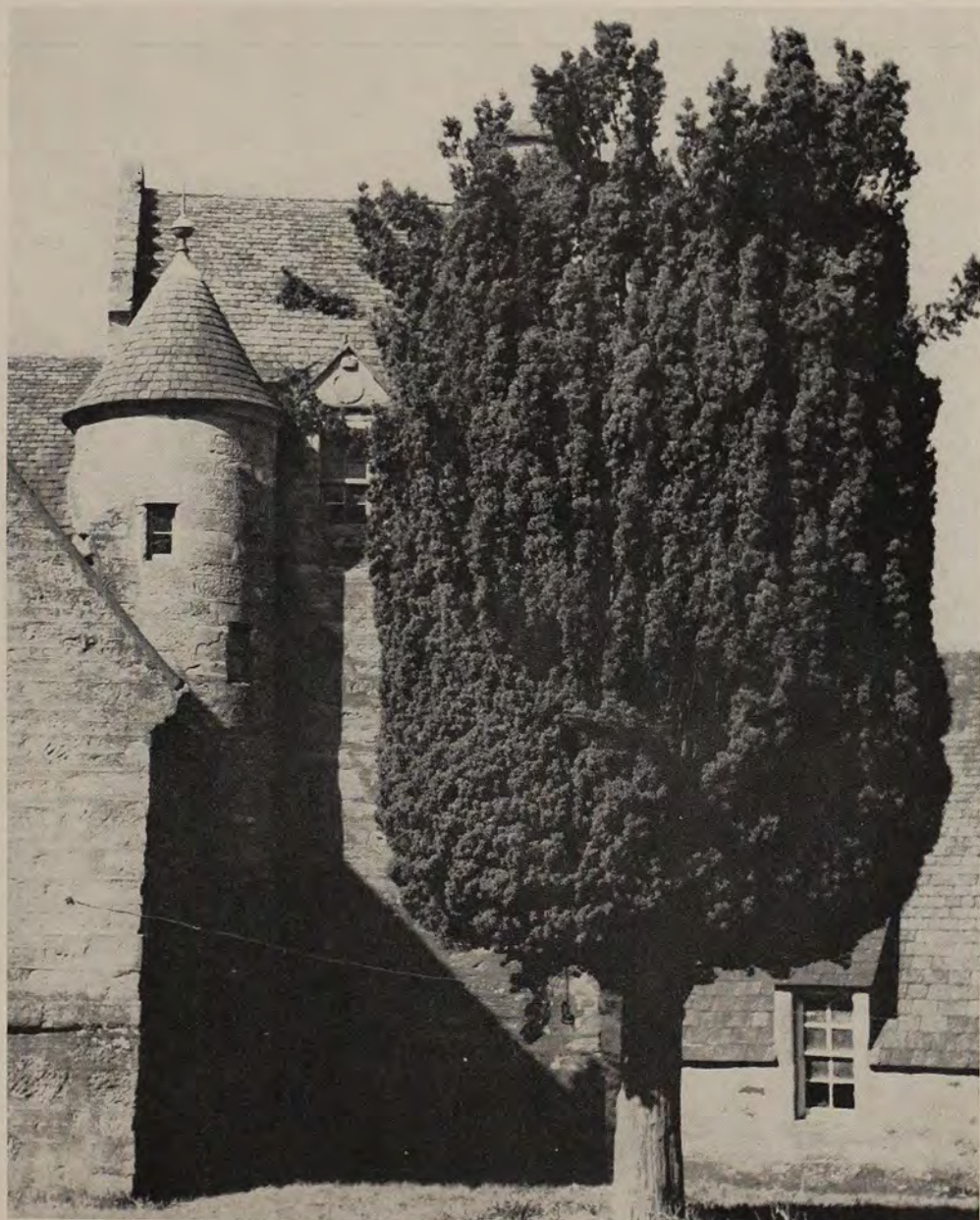


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The American Horticultural Magazine is the official publication of the American Horticultural Society and is issued four times a year during the quarters commencing with January, April, July and October. It is devoted to the dissemination of knowledge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

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OCTOBER COVER ILLUSTRATION

Taxus baccata 'Stricta'—the Irish yew growing at an old castle in Scotland. ARNOLD ARBORETUM
Copyright, 1964, by the American Horticultural Society, Inc.

A Message from the President:

There is an invigorating challenge in the opportunity of serving American Horticulture through our American Horticultural Society. Probably nowhere in the world are there so many people who find sheer delight in the horticultural wonders of their country than in America. We are unique in the number of societies, clubs and organizations devoted to plants, gardening and horticulture.

Many of us have been introduced into the wonderful world of plants by word or incident of association through a friend. This awakening may have taken place at childhood or later life. There is no age limit for an interest in the culture of plants. It proves equally fascinating to members of both sexes. I know of no religion, nationality, race nor any individual human being to which Horticulture has been denied.

The degree of becoming indoctrinated varies with every individual. Suffice it to say that all of us find an ever widening horizon of beauty and satisfaction with this association. The American Horticultural Society motivates an expanding opportunity for the individual and for the special organization to broaden horticultural horizons.

I never fail to be impressed by the way in which more and more dedicated and talented people devote their time to the performance of many services and committees which make up this organization. They, in turn, serve Horticulture on a national level of interest. The American Horticultural Magazine, as an example represents the efforts of a great many of dedicated interest including committee members, horticulturists, gardeners, professionals, amateurs and specialists. They come from all parts of the country and represent all kinds of plant interests. The pooling of their informational resources has built this magazine into a sought after treasure of horticultural knowledge—not only in this country, but abroad as well. I like to look upon the American Horticulture Magazine as a four-times-a-year armchair va-

cation into new adventures of Horticulture. The ever presence of its issues for ready reference likewise recalls to me the "cream" of American Horticulture.

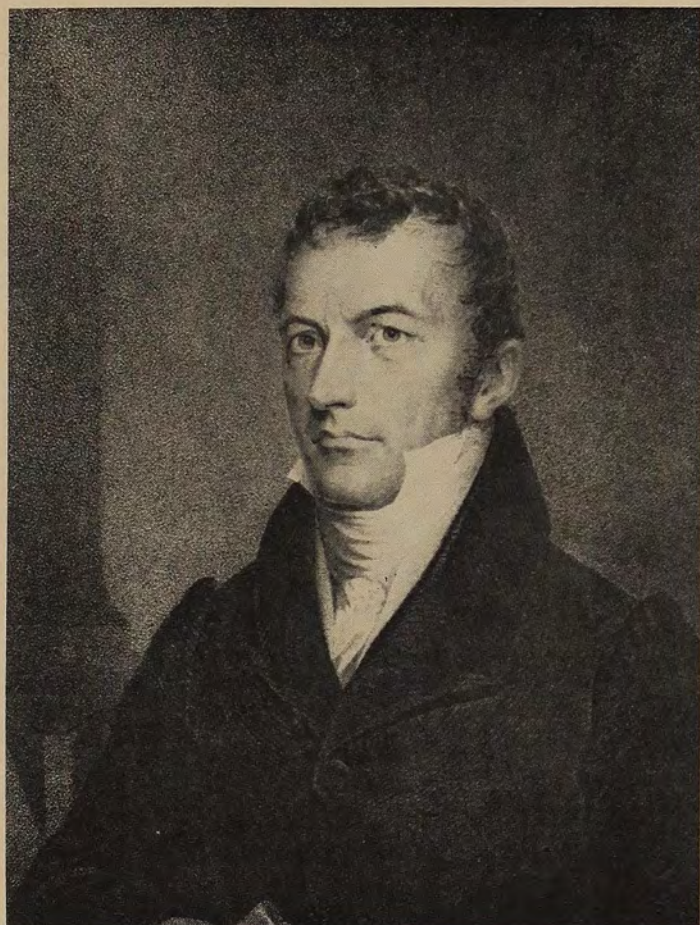
This means of horticultural communication to our members is not the only way in which horticultural horizons are broadening in this country. International association in Horticulture and among horticultural enthusiasts has also expanded immeasurably. This interest on the part of the Society has contributed to the selection of the USA as the site of the 1966 International Horticultural Congress to be held in mid-August of that year on the campus of the University of Maryland. AHS will, of course, hold its 21st annual Congress in conjunction with that unique event in this country.

The American Horticultural Congress has become a tradition and a means of broadening interest and knowledge about the Horticulture of different regions in the USA. This year's 19th Congress is held in New York City and has in addition to the wealth of Horticulture, already in this area, the New York World's Fair which has proclaimed September 30, 1964, as "American Horticultural Society Day."

Next year's 20th American Horticultural Congress will be held at the deep South's Pine Mountain, Georgia, October 13-15, 1965.

We are very pleased to announce that the 19th Williamsburg Garden Symposium will be held in cooperation with the American Horticultural Society. The theme of the Symposium will be, "New Horizons for Horticulture" and is scheduled to be held at Colonial Williamsburg, Va., March 21-26, 1965. Anyone who has not yet experienced a Williamsburg Garden Symposium, should make every effort to attend this one. The facilities are superb and the quality of the program is of the finest. Time and pace of the week there allow for ample horticultural and gardening conversation with many old friends as well as new ones.

(Continued on page 198)



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French Gardeners in Colonial America

CAROLYN S. LANGDON*

Peach trees in Georgia and Florida, apple and pear trees in New York, fine small gardens in New England, vast formal gardens in the South—these are in large part America's garden heritage from the French Huguenots of our early colonial days. For the number of these refugees among our early settlers was far greater than is generally realized, and their influence on gardening in the American colonies widespread.

