. H. Wilson of the Arnold Arboretum in 1914.

In addition to collecting in the wild, small nurseries and plant breeding stations were visited. Since the trip coincided with the flowering and exhibition of chrysanthemums, it was possible to make a rather complete collection of the modern Japanese varieties. A number of woody plant cultivars were also obtained from rare-plant growers in Japan. The purpose of the trip was to secure as many species as possible for introduction into the United States to determine their horticultural adequacy.

Although collectors have explored Japan frequently, the objectives, in terms of plant materials, generally have been to obtain types that would prove hardy in the more northerly parts of the United

States. This was also true of the 1955 exploration. Most collectors however, have neglected the regions of warm temperate Japan perhaps partly because the Japanese themselves are not entirely familiar with these places. It would be assumed that the plants native to areas with warm-temperate and even sub-tropical conditions might have distinct limitations in the United States. Yet, an agro-climatic study will show that in terms of yearly variations in climate southern Japan is remarkably like parts of the southern United States. A brief survey of the plants grown in the southern nurseries that are popular as garden plants will confirm this statement. It should be noted, however, that most plants were introduced from cultivated sources in Japan rather than from the wild.

We may conclude that there remains in the forests of southern Japan a number of plants, particularly broadleaved evergreens, that are worthwhile testing. These may eventually provide a greater range of ornamental plants for our southern gardens than has been available. Among the many ornamentals native to warm temperate Japan that have become components of American gardens of the south are: *Ardisia crenata*, *Camellia japonica*, *C. sasanqua*, *Fatsia japonica*, *Ilex crenata*, *I. integra*, *Ligustrum japonicum*, *Osmanthus ilicifolius*, *Pittosporum tobira*, *Podocarpus macrophyllus*, *Raphiolepis umbellata*, *Rhododendron* spp., and *Viburnum odoratissimum*. From the manner in which these species have been adapted to our climate, we can surmise that those that are yet to be introduced from the forests of Shikoku, Kyushu, and lower Honshu will be interesting with respect to behavior and ornamental merit.

JAPAN'S CLIMATE AND VEGETATION

Japan, despite being an insular empire, is unique in its climatic status owing to its position off the great Asian land mass and the occurrence of two great monsoons, one during the summer and the other during the winter. The summer monsoon drives up from the southern oceans providing hot, wet weather while the winter monsoon blows steadily down from Siberia so that the winters are colder than might be expected for an island environment. Climate-wise, Japan has been compared very favorably to the eastern coast of North America. It has been possible to pinpoint localities from Maine to Mississippi that have climatic counterparts in Japan. On the whole, precipitation in Japan is always higher than in the eastern United States but month-to-month fluctuations in temperature and rainfall, together with the time of spring and fall frosts, find marked similarity. As pointed out earlier, this likeness could permit a comparable adaptation of woody plants and the great array of Japanese plants successfully introduced into the eastern United States during the past 100 years is largely due to the similarity in climate of the coastal areas of the United States and Japan.

The great potential for finding plant materials in Japan is explained by the fact that Japan is one of the most heavily forested of civilized countries. Mountain forests occupy no less than 55 per cent of the land mass. High rainfall during the growing season, accompanied by adequate temperatures, has caused these forests to be luxuriant in woody plants. Because the Japanese have practiced careful silviculture for many centuries, great forests are under Imperial control and certain parts of them are allowed to remain in a natural state of development. Unauthorized collecting is not permitted in such areas.

Other forests, such as the forest of the Grand Gegu shrine on the Kii Peninsula, are restricted by religious control. Here, collecting is sanctioned only after careful deliberation. To comprehend the magnitude of the virgin forests of Japan and to behold the splendor of luxuriant warm-temperature, broad-leaved evergreen forests, it is necessary to make ar-

rangements for an exploration into the restricted tracts where the path, which may begin at a Shinto Torii (gate) or a Buddhist temple, leads into a wilderness carefully protected for centuries.

Japan's broadleaved-evergreen forests are found mostly on the islands of Kyushu, Shikoku, and lower Honshu from sea level to 2,400 to 2,600 feet elevation. Above this point deciduous-conifer forests dominate up to about 6,000 feet. Rarely are there true alpine zones in these areas. On the tiny island of Yaku, in the China Sea, however, an alpine zone where many dwarf plants grow, occurs above the timberline. (This island actually has the highest elevation of all Kyushu.) In certain places, the forests are restricted because the hills fall directly to the ocean in wave-cut plateaus, or the terrain may descend gently to the water so that broadleaved evergreen trees become dwarfed by the constant wind and reduced fertility of the beach area.

The collecting areas, exclusive of the Yatsugatake Mountains, were similar in climatic and geological characteristics. The winters are the mildest of all Japan and are generally cold but accompanied by sunny weather and little rain. January is the coldest month and in southern Shikoku and around the Kii Peninsula, there is a mean January temperature of approximately 43° Fahrenheit. A minimum of 18 degrees has been recorded. The frost-free period is between 240 and 280 days; the snow falls six or seven times during the winter but does not accumulate. August is the hottest month with a mean of 80 degrees. Rainfall is greatest during the summer months with a July maximum of 8 to 17 inches and least in January with a maximum of 2 to 3 inches. The annual precipitation is between 50 to 100 inches. Tanegashima is similar to the main southern Japanese islands but experiences less cold. Yakushima, however, with its high mountains has a climatic range that varies from frost-free at sea level to severe cold in the uplands (Hana-no-ego—5,200 feet altitude), where snow attains a depth of several feet and lasts until early March. Typhoons, which occur during September and October, are characteristic of the whole area.

The soils in the mountain forests are Lithosols. They are thin, stony surface



A general map of Japan showing the collecting areas

soils, acid, and low fertility. Owing to the rugged relief, their immature nature, and low fertility, forestry is about the only agriculture these regions will support. The best mountain sites are planted *Cryptomeria japonica* while *Chamaecyparis obtusa* will grow well at higher elevations and under poorer conditions of soil.

COLLECTING AREAS

The Yatsugatake Mountains (October 8-12)

The Yatsugatake Mountains (35° 55' N. 138° 20' E.) are a group of inactive volcanic peaks arranged in a slightly curved line, running north and south in Nagano Prefecture for a distance of approximately 12 miles. All of the major peaks exceed 7,000 feet altitude, the highest being 9,508 feet. The lower elevations have been cleared of natural forests and replanted to larch, but above 4,800 feet natural stands of fir and hemlock exist.

We traveled from Tokyo by rail to a small town called Chino, not far from Suwa Lake, where a mountain innkeeper had arranged to meet us with a jeep. The mountain roads are pitifully poor at this time of the year. It required 4 hours to grind our way up to Shibuyō Onsen (inn), 4,950 feet. Since we had collected here during the summer of 1955, we were familiar with much of the terrain and vegetation. Our main interest was in collecting late-flowering forms of *Rhododendron japonicum*. This azalea inhabits open fields, especially boggy plateaus. It normally flowers in early May. Both yellow and orange forms grow wild on this mountain. We had observed several orange-flowered plants in bloom on July 20, 1955, but owing to the time of year it was impossible to secure living collections. Our local collector had been appointed to visit this meadow during the summer of 1956 and to place large stakes in late-blooming clumps. When we arrived in October, the majority of clumps of *R. japonicum* had defoliated, but those which were late-flowering held green leaves even at this late date. A number of rootsuckers and several capsules were gathered for observation and possible breeding.

This mountainous region contained a number of familiar woody plants—many

now in cultivation in the United States; but, there were also species that have not been successfully introduced. *Ilex geniculata*, a deciduous holly with red fruits on long stalks, was the most noteworthy. The edges of the fields and wooded slopes contained such species as: *Hydrangea paniculata*; *Clethra barbinervis*, that grew stiffly upright to about 10 feet and terminated in nodding clusters of fruits; *Ligustrum ciliatum*, a spreading privet that usually remained less than 4 feet high; and *Sorbus rufo-ferruginea*, readily discerned by the brilliance of the red autumnal foliage. Isolated colonies of *Chamaecyparis obtusa* occurred in open places. We noted a small araliad, *Kalopanax sciadophylloides*, with a distinct columnar habit on rocky slopes. On the wettest parts of the meadow among cinnamon ferns, *Trollius hondoensis*, a yellow-flowered perennial and *Hemerocallis thunbergii*, with lemon yellow, fragrant flowers, prospered. While on bare ground, among stone chips, *Scabiosa japonica*, mostly purple but occasionally pink or white, was still in flower.

Following a trail up into the chilly coniferous forest, we began to explore the area for ground-covering plants. *Cornus canadensis*, with red fruits, and *Linnaea borealis*, a white-flowered species, indicate the character of the area for these species are also native to the colder regions of the North America continent. In occasional clearings, *Lilium medioloides*, with false whorls of leaves, could be found. *Convallaria keiskei*, the Japanese lily-of-the-valley, was covered with orange fruits. Ericaceous plants were abundant. Noted were: *Pieris nana*, *Arctous japonicus*, *Gaultheria miqueliana*, *Rhododendron fauriae*, and *Vaccinium vitis-idaea*.

Ilex rugosa, a prostrate, evergreen holly, was a dominant plant along the forest floor. Scrambling over decayed logs and scarcely larger than the thick mats of sphagnum into which it had rooted, this holly covered several acres. Yet only a handful of the red berries could be collected. Failure to produce an abundant crop of seeds seemed consistent for this species. A number of female plants and some fruits were collected. (It has been recorded by the Japanese that where *I. rugosa* and *I. leucoclada* grow together, a natural hybrid can be found.)

After reaching an elevation of about 7,500 feet we retraced our trail to the inn assembled our collections, completed field notes, and prepared for our returning.

We descended by jeep to Chino pausing along the trail to collect fruits of the many shrubs that grew by the wayside. The scrub was a tangle of deciduous shrubs and vines such as *Berberia racemosa*, a scandent species with reddish-black fruits; *Lindera obtusiloba*, a small shrub with yellow flowers appearing prior to the leaves in spring; and *Schizandra chinensis*, a vine with whitish flowers in June followed by orange berries in the fall. *Rosa multiflora* and *Rhododendron obtusum* var. *kaempferi* were everywhere. *Enkianthus campanulatus* could be readily distinguished by its whorled yellow leaves. From Chino we returned to Tokyo by express.

Southern Shikoku (October 14-22)

Southern Shikoku is characterized by two prominent capes—Muroto and Ashizuri. The climate of this part of Japan simulates that of central Georgia across to Mississippi, inclusive of the gulf area. The terrain is extensively mountainous. The land may drop to the ocean in steep cliffs that support only herbaceous plants or the descent may be more gradual where the broadleaved-evergreen forests grow down to narrow, rocky beaches.

Kochi is the major city, lying inland from Tosa Bay. It is the starting place for any travels to the south. Our first exploration in this area was to Cape Muroto (33°15' N, 134°11' E.). We reached it by traveling on a winding dirt road along a coastline where the black sandy beaches were lined with huge trees of *Pinus thunbergii*, the Japanese black pine. Standing on the beach road at Muroto, one can see a great broadleaved forest that ascends steeply, presenting a mosaic of green. The evergreen oaks, *Quercus cuspidata* and *Q. sieboldii*, are among the largest trees in this forest. The more common woody plants in this association were *Camellia japonica*, *Eurya japonica*, *Ficus erecta*, *Ligustrum japonicum*, and *Pittosporum tobira*. Lesser known species occurring here were *Prunus zippeliana*, *Distylium racemosum*, *Machilus thunbergii*, *Ilex integra*, and *Podocarpus nagi*. Shrubs include *Maesa japonica*, *Lasian-*

thus satsumensis, a rubiaceaceous shrub with large blue fruits; *Damnacanthus indicus*; *Sarcandra glabra*; and several evergreen species of *Symplocos*, including *S. glauca*, *S. prunifolia*, and *S. lanicifolia*.

Along the beach, *Quercus wrightii*, with gnarled wind-form, grew among huge rocks. Other salt-spray tolerant plants found just behind the beach, were *Raphiolepis umbellata*, *Pittosporum tobira*, *Ficus erecta*, and *Eurya emarginata*. The narrow, level beach was covered by small stones. Here, *Rosa wichuraiana*; *Dianthus japonicus*, with bright pink flowers; *Lactuca keiskeana*, yellow-flowered and with succulent leaves; *Lathyrus maritimus*; and a prostrate legume, *Indigofera pseudotinctoria*, a rugged plant with a deep extensive root system that strongly defied the removal of the shrub, spread rampantly.

The forest was rich in cryptogams. Several interesting ferns, such as the tiny *Pteris cretica* var. *albo-lineata*, *Rumohra aristata*, and *Osmunda bromeliifolia*, flourished. *Psilotum nudum* occasionally could be found among rotted tree stumps.

At Kochi, we paused long enough to visit a serpentine hill with several interesting deciduous trees and shrubs in the flora. *Corylopsis spicata*, a deciduous shrub with bright yellow flowers in March, before the leaves, is endemic to this locality. *Ilex serrata*, deciduous, red-fruited holly, and *Viburnum erosum*, a red-fruited species that has never succeeded too well as a garden plant, were noted.

Ashizuri-zaki (32°44' N, 133°01' E.) is a heavily forested cape isolated except for a narrow road that traverses two mountain passes. Along the valleys, *Camellia sasanqua* was found in bloom. The trees were 18 to 20 feet tall, evidently escapes for I saw only one locality where this species was probably natural. We journeyed to Nakamura village and traveled through magnificent reforested areas of Cryptomeria to the small port of Shimizu. From here, we traveled to the very tip of the cape, making our headquarters at the forestry bureau official's residence. Ashizuri-zaki ends in an abrupt sea-cliff. At this point, Nakai, a leading Japanese botanist, once counted 148 woody species. The abrupt rocky sea walls encouraged no woody plants but extensive colonies of *Hemer-*



Map of Shikoku showing routes of travel and places visited

ocallis aurantiaca var. *littorea* abound. It was a most rewarding sight to approach the sea-cliff through groves of gnarled *Camellia japonica* and to step out onto a terrace of *Zoysia japonica* to find this beautiful daylily in bloom by the thousands. *Peucedanum japonicum* with large columbine-like leaves and heads of white flowers was scattered among them.

From the sea-cliff, we returned to the dense undergrowth, heavily populated by gray, distorted, multi-stemmed clumps of camellias. Among the trees not previously noted was *Actinodaphne lancifolia*, with handsome variegated brown and white bark. *Ilex integra* occurred frequently: it has the largest fruit of any Japanese species of holly. Some trees reached 30 to 40 feet. *Euonymus japonicus* and *Pittosporum tobira* were seen frequently and lianes and ephiphytes were everywhere. Among the ferns, *Angiopteris suboppositifolia* had fronds up to 9 feet.