As early as 1562 French Huguenots, fleeing religious and political problems at home, were gardening in Florida. These colonists—soldiers, laborers, and noblemen—brought to Fort Caroline on the St. John's River not only swords and carpenters' adzes but garden tools and seeds. In their three years in the wilderness they planted crops and started tiny fruit trees. When the colony was destroyed by the Spanish under Menendez in 1565, these vegetables and fruits were, it is believed, taken into Indian gardens or escaped into the wild.

By 1685 persecution of the Huguenots in France became widespread. Singly and in small groups, nearly half a million people secretly fled to neighboring countries. Able merchants, skilled artisans, and many of the finest gardeners of Europe sought freedom of worship in Holland, Switzerland, and Germany, England, Ireland, and finally America. Some were able to save a part of their wealth. More carried away only their skills or trade secrets. Many brought their knowledge of gardening and special ability to cultivate the soil. With all, their love of the beautiful showed in their love of flowers.

Although their story is less familiar to us than that of the English Pilgrims, the Huguenots were not strangers to the first Plymouth colonists. When the little band from Scrooby, England, reached "fair and beautiful Leyden," they found many French there. Some of the group of Nottinghamshire farmers became weavers or served as silk workers side by

side with Huguenot artisans. Both sets of refugees worshipped in the same church, and both eagerly negotiated to come to America.

However, there was one difference between these two alien groups. While the English clung to their nationality, fearing to lose their names and language in Holland, the French were more adaptable, more ready to learn a new manner of speech or to alter their names to Dutch or English. So it was that, when the Pilgrims were the first to leave Holland to sail to the New World, some French refugees went with them. On board the little ship *Speedwell* sailing from Delfthaven to meet the *Mayflower* at Southampton was Guillaume Molines with his wife and two children. Before he reached America, he was known as William Mullins, and we remember him as the father of Priscilla Alden.

The *Mayflower* arrivals have been credited with bringing a love of gardening and knowledge of its practice to America. But since more Huguenots were welcomed to the colony even in the following year, it is not surprising that flowers as well as vegetables and herbs promptly appeared in tiny kitchen gardens. The Huguenot hollyhock grew side by side with "sparagus" and tansie.

Huguenots came in large numbers to Boston. In 1662 a group of merchants from La Rochelle petitioned the governor and magistrates for permission to settle in that Puritan town. Their fine gardens were presently pointed out to travelers. Boston as readily welcomed a destitute group, fifteen French families and their minister. Townspeople took them into their homes, collected money and clothes, and the government granted them free land. Soon other French refugees, purchasing or leasing farm lands in neighboring townships, established fine orchards and door-yard gardens. Joyous and thrifty, these French Calvinists, more sensitive to beauty than the Puritans, on reaching

*Glastonbury, Connecticut.

America readily became New England gardeners.

Meanwhile, fourteen years after Henry Hudson had discovered the river, New Amsterdam was still only a Dutch trading post in the wilderness of Manhattan Island. In 1623 about one hundred and fifty colonists, almost all of whom were Walloons (Huguenot refugees in Holland from France and Flanders), arrived aboard the *New Netherland* to build the first homes and make the first gardens there. Others settled on Staten Island and Long Island where for many years fruit culture excelled about such towns as Flushing.

Some of the best French farmers and gardeners to come to the American colonies settled near the Hudson River in New York in Dutchess, Orange, and Ulster Counties. These farmers brought their native skill to little towns like Esopus and New Paltz, first founded by Huguenots who had sought temporary refuge in the Rhineland. Far better than the English colonists they knew how to manure land, rotate crops, and grow cultivated grasses. They were acknowledged experts in the establishment of orchards and vineyards. Many French intermarried with the Dutch, making good gardening inevitable, so that this section of New York State is still noted for the fine orchards and gardens of their descendants.

The coast town of New Rochelle, New York, was founded in 1689 on some 6,000 acres by another group from the city of La Rochelle who had fled after the Revocation of the Edict of Nantes. They brought with them chests of grafts and roots from the best fruit-growing and wine-making districts at home. Soon they were joined by other refugees from many parts of France, and their cluster of one-room cabins became a picturesque village of handsome homes of notable horticulturists.

At the same time Huguenots were gardening in the Middle Atlantic states as well as in New England and New York. Before William Penn arrived in Pennsylvania in 1681, they had settled there; and his agents all over Europe recruited many more. Andrew Doz, a refugee in London when Penn came to America, accompanied the proprietor to investigate the advisability of planting vineyards. In 1690 he was personally rewarded by a grant of two hundred acres of

land including the first vineyard in Pennsylvania which he had already laid out on the east bank of the Schuylkill River. Throughout the colony vintners from Champagne and Burgundy who had fled first to the German Palatinate settled among German neighbors and, often changing their names, lost their French identities but not their wine-making skill.

By the close of the Revolution, in Delaware where one of the earliest Huguenot settlements had been made, fruit growing and gardening were encouraged by men of wealth. Among these, Eleuthère-Irénée du Pont de Nemours, Huguenot founder of the Du Pont family in America, became actively interested in gardening near Wilmington.

Perhaps more than elsewhere in this country, the Huguenots have received credit for their influence on gardening in the South. They arrived there in large numbers and often settled together in this "Canaan" with its climate so like their native France.

Charlestown, South Carolina, had been established in 1670 by the English. In 1685 a band of Huguenots joined the colony and more moved there from New York and New England. Yet three years before, according to Samuel Wilson in an English pamphlet designed to advertise the new colony, "French Vigaroons" there, provided free passage by King Charles himself because they were "skilled in wine," were encouraging the cultivation of native grapes as well as European varieties for wine-making.

The settlement on the east bank of the Cooper River, early called the "French Quarter," was famous for its fine small gardens. Later, on both the Cooper and the Ashley Rivers appeared large well-planned, well-kept formal gardens on the vast estates of men wealthy from plantings of cotton, rice, and indigo. And always the Huguenot plantations were acknowledged among the most beautiful.

Henry Laurens typified the interest of the wealthy Huguenot merchant in plant collecting. For a forty acre lot in Ansonborough called Laurens Square, he imported an outstanding collection of fruits, flowers, and ornamentals. Through wide business contacts he and his wife, Elinor, also a remarkable gardener, are said to have introduced many of the cultivated plants suitable to South

Carolina, among them the olive, lime, alpine strawberry, and blue grape.

In Virginia, too, Huguenots had arrived as early as 1610 on ships carrying supplies to Jamestown. In 1619 they were planting vines for the Virginia Company; in 1621, mulberry trees. When these ventures proved unsuccessful, they turned to tobacco.

One thirty-year-old Frenchman, Nicholas Martiau, who arrived in Virginia in 1620 was the first ancestor to settle in America of a later famous gardener, George Washington. Through Mary Washington, whom Lafayette found working in her boxwood garden when an

old lady, may have come this Huguenot trait.

Wherever the Huguenots settled, trim gardens surrounded by neat fences or hedges appeared, for their love of the beautiful showed itself especially in the growing of flowers. Fine rice and tobacco cultivation, improvement of native vines, and the introduction of many new fruits, we owe to these Huguenot gardeners. While many names like Joel Poinsett, plant collector of Charleston, South Carolina, and Louis Le Conte, botanist of Liberty County, Georgia, witness the transmission of their love of gardening to their descendents.

A Message from the President:

(Continued from page 194)

Many of us feel that there is much more place in AHS for the specialized plant and other member organizations. It is our fervent hope that a Spring Directors' Meeting at Colonial Williamsburg during the Garden Symposium will bring the AHS representatives of our organizational members to discuss methods of improving this important relationship for the mutual benefit of all.

I cannot emphasize too gratefully, the devoted services of our Acting Secretary-Treasurer, Mrs. W. T. Wilson. When, during this summer, she suffered surgery and hospitalization, she was not able to go to the office, she had her office work brought to her. Most everyone

would take such an opportunity to read all those things that time would not previously permit—but not Grace . . . AHS came first. She is dedicated to this organization and has expanded its horizon under trying conditions. To the many others who contribute their time and talent for united and better American Horticulture, my deepest appreciation and thanks on behalf of all of the members of the American Horticultural Society.

Through your efforts, the membership will grow because we all want to grow with your extension of the horticultural horizons in this country.

July 1964
RUSSELL J. SEIBERT
Kennett Square, Pennsylvania

Fastigate Trees

DONALD WYMAN*

Frequently one needs to plant a fastigate tree in the garden for some very special purpose. These may be difficult to find in small, local nurseries, but of the sixty or more being grown in the Arnold Arboretum in Jamaica Plain, Massachusetts, at least forty of them are available from some nursery in America. Of course it is possible by continual shearing, to make a columnar mass of foliage out of almost any tree, but the older and larger the tree becomes, the more difficult and time-consuming is the task of shearing. It is far better to obtain the normally fastigate tree, the one that naturally grows with a narrow, upright habit, and there are enough of these to supply any reasonable need.

In the first place, fastigate trees are used as accents in front of buildings, especially those where there is little space between the building foundation and the sidewalk. There may well be a limit

*Arnold Arboretum.

***Thuja occidentalis*—several clones of this species have a narrowly pyramidal habit.**

ARNOLD ARBORETUM



to the height at which such trees are useful, for in cramped quarters one usually does not need a tree much higher than the building itself.

Then there is the need for placing a narrow, upright accent point at some place on the home grounds. We seldom use Lombardy poplars now, but they were very much in demand at the turn of the century. I will never forget the two at the end of a long vista on the old George Eastman estate in Rochester, New York. These two trees were in a unique setting and were so tall and upright that they were the focal point for the entire garden area.

Windbreaks and screens can easily be formed in a narrow strip by the use of fastigate trees. In fact, this is probably their most popular use. Not all the varieties mentioned in this article will grow as fast as the Lombardy Poplar, but such trees do not take up much space on a narrow city lot and can be very important assets, especially for screening purposes.

If the windbreak or screen is needed only up to a certain height, such trees are easily controlled merely by cutting off the tops every year or so. It is not difficult to "top" them and the home owner can easily perform the operation, using a step ladder and pole shears.

Fastigate trees differ materially in their respective habits and in the way in which they grow over the years. Some, like the maples, will retain their narrow habit throughout their normal life span. Others, such as the narrow varieties of *Malus*, *Cornus* and *Sorbus*, will not. As youthful trees they are excellent, but as columnar specimens they fail miserably when mature. The simple fact is that as the upright branches grow longer and longer, and the trees bear heavier and heavier crops of fruits, the branches are bent, sometimes almost to the horizontal. There comes a time when these branches will not spring back to the upright position after the fruits have fallen, and so these trees will eventually tend to take on the normal, wide-spreading habits of the species.

There are at least six maples in this



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Acer rubrum 'Columnare.' This tree will grow wider as it matures.



ARNOLD ARBORETUM

Acer saccharum 'Temple's Upright,' formerly named *A. saccharum* monumentale. This does not have a central trunk.

Carpinus betulus 'Fastigiata'

ARNOLD ARBORETUM



Fagus sylvatica 'Fastigiata'—always retains its fastigiata habit.

ARNOLD ARBORETUM



narrow group and all of them are good. The narrowest is probably *Acer saccharum* 'Temple's Upright' which has a single central leader. The 69-year-old tree in the Arnold Arboretum is approximately 75 feet tall and only 15 feet in diameter of branch spread. A younger plant propagated from this tree is 40 feet tall and only one foot in diameter! This is so narrow that it is really a freak and has little ornamental value. The 'Newton Sentry' maple is slightly wider in branch spread than the 'Temple's Upright', but it has several main upright branches and no main trunk. *Acer platanoides* 'Erectum' is another narrow clone narrower than *A. platanoides* 'Columnare'. The oldest specimen we have of *Acer rubrum* 'Columnare' is about the widest of all these narrow maples and is still a narrow tree for its size.

Two of the narrowest of these fastigate trees are probably *Populus tremula* 'Erecta' and *Koelreuteria paniculata* 'Fastigiata'. The former was brought to America by the Arnold Arboretum in 1939 from the Botanic Garden of Göteborg, Sweden. Now approximately 18 feet tall, it is only two feet wide, but being a poplar, it is undoubtedly susceptible to several disease and insect troubles and thus cannot be counted on for permanence. The same is true of the other fastigate poplars, which are vigorous growers, but which may succumb to an assortment of troubles.

Koelreuteria paniculata 'Fastigiata' was introduced to America from the Royal Botanic Garden at Kew, England by the Arnold Arboretum in 1941. Our original tree eventually died, but younger trees show a very narrow habit which, in a climate milder than Boston's, might make this tree a respectable addition to the "very narrow" group.

The Sentry Ginkgo is another excellent tree, columnar to narrowly pyramidal in habit, without any serious insect or disease problems. There appear to be several clones about the country which might be carefully investigated with the idea of selecting the most narrow of the male types. Although a few are being grown, it would seem advisable to give these more prominence and for the commercial growers to give more information concerning the heights and widths of the original plants from which scions were taken.

The two narrow hawthorns are interesting and different. *Crataegus monogyna* 'Stricta' is a slow-growing, densely oval mass of twigs and leaves which may be considered to be in this narrow group. *Crataegus phaenopyrum* 'Fastigiatum', on the other hand, is faster growing, with several main branches, mostly from the base of the tree. It originated before 1930 in Durand-Eastman Park of Rochester, New York, but I think it will eventually be in the group with branches bent down to the horizontal from bearing fruits or from the weight of snow and ice, by the time it reaches maturity.

The upright variety of the European Beech, and its corresponding variety of the English Oak, are really two of a kind—excellent upright trees which may grow to a ripe old age and retain their columnar habit. It is interesting to note that, in our experience, at least, eighty percent of the seedlings of *Quercus robur* 'Fastigiata' will result in trees which have the desirable fastigate habit.

The columnar forms of the Tulip Poplar and the Sargent Cherry are excellent as young trees, but unless they have some corrective pruning along the way, may spread wider and wider as they reach maturity.

All Littleleaf European lindens seem to grow better under trying conditions than most other trees. In 1906 Alfred Rehder, of the Arnold Arboretum, sent scions from a narrow tree he observed in Sweden. One of these, now nearly forty feet tall, has a diameter of branch spread of twelve feet. Most important is the fact that this tree has a central leader with lateral branches borne at right angles to the trunk and more or less regularly produced. The lower branches become pendulous, dipping gracefully toward the ground. This was named *Tilia cordata* 'Swedish Upright' by the Arnold Arboretum in September, 1963, and is an excellent tree, especially for city conditions.

There are several elms, all vigorous growers, among which the columnar clones will retain their columnar habit for many years. 'Augustine' and 'Moline' have been two popular favorites among the clones of *Ulmus americana*, and *U. carpinifolia* 'Sarniensis' is an Old World favorite which has performed well wherever it has been used in America.

The *Betula* and *Carpinus* varieties are disappointing. As young plants they are excellent, filled with dense foliage on



ARNOLD ARBORETUM

Betula pendula 'Fastigiata.' The form of this tree would have been retained better if the second trunk (on the right) had been removed when it first appeared. It spoils the entire tree at this stage.

Crataegus monogyna 'Stricta'

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Crataegus phaenopyrum 'Fastigiata'

Malus baccata 'Columnaris' — The branches of this tree will spread out as more and more fruits are produced each year.

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Populus alba 'Pyramidalis.' The popular Bolleana Poplar, but like most poplars, weak-wooded and susceptible to various pests.



ARNOLD ARBORETUM

Prunus serrulata 'Amanogawa'—The narrowest of all the ornamental cherries.

Prunus sargentii 'Columnaris' growing in the Arnold Arboretum.

ARNOLD ARBORETUM



Sorbus aucuparia 'Fastigiata'—among those trees which do not retain their youthful fastigate habit at maturity.

ARNOLD ARBORETUM



upright branches. But in the varieties with long, upright branches originating near the base of the tree, these also tend to grow heavier with age. A young *Betula pendula* 'Fastigiata' was an excellent, tightly columnar specimen for its first seventeen years, but then the tips of the branches became so long and heavy with foliage that they began to spread, reaching for the horizontal position and eventually spoiling the outline of the tree.

Cornus florida 'Fastigiata' is another tree in this same category. Young trees of this clone are nicely upright and narrow, with their major branches coming from the base of the tree, but the original specimen in the Arnold Arboretum was as wide as it was tall (twenty-five feet) when it was twenty-five years old, and so could no longer be considered fastigiata in habit.

Of the evergreens with columnar habits, the narrowest is probably the upright variety of the Italian Cypress (*Cupressus sempervirens* 'Stricta'). Hardy only from Zone 7 southward, trees of this can be twenty feet or more in height, but only a few feet in branch spread. This is the tree so popular in formal gardens of the Mediterranean area. The California Incense-cedar is another narrowly pyramidal, almost columnar tree which has been

***Pinus sylvestris* 'Fastigiata'—an excellent narrow evergreen.**

ARNOLD ARBORETUM



used considerably in West Coast gardens. It is hardier and taller than the Italian Cypress, but is used chiefly on the West Coast, or in the East where the climate is mild and the humidity high.

A narrow evergreen which should not be overlooked is *Pinus sylvestris* 'Fastigiata'. Trees of this at least twenty feet tall are only four feet across at the base, with a narrow pyramidal form tapering to a point at the top. These make truly excellent ornamental specimens and are perfectly hardy in the northern United States. There is a fastigiata form of the White Pine (*Pinus strobus* 'Fastigiata') which starts out as a columnar tree, but as it matures, the branches spread more and more. Old trees may have branches so widely spreading that they approach the diameter of the species.

There are several varieties of the Lawson False-cypress which are narrow in habit, such as 'Allumii', 'Erecta' and 'Fletcheri'. These will probably not reach the great heights of the species (120 feet), but are popular garden plants in the areas where they prove hardy. They just barely exist as far north as Boston, Massachusetts, where sometimes, in very severe winters, they are badly injured.

Finally, the junipers and the arborvitae include several cultivars in this narrow group, but most of the tree types in these two genera tend to be narrowly pyramidal in habit. The Irish Yew (*Taxus baccata* 'Stricta') is a wonderful example of an upright tree, but can hardly be termed columnar at maturity. Old plants indeed are upright in growth, but may be as much as one-third as wide as they are high.

The following list of fastigiata trees is of interest because the measurements were made on trees growing in the Arnold Arboretum. It does not include all the narrow trees grown here, although most of those commonly seen in gardens are included in this list. It goes without saying that trees of the same clones might grow larger (or smaller) in other situations. The heights listed are merely estimates, and the column for "Possible Mature Heights" is the listing for the heights of the species given in Alfred Rehder's "Manual of Cultivated Trees and Shrubs." Many of these fastigiata clones would never reach these heights, if for no other reason than that they might break up before attaining them.