A succulent-leaved evergreen tree found here was *Ardisia sieboldii*. *Dam-*

nacanthus indicus also inhabited the moist, shaded woodlands, as did *Viburnum awabuki*. This red-fruited, evergreen *Viburnum* species probably has its northern limit here but grows abundantly throughout the warmer Ryukyu Islands.

As noted previously, *Camellia japonica* was common but azaleas were almost nonexistent. Neither the common *Rhododendron kaempferi* nor *R. indicum* grows here. *R. weyrichii* was the only extensive species.

Several ancient Buddhist temples have been erected near the cape but few plants of interest have been used in the plantings. Thus we left Ashizuri-zaki, returned to Kochi, and went on to Kotohira City, in northern Shikoku. At the inn, where the 1955 visit was still remembered, excellent quarters were provided. This inn cultivates a fine array of ornamentals, ternstroemia, azaleas, hollies, and numerous herbaceous species, from which a variegated-leaved form of *Iris japonica* and *Ternstroemia mokof* were secured.

In the enormous Shinto shrine area, many large trees of *Camellia sasanqua* have been cultivated for centuries. Because these were quite ancient plants and large-flowered, we secured cuttings of each type despite the fact that they were unnamed. A part of the shrine is a Fuji-like hill called Zodzusan. A few plants of *Ilex crenata* grew on the slopes and *Rhododendron serpyllifolium* was found. The dominant azalea, however, was the red-flowered *R. weyrichii* that reached 15 feet and had trunks 3 to 4 inches thick. *Neolitsia* sp., a camphorlike tree, was noted. It is an evergreen with 2 to 3 red fruits in a cluster. Having visited Kotohira during a journey in 1955 across northern Shikoku, our stay was limited to 2 days. We returned by steamer across the Inland Sea to Okayama and journeyed by rail back to Tokyo.

Kii Peninsula (October 24-30)

The Kii Peninsula, lacking alluvial plains, is isolated by rugged mountains and is one of the least populated areas of southern Japan. Transportation is mostly by coastal shipping or over poor, dirt roads that wind tediously through the mountains. Knowledge of the plants is mostly local but it is said to be unusually rich in various types of evergreen woody plants of a warm temperate and subtropical nature.

The four major stops on this peninsula were: 1. Tanabe and adjoining Kashima (33°44' N. 135°23' E.); 2. Kushimoto and Oshima (33°27' N. 135°46' E.); 3. Nachisan and Shingu (Approx. 33°44' N. 135°59' E.); and, 4. Yamada (Approx. 34°34' N. 136°34' E.).

Our first collecting locality was a small island called Kashima, near Tanabe. Owing to its sacred status, it has been left entirely to primeval vegetation. Huge trees of *Aphananthe aspera*, an elmlike species reaching 60 feet, covered the whole island. We also observed that *Bauhinia japonica* grew as a liana and probably reached its northern limit here. The seeds of this plant are used to make short necklaces for Buddhist ceremonies. *Cocculus trilobus* grew on fallen tree trunks; it climbed over other plants along the cleared beach. The luxuriant foliage and bright blue clustered fruits made this climber especially attractive.

After exploring this tiny island we continued across the bay to Shirahama, a former pearl culturing center. The hillsides were shaded by some trees of *Quercus phillyraeoides* larger than usually seen. These had trunks 1 foot or more in diameter and reached more than 30 feet. It was here that *Ardisia villosa* was first seen. It grew as a restricted ground-covering plant in shady places. *Callicarpa mollis*, with small purple fruits and very hairy leaves reached 10 feet but it is definitely inferior to other species of this genus from an ornamental viewpoint. Of the ferns, *Dicranopteris dichotoma* may be of garden use. The rhizomes are thick and ramifying and the fronds are evergreen and deeply pinnate. The area was rather disturbed and only a few wild plants of interest were noted. We left the locality and traveled by 3rd class train down to the lowest point of the Kii Peninsula, stopping at Kushimoto. From there we took passage to a small island called Oshima. This is a typical fishing community where little agriculture is practiced. Occasionally we found small orchards of a citrus species, *Fortunella margarita* (Kumquat). Natives surrounded their homes with tall hedges of *Distylium racemosum*, an evergreen tree native to the island. A small experimental garden is maintained by Kyoto University where *Camellia oleifera* is cultivated for its oil. Of the plants which occurred along the trails, *Ilex rotunda*, with its dense clusters of small red fruits and glossy, entire leaves, was the most outstanding tree. Other species noted were: *Dendropanax trifida*, with its 3 to 5 lobed leaves; *Machilus thunbergii*; *Rapanea neriifolia*, an evergreen tree or large shrub with narrow oleanderlike foliage; and *Viburnum japonicum*, an evergreen, red-fruited species pendant with heavy fruit clusters. The tiny ground-cover, *Trachelospermum asiaticum*, also was abundant. The most commonly cultivated plants were *Alpinia* and *Crinum asiaticum*. *Crinum asiaticum* has huge seeds that resemble bulbs. According to the local farmers it is highly resistant to salt water.

At Nachi, there is a densely forested tract that is a part of the famous Kumano Gongen Shrine. Several small streams flow through the region that merge into a waterfall about 400 feet high. We



Map of Kii Peninsula showing routes of travel and places visited

pursued a trail above this fall through a planted forest of *Cryptomeria japonica* and into an uncut jungle of vines and dense shrubs. *Euchresta japonica*, an almost extinct evergreen legume with dark purple fruits, was fairly common. During my previous journey to Japan, I had searched widely for this species for it is reputed to be of medicinal value. I had previously located only a few plants that were protected against collecting. *Lasianthus satsumensis* and *L. japonicus* also flourished. These species bore both clusters of small white flowers and pale blue fruits. Their differences are minor

horticulturally and I do not know if they have been cultivated in the United States. A small, succulent ground cover spread over moist rocks and poked into the stone walls. This urticaceous plant, *Pellionia minima*, with purplish-green stems, is a plant for dense shade, coolness, and high moisture.

After traveling up through the forest for several hours, we reached the top of the pass where hemlocks and falsecypress towered. There were the usual orchid epiphytes, but it was impossible to reach them as the trees grew off at an angle from the edge of the cliff. Even the local

forester, who normally would climb any tree, declined to attempt the collection. Frequently, we collected orchids where cryptomerias had recently been cut and still lay on the ground.

Descending from the pass, we plunged into a damp, gloomy woods along the stream and came upon a second but smaller waterfall. There, the filmy ferns of the genus *Hymenophyllum* grew on the stream-eroded, dripping walls. At drier localities we observed several ericads, such as *Rhododendron serpyllifolium*, the azalea with the smallest leaves being less than one-fourth inch long, and a leafless ericad, *Hugeria japonica*. It more nearly resembled an epiphyte than a terrestrial plant. *Asarum*, the wild ginger, was rather common, sometimes with plain green heart-shaped leaves but occasionally with richly mottled foliage. A cold rain dampened the whole aspect during the return journey. Later at the city of Shingu we paused to inspect a floating sphagnum bog and found it to be a composite of cool-temperate and warm-temperate plants. *Ilex sugeroki*, *I. serrata*, *Photinia villosa*, and *Daphniphyllum humile* were all characteristic of northern Japan. During some era, warm-temperate plants such as *Vaccinium bracteatum*, *Ardisia villosa*, *Pittosporum tobira*, and *Myrica rubra* had invaded the bog to thrive in this soggy environment.

From Shingu, we traveled by jeep and bus over Yanokawa Pass (2,400 ft. altitude) to Oase. At first the vegetation was warm-temperate but at the top of the pass, distinctly cool-temperate plants flourished, namely, *Ilex geniculata*, with red hanging fruits, *Prunus serrulata*, *Cornus kousa*, *Pieris japonica*, and many trees of *Carpinus*, almost covered with ripe seeds. Shortly after we had passed the summit and began to descend, *Camellia japonica* became noticeable and huge specimens of *Idesia polycarpa*, with red, grapelike clusters of fruits towered above the road.

Our final stop on Kii Peninsula was the forest of the Grand Shrine of Ise, particularly in the Jingu shrine. This is the finest example of Shinto shrine architecture. The temples are constructed entirely of Hinoki cypress, polished to a brilliant orange. To provide the timber to continue the erection of new structures, a large forest of Hinoki cy-

press is maintained. A part of the forest is permitted to develop naturally and collecting is rarely sanctioned. Fortunately, the chief forester was a student of our guide, Dr. Takeda, and we gained entrance. This area is unusually warm and some subtropical species grow here. The main forest is said to contain trees over 1,000 years old. A small stand of *Loropetalum chinense* occurred and was thought to be natural. There are only ten trees but apparently it was abundant several hundred years ago. The trees are multistemmed, about 20 feet, and bloom both fall and spring, with tiny whitish flowers. (This species is hardy at Glenn Dale, Maryland, remaining somewhat evergreen in winter.) The principal trees are the evergreen oaks, *Quercus cuspidata* and *Q. glauca* but of greatest interest was the evergreen *Symplocos* species, which were large trees. One in particular, *Symplocos theophrastaefolia*, had leaves that resembled *Ilex latifolia*; several times seedlings were erroneously shown to me as that holly. *Prunus spinulosa*, a rare evergreen cherry with spiny, crisp leaves, occurred here. This tree should be a fine addition to our southern gardens for its foliage is handsome and it grows rapidly, reaching 20 feet. It can be increased by cuttings easily and it transplants well. We had seen *Damnacanthus indicus* several times earlier. This is a remarkable small plant, with its foliage and branches in fanlike arrangement. But a different species occurred here. This was *D. macrophyllus*, a larger shrub, with leaves about 1 to 2 inches long, purple colored when young. It is spined and has red berries. *Pellionia*, *Ficus pumila*, *Ardisia japonica*, *A. villosa*, *Trachelospermum asiaticum*, and *Epimedium macranthum* are good ground covers which thrived in this forest and should be tested as such. A notably good representation of holly species was found: *Ilex crenata*, *I. hanceana*, *I. integra*, *I. pedunculosa*, *I. rotunda*, and *I. serrata*. *Ilex latifolia* was said to occur but I saw only cultivated specimens. In the arboretum, several conifers flourished but I was surprised to find *Sciadopitys verticillata* growing so well in a warm-temperate atmosphere. We gathered several cones and extracted a quantity of seed. Seed germinates immediately when fresh.



Rhododendron japonicum occurs in open boggy meadows on the Yatsugatake Mountains; trees in the background are *larix* and *chamaecyparis*



The coast line of southern Shikoku is a series of rugged projections as the mountains approach the sea



Hemerocallis aurantiaca var. littorea blooming along seacliffs in October, Ashizurizaki, Shikoku



Sarcandra glabra is a small evergreen shrub with either orange or red fruits; it occurs throughout southern Japan, Yakushima, and Tanegashima

While most of the trees were of academic and horticultural interest, several were of religious significance. In addition to the use of Hinoki cypress for all construction, *Meliosma rigida* was used in a whirling gimlet to ignite sparks as it bored into a block of Hinoki. The same method has been used for centuries to light the fires in the temples and the practice is continued today.

During our stay at Yamada city, we visited a grower of curious varieties of *Psilotum nudum*. This rare cryptogam was in vogue for centuries. As many as 200 varieties had been developed with cristate and distorted stems. This leafless plant makes interesting pot subjects and is easy to cultivate. Gradually, interest in this plant has diminished; today, scarcely 30 types are cultivated. Several kinds were purchased to bring back to the United States for observation because they are not known in our culture and will shortly cease to exist in Japan. From Yamada we returned to Tokyo to ship our collections and to prepare for our next journey.

Yakushima, Tanegashima, and Southern Kyushu (November 16-December 10)

Yakushima and Tanegashima lie about 70 miles south of the Kyushu port of Kagoshima, at the edge of the China Sea. The islands form a part of the chain extending from Kyushu to Formosa and are a part of the Prefecture of Kagoshima. These islands have been a constant collecting ground for Japanese botanists. Yakushima, in particular, has been noted for the extent of its woody flora and E. H. Wilson considered it "a plant collector's paradise."

We first visited the agricultural experiment station at Kurume, Kyushu, to outline the course of the exploration. It was also intended that some of the collections would be sent only as far as Kurume to be held until our return. Two members of the station staff, Mr. S. Abe and Mr. T. Tamoura, took part in the journey, acting as guides and collecting plants that were of interest to them. Prior to leaving Kyushu, we visited the University of Kagoshima where herbarium specimens and plant lists of Yakushima are held. The local botanist, S. Hatushima, was able to pinpoint areas that would be worth visiting to obtain rare species.

Yakushima is a small, round island about 14 miles across. It is surmounted by the highest peaks of the Kyushu area. The highest mountain is Miyanouradake, 6,348 feet. The flora closely follows the geological structure, of which granite represents about 70 per cent of the land mass. This formation covers the central part of the island and extends to the western side. Surrounding this is a horseshoe-like region of mesozoic rock that extends from the northern side to the southwestern side in a band from about 300 to 1,800 feet in altitude. On this curious plant, seed germinate before they fall to the brackish sand. The vegetative units are largely determined by these two geological formations. A coastal savanna occurs along the river estuaries. Near the mouth of the Kurio River, a true mangrove formation of *Kandelia cande* has developed. The broadleaved evergreen forests occur up to about 1,800 feet. Above this is a vast stand of conifers, mainly cryptomeria and fir, with some deciduous trees, up to 5,500 feet. Above the forested zone, a subalpine climate prevails; there, the plants are mostly dwarfed. The chief species is a rampant bamboo, *Sasa owatarii*. The climate and vegetation vary from subtropical through cool-temperate to sub-alpine.

The most rewarding collecting areas followed the formations of mesozoic rock, roughly from the village of Nagata on the northwestern coast to Kurio on the southwestern. These villages mark the limits of the broadleaved evergreen forests. The western side is notably poor in plant communities since the granite formation abuts the ocean. No towns or passable roads exist on this part of the island.

About 1,100 species of plants are listed for Yakushima: Cryptogams, 212; gymnosperms, 14; dicots, 609; and monocots, 280. These species extend over the entire island, and, while forestry is the major agricultural pursuit, only the small alluvial areas are cultivated. The logs from the stands of cryptomeria are prized for their beautiful grain and are used mainly in making veneer for Japanese homes. Cryptomeria from this island is called "Yakusugi." A secondary forestry industry is the distillation of camphor oil from *Cinnamomum camphora*.



Map of Yakushima, showing routes of travel on the island

Certain areas on the warm southern side are devoted to the culture of a large, loose-skinned sweet citrus called Ponkan—a special product of the island. The trees are grafted onto either the wild *Citrus tachibana* or *Poncirus trifoliata*.