ARNOLD ARBORETUM

Tilia cordata 'Swedish Upright'—
This tree is growing in the Arnold
Arboretum and is 58 years old.

Ulmus carpinifolia 'Sarniensis' —
growing on the campus of Pennsyl-
vania State University at University
Park, Pa.

ARNOLD ARBORETUM



ARNOLD ARBORETUM

Ulmus americana 'Moline'

Chamaecyparis lawsoniana 'Fletcheri'
growing at Kew Gardens, England.

ARNOLD ARBORETUM



However, the figures do have some value as an indication of how these trees perform over the years.

(Note: All trees with ages listed are growing currently in the Arnold Arboretum.)

	Height (estimated)	Diameter of Branch Spread	Age	Estimated Possible Mature Height
<i>Acer platanoides</i> 'Columnare'	30'	16'	39	90'
<i>Acer platanoides</i> 'Erectum'	35'	9'	34	90'
<i>Acer pseudoplatanus</i> 'Erectum'				90'
<i>Acer rubrum</i> 'Columnare'	90'	25'	64	120'
<i>Acer saccharum</i> 'Temple's Upright'	75'	15'	69	120'
<i>Acer saccharum</i> 'Newton Sentry'	75'	20'	42	120'
<i>Betula pendula</i> 'Fastigiata'	32'	10'	20	60'
<i>Carpinus caroliniana</i> 'Pyramidalis'	18'	6'	21	36'
<i>Carpinus betulus</i> 'Columnaris'	30'	12'	30	60'
<i>Carpinus betulus</i> 'Fastigiata'	30'	30'	42	60'
<i>Cercidiphyllum japonicum</i> (one trunk)	40'	15'	18	75'
<i>Cornus florida</i> 'Fastigiata'	25'	25'	25	25'
<i>Crataegus monogyna</i> 'Stricta'	6'	4'	13	30'
<i>Crataegus phaenopyrum</i> 'Fastigiata'	10'	4'	15	30'
<i>Fagus sylvatica</i> 'Fastigiata'	60'	20'	50	90'
<i>Ginkgo biloba</i> 'Fastigiata'	60'	15'	—	120'
<i>Koelreuteria paniculata</i> 'Fastigiata'	9'	2'	5	30'
<i>Liriodendron tulipiferum</i> 'Fastigiatum'	75'	30'	65	150'
<i>Malus baccata</i> 'Columnaris'	12'	15'	10	50'
<i>Malus prunifolia</i> 'Fastigiata'	10'	6'	11	20'
<i>Malus robusta</i> 'Erecta'	10'	6'	11	40'
<i>Malus</i> 'Van Eseltine'	8'	4'	13	25'
<i>Populus alba</i> 'Pyramidalis'	40'	12'	—	90'
<i>Populus nigra</i> 'Italica'	40'	9'	—	90'
<i>Populus simonii</i> 'Fastigiata'	25'	20'	14	50'
<i>Populus tremula</i> 'Erecta'	18'	3'	25	75'
<i>Prunus sargentii</i> 'Columnaris'	15'	10'	29	75'
<i>Prunus serrulata</i> 'Amanogawa'	15'	4'	15	20'
<i>Quercus robur</i> 'Fastigiata'	25'	10'	33	75'
<i>Robinia pseudoacacia</i> 'Erecta'	18'	12'	13	50'
<i>Sorbus aucuparia</i> 'Fastigiata'	25'	15'	13	45'
<i>Taxodium ascendens</i>	30'	9'	58	75'
<i>Taxodium distichum</i>	30'	12'	30	150'
<i>Tilia americana</i> 'Fastigiata'	16'	3'	12	120'
<i>Tilia cordata</i> 'Swedish Upright'	35'	12'	58	90'
<i>Tilia platyphyllos</i> 'Fastigiata'	7'	3'	10	120'
<i>Tilia tomentosa</i> 'Erecta'	6'	3'	6	90'
<i>Ulmus americana</i> 'Ascendens'				120'
<i>Ulmus americana</i> 'Augustine'	30'	15'	15	120'
<i>Ulmus americana</i> 'Columnaris'	80'	25'	41	120'
<i>Ulmus americana</i> 'Fiorei'	15'	1½'	62	120'
<i>Ulmus americana</i> 'Lake City'	80'	30'	33	120'
<i>Ulmus americana</i> 'Moline'	40'	30'	37	120'
<i>Ulmus americana</i> 'Princeton'	40'	30'	29	120'
<i>Ulmus carpinifolia</i> 'Dampieri'	30'	20'	56	90'
<i>Ulmus carpinifolia</i> 'Sarmiensis'	75'	25'	61	90'
<i>Ulmus glabra</i> 'Exoniensis'	7'	3'	13	120'
<i>Ulmus procera</i> 'Viminalis'	12'	4'	13	120'
<i>Evergreen Trees</i>				
<i>Chamaecyparis lawsoniana</i>	24'	8'	65	120'
<i>Chamaecyparis lawsoniana</i> 'Allumii'	6'	4'	11	120'
<i>Chamaecyparis lawsoniana</i> 'Erecta'	20'	8'	24	120'
<i>Chamaecyparis lawsoniana</i> 'Fletcheri'	12'	6'	—	?
<i>Chamaecyparis obtusa</i> 'Erecta'				120'
<i>Cupressus sempervirens</i> 'Stricta'	25'	3'	—	75'
<i>Juniperus chinensis</i> 'Columnaris'	8'	4'	8	60'
<i>Juniperus chinensis</i> 'Mas'	30'	12'	45	60'
<i>Juniperus chinensis</i> 'Pyramidalis'	6'	4'	15	60'
<i>Juniperus virginiana</i> 'Pyramidalis'	30'	10'	62	90'
<i>Juniperus virginiana</i> 'Schottii'	20'	12'	63	90'
<i>Libocedrus decurrens</i>	60'	25'	65	135'
<i>Picea abies</i> 'Columnaris'				150'
<i>Pinus cembra</i>	15'	8'	45	75'
<i>Pinus strobus</i> 'Fastigiata'	60'	30'	67	100'
<i>Pinus sylvestris</i> 'Fastigiata'	20'	4'	—	75'
<i>Pseudotsuga menziesii</i> 'Fastigiata'	6'	3'	12	120'
<i>Taxus baccata</i> 'Stricta'	30'	12'	—	60'
<i>Thuja occidentalis</i> 'Douglasii Pyramidalis'	9'	6'	12	60'
<i>Thuja occidentalis</i> 'Fastigiata'				60'
<i>Thuja plicata</i> 'Fastigiata'				150'
<i>Tsuga canadensis</i> 'Kingsville'	18'	3½'	—	90'



ARNOLD ARBORETUM

Quercus robur 'Fastigiata'*Juniperus chinensis* 'Mas.'

ARNOLD ARBORETUM



Gourds and People

THOMAS W. WHITAKER*

Gourds have had an enduring fascination for horticulturists, ethnobotanists, archeologists, and just plain people. The archeological record suggests that the association between gourds and man has been lengthy, intimate, and probably of mutual benefit. Like corn and some other cultivated crops the white-flowered gourd depends completely on man for its dissemination and survival, since it has never been found in the truly wild state.

Nearly all fruits commonly referred to as gourds belong to the gourd family, Cucurbitaceae. The tree gourd or calabash tree, *Crescentia cujete* L., however, is in an entirely different family, the Bignoniaceae. In this report I shall follow L. H. Bailey's definition of a gourd, namely the hard-shelled durable fruit of certain species of the Cucurbitaceae grown for ornament, utensils, and general interest.

In comparatively recent years gourds have stimulated the production of at least three books,** and there is a thriving Gourd Society of America with its own house organ, "Gourd Seed." The purpose of the present report is to relate some of the little known facts about the history and use of gourds for utensils and ornamentation, and to describe briefly their culture and preparation for use.

Kinds of Gourds

According to the preceding definition of a gourd, fruits properly called gourds fall within the genera *Lagenaria* and *Cucurbita*. This would preclude the use of the term gourd for species having fruits that lack hard, durable rinds such as the vegetable sponge or dish-rag gourd, *Luffa cylindrica* Roem.; the snake gourd, *Trichosanthes anguina* L.; the wax

gourd, *Benincasa hispida* (Thunb.) Cogn.; or the teal gourd, *Cucumis dipsaceus* Ehrenb. Nearly all the gourds used for utensils, ornament, musical instruments, floats, and whistles in the past or at present belong to one or the other of two species, the white-flowered gourd, *Lagenaria saceraria* (Mol.) Standl. or the yellow-flowered gourd, *Cucurbita pepo* var. *ovifera* (L.) Alef.

The shell, or rind, of the yellow-flowered gourd is thin, brittle, and of about the thickness of a sheet of newsprint. Because of the thin rind it is unsuitable for craft work. It can, however, be painted and used as an ornament. In contrast, the rind of the white-flowered gourd may be over one-quarter inch thick. It is tough, extremely durable, and highly fire resistant.

There are a number of cultivars of the yellow-flowered gourd based mainly on shape and skin color. Common examples are 'Pear Gourd', 'Orange Gourd', 'Bell Gourd', 'Nest-egg Gourd', 'Spoon Gourd', 'Bicolor Gourd', and 'Warted Gourd'. There are a number of cultivars of the white-flowered gourd based entirely on shape. Some common ones are 'Dipper Gourd', 'Hercules Club Gourd', 'Powder Horn Gourd', and 'Kettle Gourd'. A cultivar with long, slender fruits, circular in cross-section, is used for food in some countries. It is prepared for the table much as summer squash is used. One of the odd forms of the white-flowered gourd is the cultivar 'Maranka' or 'Dolphin Gourd'. It is characterized by elevated ridges or wrinkles over the belled portion of the fruit.

Origin and Archeological History

The yellow-flowered gourds have no archeological history. Their use for ornamental and decorative purposes is thought to be a comparatively recent development. This is not true of the white-flowered gourd. Its use by man is well-documented from perhaps as many as thirty or more archeological sites in the

*U. S. Department of Agriculture, ARS, Crops Research Division, La Jolla, California.

**Bailey, L. H. 1937. The garden of gourds. MacMillan Co. 134 pp.

Dodge, E. W. 1943. Gourd growers of the South Seas. Ethno. Ser., Gourd Soc. Amer. No. 2. Boston.

Organ, John. 1963. Gourds—Decorative and edible for garden, craftwork, and table. Charles T. Barnford Co. 189 pp.



Boxes of assorted yellow-flowered gourds, showing several warted forms.

A large kettle-shaped gourd on the left and a resonator used for a drum on the right. In the background, "gourd" is spelled out by training one of the long, cylindrical cultivars into the appropriate letters of the alphabet.



Western Hemisphere, and its cultivation extends backward in time at least 10,000 years.

Most authorities assume that the white-flowered gourd is a native of the Old World, probably Africa. Meeuse cites some records of this plant from South Africa taken at locations where escapes from cultivation would be most unlikely to occur. These observations suggest that *Lagenaria siceraria* is a wild plant in South Africa; however, the evidence is by no means conclusive.

It seems odd that although most botanists agree that *Lagenaria siceraria* is probably from Africa there is only one recorded archeological specimen from the Old World. Schweinfurth identified a "shell" of *Lagenaria* obtained from an Egyptian tomb, dated at the time of the 5th Dynasty (about 3500-3300 B.C.). There are reports that the gourd was cultivated in Greco-Roman times, and presumably there was a Sanskrit name for the gourd. The significance of these reports is difficult to evaluate and more critical information is needed before they are generally acceptable.

If we assume that *Lagenaria siceraria* is indigenous to Africa, there immediately arises the problem of how it was introduced into the Americas before "the discovery" in 1492. Dr. G. F. Carter and I have conducted experiments with these gourds that demonstrate they will float in sea water for over one year. The seed, moreover, retains a high degree of viability after such periods of immersion. Oceanographers inform me that current and wind velocities are such that at least 145 days, with some qualifications, would be required for a floating object to reach the coast of Brazil from tropical Africa. Reasoning from this information, gourds could have reached the Americas without the intervention of man. This does not deny the possibility, however, that a pre-historic voyager carried a gourd with viable seed in his primitive canoe when he first landed on the shores of the New World.

At the vast midden of Huaca Prieta located on the north coast of Peru, Mr. Junius Bird, of the American Museum of Natural History, recovered an enormous quantity of plant materials. Among

The 'Dolphin' or 'Maranka' gourd.





An assortment of pre-historic gourds showing numerous uses: water bottle, work basket, stimulant container, liquid container, and bowls. The bowl on the extreme right (lower photograph) shows a very fine pyro-engraving of a bird.

them were many well-preserved specimens of *Lagenaria*. Most of these materials were dated at about 3000 B.C. The specimens were sorted into four broad categories based upon use: (1) containers; (2) fish-net floats; (3) discs of unknown use; (4) scoops or ladles. This immense collection of materials cannot help impressing one with the importance of the gourd to primitive civilizations, especially before the invention of pottery.

In later civilizations that developed along the coast of Peru, the use of gourds attained a high degree of sophistication. Gourds were made into water bottles, work baskets, containers for

stimulants, and other utensils. Some were so valuable that broken ones were repaired by lacing them together with cotton cord. The remarkable symmetrical, intricate, and beautiful designs traced on the gourds by pyroengraving and carving is certainly an indication of the advanced craft work of these people. The designs frequently depicted animals, generally birds.

In North America the use of gourds by man was shown to exist as early as 7000-10,000 B.C. in plant material collected from an archeological site near Ocampo, Tamaulipas, Mexico. In central Mexico near Tehuacan, Puebla,

Mexico, we found specimens of gourd rinds in strata shown by radiocarbon methods of dating to be about 7000 years old (5000 B.C.). In the American Southwest and northern Mexico, gourds were plentiful and apparently the universal household utensil prior to the coming of the Spaniards. They are found in pre-Columbian sites throughout the Southwest and as far north as Nebraska, South Dakota, Iowa, Illinois and eastward into Kentucky. The record suggests that the white-flowered gourd was the first cucurbit to be used by man in the Americas.

Culture of Gourds

The culture of gourds is similar to that of muskmelon, watermelon, pumpkin, squash, and other cucurbits. They are frost-tender plants requiring a frost-free period of 140 days or even more to mature fruit. In the United States all except the northern tier of states bordering Canada are suitable for gourd culture. Artificial arrangements can be made to lengthen the growth period. Thus, frost damage can often be avoided by planting outdoors under glassine paper covers, or in coldframes, or in greenhouses. If the last two methods are used, transplanting to the field is necessary after the danger of frost is over.

Almost any well-drained soil in good tilth is suitable for the culture of gourds. Sandy loams are preferable. The pH of the soil should be neutral or nearly so.

Gourds grow rampantly and are voracious feeders; for this reason they should be generously supplied with plant nutrients throughout the growing season. Unless the gardener is acquainted with the responses to be anticipated from his particular soil, the application of a complete fertilizer is suggested. Often the county agent or farm advisor has the information needed to make specific recommendations.

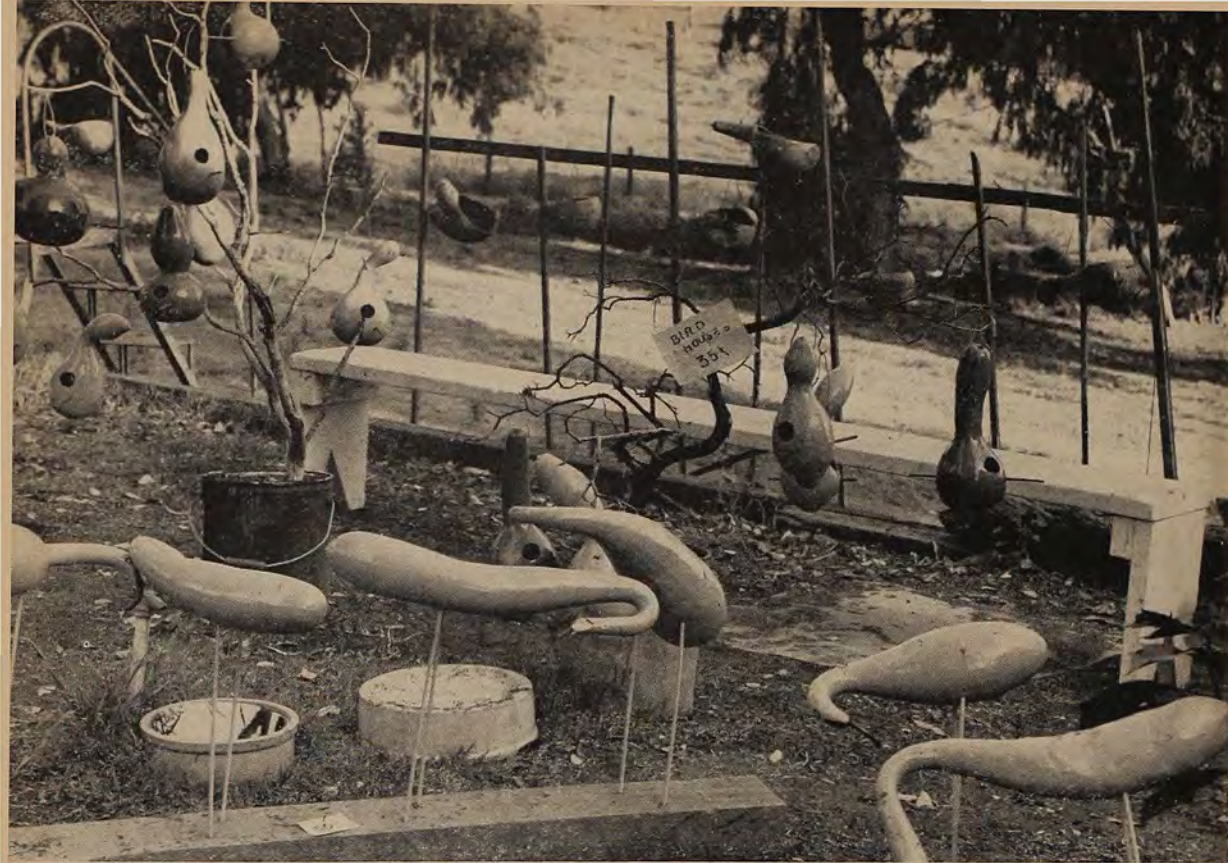
Like most other cucurbits, gourds are normally planted in hills, $\frac{1}{2}$ inch to $1\frac{1}{2}$ inches deep, and thinned to one or two plants per hill. They grow vigorously and occupy considerable area; hill spacings 6 to 8 feet apart are usually adequate. An excellent place to plant gourds is adjacent to an arbor, trellis, or fence. The vines can be trained to cover these structures. Thus better quality fruits can be obtained because they are given some support and are not in direct contact with the soil. For best results a steady source of moisture is indispensable. If irrigation water is supplied it should not be in such quantities as to waterlog the soil.