The population is scattered around the perimeter of the island in series of small villages, Ambo being the largest, Miyanoura next. Both ports are shipping centers for cryptomeria logs. A single mountain village occurs about 2,500 feet altitude at Kosugidani and it can be reached only by a narrow-gauge lumber railroad. An airstrip for light aircraft having just been completed at Kosedo made it possible to fly out living collections to Kyushu. From there, the plants were sent to Tokyo by rail and thence to Washington, D. C.

E. H. Wilson's last collection from Yakushima was made in 1914. Since then, Japanese botanists have been very active in vegetational surveys and it was possible to determine exact locations for

some of the rarer species; for example, *Ilex liukiuensis*, occurring only along the Isso River, and *Lagerstroemia fauriei*, isolated in the hills above Kurio. A relic which is called "Wilson's Stump," remains on the island as a reminder of his explorations and of his remarks that this cryptomeria was the largest living specimen he had ever seen. The stump is 35 feet across at its base.

We traveled first to the northern part of the island as far as the Nagata Light. *Camellia sasanqua* grew wild along the beach road and was covered with flowers of various sizes but always pure white. In the undergrowth and on rocky ledges, *Ligularia tussilaginea* was particularly abundant and conspicuous because of the heads of bright yellow daisylike flowers. *Hibiscus mutabilis* was also in flower, with its large pink or white blooms but aside from these plants, the great show of color was provided by the fruiting of the many woody plants. Occasionally terrestrial orchids were in flower but in most instances they were inconspicuous.



Ilex liukiensis, a red-fruited, evergreen species of holly, occurs in Yakushima; it has not been introduced previously



Eurya emarginata growing in open sunny fields of Tanegashima

The Isso River drops swiftly from the mountains. We followed its twisting course back up into the hills, often crossing from bank to bank by leaping over gigantic granite boulders that were lodged in the stream bed. Often the trees and shrubs grew in midstream where the rocks had accumulated debris and soil. It was in such a locality that we found *Ilex liukiensis*. This evergreen holly was prolific in its fruiting habit; the berries were bright red. It has never been in cultivation. *Ilex integra* also occurred along the banks of the Isso River. In shady places, *Sarcandra glabra* was a common shrub and bore terminal clusters of either orange or red fruit. On the rocks and along tree trunks, climbing ferns were frequently seen. Of the trees observed along this river, those which should be of ornamental interest are: *Elaeocarpus japonicus*, an evergreen tree with gray bark, leaves more-or-less whorled, and racemes of blue fruits; and *Stachyurus lancifolius*, a deciduous tree with small yellow flowers before the leaves. Of the terrestrial orchids, several species of *Goodyera* with distinct leaf markings grew in the damp humus. A *Calanthe* with spikes of bright yellow flowers was in full bloom and the most colorful of the orchids for it occurred in colonies of possibly fifty plants.

Returning along the sea road, we found *Smilax china* scrambling on the sunny banks. This vine is almost thornless and has large red berries. *Kadsura japonica*, *Morinda umbellata*, and *Alpinia kumatake* were abundant on the roadsides. *Elaeagnus crispa* was widespread in abandoned fields and along the roadsides. The berries sometimes were large and edible. They were about the size of a wild cherry and acid.

We returned to the small inn at Miyaura, packed our living collections for air shipment, sorted out seed lots to dry, and assembled the dried specimens. Our next trip surveyed the Miyaura River which drops gently from the hills and has a broad alluvial plain. Along here we inspected several small camphor distillation plants. The outstanding shrubs along the trail were *Callicarpa japonica* var. *luxurians* and *C. tosaensis*. These grew to 15 feet, overarched by ponderous clusters of purple fruit. I have never observed *Callicarpa* fruiting so abundantly in cultivation. As we entered the

denser part of the forest, asarums appeared in numbers. This shade-loving plant has large heart-shaped leaves mottled with many combinations of green. It grew in various habitats, sometimes on the forest floor in humus and again clinging to the sides of steep rocky stream bed. The leaves were 6 to 8 inches long.

As we reached higher elevations, the vertical, eroded stream walls were pocketed with small plants of *Rhododendron indicum*. In midstream the plants developed into dense, low thickets. Surprisingly, many of the plants were in full bloom although it was November. *Camellia sasanqua*, bloomed along the river bank. The combination of brick-red azaleas and white camellias was a magnificent color display. Stepping back a few paces into the damp forest, we found the small but always delightful *Damnacanthus indicus* covered with red berries, and the previously noted *Calanthe* covering a swale with its spikes of yellow flowers. The trees were entwined with *Psychotria serpens*, an evergreen vine having white fruit.

Having explored the broadleaved-evergreen forests of northern Yakushima, we moved our base camp to the forestry office at Ambo. We ascended Miyaura-dake by a small lumber train to as far as the camp called Kosugi-dani, about 2,500 feet altitude. The forests had begun to lose their evergreen character although *Camellia sasanqua* still occurred sporadically. We counted hundreds of trees of *Stewartia monodelpha* which were completely defoliated but spectacular with their polished orange trunks that stood out from the dark cryptomeria foliage. This tree was especially prolific in the mountains, sometimes reaching 50 feet in height. The trail to the upper meadows of Miyaura-dake led through the large forests of cryptomeria and firs. Along the way, large clumps of *Rhododendron metternichii* were abundant. Sometimes, large branches of the conifers, sweeping off at a low angle, would accumulate forest duff and the rhododendrons would spring up on the branches almost in an epiphytic manner. *Rhododendron tashiroi*, a small azalea, was occasionally in flower, purple with a reddish blotch. A holly that is closely related to *Ilex crenata* occurred up to about 4,500 feet altitude. This is *I. mutchagara*, an evergreen species with

black fruit. *Daphniphyllum macropodum*, with red petioles, occurred in sunny localities reaching to 30 feet. The size of *Clethra barbinervis* was astonishing. Some of the clumps reached 30 or more feet in height.

Hana-no-ego (Flowering Swamp) is a subalpine sphagnum bog about 5,200 feet altitude. *Juniperus chinensis* var. *sargentii* flourished in large pendulous clumps. This variety with its grayish, threadlike adult branchlets scarcely resembles the juvenile form so commonly grown in the United States. As we wandered around the soggy meadow, these plants were noted: *Buxus microphylla* var. *japonica*, *Eurya yakusimensis*, *Rhododendron yakusimanum*, *R. metternichii*, and *Viburnum urceolatum*. Occasionally, a plant of *Pieris japonica* grew around the drier perimeter of the swamp but no azaleas occurred. It was interesting to note how well the plants grew in this cool, moist atmosphere and high water table, where every footprint left a reservoir of water.

Returning from Hana-no-ego, we passed a number of specimens of a *Camellia* called *Camellia hayaoi*. They had large, shiny, black fruits and according to my guide, small red flowers that only partly opened. *C. hayaoi* differs in other minor details from *C. japonica* and may be only a form of that species.

We concluded our collecting in the mountains, returned to Ambo by the narrow-gauge railroad, and proceeded around the southern coast to a town called Kurio. This region had been heavily felled for logs and was in a state of semi-devastation. It had been a privately owned forest and was in sharp contrast to the fine silvicultural practices of the imperial Japanese foresters. The logging road had been abandoned and camphor distillation and charcoal burning were removing the remainder of the large trees. In these hills, we found *Lagerstroemia fauriei*. This deciduous tree with brown and green flaky bark grows to 30 feet. The flowers are white. Only a few trees of this endemic species were noted; it was evident that it would soon be extinct in the wild. *Acer rufinerve* was widespread along the rocky streams—brilliant yellow in its fall color. The trunk of this maple is striped green and white.

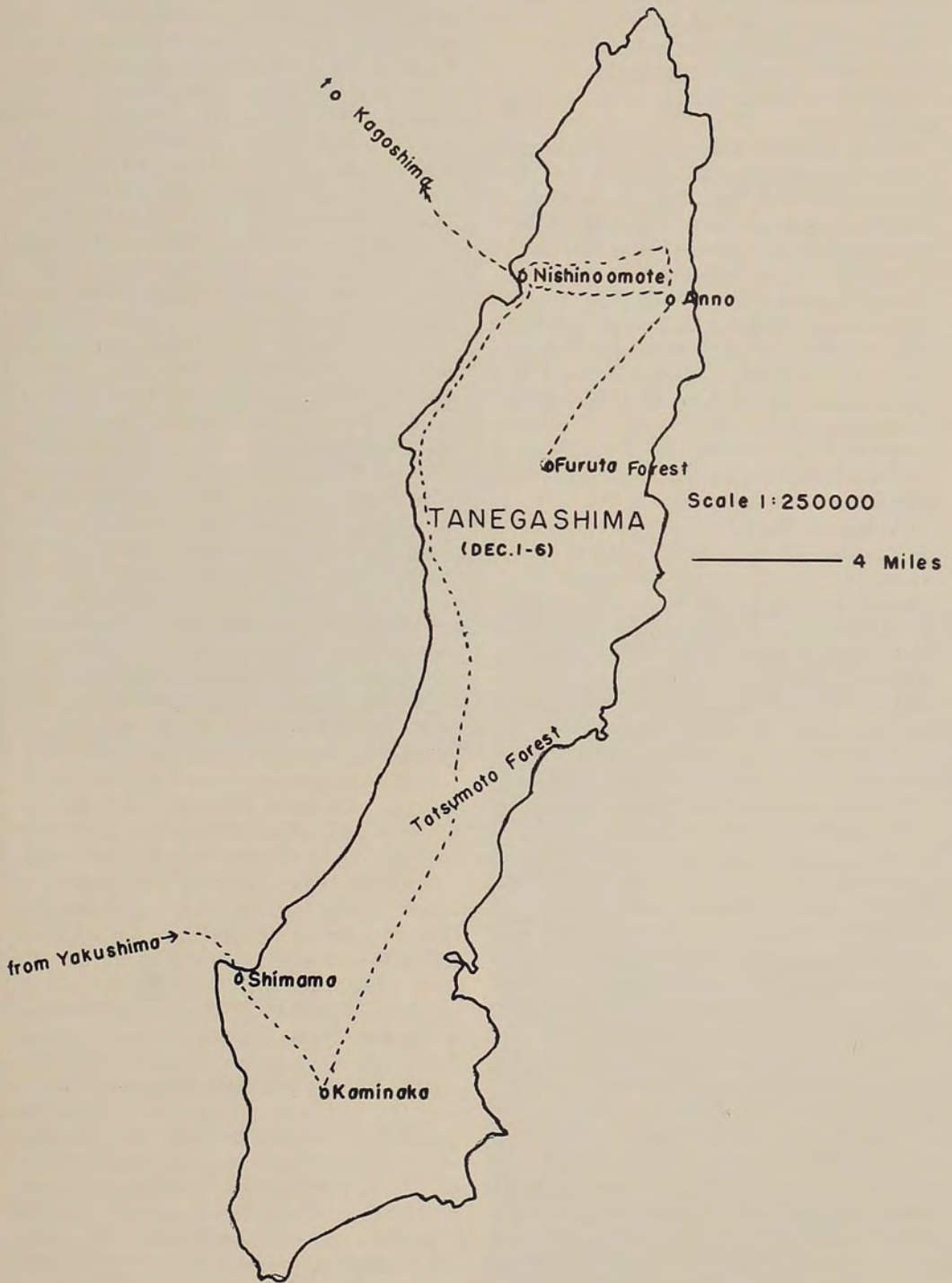
We followed along the beaches of the

southern part of the island where *Canavalia lineata* was rampant and covered the sand with bright yellow flowers and large hairy pods. *Buddleia curviflora* grew in sunny places along the beach road and had nodding spikes of purple flowers. The few streams had mostly dried up but among the rocks terrestrial orchids such as *Calanthe*, *Dendrobium*, and *Goodyera* occurred. *Chrysanthemum indicum* and *C. japonense* also flourished in the baked soil and bright sunlight and matted the ground with many white flowers having yellow centers.

The coast between Ambo and Miyanoura is exceedingly rocky and the huge stones sheltered several woody shrubs. The gnarled and twisted windforms sometimes were swept flat along the rocky surfaces. *Raphiolepis umbellata*, *Quercus wrightii*, and *Rhododendron lateritium* were among the plants found here. Two species of cinnamon, *C. brevifolium* and *C. daphnoides*, were especially of interest for both were shrubby plants, evergreen, and highly suited to the dry conditions of the coastal areas. We noted that these same species were sometimes used as ornamental plants by the islanders. They are of no value for spice.

Because the high seas prevented the return of the steamer, we stayed and returned once more to the Isso River area where additional collections were secured—mostly orchids, ferns, and herbaceous plants. Final air shipments of plants were made and on December 1 we were able to embark on the *Chofukumaruru* for the short journey to Tanegashima. These islands are only about 12 miles apart.

Tanegashima is a narrow island approximately 36 miles long and 8 wide. It is devoid of high mountains and largely given over to agricultural programs, particularly new crops. Because this island is among the southernmost territories of Japan certain subtropical and specialty crops probably can be grown. At present, rice, sugarcane, and sweet potatoes are the principal crops. Certain areas, removed from forestry, have been planted to *Vetiveria zizanioides* from which a perfume base is derived. The success of these crops is due largely to the efforts of the Anno branch of the Kyushu Experiment Station which serves



Map of Tanegashima showing routes of travel on the island

as a kind of plant introduction station for the island. American varieties of sugarcane have been tested and found to be especially suited. Members of the staff of the Anno Experiment Station gave much of their time during our collecting both on Yakushima and Tanegashima.

There are two large experimental forests—Tatsumoto (or Tachimoto) and Furuta. Our first visit was to Tachimoto Forest in the southern part of the island. Although mostly planted to cryptomeria, a number of evergreen oaks have survived, *Lithocarpus edulis* being common. Cycads and epiphytic orchids grew on the trunks and horizontal branches of the trees. There were relatively few new woody plants here but *Helicia cochinchinensis*, a small tree, with evergreen foliage thriving in dry soils, was noted. *Dendropanax trifida* occurred along the sides of the trails.

Along the coast, numerous colonies of *Juniperus conferta* spread prostrate along the sand dunes, the main stems flat and rooting in the sand while secondary branchlets stood upright. This juniper is an excellent plant for preventing dune erosion and has a wide range of heat and cold tolerance. In the town of Nishi-no-omote, *Cinnamomum brevifolium* grew along the dusty, dry road. We paused long enough to collect its seed. Unfortunately, seed of the cinnamon is highly perishable. Several successive seed lots were needed to produce a crop of seedlings.

In Furuta National Forest, evergreen oaks were also plentiful. These were generally accompanied by the usual epiphytic orchids, climbing ferns, and cycads. Occasionally, we noted *Citrus tachibana* growing in rocky, dried stream beds. Its sour fruit was about the size of a small plum and was borne in profusion. *Idesia polycarpa*, *Ilex hanceana*—a red-fruited holly with very small berries; *Symplocos japonica*, upright, about 8 feet tall with a habit suggesting a good hedge plant; and *Eurya emarginata*, dotted the open hillsides. *E. emarginata*, a camellia relative, grows in a broad spreading manner and will serve as a choice foundation plant. *Elaeagnus crispata* was especially common. *Clematis crassifolia*, an evergreen vine, laced the cryptomerias with large clusters of white flowers about 1 inch across.

Phaius maculatus was the most striking of the orchids. We came upon it while climbing up a shaded hillside. This terrestrial species first appeared to have small spots of sunlight flicking across the leaves but in reality this mirage was a multitude of large yellow variegations. The pattern was consistent among wild specimens and of a genetic nature. Later in our travels on Kyushu, we saw *P. maculatus* var. *minor*, smaller in every detail, including the leaf spotting.

Winter storms dashing the surf high above the breakwater at Nishi-no-omote prevented our leaving Tanegashima until December 7 and on that date we returned to the island of Kyushu aboard the *Chofukurumaru*, forwarded our collections to Kurume, and traveled down to Hirakiki Mountain in Satsuma. On the slopes of this cone, the vegetation was greatly disturbed by charcoal collectors. This whole area was generally poor in agricultural land. About half way to the top of the cone, several terrestrial orchids were gathered, *Goodyera maximowicziana*, characterized by pink-striped velvety leaves was the most unusual. *Ardisia japonica*, with solitary red berries grew along the roadside. This is the hardiest species of *Ardisia* and was used in the gardens of Koyoto as a ground cover.

We finally returned to Kurume, Kyushu, to visit local nurseries and the experimental station. The Kurume Horticultural Field Station is a leading institution in Japan, devoted to vegetable crops, small fruits, and ornamentals. One can see in proper scale, small hills transformed into a likeness of the mountains of Kyushu with the different azalea ecotypes planted on the proper mountains, Kirishima, Unzen, Sakurajima, and Aso. Elevations are marked and the whole display carefully executed. Here, too, the old azalea varieties of Kurume have been assembled and the newest varieties have been added. A collection of Glenn Dale azalea varieties has been included and recently several native American species introduced. The most recent race of azaleas to be noted was the so-called Hirado azaleas. These are large-flowered clones that have existed for possibly 500 years on the small island of Hirado, near Nagasaki. Some 200 clones have been brought to the Kurume station for use in breeding and dissemi-



A forest of Phyllostachys pubescens with some cryptomerias and undergrowth, in southern Kyushu

Piper kadsura and Ficus pumila, growing together on tree trunks at Murotozaki, Shikoku



nation to the Japanese nursery trade.

Our arrival in Kurume was accompanied by cold weather and a light snow-fall making living in poorly heated Japanese quarters rather gloomy. It also heralded the end of our collecting trip. On December 10 we returned to Tokyo with our collections of seeds, plants, and herbarium specimens.

Survey of Chrysanthemum Nurseries and Other Plant Culture Centers
November 4-15 — December 12-15

Since the chrysanthemum is the flower of the Imperial family of Japan, considerable importance is attached to its culture, development, and display. Large exhibitions of chrysanthemums are given in the major cities; such as, Tokyo (Shinjuku Gardens), Hirakata (Hirakata Park), Shizuoka, Mishima, Osaka-Kobe, Akashi, Okayama, and Fukuyama.

For display purposes each show employs its own staff of cultural experts and breeders. Often the varieties raised for a particular exhibit are not released for general distribution and this results in types peculiar to that show. Thus, to see all of the kinds of chrysanthemums, ultimately, every show should be observed.

In addition to these public shows, several commercial breeders of chrysanthemums also exhibit. Of these, I visited: Bisho-en, Motomachi, Matsumoto City; Seiko-en, Kanemaru, Hiroshima-Ken; Shuho-en, Kanemaru, Hiroshima-Ken; Taikai-en, Kusanaji, Ki-machi; and Taihoen, Hirakata City. At each, representa-

tive varieties were presented for introduction into the United States. All of the varieties have been placed in quarantine at Plant Introduction State at Glenn Dale to be indexed for possible virus diseases before distribution.

Other plant-growing areas visited during the tour were around Angyo, Saitama-ken. Through the efforts of Mr. Nakada at Koju-en, Angyo, Kawaguchi, Saitama, a large collection of rare cultivated forms of woody plants were assembled. Of these the following may be noted: A weeping form of *Zelkova serrata*, a variegated form of *Z. serrata*, two ornamental varieties of *Camellia sinensis*, a white fruited form of *Ilex serrata*, a variegated form of *Ilex crenata*, dwarf and yellow-tipped forms of *Cryptomeria japonica*, and a compact, dwarf type of *Juniperus chinensis*.

In addition to the ornamental collections, the wild form of *Pyrus serotina* was located. This species is almost extinct in Japan owing to its having been cut for charcoal. Near Mishima a wild tree was located and all fruits gathered for use by pear research workers in the United States. For use by crops research workers in the United States varieties of tea (*Camellia sinensis*) and types of sugarcane (*Saccharum spontaneum*) were also collected. From the National Experiment Station at Hiratsuka, persimmon varieties were obtained and through the Special Products Section, Ministry of Agriculture, leading varieties of udo, *Aralia cordata*, were obtained.

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The snake melon, Cucumis melo var. flexuosus

The Muskmelons

CHARLES W. REYNOLDS¹

The muskmelon plant is believed to be native to Central Asia, somewhere in the general area of Iran, Kashmir, and Afghanistan. Although closely related species have been found in the wild in this region, the muskmelon itself has not been. This crop apparently reached a high state of development in Persia and neighboring lands at a rather early date. It was introduced to the Greek

and Roman worlds a century or so before the Christian era. It is believed that the plant was not known to the ancient Egyptians, but that the melon which the Israelites longed for after the Exodus was most likely the watermelon instead.

Culture of the muskmelon spread into other European countries during the late years of the Roman Empire and through the Middle Ages. Its use in Spain was common enough in the 15th Century that seeds were brought to

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America on the second voyage of Columbus. From this importation and undoubtedly many others by the explorers and colonists, the crop was quickly adopted by the American Indians. It is now grown throughout the United States and has become one of our most important truck crops.

The delectable aroma and delightful taste of this fruit have made it a favorite of American fields and gardens. It is prized for use as an appetizer, a salad, or dessert. Few horticultural products are more enjoyable for eating out of hand at other than meal times when the muskmelon attains that degree of sweetness, aroma, and flavor that we expect of it.

The muskmelon is *Cucumis melo*, a cucurbit and therefore closely related to other common vine crops like the cucumber, watermelon, squash, pumpkin, and various sorts of gourds. It is similar in many ways to these plants, but contrary to popular belief it does not cross with any of them. There may be many reasons for the poor flavor which sometimes occurs in muskmelons, but one of them is not hybridization with cucumbers and gourds! Many attempts to produce crosses with these species have resulted only in failure.

The muskmelon plant is a trailing or somewhat climbing vine having angled stems. Its hairy leaves are rounded at the apex and not distinctly lobed like those of the cucumber. Its fruits are not spiny but may be pubescent when young becoming glabrous near maturity. The fruit type shows extreme variations, sometimes looking more like an orange, banana, or cucumber than a muskmelon. Fruits may be round, oval, oblong, or very long and slender. They may vary in length from three or four inches to more than three feet. The surface may be white, grayish green, golden yellow, orange or black; it may be covered with a network of corky tissue or it may be quite free of net. The flesh of some kinds is white, of others green, and of still others salmon or orange. It may be of excellent flavor or quite inedible.

There is considerable confusion with regard to the name by which this plant should be called. Popular usage includes primarily the terms "cantaloupe," "melon," and "muskmelon," but these are used with somewhat different meanings

by different people. We sometimes hear "winter melon," "Honey Dews," "Persians," or "Casabas" used to refer to certain groups or kinds. Botanically the term "cantaloupe" should include only those members of the group having hard, rough, warty rinds; but it is frequently used to refer to most of those grown in this country, though not usually to the winter melons. To some of our Southern friends especially, the word "melon" brings back memories of juicy, red ripe watermelons—a related but quite different species. The name "muskmelon" implies the presence of a musky odor which many members of the group do not possess. It is this name, however, which is most often used to refer to the group as a whole.

UNUSUAL MELONS

By whatever name we may know them, there are some forms so unusual that they are not easily recognized as belonging to the group. The diverse forms in existence have been grouped into several botanical varieties or subspecies, only two of which are important in America. A very peculiar one is the variety *flexuosus*, the snake or serpent melon sometimes called the snake cucumber. Its fruits are slender, often three or more feet in length and quite crooked or coiled. The surface may be ridged or corrugated but is not netted like that of the usual muskmelon. The flesh is white and has a somewhat sour cucumber-like taste.

The variety *dudaim* is called the pomegranate melon or Queen Anne's pocket melon and is grown for its highly perfumed ornamental fruits. They are about the size and shape of an orange and the surface is marbled longitudinally with rich brown overlying a yellow ground color. They are highly fragrant but not generally edible.

The mango melon, var. *chito*, is used in making preserves and pickles. The small fruits are round or somewhat oblong and are yellowish in color when mature. They have white or pale yellow cucumber-like flesh with no muskmelon odor whatever. The oriental pickling melon, var. *conomon*, produces large fruits up to two feet long and six inches in diameter. They are typically oblong but may be bottle- or club-shaped. The surface may be somewhat furrowed and



Field of muskmelons growing on the Eastern Shore of Maryland

is typically green with paler stripes. The flesh is white or greenish and lacking in sweetness. These are used for preserving or pickling and in cooked dishes in oriental countries. All of these botanical varieties cross freely with the usual muskmelons.

Strictly speaking, the term "cantaloupe" should be used only for those melons of the subspecies *cantalupensis*, often called the rock melons. These have very hard, rough, more or less warty rinds. They are popular in certain European countries but are practically unknown in America. The name comes from the Cantaloupo area near Rome, to which this type seems to have been

brought from Persia. In the United States the name "cantaloupe" is used loosely to refer to the netted melons, described below.

THE NETTED MELONS

The variety *reticulatus*, generally referred to as the netted or nutmeg melons, includes nearly all the common American varieties. This group is characterized by small to medium sized fruits that vary in shape from oblate to spherical to oblong. Most varieties have ten longitudinal grooves called sutures with ribs or ridges in between. In some varieties the ribs and sutures are obscure or entirely lacking. As the fruits mature,



*The netted melon, Cucumis melo var. reticulatus,
of the Hale's Best type*

the surface becomes more or less densely covered with a network of corky suberized tissue called the net. The rind color is greenish when immature frequently becoming yellow or orange between the ridges of the net as ripening approaches. The internal flesh color may be greenish or salmon pink to orange when ripe. The fruits become separated from the fruit stem or peduncle when ripe, leaving a hollow or sunken stem scar. This is called "slipping." As ripeness approaches a slight crack develops around the attachment of the fruit to the stem. When the crack completely encircles the peduncle the melon is said to be at "full-slip" and will

separate easily and cleanly if slight pressure is applied against the stem. Studies have shown that the fruits reach a maximum of sweetness and flavor at about the "full-slip" stage. If they are left much past "full-slip," abscission is completed and the melons become overripe. For long distance shipment they are picked slightly earlier at "half-slip" with little or no reduction in quality. The development of the "slip" in the netted melons is an important indication of ripeness. At this time also the rind changes from green to yellow, the fruit becomes somewhat softer, and the fruit stem feels waxy to the touch. Melons of the *reticulatus* group which do not net

properly are likely to be of poor quality. They are culls and are referred to as "slickers" in the trade.

NETTED MELON SUBGROUPS

The netted melons are sometimes subdivided into groups of varieties having similar characteristics, each named for a well-known variety in the group. For example, the most important group of varieties today is the Hale's Best group, including 'Hale's Best 36,' 'Hale's Jumbo,' 'Early May,' 'Purdue 44,' and the powdery mildew resistant lines 'PMR 45,' 'PMR 6,' and many others. Nearly all the netted melons grown in the western states for shipment to eastern markets as well as many of those produced in the East are of varieties belonging to this group. The fruits are round to oval in shape, about five or six inches in diameter. They are covered by a heavy net, are indistinctly ribbed, and have orange flesh. They are early to midseason in maturity and are well suited for long distance shipping.

The Defender group includes the popular variety 'Delicious,' the Fusarium resistant 'Delicious 51,' 'Burrell's Gem,' 'Osage,' and many others. These have medium sized fruits about five or six inches across and are oval in shape. They have a coarse, open net and fairly prominent ribs. They are better adapted for home garden and local market than for shipping.

The Hoodoo group includes the widely-grown local market variety, 'Hearts of Gold.' The oval fruits are about six inches in diameter and have orange flesh. They are distinctly ribbed and are heavily netted except over the sutures.

The Surprise group has rather prominent ribs and the netting is coarse and somewhat sparse, sometimes irregular or streaked. A few varieties in the group are rather well netted. The fruits are nearly globular, about six or seven inches in diameter. Some of the popular varieties of the group are 'Bender's Surprise,' 'Iroquois' (Fusarium resistant), and 'Schoon's Hard Shell.'

The Honey Rock type has rather small round fruits with a hard rind. The grayish surface of the fruits has little or no ribbing and a coarse, rather sparse net. The flesh is orange.

The Rocky Ford group also has small

round fruits which are not ribbed, but these are heavily netted. In the Rocky Ford variety the flesh is green with a pink or salmon-tinted area near the seed cavity; in other varieties of the same group, such as 'Superfecto,' the flesh is orange.