Diseases and Insects

Like all cucurbits, gourds are subject to destructive damage by several leaf diseases. The yellow-flowered gourd is susceptible to attack by the powdery mildew fungus, *Erysiphe cichoracearum* DC. Under optimal conditions for the

An assortment of white-flowered gourds tossed into a rack for curing.





A medley of gourds made into bird houses and bird feeders. Those in the foreground will be painted to resemble flamingos.

disease it will frequently defoliate the plants and severely reduce the quantity and quality of the crop. The white-flowered gourd is not nearly as susceptible to the disease as the yellow-flowered gourd. The fungus does not sporulate freely on the foliage of the white-flowered gourd. For this reason it is easier to control. Sulphur or Karathane applied as dusts or liquids will control the disease depending upon the timeliness, coverage, and spacing of the applications.

Downy mildew, *Pseudoperonospora cubensis* (Berk. & Curt.) Rost., another serious leaf disease, often attacks gourd plants. If the season is moist, with prolonged periods of high humidity and high temperatures, the plants quickly become completely defoliated with consequent damage to the crop. There are no really effective means of controlling the disease. If the vines are spread apart so that the foliage receives plenty of aeration, less damage is likely to occur.

A number of virus diseases attack gourds; the most common are cucumber mosaic, watermelon mosaic, and squash

mosaic. Cucumber mosaic and watermelon mosaic viruses are transmitted by aphids, usually the melon aphid or green peach aphid. These viruses are not carried through the seed. On the other hand, squash mosaic is carried by the seed. It is transmitted from plant to plant by cucumber beetles, squash bugs, and other insects with chewing mouth parts. There are no effective controls for watermelon and cucumber mosaics, but squash mosaic can be controlled by planting seed free of mosaic virus and by taking vigorous measures to reduce the cucumber beetle and squash bug populations.

Among the most destructive insects with which the gourd grower has to contend are cucumber beetles. At least four species of these ubiquitous pests attack cucurbits. As a rule only one or two species are present at one time. The larvae or grubs attack the young seedlings at the soil line, and often kill the plants. The adults feed on the foliage, and in addition to causing the primary damage they may infect the plants with one of

the squash mosaic viruses. Malathion dusted on the foliage will control the adults.

Aphids are a persistent hazard to the gourd grower. The melon aphid is the most common one on gourds, but the green peach aphid can also be a damaging pest. Aphids are apt to develop in colonies on the underside of the leaves on the young, tender shoots. The leaves curl and become sickly, and if the infection is severe the entire plant will be stunted. In addition to the primary damage, aphids are vectors of both the cucumber mosaic virus and watermelon mosaic virus. A number of insecticides will control aphids if applied before the leaves commence to curl. After the leaves have curled into a tight knot, the insects are protected and difficult to kill because the insecticide cannot be brought into contact with them.

Preparation of Gourds for Craft Work

Gourds should be allowed to remain on the vines as long as possible. Immature gourds are apt to shrivel and decay shortly after they are harvested. It is a good idea to leave the fruits on the vines until they are killed by frost. In frost-free areas the vines usually deteriorate about the time the fruits are mature. Gourds should be severed from the vine with clippers or shears, leaving most if not all of the peduncle attached to the fruit.

After harvest the gourd should be placed in dry, well-ventilated bins or racks to cure for a month to 6 weeks or even more. When cured they are prepared for lacquering, varnishing, or painting by thoroughly scouring the surface to remove the thin epidermal layer. The white-flowered gourds are placed in a water tank and forcibly sub-

merged for several hours to soften the epidermis. After this treatment they are scrubbed with fine steel wool. They are easily cleaned by the combined water and steel wool treatment. Next they are dried, and when thoroughly dry are polished with fine-grade sandpaper. At this point they are ready for working. In contrast to the white-flowered gourds, the yellow-flowered gourds are simply washed to remove dirt and grease, and dried. They are then ready for varnishing, lacquering, or painting.

Before gourds can be used for craft work, an opening must be made through which the seeds and dried remains of the placenta tissue can be scooped out. A sharp knife blade is a good tool for this purpose. Usually the opening is made so that it can be replaced without damage to the shell. Tools for craft work are few and simple. A sharp knife, preferably a jack-knife, a small, pointed, thin-bladed saw, and a few paint brushes are essential, but no other tools are required. Some of the articles that can be fashioned from fruits of the white-flowered gourds are shown in the photographs.

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Some Trees and Shrubs of the Southeast

ELIZABETH LAWRENCE*

For many years I have tried to grow all of the available flowering trees and shrubs native to our area, but not always with success, for some of the most beautiful kinds are difficult at best, especially in a small garden where conditions do not meet their needs.

A tree that I have never been able to establish is the Mountain *Stewartia*, *Stewartia ovata*, though I read of it in Northern gardens where it blooms in July, and is hardy to Zone V. (All references to hardiness are taken from Dr. Wyman.) *Stewartia malacodendron* of the Coastal Plain, is hardy to Zone VII. Although it has a name for being difficult in cultivation, I have known of it in several Southern gardens near places where it grows naturally, and I have seen it in bloom in the woods in early May. The flowers are creamy white with wine colored stamens. I measured flowers four inches across, and the tallest tree I saw was twelve feet. For a long time there was no source for this species, but it is in the recent catalogues of the Tingle Nursery Company, Pittsville, Maryland.

Yellow Wood, *Cladrastis lutea*, is a large tree of the high mountains of North Carolina and Tennessee, that is hardy to Zone III. The only time I have ever seen a mature specimen in full flower, was at the Brooklyn Botanic Garden late in May. The small pea-shaped flowers are pearly white with bright green calices. They are loosely strung in slender, delicate racemes—more beautiful even than white wisteria. Unfortunately it is not a tree that blooms freely when young. I knew of one that bloomed a little after seven years, but I have read that they do not bloom well until fifteen or twenty years old. Mine has been growing in the garden for twelve years, and has produced one small panicle so far. In the meantime it has grown to a height of about twenty-five feet, with an almost equal spread, and if it gets to fifty feet, as Hortus Second says it does, it will take up most of my garden. It is a graceful

tree with a dark trunk (double from about three feet from the ground) and dark branches, and large compound leaves that are bright green in spring, and bright yellow in fall. The tree is called Yellow Wood because a yellow dye is extracted from the hard wood. It comes from limestone country, and rich moist mountain slopes, but seems to adapt itself to any soil, even a dry one.

The Clammy Locust, *Robinia viscosa*, is another member of the pea family that is endemic to the high mountains of the Carolinas and Tennessee, and hardy to Zone III. It is a delightful little tree with fine leaves and short racemes, to $3\frac{1}{2}$ inches long, of mallow-pink flowers. In my garden it grew to twelve feet the first summer and must have been from fifteen to twenty feet tall when it was crowded out by some bamboo, eight years later. It bloomed profusely the first of May, and again very freely in July and August. If the suckering can be controlled, I cannot imagine a more pleasing tree. If left to itself it makes a thicket.

Robinia kelseyi (hardy to Zone V) is a formless sort of shrub to something like twelve feet tall, but probably less. I planted it under a pine tree, and in April the phlox-pink flowers were so pretty that I left it until it had almost taken over, and then I had a time getting rid of it. I can't see that it is superior to *Robinia hispida*, and it is equally invasive. Both bloom such a short time and are not at all attractive when out of bloom.

One of our best contributions to gardens is a pair of shrubby horse-chestnuts: *Aesculus parviflora*; the Bottlebrush Buckeye, and *A. pavia*, the Red Buckeye. Both have conspicuous flowers and deep green, palmately divided leaves. *A. parviflora* is another shrub that suckers freely, but the suckers stay close to the plant instead of wandering over the garden. The shrub is usually not more than six feet tall, but it increases a little in girth each year, and continues to

*Charlotte, North Carolina.

spread to a width of 15 feet or more. It blooms in my garden about the middle of June, and a month later in the North. Creamy sixteen-inch spikes of long-stamened flowers stand above the foliage like enormous candles, or like fox-tail lilies. I don't know how hardy *A. pavia* is, but mine came from Kingsville, Maryland, and I see by the Plant Buyer's Guide that it is grown in nurseries on Long Island, in Connecticut, and in Cincinnati, Ohio. Mine was sent out as the variety *humilus*, which is described as very low, almost prostrate at times, but in fourteen years it has grown to a height of ten feet, and is more of a tree than a shrub. It blooms for about three weeks in late April and early May. The eugenia-red flowers are in erect panicles to ten inches long. Children and livestock are poisoned by eating buckeyes, but chipmunks carry mine off, and Indians are said to like them roasted.

Hydrangea quercifolia is another shrub handsome in flower and leaf. It is easily grown and will stand considerable shade, but it is native to the Far South, and is not dependable for flowering north of New York though it is root hardy to New England. It blooms here in late May.

When I planted the Silver-leaf Hydrangea, *H. radiata*, of the Carolina mountains many years ago, it died without flowering, and I have not been able to try it again as it is not in the trade at present. Mrs. Lounsbury says the mountain people call it ninebark, because the bark peels off in layers.

One spring I happened to be in Asheville when Mr. Crayton, an old mountaineer who knows every leaf and blade from Virginia to Florida, had just come back from a collecting trip, and he let me have a small plant of *Pinckneya pubens* dug from the margin of a Georgia swamp. I did not suppose that it would live in my dry garden, but it did, and in three years it grew to five feet tall, and began to bloom. For the next ten years it bloomed beautifully, but for the last two, whether it is suffered from the loss of a sheltering pine, or from unusually severe winters, or both, the flowers and foliage have been sparse. The beauty of the tree is in the enlarged calyx lobes, which are sometimes three inches long, though usually less, and of a bright clear pink (H. C. C. 21/2). They begin to

color the last week in May, or early in June, while the small speckled flowers are still in bud, and they are effective for about six weeks. The leaves are large, to seven inches long, and of a bright calla green in summer, and golden yellow in fall. I don't know how hardy *Pinckneya* is, but Mr. Hohman told me some time ago that a small plant had wintered at Kingsville. Since it has grown so long in my garden under the least favorable conditions, I should think it would be worth while to try it in rich moist soil and part shade at least as far north as Baltimore.

The Foam-climber, *Decumaria barbara*, grows in swamps with *Pinckneya*, and Tupelo and Cypress, and it also grows on a wall in my garden, in a very dry place, though it would appreciate a damp one. It is evergreen on the Gulf Coast, and might be here in a favorable situation, but mine loses its leaves in midwinter. The leaves are large and lustrous ovals to five inches long, and of a bright yellow green. Small creamy flowers in frothy corymbs come into bloom the latter part of May. *Decumaria* is said to be hardy to Boston, but I should think where it is at all doubtful, it would be better to plant its relative, *Hydrangea petiolaris* instead. For the South it is a handsome vine, climbing by aerial rootlets to thirty feet on trees, but on the garden wall it has become shrubby.

Two more or less evergreen shrubs of the evergreen shrub bog will grow in drier places. Titi (or Leatherwood), *Cyrilla racemosa*, is a tree to thirty five feet in the Pocosins, but in my very dry garden it has grown to little more than six feet. I thought it would be valuable because it blooms in July, but the narrow racemes of small white flowers are rather dingy. They are something like those of the Sweet Pepper Bush, only not fragrant and not so pretty—especially not so pretty as *Clethra acuminata*, a species of the Southern mountains, which also blooms in July. Titi leaves turn red in the fall, and sometimes in the garden they persist through the winter and are still pretty in January. Titi is said to be hardy to Zone V. Mine came from Kingsville, and it is listed in the current catalogue of the Upper Bank Nurseries, Media, Pennsylvania.

In cultivation the Loblolly Bay, *Gordonia lasianthus*, does not grow to be a large tree as it does in swamps.

Those I have seen in gardens are slender shrubs. I have learned that they need shade. One lived for some years, in my garden, and bloomed all through July and August, and again in the fall; and in winter there were always a few bright red leaves. The large round buds are as pretty as the silky white flowers, which are nearly four inches wide, and very like those of the *stewartias* (their relatives) but with more substance. *Gordonias* are extremely difficult to transplant, and I have been successful only with plants grown in containers.

Poison Bay, *Illicium floridanum*, comes from the swamps of Florida and the Gulf States, but is hardy in Zone VII. It will grow in dry soil, but in my garden it is the first plant to wilt in dry weather. As soon as I see its leaves drooping I begin to water. The leaves are aromatic, but the many-petalled, oxblood red flowers, are foetid. Their scent give it the name of Wet-dog Tree. In the Mississippi Market bulletin *Illicium florida-*

num is advertised as Red Magnolia.

Leucothoë populifolia, also from the Florida swamps, adapts itself perfectly to dry shady situations, and is one of the best evergreens in my garden, where it is a shrub to six or eight feet with an equal spread. In late May the slender arching branches are crowded with cylindrical flowers that look like tiny milk-glass bottles beneath the neat double rows of narrow acuminate leaves. The shrub is sometimes called Pipewood, because the hollow stems are used for pipestems. *Leucothoë populifolia* is less hardy than *L. fontanesianum* (*L. catesbaei*) but it must be satisfactory at least as far North as Pennsylvania, as it is listed by the Upper Bank Nurseries.

I try so many native plants in my own garden without ever hearing what they do in other parts of the country. I should like very much to hear from anyone who grows these, or other Southern plants, or who knows what they do in other parts of the country.

A Preliminary Look at *Zephyranthes* and Kin

B. Y. MORRISON*

Because the writer discovered that the effects he could have in his northern garden with small bulbs could not be duplicated in this southern garden, it seemed necessary to discover if there were other bulbous plants that could simulate the effect, even if not completely to our liking. Because the commonest of all *zephyranthes*, that has been known in commerce as *Zephyranthes carinata*, *Z. rosea*, and now properly is *Z. grandiflora*, was an old and established plant here with annual bloom and a few others were fairly common in the area, chiefly *Z. candida*, it seemed a logical conclusion that others might do as well. This has not been completely demonstrated as yet, but there are several possible sources of error that must be examined before the veto is given to many kinds that are beautiful and well worth growing where they are suited.

For some, the matter of cold hardiness must take first place if one means to plant them permanently, and not treat

and store over winter. From some correspondents, a mulch has been suggested and one at least suggested deeper planting.

Next, one should, indeed must, consider the pH of the soil, particularly for all that come from any area other than the Eastern Coast regions. This preference for soil, that is beyond the neutral point up to pH's as high as 8 or 9, limits perhaps, their free use in this area, where the normal soils are from neutral to acid, and in this garden are kept so for the benefit of many acid loving plants.

In nature, this alkaline soil is often, if not generally combined with a climate that is best described as a wet-season, dry-season climate. While we here often have periods of alarming drought, we also have periods of excessive rainfall, not all of which is compensated for by the swift drainage that follows on this sandy soil.

Without realizing all of these factors, the earlier work with trial plantings re-

*Pass Christian, Mississippi.

sulted in as many failures as successes. In addition, the severe winter of 1962/63, played havoc with many kinds that were in pots in a cold frame, that was not sufficient protection, when the temperatures dropped to 8° F. Freezing worked not only on the top of the pots, but from the sides as well. Neither sash nor mats were sufficient.

The bulbs here have come from many sources, bought whenever this was possible, some gifts, some shamelessly begged and a few collected, but most were gifts from fellow gardeners who are as keen or keener than the writer.

The soil mixtures in pots were modified by the addition of large amounts of crushed clam shells, the easiest source of lime in this area, as these shells are the common cover for drives and paths. They are small, easily crushed and make a durable surface. The other usual ingredients, bonemeal, a touch of complete fertilizer and a very little peat, were in the usual basic sandy loam of the area.

The family is in a state of transition, as regards taxonomy, as several scientists are working it over, and in time the complete revision will be available so that the names used in this paper, which are no more than the currently used names in commerce, will be altered. The genus *Cooperia* will disappear into *Zephyranthes* for reasons that seem sound enough to taxonomists, but of little importance to gardeners who are considering only the gross visual effects of their plants. There may be other alterations in specific names of *Zephyranthes* itself.

One may be more than impatient for all this, for there are many new plants coming into the market, mainly through the activities of Dr. Thad. Howard of San Antonio, but nobly supplemented by the work of Mr. and Mrs. Morris Clint of Brownsville, who have been indefatigable in collecting and growing and sharing, from the trips through Texas and Mexico; from the studies of Drs. Flory and Flagg, until recently at Blandy Farm, Boyce, Virginia, who have done some collecting as well. In time there may be other finds through the collecting of Dr. S. S. Solymosy, of Lafayette who has collected under the auspices of the Louisiana Society of Horticultural Research. Other names probably should be included as among the collectors, chiefly Mr. Fred B. Jones of Brownsville



Dr. Howard's 'Karankawa' upper left. Center: 'Clint 412,' white with faint pink line along center of outer segments, deep green at base of tube.

Lower left: *Z. clintiae*, one of a "complex" showing a considerable range of colorations. The flower drawn was a clear "Rose Red" of Ridgway, but there are many paler forms.

Lower right: *Z. 'Clint 410,' white faintly veined with pink, paler than Rose Pink.*

3/5 natural size

and several California growers whose names have not come to the writer, but growers rather than collectors. From the above it will be seen, that most of the activity has been in the wet-season, dry-season areas and not much in the eastern parts of the country which may be less varied but at least provides the spectacular *Z. atamasco*.

All newly bought or otherwise acquired bulbs are potted in the mixture outlined before, not to protect them altogether, but to be certain that there are

no mixtures of bulbs. This method makes it easier to control seeds, that fall quickly from the capsules when ripe and as the scapes usually fall over, such seeds

Upper left and the single flower immediately below it, Cooperia smallii, Pale Lemon Yellow (Ridgway). Upper flowers from different collection than lower showing the range of form.

Upper center: 'Lolita' Dr. Howard's, "small coppery yellow."

Left center; and openface below: Habranthus texanus. Fine strong yellow with coppery red markings.

*Bottom: Z. citrina, golden yellow.
3/5 natural size*



could easily fall into an adjoining clump in the garden, but pots can be and are spaced enough and watch is kept that the pods are turned so their seeds will fall into the pot to which it belongs, if the seed is to be saved. This done only for such plants as are believed to be species. Each pot has a metal label with the name of the plant, the source and the number of bulbs planted.