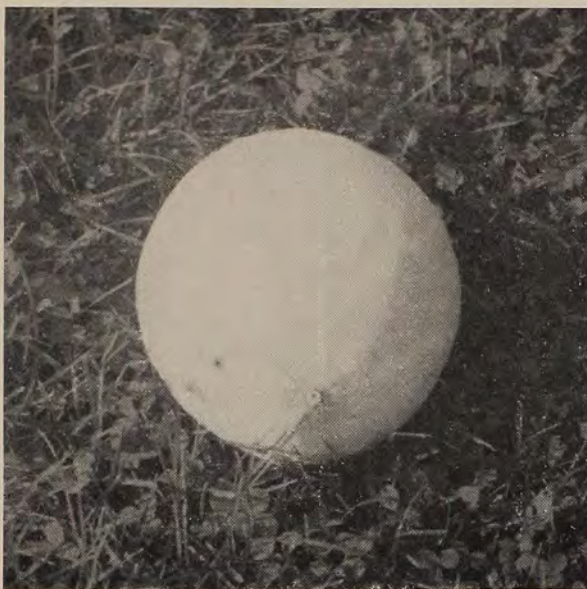
THE WINTER MELONS

There are about a half dozen varieties of commercial importance in this country that are not of the netted group. These are the winter melons, so called because they have firm flesh and store well for a period of several weeks to a few months. They have little of the musky odor of the usual muskmelon and for this reason the group is called by the varietal name *inodorus*. The varieties of this group require from two to four weeks longer to ripen than the typical netted melon. They are adapted only to those areas with long growing seasons, such as the southwestern United States. The surface of the fruits may be quite smooth as in the Honey Dew; it may be covered by many longitudinal furrows as in the Casabas; or it may have varying degrees of netting like Honey Ball and the Persian type. The flesh may be white, green, salmon or orange. They are generally sweet and have a distinctive flavor.

Among the winter melons (variety *inodorus*) three general types are important. The Honey Dew group produces fruits with a smooth white rind which changes to a light cream color on ripening. They typically have no net and no ribbing. They are round to oval in shape and generally six to eight inches in diameter. The flesh is usually green. The Honey Ball variety is slightly smaller, may have sparse netting, and some lines are orange-fleshed. It is usually grouped, however, with the Honey Dews.

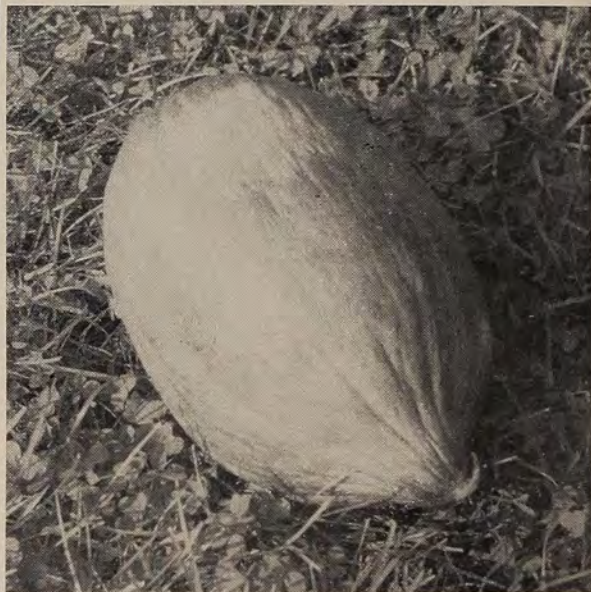
The Casaba group has large greenish or lemon yellow fruits which are also not netted or ribbed. The rind is grooved longitudinally with many small furrows. In the variety Golden Beauty the flesh is white and the shape globular. 'Crenshaw' has pinkish orange flesh and is somewhat pear-shaped.

The third type is the Persian with round fruits about seven or eight inches in diameter. The dark green surface is profusely covered with a fine grayish net and the flesh is orange.



'Honey Dew'

*Three cultivars of the Winter
Melons, Cucumis melo
var. inodorus*



'Crenshaw'



'Casaba'

CULTURE

It is not difficult to grow excellent muskmelons if one understands something of the climatic and cultural requirements of the plant. First of all, the muskmelon thrives under very warm, sunny, dry conditions. This is a principal reason for the remarkable success of the melon industry in the southwestern United States. Extended periods of cloudy, rainy weather, especially during the ripening season, may result in low sugar content of the fruits and therefore poor quality. Rainy, humid weather is also conducive to foliage and fruit diseases.

A sandy loam soil with good drainage and a good supply of organic matter is preferred for muskmelons. A few shovelfuls of manure or compost spaded into the soil where the hill is to be planted gives excellent results in the home garden. The soil should be well limed since melons do very poorly on strongly acid soils. A pH of 6.0 to 6.5 is best. A good supply of magnesium as well as calcium is needed, for it is known that too little available magnesium may result in melons with low sugar content and poor flavor. Therefore a high magnesium lime is to be recommended especially on sandy soils.

Since the plants need liberal amounts of nitrogen, phosphate, and potash, a mixed fertilizer, such as 5-10-10 or 8-8-8, should also be supplied. The fertilizer should be well mixed with the soil before planting at the rate of about one pound per hundred square feet. An equal amount should be applied around the plants and worked lightly into the soil surface at about the time the vines begin to run. Fertilizer should not come in contact with the seed or the foliage of the plants at any time. A level tablespoonful of borax per hundred square feet is often beneficial in producing better quality melons. It should be thoroughly mixed with the fertilizer to be applied before planting. Since excessive amounts of borax may be toxic to plants, no more than the recommended amount should be used.

Melons should be planted in a warm soil as soon as the danger of frost is past in the spring. Commercially they are

planted about three feet apart in rows four to six feet wide. Approximately this amount of space should be provided in the home garden since the vines have considerable spread at maturity. Several seeds are usually planted in a hill. They are covered with soil to a depth of about three-fourths inch and thinned to one or two plants per hill a couple of weeks after emergence. Shallow cultivation is practiced as needed for control of weeds.

DISEASES AND INSECTS

There are numerous disease and insect pests of muskmelons. Some, like Fusarium wilt and anthracnose, are soil borne; therefore melons should not be planted in soils where related vine crops have been grown in recent years. Under eastern conditions a regular spraying or dusting program with an effective fungicide is generally necessary for control of the foliage diseases like leaf spot and downy mildew. Varieties resistant to powdery mildew have been widely used in the West for a number of years. New varieties with resistance to downy mildew are growing in popularity in the East. Since serious damage from cucumber beetles is likely to occur just as soon as the young plants emerge from the soil, the insect control program must begin early. In addition to the beetles, aphids and pickle worms may be serious problems in some areas. Since disease and insect problems vary in different sections of the country the control recommendations of local Agricultural Experiment Stations should be followed.

In summary, to produce muskmelons of good quality we need a productive soil that is well supplied with organic matter and plant nutrients. We should plant healthy seed of an adapted variety. We must provide protection from the depredations of insects and plant diseases to which the melon plant is subject. Vigorous plants with healthy vines and leaves will rarely fail to produce attractive fruits with the sweetness and flavor that are desired. Unthrifty plants which have lost their leaves as a result of deficient plant nutrients or attacks of plant diseases can yield only poor quality fruits of low sugar content, little aroma, and insipid flavor.

A Book or Two

(Books designated "(Library)" are available for loan to the Membership)

The Book of Flowering Trees and Shrubs.

Stanley B. Whitehead. Frederick Warne & Company, Ltd., London, England. 1956. 244 pages. 63 plates in colour. \$3.50. (Library).

Before one purchases any of the many British gardening books which are being sold in this country, one should take into consideration the inevitable drawbacks which these books have for the American gardener. These faults result from the marked climatic differences between Great Britain and the United States. The winters are considerably less severe than in our Northern States, and British summers are much less hot and dry than in much of this country. Thus, many of the plants recommended for British gardens as well as methods for cultivating them, would be unsuitable here.

Although this book is of a handy size, is profusely illustrated with colored plates, and is well written, it still has the above mentioned drawbacks.

D. G. HUTTLESTON

Beneath the Greenhouse Roof.

Charles H. Potter, Criterion Books, New York. 1957. 246 pages. Illustrated \$5.95. (Library).

There have been a great number of books in recent months on home greenhouses and growing plants in them—all evidence of an increased home-gardening interest. This is another but a most complete book. It is organized in a logical manner beginning with the location and construction of a greenhouse to the culture of many kinds of plants. The author writes in a pleasing although wordy manner, but he is easy to read. Suggestions are made as to the kinds of plants that may be grown together. A number of illustrations of plants and operation of construction or greenhouse practice, are helpful.

C. B. L.

Decorating with Pods and Cones.

Eleanor Van Rensselaer, D. Van Nostrand Company, Inc., Princeton, New Jersey. 1957. 179 pages. Illustrated. \$4.95. (Library).

Eleanor Van Rensselaer's *Decorating with Pods and Cones* is certainly the most comprehensive book seen on the subject of dried materials.

Some of the plant material dealt with is better known to our Pacific States and would be difficult to obtain in other regions, but a wealth of substitutes are suggested.

Mrs. Van Rensselaer supplies the reader with numerous unique ideas for dried decorations and affords a background upon which to originate one's own designs.

It is definitely a book well worth adding to one's collection.

CAROL LANDA

The Daffodil and Tulip Yearbook, 1958.

Edited by Patrick M. Synge and Miss G. E. Peterson. Royal Horticultural Society, London, England. 164 pages. 23 illustrations. \$1.65, postpaid. Also available from America Daffodil Society, 10 Othoridge Road, Lutherville, Maryland. \$2.25, postpaid.

The precedents for this volume, now making its 23rd interrupted appearance, are so well established and its fabrication handled with such unerring taste and technical competence that there is little left for a reviewer except to record its appearance and commend it to all daffodil lovers.

The familiar sequence of papers, lengthy reports on shows at home and abroad, the disturbingly long list of newly registered daffodil names are all appropriate in a book of the year, but the pattern of record rather than opinion has become so set that there is an inclination to greet each volume with the affection and complacency accorded the *World Almanac*.

American readers will not be disappointed in the pages allotted to them. John Wister's perceptive paper on daffodils in America is written by one who figured largely in the history of which he writes. He foresees waning dependence on ill-behaved foreign introductions and the early emergence of strains more suitable to our climatic vagaries, a vision which this reviewer shares. Reports on leading American daffodil shows and on the convention of the American Daffodil Society by Willis H. Wheeler and Ethel C. Peters are of especial value because, unfortunately, no similar record is available in the current American Daffodil Yearbook.

One has the nagging feeling that the comprehensive record offered by the subject of this review is not quite complete. Replete with breathless evidence of our progress toward bigger and presumably better daffodils, the suspicion persists that the industry is a persuasive if beneficent factor in editorial policy. The voice of the gardener is still. There is no concession to the spreading belief that the race is not always to the swift. Occasionally pages of this respected and valued publication might well be devoted to reflection on whether in our thirsty race for the mirage of exhibition quality we are not missing many of the rewards the daffodil has to offer.

GEORGE S. LEE

President, American Daffodil Society

Plant Propagation.

John P. Mahlstedt and Ernest S. Haber. John Wiley & Sons, Inc., New York. 1957. 413 pages. Illustrated. \$7.50. (Library).

The authors present a wealth of information on plant propagation with a good basic background in fundamentals as well as the most up-to-date equipment on propagation. However, the text is just about the same as any one of several other American texts when it comes to propagation method. The main weakness is the

limited amount of specific information which can be applied to the more difficult plants. This is perhaps due to the limited number of kinds of difficult plants we choose to propagate and which are handled with a special interest in England. I find that when it comes to a technique problem in plant propagation, a more ready source of information is the book by W. G. Sheat, *The Propagation of Trees, Shrubs and Conifers*.

J. L. C.

Flower Arrangement Art of Japan.

Mary Cokely Wood. Charles E. Tuttle Company, Rutland, Vermont. 1957. 125 pages. Illustrated. \$2.75. (Library).

The Oriental flavor noticeable in many of the new residences in United States no doubt has caused many modern home-makers to realize that Japanese-style flower arrangements make fitting decorative notes in their present-day homes. In her book, published in the early 1950's and now in the third edition, Mrs. Wood emphasizes the superior beauty of line and design of Japanese floral art over the old "squatty bunch of flowers" of a past generation of arrangers.

Mrs. Wood says that her book is meant as an introduction to the rules of line and design of Japanese floral art as taught to her in Japan during the late nineties, before "westernization had touched it."

"After the student has worked out the principles contained in this volume," she writes, "he can easily go on, either to learn how to handle groups of three lines or to the modern, less restrained styles."

In this book of 125 pages with over 100 line drawings of masterpieces of Japanese flower arrangements and half as many more diagrams and illustrations of materials and equipment, the author not only gives clear detailed instructions on how to proceed to master the ancient art but with charm and understanding also tells much of the historical and philosophical background. If the reader never intends to make a flower arrangement he will still be well rewarded for reading the book simply by the added appreciation of art he will have gained.

Japanese floral art strives to present "a moment of arrested growth in the life of a living plant." Mrs. Wood says further, "Each plant or tree has some dominating spiritual and physical element which is important and pleasant to emphasize . . . if one can learn to restore 'cut' flowers to an appearance of life and growth and project the personality of the flower used, he has learned to do what the painter and sculptor does . . ." Only he uses living material that must not only be vital but also must look vital. "More than that," she adds, "it trains the eye to see new beauties in Nature."

The equipment needed for Japanese flower arrangements is not complicated or expensive but it is somewhat different than that used in making Western style arrangements. Pictures and text give a complete idea of what to get and how to use it. Containers are of endless variety and interest and the chapter on this subject gives many suggestions of what constitutes

good flower vases and bowls. The line drawings show many unusual and beautiful containers, bases and stands used by the flower masters of Japan.

Chapters on plants materials and secrets of how to bend stems and make flowers last longer are filled with many hints and ideas that will be of help to both neophytes and advanced students. A summary of "Errors to be Omitted" from ancient volumes published almost 300 years ago in Japan adds a touch of humor to this gentle serious book.

A short pronouncing glossary of Japanese terms used in the book and an extended bibliography of Western language books and Japanese works, some of the latter dating from 1643, are included.

The book is bound in silk-covered boards in the Japanese style.

ERNA BERT VAN WERALD

Plant Doctoring Is Fun.

Cynthia Westcott. D. Van Nostrand Company, Inc., Princeton, New Jersey. 1957. 280 pages. Illustrated. \$4.50. (Library).

Cynthia Westcott, the plant doctor, has written an enjoyable story of the pleasant things, plus the trials of her profession. She has made a name for herself professionally as a plant pathologist as well as one who can be very practical in caring for a garden or speaking and writing for the home gardener. Anyone who knows her, has heard her speak, or read her will enjoy this story of her activities. She writes in an informal manner; you can follow along in the car, loaded with sprayers and luggage, or take a tour around the country speaking to garden groups or gathering information. You will learn about some of the pests, and how they grow, spread, and are controlled. In these travels you will meet many gardeners and professional research workers. And the book ends with a chapter "Slapdash Cookey" having to do with cooking and entertaining during her annual Rose Day and open house.

C. B. L.

Tropical Plants and Their Cultivation.

L. Bruggeman. (Translated from the Dutch). Thomas Y. Crowell Company, New York. 1957. 228 pages. Illustrated. \$12.00. (Library).

A more appropriate title would be "Plants to Grow in the Tropics," since scattered throughout the book are plants the reader will recognize as being hardy in the northern States. Examples of perennial or woody kinds mentioned are *Aster novae-angliae*, *Thuja orientalis*, *Hemerocallis*, *Allthea rosea*, *Dianthus*, and *Lonicera japonica*. The book has an introduction by W. M. Campbell, Curator, the Royal Botanic Gardens, Kew. He also supplied additional cultural notes.

The author has described briefly many plants with brief notes of description and cultural suggestions. These would be most helpful to a gardener in the tropics since they even include elevations above or below where culture would

be successful. Mr. Campbell has added an additional paragraph to the cultural data with suggestions for the gardener in the temperate regions who would grow these plants in the greenhouse or in the outdoor garden. The plants in the 10 chapters are grouped together either on their relationship, as ferns and fernlike plants, cycads and palms, conifers, bamboo, or on their garden use or growth habits, as annuals, perennials, water and marsh plants, trees, and shrubs.

There are 292 beautiful illustrations in color by Ojong Soerjadi which are most useful in identification. The gardener will recognize many plants described in this book as annuals that are grown in the garden, as florists plants, or plants found in tropical conservatories. The home greenhouse gardener would find the book useful as a reference.

C. B. L.

American Daffodil Yearbook, 1957-58.

Edited by Carey E. Quinn. Published by the American Daffodil Society. 76 pages. 6 illustrations. Supplied to members by the American Daffodil Society, 10 Othoridge Road, Lutherville, Maryland, annual dues, \$3.00.

A review in this magazine at this time of an American Daffodil Yearbook merits more than the customary treatment. Actually the Yearbook for 1957-58, while the second published by the American Daffodil Society, is the eighth of a series of American Daffodil Yearbooks going back to 1935.

Maryland, Washington, D. C., and Virginia had, even in 1935, long been a center, probably the outstanding center, of amateur daffodil interest in this country. In that year the Maryland Daffodil Society of the Federated Garden Clubs of Maryland held its Twelfth Annual Daffodil Show in Baltimore, Maryland, and the Garden Club of Virginia its Fourth Narcissus Show in Alexandria, Virginia.

The American Horticultural Society gave its support to the Maryland and Virginia shows and in 1935 organized a Narcissus and Tulip Committee with the editor of this magazine, B. Y. Morrison, as chairman. Many of the best known horticulturists in the country were members of the Committee: Miss Mary Judson Averett of New Jersey; Leonard Barron of New York; Miss Mary McD. Beirne of Virginia; Mrs. Paul M. Davis of Tennessee; Mrs. F. Stuart Foote of Michigan; Mrs. Mortimer J. Fox of New York; David C. Griffiths of the District of Columbia; Mrs. R. Howard Hall of Michigan; Mrs. Floyd Harris of Virginia; Frank McWhorter of Oregon; Sydney B. Mitchell of California; John C. Wister of Pennsylvania; and Richardson Wright of Connecticut. The result was the first American Daffodil Yearbook, that of 1935, with a preface by Mrs. Francis King.

Then, as in today's Yearbook, there were articles by Guy L. Wilson and Jan de Graaff. There was an account of miniature daffodils, but written by Mary Brown Stewart instead of Roberta C. Watrous. In general, considerable similarity of topics will be found in the first and most recent of these Yearbooks. It is unlikely, however, that a yearbook today, in view of present

tendencies to confuse "newest" and "best," would contain such articles as Alfred Bates', "In Praise of Old Daffodils" and Carl H. Krippendorf's, "Daffodils in Woodlands."

The 1935 Yearbook was followed by American Daffodil Yearbooks for 1936, 1937, and 1938, all issued by the American Horticultural Society. A gap occurred until 1942 when, during World War II, the fifth of the series, called merely the Daffodil Yearbook, was issued jointly in this country by the Royal Horticultural Society of Great Britain and the American Horticultural Society. It was edited by B. Y. Morrison. These early yearbooks displayed excellence of format and contained numerous fine plates of daffodil varieties including many species and near relatives, and *triandrus*, *jonquilla*, and *poeticus* hybrids.

The enthusiasm for daffodils in the Washington metropolitan area initially engendered by these earlier activities of the American Horticultural Society and by the examples afforded by the Maryland and Virginia daffodil societies, continued and was largely responsible for the organization in 1950 of the Washington Daffodil Society with a membership covering not only the District of Columbia but nearby suburban Maryland and Virginia. In addition to its annual show that Society sponsored an annual Daffodil Institute at which daffodil papers, demonstrations, and lectures were given. In 1955 the Washington Daffodil Society issued its modest Washington Daffodil Society Yearbook, edited by Mrs. George D. Watrous, Jr., and Mrs. John S. Moats.

Members of the Washington Daffodil Society also initiated meetings held in nearby Maryland the previous years (1953 and 1954) that, with the assistance of daffodil fanciers from over the country, resulted in the formation of the American Daffodil Society. This newly created national society adopted as its first yearbook, and distributed to its members, the 1955 Washington Daffodil Society Yearbook, converting it into an American Daffodil Yearbook. Thereafter, the American Daffodil Society took over the publication of the American Daffodil Yearbook, that for 1956 being edited by Freeman A. Weiss and that for 1957-58 by Carey E. Quinn.

The current American Daffodil Yearbook is published by an organization that, despite a membership of around 900, is still in the "young-and-struggling" stage. The Yearbook cannot be expected as yet to equal the excellence of the earlier American Daffodil Yearbooks, particularly in comprehensiveness, format, and illustrations. More experience and money are needed. Nevertheless, the present Yearbook is a creditable piece of work.

The Symposium on best exhibition and garden decoration daffodils in the various classes, based on balloting by experienced daffodil specialists across the country, is with its accompanying comments most informative and at the same time succinct. It is of immense help to the great majority whose time, pocketbooks, and garden space do not permit them to collect and test the numerous introductions over the years. Freeman A. Weiss has the best and most practical account to date on nematodes and viruses as they affect daffodils. Willis H. Wheeler lists from outstanding daffodil breeders over the world their sug-

gestions as to parents for breeding work and results to be expected from their use, together with an explanation of crossing techniques. Carey E. Quinn makes valuable and pointed suggestions on judging daffodils. Mrs. Watrous deals with the culture of the species miniatures; Harry I. Tuggle, Jr., appraises the "whites;" and Grant E. Mitsch has a realistic evaluation of the present "pinks" and his own work in this area. There is a straightforward how-to-do-it article by Harold S. King on growing daffodils. Jan de Graaff speaks his mind on top daffodils of moderate cost and it is easy to agree with him. The above by no means exhausts the list of the more valuable materials in this Yearbook.

On the debit side over a fifth of the Yearbook is taken up with "housekeeping" matters, Society operations rather than the daffodil as a plant. Illustrations are few and poor. The layout does not display the articles to best advantage—inadequate headings and spacing, unsatisfactory arrangement, interspersed advertisements, variations in typography. Thus the eye rebels at the two articles where the numerous varietal names are in "all caps," a practice fortunately not followed in other articles. There is much room for improvement in format and for professional assistance in this area.

A good start for the American Daffodil Yearbook has been made under its present sponsorship. The future should soon bring the Yearbook up to a par with its earlier predecessors and the Daffodil Yearbook series of the Royal Horticultural Society.

FREDERIC P. LEE.

Linnaeus.

Arvid Hj. Uggla, translated from the Swedish by Alan Blair. Swedish Institute, Stockholm, Sweden. 1957. 34 pages. 22 illustrations. Free. Obtainable from Royal Swedish Embassy, Washington 8, D. C.

This pamphlet was published in celebration of two hundred fiftieth anniversary in 1957 of the birth of Carolus Linnaeus (1707-1778), the great Swedish botanist.

It contains a brief, interesting account of his life and many fine illustrations of Linnaeus, and of his family, writings, garden, and honors. The format is most pleasing.

FREDERIC P. LEE

A Year of Flowers.

Rachel E. Carr. Charles E. Tuttle Company, Rutland, Vermont. 1956. Illustrated. \$2.00. (Library).

A twelve-month engagement calendar that may be used any year. A calendar for each month is shown for the years 1957 through 1960 but engagements may be written in for any year, without confusion.

The full page illustrations are of Japanese flower arrangements, each with a short description of the photograph as to style of arrangement, color and material of container, and a few words about the plants or flowers used. Twelve of the 48 illustrations are in full color. Plastic binding and paper covers. A nice little any-time gift for the flower arranging enthusiast.

ERNA BERT VAN WERALD

Plants of the Bible.

A. W. Anderson. Philosophical Library Inc., New York. 1957. 72 pages. 12 color plates. \$6.00. (Library)

Not to be compared with Moldenke's scholarly *Plants of the Bible*, Mrs. Anderson's volume is more of a decorative book. The number of plants covered is relatively very small and the writing is definitely keyed to the average reader.

The twelve colored plates are handsome and the text is interestingly written, discussing the diversity of opinion as to what specific plants are referred to in Biblical text.

D. G. HUTTLESTON

The Rose Annual 1957.

Editor Bertram Park. National Rose Society of Great Britain. 1957. 200 pages. Illustrated. (Library).

American Rose Annual 1957.

Editor Frank H. Abrahamson. American Rose Society (Distributed by Hanover House, Garden City, New York.) 1957. 266 pages. Illustrated. \$4.50. (Library).

Year Book of The Canadian Rose Society 1956.

Editor A. J. Webster. The Canadian Rose Society. 1956. 164 pages. Illustrated. (Library).

One of the supporting indications that the rose is the favorite flower of both the gardening and the lay public is the volume of literature devoted to it—yearbooks, for instance, of which there are at least three that are readily accessible to American gardeners. Most ornamentals have but one annual volume, in the English language at any rate.

The volumes under current mention follow their usual pattern of a mixture of cultural notes, rose history, variety appraisals, a few articles of scientific significance, and some fine color plates of recent rose introductions. Among the noteworthy contributions to scientific literature of the rose are (in the *American Rose Annual*) "Revision of the Genus *Rosa* in Eastern North America—a Review" by W. H. Lewis, of the University of Virginia; "American Rose Species and their Hybrids at the Botanical Garden of the University of Michigan" by Eileen W. Erlanson Macfarlane, of the Institutum Divi Thomae Foundation; and "Breeding Winter-Hardy Rambler Roses" by E. B. Risley, of the University of New Hampshire. The British Annual contains an article on a novel (to Americans) theme, "The Rose in Heraldry" by the late H. S. Lecky (reprinted from an earlier Annual); also "The Fragrances in our Roses" by the late J. A. Gamble. The Canadian Year Book presents a brief review of "Roses of the Alba Group," of special interest to Old Rose fanciers, by G. S. Thomas. The 16 color plates of the current British Annual, as also in the 1956 issue, are especially fine—beautifully reproduced natural color photographs. The use of dark blue and neutral shaded backgrounds lends particularly rich tones to the flower colors.

F. A. W.

The Camellia.

Edited by Beryl Leslie Urquhart. The Leslie Urquhart Press, Sharpthorne, Sussex, England. 1956. 18 x 13 inches, 56 pages, 20 illustrations in color. \$12.00.

This is a luxurious book of camellia color plates made and printed in Germany and reproduced from three paintings of Raymonth Boothe and seventeen of Paul Jones. It is intended as the first of a series of similar volumes on camellias. Eighteen plates are of *Camellia japonica* clones, old and new, one of C. 'J. C. Williams' a Williams hybrid, and one of a species, *C. sinensis*.

The plates show flowers and leaves in natural size and are both precise and beautiful in their presentation. The color reproduction is excellent and in only three or four instances is the exactness of the color to life likely to be questioned. The variability of camellia flowers makes it difficult to say occasionally whether the flower selected to represent the plant is typical in each instance.

Each plate is accompanied by a full description and a history of the variety and usually by a "Note" of appraisal by a camellia specialist or the editor. There are brief articles on the early introduction of camellias and the development of interest in them in England and on the Continent and in the United States and Australia.

A few of the varieties as, for example, 'Satanella,' 'D. Herzilia de Freitas Magalhaes,' and 'Augusto L. Gouveia Pinto,' are little known in the United States, at least under the names used. 'Gauntletti' appears to be a new name for "Grandiflora Alba" or 'Lotus'; and 'Grand Sultan' for 'Mathotiana.'

It is hoped the series will be continued to completion for it will afford a valuable reference work on camellias.

In only two or three instances do the plates duplicate varieties shown in color in Hume's *Camellias in America*.

FREDERIC P. LEE

The Complete Book of Chrysanthemums.

Cornelius Ackerson. The American Garden Guild, Inc., and Doubleday & Company, Inc., New York. 1957. 256 pages. Illustrated. \$4.95. (Library).

This is a complete book on the home culture of the chrysanthemum and should provide the answers for most gardeners. Those who are less familiar with this plant will perhaps be surprised how versatile it is and what can be done to control or regulate its growth and flowering. This book tells how to grow the large flowering types both as a plant in the garden and in a home greenhouse. The author describes the techniques of disbudding, pinching, supporting and training of plants. Chapters are devoted to the usual cultural topics such as propagation, soils and fertilizers, and summer and winter care. Other chapters include use of chrysanthemums as a landscape plant, chrysanthemum shows, history and development of the flower, and the classification of the bloom types and species. Yes, there is even a chapter on Arranging of Chrysanthemums, with several attractive color pictures. It is an easily read book, although wordy and repetitious in parts.

C. B. L.

Pinks. Selection & Cultivation.

F. R. McQuown. Charles T. Banford Company, Boston, Massachusetts. 1955. 176 pages. Illustrated. \$3.00. (Library).

Mr. McQuown is a past-president of the British National Carnation Society which refers more to the garden carnation than to the greenhouse crop. The lovely garden pinks that do so well in England do not thrive under our climate and fail after a year of our heat and humidity. However, if you wish to try to cultivate garden pinks, this small book can be a complete reference. Not only does the author discuss the standard cultural facts in a very exacting manner but he includes two chapters on the breeding of pinks. In the chapter on "More Advanced Breeding" he discusses the gene behavior of pinks and what to anticipate in the way of results of various color combinations and plant types. The book is staid and without any attempt to glamorize the subject. Not one to be read for sheer horticultural pleasure but a thorough textbook for anyone engaged in carnation culture or breeding.

J. L. C.

The Scented Garden.

Eleanor Sinclair Rohde. [Printed in England; published by Charles T. Bradford Co., Boston, Massachusetts.] First published in 1931, revised and enlarged, 1948. 318 pages. 20 illustrations. 3 Garden Plans. \$3.75. (Library).

Miss Rohde's book would have a strong appeal to anyone interested in the romance of plants. Old herbals and early writings are liberally quoted. Many plants with fragrant foliage as well as flowers are discussed. The history of their cultivation and their role in modern gardens are treated. One chapter is devoted to recipes for pot-pourris and other aromatic concoctions.

The descriptive and cultural notes on the individual plants in the last quarter of the book are so brief as to be of little value. The fact that it was written for English gardeners would reduce the value of this section of the book for Americans.

D. G. HUTTLESTON

Roses of the World.

Shozo Suzuki, Todoroki Rose Institute, Koyo-Shoin, Kanda, Tokyo. Distributed by Charles E. Tuttle Company, Rutland, Vermont. 1956. 242 pages. 188 pages of color. \$15.00 (Library).

This book is printed in Japanese, in typical manner of back to front for us, but it has many excellent color plates of roses (over 287), varieties and species that will be easily recognized. Each plate has a caption but with the variety name in English for all to read. There are some nice pictures of rose gardens in Japan. From the pictures and the line drawings, and the few words in English here and there in the text, it is obvious that the author has covered the subject of rose growing very completely. There are a few sketches of planting and pruning, and of propagation. Others illustrate the cross section of a stem and a growing tip of the plant.

This book should be a good reference, picture wise, in a collection of rose books but since it is written in Japanese it probably will not be read very often by English readers.

C. B. L.

The Gardeners' Pocketbook



HERBERT DOUD

The "Knock-away" Tree — Ehretia anaqua

Growing a "Knock-away" Tree

Many white flowers, dark green foliage, and a quantity of red and yellow berries make *Ehretia anaqua* (syn. *E. elliptica*) a triple threat shade tree in South Texas. It is commonly called "Anaqua" tree in Mexico, corrupted to "knock-away" in English. Corymbs of small white flowers are produced in profusion in late winter and sometimes repeat through spring and early summer. The short stiff hairs on the leaves give them a rough touch like that of a cat's tongue. The trees usually have a stocky appearance and are long-lived.

Widely scattered wild specimens grow as far east and north as Houston and near Austin. But the tree becomes more common in the wild from Victoria

southward into Mexico. Since the trees in Victoria have endured a minimum temperature of 9 degrees Fahrenheit, it is reasonable to assume that anaquas from the northern part of their range can be grown through the Gulf States and Southern California if soil and moisture differences are not limiting factors.

Although native to an area where the soil is often alkaline, trees grow well planted in sandy loam soils in Houston along with characteristic eastern flora. Over four feet of growth the first year from germination has been obtained in containers with a three-fourths coarse sandy topsoil and one-fourth German peat mixture. Fresh seed give over 50 per cent germination in thirty days. Trees up to three inch caliper have transplanted well, balled and burlaped from

the wild with three feet of new growth the first year.

While the anaqua is evergreen in the lower Rio Grande valley, in Houston, it is partly deciduous especially in colder winters.

The tendency to send up sprouts from the roots indicates that root cuttings may be a good method of propagation if clonal selection is desired. This tendency also accounts for the multiple trunks or clump type growth sometimes seen. It is possible to train trees to a single trunk, several low trunks of almost equal diameter, or several trunks rising from the ground a foot or two apart.

Old anaqua trees in Victoria average as large as live oaks in trunk diameter, but with a more upright dense type of growth. The trees are beautiful when in full bloom and when the bloom repeats in summer with masses of red and yellow berries present, it is an eye-catching sight.

Although it may not be safe to forecast a tree's requirements outside its natural range, it would seem that the Texas *Ehretia* (several other species are found in Asia) would grow where it had hot summers, mild winters, and good drainage. With seed produced so profusely and germinating so easily, propagation is certainly no problem.—LYNN LOWREY, *Lowrey Nursery, Houston, Tex.*

Observations on Pentas lanceolata

Pentas lanceolata Schum., an herbaceous, sometimes almost woody, plant of RUBIACEAE, has been in cultivation for over a century. This handsome ornamental of African origin is relatively little known to American horticulture despite the fact that it has been grown in this country for years. Because it appears to possess numerous desirable qualities, I have attempted to assemble a collection of its variations for study. These comments are based on preliminary observations made on the limited collection I have thus far been able to bring together. This collection consists of nine

color variations, seven of which are female and two of which are male plants.

My first view of *P. lanceolata* was from a moving car window. I got the impression that I was seeing an unusual geranium (*Pelargonium*). This first impression was sufficiently vivid to suggest that, perhaps, here was a plant that could be substituted for the geranium in the Gulf Coast area where geraniums are grown with difficulty, and then not too well.

From a plant-production point of view *P. lanceolata* presents no serious problems. Stem cuttings are easily rooted in about three weeks. No special cultural requirements are needed except that temperatures must be well above freezing; however, it will survive light frosts. It is much more tolerant in its light and moisture requirement than the geranium.

The leaves are dark green and attractive and the plant is upright in habit. Among the cultivars observed, there is a rather wide range of compactness of growth. The general aspect of the foliage is pleasing.

The inflorescence is borne terminally and flowering is repeated many times during a growing season as the lateral branches develop. The inflorescences of the better cultivars will measure up to 9.5 cm. across when well grown. The number of florets is variable as is the size of the individual florets. This variation is sufficient to suggest that improvements may be made by breeding.

The color range of the cultivars observed includes white, shades of lavender, pink, and red, all of which are attractive. I believe there is a good possibility of increasing the color range through breeding.

Although the flowers appear to be morphologically perfect, only one sex seems to be functional on any given plant. Critical observations on this situation have not been made.

From preliminary observations of this species of *Pentas*, it is likely that it is adapted to Gulf Coast conditions and can be handled like other tender perennials. The fact that it will grow and bloom in both full-sun and semi-shade exposures increases its potential use in gardens and planter boxes.

The variations of both the vegetative and floral parts seem ample to expect that substantial improvement can be



GEORGE HAMPLER, LONGWOOD GARDENS

Pentas lanceolata Schum.

made through reasonable breeding efforts within the species.

To my knowledge there are no other species of *Pentas* growing in the United States. E. P. Phillips, in his book, *The Genera of South African Flowering*

Plants (Second Edition, 1951), states that fifty-nine species have been named. An effort should be made to secure them for possible use in hybridizing.—I. S. NELSON, *Director of Research, Southwestern Louisiana Institute, Lafayette, La.*

Cuphea micropetala

Years ago, one commonly saw the old Cigar-flower in unimportant gardens and later on came to learn of the very different *Cuphea petiolata* that accepts garden conditions with great success. But neither of these species reminded one of the genus when a plant common in lesser gardens in this region came into late summer flowering and made tall plume-like growths topped in every case with a compound terminal raceme of showy yellow to scarlet flowers. Inquiry locally brought no information, though many people knew the plant at once when it was described. No one seemed to sense the fact that here was a tough herbaceous perennial, that came to the peak of its flowering in early autumn when the pyracanthas are turning to the glory of their colored fruits, and there is enough of autumn in the air to make yellow to orange to scarlet very acceptable colors in the greenery.

Specimens sent to Washington have been identified as *Cuphea micropetala*—the species with almost invisible true petals hiding between the calyx teeth.

The plant grows to much more than the two feet credited to it in such texts as are available here, making as much as six feet in the somewhat shaded border where we have it. The strong shoots with their handsome leaves bring into the foliage masses the same design element that one has from the plume stems of the Philippine lily and would have from the larger *Liatis* were that grown. As cold weather overtakes it, the leaves yellow somewhat and drop off, with the stems dying down to base as in any perennial of like character.

The brilliant part of the flower is of course the calyx. It is a most interesting one, in that, when the seed is ripe the calyx splits on one side, usually the upper side, and exposes the central fleshy column that is covered with seeds. They are a lovely gray green, that makes one more contrast in the color scheme, but only when observed close by. No seed has been sown and no self sown plants have been found, but the clump increases slowly at the crown and one can easily divide it should he wish.

In spite of its beauty the plant is not much prized here. B.Y.M., *Pass Christian, Mississippi*.

*A Miniature Holly for Modern Landscape:**Ilex cornuta 'Dwarf Burford'*

Low-growing shrubs are the vogue in the present landscaping of suburban developments. Their use is correlated with the modern architect's concept of horizontal lines, glass walls and picture windows. One of the primary functions of low-growing material is the landscape design of foundation plantings. In this design shrubs of year-round interest, preferably evergreen, are desired. Narrow-leaved evergreens have largely filled the requirements, but often added interest, such as contrasting foliage, flowers or fruit, is desired. Broad-leaved evergreens give the contrast of foliage and often add interest in the form of flowers or fruits.

Hollies include many evergreen, broad-leaved types, and are extensively used in foundation plantings. The flowers of all species are small and inconspicuous. Because holly is dioecious, an entire plant is either male or female. Most female clones will bear fruit only if a male of the same species is present within a reasonable distance. An exception is Chinese holly, *Ilex cornuta*, which bears fruit without the aid of pollination. The fruit of hollies is usually red or black and about $\frac{1}{4}$ inch in diameter.

Examples of dwarf or low-growing forms are the many selections and named cultivars of Japanese holly, *I. crenata*, available as male, female or sterile clones; Compact Inkberry, *I. glabra compacta*, a female clone; Dwarf Yaupon, *I. vomitoria nana*, a sterile clone; *I. cornuta* 'Rotunda' a sterile clone; *I. opaca* 'Clarendon Spreading' and 'Maryland Dwarf,' both female clones. The majority of the fruiting dwarfs bear black fruit, which make them less attractive than the red-fruited clones.

A dwarf, shiny-leaved, evergreen, red-fruited holly would be a desirable addition to the preceding list. Such a holly exists and should be used to advantage in both foundation plantings and low hedges. Two small specimens of this clone were donated to the U. S. National



U. S. NATIONAL ARBORETUM

*Four-year old branches of Ilex cornuta f. burfordi (left)
and Ilex cornuta 'Dwarf Burford.'*

Arboretum in January 1958 by the originator, James Ferger, Ferger Landscape Company, Wilmington, North Carolina. He has named this clone *Ilex cornuta* 'Dwarf Burford.' It was first observed as a mutation in a batch of cuttings of *I. cornuta* f. *burfordi* taken at his nursery in 1947. This miniature *I. cornuta* f. *burfordi* is especially valuable because the potentiality of 'Burford' is well known to the nursery trade. 'Dwarf Burford' should perform satisfactorily wherever 'Burford' has proved successful.

Data from the donated plants (6 years old from cuttings) are interesting. Both plants were of compact growth and averaged 18 inches in height and 18 inches in spread. Last year's annual twig growth (from 100 random twigs) averaged 4.8

cm. ($1\frac{7}{8}$ in.). Measurements from 25 leaves averaged 3.2 cm. ($1\frac{1}{4}$ in.) long and 1.6 cm. ($\frac{5}{8}$ in.) wide. The leaves are entire, shiny, dark green, of Burford-type with one spine at the apex. The fruit is red, globose, $\frac{1}{4}$ in. in diameter with a $\frac{1}{4}$ in. pedicel, borne in an axillary fascicle on previous season's growth. An average of 5.7 fruits per fascicle was produced on 40 random fascicles.

'Dwarf Burford' holly is a welcome addition to modern horticulture. This miniature form should be especially valuable since it has all the desirable qualities of the 'Burford' holly but on a miniature scale in keeping with today's architecture.—W. F. KOSAR, *Geneticist, U.S. National Arboretum, Washington, D.C.*



THE WAYSIDE GARDENS COMPANY

Forsythia 'Beatrix Farrand'

Forsythia 'Beatrix Farrand'

Forsythia 'Beatrix Farrand' was originated at the Arnold Arboretum by me. It is a selection from among several dozen triploid seedlings. The female parent was a seedling of *F. intermedia spectabilis* which had been made tetraploid by colchicine treatment and then named 'Arnold Giant.' The male parent was *F. intermedia spectabilis* in the normal diploid form.

The variety has flowers even larger than 'Arnold Giant,' frequently 2 inches across, and of a deep yellow color. The growth habit is good; and, plants may develop into a symmetrical bush, 6 to 8 feet tall. 'Beatrix Farrand' was one of the few forsythias in the Arnold Arboretum collection that flowered above the snow line following the extremely cold winter of 1956-1957.

This variety was named in honor of Mrs. Beatrix Farrand, a leading woman landscape architect in this country and a former student of Professor C. S. Sargent at the Arnold Arboretum.—KARL SAX, *Professor of Botany, Arnold Arboretum, Jamaica Plain, Massachusetts.*

Thryallis glauca

A neighbor, with a new place, while hunting about in all the nursery stands that line the highways, found a small shrub with yellow blooms that intrigued her because of its summer flowering—especially through the month of August when shrubs, except for the common crape myrtle, are not in full flowering. The proprietor knew no name except some common name that was not intelligible, nor even approximately pointed to a scientific name.

As we, too, are interested in any summer flowering plant, a second plant was gotten for the garden here. It passed the first winter in the cold greenhouse, for no better reason than no decision could be reached for a suitable place to plant it outside. This season (1957) it was planted in the front of the long border with some shade from near by tea roses and azaleas that break the noon day heat. Growth was immediate and free.

The plant, as identified, is well characterized in *Hortus II* by the adjective

"neat." That suits it precisely, with its compact habit, its handsome glaucous leaves paired symmetrically in their opposite formation, and the charming panicles of starry yellow flowers that end every shoot. They are followed by fruits that start as green berry-like capsules darkening to almost black when ripe. No attempt has been made to save any seed or sow it.

Inquiries among the more local gardeners brought no data re its identity or its possible hardiness, but since the plant in the first garden has been entirely happy, there seems little reason to expect difficulty here.

If it continues to perform as it has to date, this is a plant that should vie with some of the summer flowering hypericums for Southern garden interest.

—B.Y.M., *Pass Christian, Mississippi.*

Damnacanthus indicus

Damnacanthus indicus (P.I. 227920), is a small evergreen shrub that I collected in the eroded sandstone gullies on Kiyozumi-yama, Awa Province, Japan. Although, as the name indicates, this species is native to India, its distribution also covers many of the warmer parts of Asia. It occurs widely in the southern parts of Japan where it is known locally as "aridoshi." Probably the northern limit is in Awa, on the Chiba peninsula, which is a four-hour train trip from Tokyo. I also found *D. indicus* growing at Cape Muroto, on southern Shikoku Island and along the shady banks of the Miyanoura River, on Yakushima Island. In this last locality, it grew among familiar plants such as *Camellia sasanqua* and *Rhododendron indicum*.

Bailey describes one species and a variety in *The Standard Cyclopaedia of Horticulture*, the variety being the plant found in Japan. This is said to be *D. indicus* var. *major*, on account of its larger leaves, but I believe that what I collected is actually the species for I have other collections which are almost spineless and with much larger leaves. These latter could very likely represent the variety *major*. The Japanese botanist Honda distinguishes six species and seven varieties in the genus.



G. HAMPFELER, LONGWOOD GARDENS

Damnacanthus indicus

The plant is small, rarely more than 18 inches tall and has a dichotomously branching habit. The broad, ovate leaves are opposite, entire, evergreen, and no longer than one-half inch. They are borne so closely along the stem that they overlap and produce a dense, matted effect. A pair of stipulate spines, each aranged at right angles to the leaves, grows at each node and the flowers are axillary, white, and fragrant. The fruits are solitary, red, and contain three or more seeds.

D. indicus is not mentioned in current horticultural literature and most early European periodicals describe it only as a showy greenhouse plant. One plate examined by me appeared in *Gartenflora*

17:t 570. Bailey suggests that the plant might be adaptable for planting in the Lower South, but there is no evidence that trials have ever been carried out. Judging from the localities where I observed this species growing wild, it should be hardy throughout a number of the Gulf States.

The neat evergreen habit, restricted growth rate, and bright coral fruits commend *D. indicus* to shady locations in foundation plantings. It will be a companion plant for the gardenia, of which it is a relative. Propagation is easily accomplished by seeds or cuttings.—JOHN L. CREECH, *Plant Introduction Station, United States Department of Agriculture, Glenn Dale, Maryland.*



G. HAMPELER, LONGWOOD GARDENS

Datura mollis

The white angels' trumpet, *Datura suaveolens*, is quite well known as a greenhouse subject as well as a tender garden shrub. When I started work at Longwood Gardens in 1955, I discovered a plant here which was very similar in all respects except for the pale orange flower color. It develops that the species is an Ecuadorean one, *Datura mollis*, which, as far as we have been able to

determine, is unknown or very rare in cultivation elsewhere. The unusual color of its large trumpet-shaped, fragrant flowers, and its habit of flowering repeatedly throughout the year, certainly make it deserving to be much better known.

Though *Datura mollis* would grow into a soft-wooded tree in tropical regions, it is probably best grown in conserva-

ories as a five- or six-foot standard. It can be trained easily, however, and will flower when as small as three feet high. Its elliptic to ovate, bright leaves are about a foot in length, and the solitary, axillary flowers are borne in profusion. The pendant corollas are a foot long and remain open for 2 or 3 days. The tube is very narrow basally and expands rather abruptly in the middle to a diameter of two inches. The spreading, reflexed limb is six inches in diameter and has five long acuminate lobes on the margin. The limb color is RHS Nasturtium Orange 610/2. This fades to buff-white on the throat. The sweet fragrance becomes very prominent in a closed space. A flowering period lasts for one or two weeks and is repeated in four or five months.

Propagation is very easy and growth is rapid. Cultivation is also easy, as it is with most *Daturas*. This species does best in a mixture of loam, leaf mould and sand with a little manure or bone meal added. It will grow throughout the year in a cool greenhouse or it can be stored in a cool cellar with little water during the winter and moved to a semi-shaded location outdoors during the summer. As with many solanaceous plants, *Datura mollis* is very prone to attacks of white fly, red spider, and aphids, but these pests can be controlled by frequent syringing and occasional spraying.

Longwood Gardens has recently distributed cuttings to several institutions and a few nurseries. It is hoped that the species will soon be available in the trade.—DONALD G. HUTTLESTON, *Longwood Gardens, Kennett Square, Penn.*

Small Bulbs for Summer Bloom In the Lower South

In a garden that is essentially green throughout the summer months, and intended to be so, with a deliberate omission of annuals, whatever plants that can be used as minor contributors to color are more than welcome. In this particular garden with its sandy soil, its regularly spaced trees and large plantings of azaleas with accenting camellias and magnolias, the bordering plants have to be able to maintain themselves in competition with all other roots, most

of them longer, older, and more voracious.

One would naturally think of bulbs, and there have been very interesting experiments with all the plants that are commonly known in these parts as "rain lilies"—an unfortunate grouping—as it is meant to include, not only the *Cooperias*, which are rain lilies officially, but all the *Zephyranthes* and *Habranthus* species we have been able to gather.

Cooperias and Zephyranthes

Cooperia itself, of which we have only *C. pedunculata*, was not the happiest until it was moved into a sunny spot that is not too often watered. There, it made its usual sparse foliage clumps and after each summer rain, sent up its delightful white flowers with their particular scent. It seeds freely and the seed, if sown at once, will germinate within ten days at the latest, usually sooner. How much time will be needed to bring these infants to flowering remains to be discovered. Several groups of bulbs are in the garden with flowers as nearly like those of this species as the casual eye can tell, except that they are pale pink. They produce seed, but most of it is apparently infertile. One recalls that a cross between *Cooperia* and *Zephyranthes* has been reported, but we know of no way in which bulbs from that material could have been acquired and certainly no pollination was made here. Since this is the only species of *Cooperia* to be found in any catalogue known here, it is our only representative of the genus.

If one had a couple hundred bulbs, it would not only be a charming sight, but would fill the evening air with its perfume, pervasive and most pleasant.

Of *Zephyranthes*, we have as yet a most incomplete assortment when one considers the great number reported by H. Harold Hume in this Journal years ago. Two are commonly known in gardens in these parts, the summer blooming *Z. candida*, often called crocus by those who have no particular interest in garden accuracy, and *Z. grandiflora*, the one species so commonly known in the North as a summer blooming bulb that is later lifted and stored over winter. *Candida* is the only zephyrlily that has been seen here that can compete with grass, and in some of the oldest

gardens comes nearer to making a flower studded lawn than any other bulb. Needless to remark, these are not carefully cropped lawns. Whether or not there are other species that would do as well is an experiment that will have to be postponed until more stock is available. *Grandiflora*, which has been known as *rosea* and more often as *carinata* in the past, is a much larger bulb with flat as opposed to almost rush-like leaves, with the largest blooms of any kind grown here as yet. They are a fine clear pink and when an old established mass is in bloom after a good rain, a wonderful show results. This past summer there have been two fine crops of blooms, each following a rain rather than any hosing, though the latter will bring off a blooming period in dry weather. This year also, for the first time, this species has set seed, not much of which looks as if it were fertile. *Candida* on the other hand does seed, though sparingly as compared with some to be mentioned later on. Each of these species is well provided with leaves at blooming.

Atamasco as yet has not settled down to show whether it will thrive here or not, which may be the case or may be the result of a poor choice of location. It has been observed, however, with many plants that come from other gardens or nurseries, that more than one year must pass before one dare decide that the plant will not thrive.

The Yellow Zephyranthes

The small flowered yellow *andersoni* which is sometimes classified as a *Zephyranthes*, sometimes as *Habranthus*, is brilliant in color but the floral parts are not wide flaring so that the copper stained exterior is part of the picture. The foliage is slender and not conspicuous. Here the plant has given two flushes of blooming, not more. It seeds freely.

The other yellow flowered kinds are grown here, one called *Z. lutea* by the dealer, is identical with *andersoni*, another called *citrina*, has brighter yellow flowers, almost buttercup yellow, with wide spread perianth segments, making a starry bloom about an inch and a half wide. The foliage is ample but does not make a grassy clump as yet. Seeds are few in the capsules, but germinate as

freely as the rest. This showed no inclination to bloom until heavy rains in August.

The stock of the garden hybrid known as *Ajax* that we have, must have been raised from seed, as the individuals are not uniform in size or color. The more common color is a fine light yellow, almost primrose, but there are some darker individuals that have slightly smaller flowers. Like *citrina* it has ample but not conspicuous foliage. The seeds are few but germinate well. It will be of interest to see if still further variation appears in this generation to come. This, like *citrina*, is definitely an August bloomer here. Whatever the hue, the showy flowers are well worth having.

An attempt was made to grow *rosea* and *simpsoni* from Florida stock. Either we have a poor choice of location or *rosea* simply does not like us. The leaves which appear in summer and last through the winter are damaged by only a few degrees of frost. The flowers, again an August crop, are borne on short scapes and open widely when the sun strikes them. So far we have had no seed from it until this year. *Simpsoni* on the other hand, appears to have settled down. It too has evergreen winter foliage here, not so often touched by frosts, and blooms several times, the first crop in July and a smaller crop in August. It has seeded sparingly, but no seed has been gathered for careful sowing.

The only other *Zephyranthes* that we have was received under the name of *Z. treatiae*, which it cannot be. Usually it flowers in early summer, with one or more crops of bloom. When the mass is large enough it makes a great show, even if the flowers are smaller than those of *Z. grandiflora* which they resemble in color. They show a definite white starry area in the throat. This seeds freely and self-sown seedlings soon thicken the clump.

Habranthus

Of plants bought under the designation of *Habranthus*, we have two. *H. robustus* starts its flowering in early summer and produces two certain crops of flowers, the second following the heavy seeding of the first, and thereafter some straggling bloom, though not enough to be called a crop. This is the

most vigorous of all the smaller amaryllids we have and its seedlings come up like fine grass about the parent clumps and seem entirely happy to come to flowering without any further help. Its blooms are large, borne on twelve to fourteen inch scapes, above the meager foliage. Basically the flowers are white with beautifully tinted ends to all the perianth segments, in color a slightly lavender pink. Every bloom sets seed, probably all apomictic, and the large round seed pod is quite striking in itself. The heaviest foliage appears after the middle of August and lasts well into the winter, eventually dying off almost completely, but not from frost damage.

In much smaller quantity as yet, and not fully at home, are two small groups of *H. brachyandrus* which is more or less a counterpart in size and habit, but with flowers that are rose pink deepening to quite dark purplish pink in the depth of the throat. The few seed pods that have formed are small and do not have the globe-like shape of the foregoing. Seed germinates quickly when sown at once.

The Amaryllis Family

There is no need to discuss the Lycoris, as that was done in this Journal by Frederic P. Lee in the issue for October 1957.

The one remaining member of the Amaryllis family that should be mentioned is the plant bought and long known as *Hippeastrum miniatum*, a name that may have been altered several times since that name was given. It is an August bloomer here, with ten to twelve inch scapes that bear from three to six flowers, but not many leaves, at flowering time. In the type the color is a curious red, almost pure scarlet, but without the vibrant quality that one associates with that word. Our plants have never set any seed, but no attempt has been made at pollination.

Recently in a catalogue from South Carolina, it was noted that there was a pink form. The dealer wrote that the color was not too good, a rather faded pink. This, in our opinion, is almost a slander. Its color falls on the page with Mallow Pink in Ridgway, and that is no nasty color, believe me, for it is common enough among the excellent well

thought of bearded iris as well as our beloved azaleas. Unlike its red form here, it has set abundant seed that has germinated well. A larger planting of the red form from the same grower is only now in bud, though our old plants have finished two weeks ago.

It is still somewhat of a problem to know how best to use the plants in garden design. All of them are at their best when used in some quantity and planted in solid clumps but very few of them are available in quantities of more than one dozen and should one aspire to several thousands there is, as far as we know, nothing to do but raise one's own. This is easy but slow, and the interval between sowing and maturing of seedlings is still unproven here.

An Opportunity

One wishes for ground covers that will cover the bare earth and help prevent a certain amount of damage from rain splashing the soil up high on the scapes, and yet few plants come to mind here. The annual, *Torenia fournieri*, which is established as a weed here, makes a fine foil for the Lycoris scapes that rise above it, and looks well with its blue purple flowers, but that has not yet been tried for the others. It is possible that some of the forms of *Phlox subulata*, that persist here, would serve as by August they have made their growth and have fresh green mats of new twigs. The material is still too scanty to risk any of it with the plant known in these parts as Monkey Grass, a plant that surely cannot be a *Liriope* or an *Ophiopogon* but a *Mondo*? But who are we to presume? Other bulbs do come up and flower through old masses, but whether these amaryllids would or not, will have to be determined by some one else.

Certainly there is a chance for some amateur to make some money, slowly to be sure, if he will raise an annual crop of seedlings from all of them and get them into trade at prices that would be comparable with the costs of tulips that are useless down here. Now, one must hunt for offerings in the several "For Sale, Want and Exchange" bulletins published by most Southern States, and then bring the anything but uniform bulbs into vigorous health and growth. —B.Y.M., *Pass Christian, Mississippi.*

Organizations Affiliated With The American Horticultural Society

- American Association of Nurserymen
- American Begonia Society
- American Begonia Society, San Francisco Branch
- American Camellia Society
- American Daffodil Society
- American Gloxinia Society
- American Hibiscus Society
- American Iris Society
- American Peony Society
- American Rhododendron Society
- American Rhododendron Society, Middle Atlantic Chapter
- American Rose Society
- Bethesda Community Garden Club (Maryland)
- Birmingham Horticultural Society (Alabama)
- California Garden Clubs, Inc.
- California Horticultural Society
- Central Florida Horticultural Society (Orlando)
- Chester Horticultural Society (Virginia)
- Chevy Chase (D. C.) Garden Club
- Garden Center of Greater Cincinnati
- Garden Center of Greater Cleveland
- Garden Club of Alexandria (Virginia)
- Garden Club of Chevy Chase, Maryland
- Garden Club of Danville (Virginia)
- Garden Club of Fairfax (Virginia)
- Garden Club of Montclair (New Jersey)
- Garden Club of Virginia
- Garden Study Club, Delray Beach, Florida
- Georgetown Garden Club (D. C.)
- Herb Society of America
- Holly Society of America
- Houston Horticultural Society
- Hunting Creek (Alexandria, Virginia) Garden Club
- International Geranium Society
- Iowa State Horticultural Society
- Kenwood Garden Club (Maryland)
- La Salle Horticultural Society (Montreal)
- Manitowoc Men's Garden Club (Wisconsin)
- Men's Garden Club of Fairfield County (Connecticut)
- Men's Garden Club of Montgomery County (Maryland)
- Michigan Horticultural Society
- Midwest Horticultural Society
- Moline (Illinois) Horticultural Society, Inc.
- National Association of Gardeners
- National Capital Garden Club League
- National Landscape Nurserymen's Association
- Neighborhood Garden Club (Virginia)
- New England Wild Flower Preservation Society
- New Orleans Garden Society, Inc.
- New Orleans Horticultural Study Club
- North American Lily Society
- Northern Nut Growers' Association, Inc.
- Ohio Association of Garden Clubs
- Pennsylvania Horticultural Society
- Perennial Garden Club (D. C.)
- Pittsburgh Garden Center
- Plainfield Garden Club (New Jersey)
- Potomac Rose Society (D. C.)
- San Francisco Garden Club
- Seven Seas Garden Club (Maryland)
- Southern California Camellia Society
- Takoma Horticultural Club (Maryland-D. C.)
- Waterfront Garden Club (Alabama)
- Worcester County Horticultural Society (Massachusetts)



Hymenocallis occidentalis