Under the present plan, all such are kept in the cool greenhouse until they are established and then are taken into the open frame in summer. This is in an area where sun falls on it from about 8 in the morning till 4 in the afternoon. It is possible that this is not enough!

Seeds are sown on screened sphagnum over the proper soil mixture and if fresh germinate with alarming rapidity, at any time of year when sown. In the earliest sowings a drastic mistake was made in having too much peat in the mixture and of sowing the seeds too thickly. The peat freed itself from the mix and made a layer close under the sphagnum, and the seedlings damped off as if by fire. A stupid mistake to make but not repeated! The next step in deciding the best method of transplanting the seedlings for growing on to flowering will have to be determined this summer as obviously not all can go into the open beds unless some better method of making and maintaining a proper and suitable pH can be worked out. By raising the level of the beds above the natural soil levels drainage can be accentuated and sites can be chosen where there will be full sun, when we have sun. Nothing can be done to mitigate a week of rainy days.

As the frames were in some need of repair, all potted bulbs were taken into the cool greenhouse this past winter, 63/64, and were kept on the floor where they had only partial sunlight during the middle of the day. Undoubtedly less than was ideal. In spite of this, practically all pots are now (March 1964) filled with what appears to be luxuriant foliage and on the soil shows, not only the bits of shell of the mix, but the as yet undissolved pellets of phosphate that have been added. As soon as the frames are in order, all will go outside again, but labor is difficult to find here, and the date of the emergence may have to pre-date the repairs!

In the garden proper, the following species seem to be permanent, and in

most cases happy in their situations. Those that might be bettered are noted under each descriptive note.

The only eastern species that is growing here, is the old and well known *Z. atamasco* which presents no problems as it is completely deciduous, sends up its foliage early in the year and after blooming ripens off and disappears until the following spring. The flowers are large, white and usually erect, so that the lily-like form is well displayed. The only loss during the period came to a selected bulb with extremely well flowered style of bloom, that was frozen when the potted bulb was in the frame with insufficient protection.

With this type of plant, there is no recurrence of bloom as there is with many other species and garden forms. When one has an adequate supply, the effect in the garden is striking. After the winter of 1962/63, our clump did not flower at all, and this spring after the milder winter of 63/64 there is as yet only a great mass of light yellow green foliage, although at this writing (March) the season is not far advanced.

In the sequence of bloom, after the 1962/63 winter with its lows of 8° F, 10° F, and 7° F the first to bloom in 1963 was *Zephyranthes insularum*, as it grew in the pot, not in the garden proper. In the open its growth has been irregular here, with considerable leaf damage, from frosts and resulting weakness of growth. The leaves are dark green, tend to curve so that they make a mass on the ground, and the scapes overtop them about four to six inches, each scape bearing a smallish white flower, with some pink tinting on the backs of the segments, and a hint of green deep down in the throat inside. This is usually reported as cold tender, and while never killed outright here, does not appear to be entirely successful as compared to other more vigorous kinds.

The second plant to flower was 'Jacalá Bicolor' (Clint 618) a kind without botanical baptism as yet, but a charming thing. The base color here is a pale yellow of the fugitive type, with washes of color from the tips downward, a brilliant red which varies in degree and extent. In a 1964 listing, separate clones are designated, with more intense coloring, and others with little or none. In the bulbs flowered here, the red showed chiefly at the very tips, but Mrs.



Upper left: 'Peachy,' upper right, 'San Antone' a Howard hybrid of *C. smallii*, "coppery yellow approaching orange at times."

Center: Kitty Clint, a near white, the pale yellow being perishable. The same flower form appears in Dr. H.'s 'Pink Ice.'

Lower left: 'Clint M-22,' a member of the 'Clintiae complex' with flowers *Amaranth Pink* of Ridgway.

Lower right: 'Clint M 460,' white with faint suggestions of pink shadings. 1/2 natural size

Clint writes that "it is variable in nature as (she) has collected and grown not only the red-tipped form with bright yellow in the throat, but others with rose flushing, some bordered with rose red, some presumably apricot or orange all over." Whatever color one has, the plant is a nice thing with some recurring bloom here, outside its presumably best range. The foliage is narrow and not showy, but does hold into cold weather.

How it will persist when planted in the garden, remains to be proven.

The runner-up in flowering was another Clint collection, a *Cooperia*, known now as Clint 292. This has flowered well, and for several weeks from a stand of narrow, dark green leaves, with taller scapes, and blooms that open in the late afternoon or evening. These usually last several days unless the temperatures are too high. It has recurring flowering through the summer, and appears to be a plant that will multiply rapidly from offsets. The astonishing thing about its

bloom is the great length of the perianth tube, which can be seen in the drawing. As yet no seed has formed here, but Mrs. Clint reports that it will seed sparingly, if hand pollinated.

In a local garden and yard here in the Pass, there is a plant, that seems identical with this to the writer's inexperienced eye. No one has any idea when it was planted or whence it came. This local form, if it is the same, seeds prolifically, increases from the base with innumerable offsets, flowers intermittently all summer, after each rain, when these are widely separated in time. The location is on very sandy soil with bulbs growing in mixed turf, and receiving no garden care. As with the Clint 292, the flowers are late blooming and pleasantly scented.

The runner-up was another Clint collection, a nice *Zephyranthes* offered in trade as Clint 375. The blossoms are relatively small, as compared to the largest kinds, but large enough for show. The color is a clean rose pink, and the blooms are freely produced. It seeds freely and the young seedlings grow on well. If this likes our situation, it should make a good rival to *Z. miradorensis*, which will be described later.

Just after these three, there were blooms on two more Clint collections, flowering here for the first time; *Habranthus immaculatus*, (Clint 456) and *H. sp.* (Clint 829). The first has large flowers of shining white that is accented by the deep green base on the outer side of the tepals. Mrs. Clint writes that the flowers in nature vary in size, but the bloom here was as large as that of the familiar *Habranthus robustus*. The bloom from Clint 829 was a clear yellow that did not fade in the sunlight, but unfortunately no color chart reading was taken. The bloom is smaller than that of *H. immaculatus* more nearly that of most *Zephyranthes*, and of the same crocus-like shape. There are bulbs in the collection of another species, *H. concolor* (Clint 424), that have not yet bloomed. The flowers are said to be the same as those of *C. smallii* a very dependable bulb here, self-sowing and flowering repeatedly all through the year when warm weather prevails. This species is often offered in trade as *Z. smallii* the correct named under the new concepts. The yellow of *Z. smallii* is perishable,

Upper left: 'Alamo' 'Dr. Howard's,' 'clear ink.'

Upper right: 'Apricot Queen,' Dr. Howard's "clear apricot with yellow center."

Center: to show face of 'Alamo.'

Lower left: 'Clint M 499,' my only note is flowers yellow.

Lower right: *Z. pulchella* 'Oso,' Lem-on Chrome of Ridgway. 1/2 natural size



fading to near ivory. Although this has accepted garden conditions here, and self sown as noted, Mrs. Clint reports that in nature it often is found in places that are almost flooded in the spring blooming time.

After this first flush of early blooms, there were more and more simultaneous flowerings, so that no precise order can be given.

Many of Dr. Howard's hybrids appeared in this period, some of which are shown in the drawings. These included, 'Prairie Sunset', which seemed a pale sunset here, though the fine hues of yellow, pink and apricot are fine enough. 'Apricot Queen', with color to suit the name 'Karankawa', a curious pink, said to be a *Cooperia* hybrid, showed flowers that often lacked the symmetry of other blossoms; 'Peachy', a very nicely formed smaller flower, but very prolific, and repeating, gave colors that resemble the inside of a fine canteloupe; and the last of this group, a selection of *Z. pulchella* offered as 'Oso', to indicate the location of its collection. This is a non-fading yellow, much like the color of *Z. citrina*, another non-fader, but brilliant. It is reported that this was originally collected by Fred B. Jones, who is another special collector and botanist concerned with *Zephyranthes*.

Others of Dr. Howard's hybrids had bloomed in the greenhouse before the unhappy move to the frames, and the drawing of 'Kitty Clint' was made in 1962. The drawing shows the type of bloom, which is also that of 'Pink Ice', of which there was also a bloom in the greenhouse in 1962. 'Kitty Clint' is a pale yellow so pale that it looks ivory with age of one day; 'Pink Ice' is as pale a pink as the other is yellow. Neither survived the ordeal of freezing in the winter of 1962-63, but as they were in pots this may not be as safe reading.

Other Clint collections had bloomed in the greenhouse in earlier years, and some of the drawings show blooms from such.

Among them is a group known to the inner circles as the *Clintiae* complex. This is represented in the drawings by *Z. clintiae* "red" which is often taken as the typical form for garden use. This is shown in the fashion in which the flowers are usually carried although as the flower matures, the petals separate and spread more widely.



Left: *Cooperia* sp. 'Clint M 292' dazling white, marked by the long slender tube; the scapes are often twelve inches tall from ovary to ground.

Lower center: This is the flower of the *Zephyranthes* introduced as *Z. sp. Valles, Mexico*. Flowers a pale yellow that lightens the second day.

Right: *Habranthus immaculatus*, drawn from a photograph lent by Mrs. Clint to supplement my notes. Pure white, with deep green at base of tube. Mrs. Clint has photographs showing other blooms with segments more widely spread but the bloom here, was of the type shown. The flower as drawn is probably not quite natural size.

3/4 natural size

These are all important for the record, as they show the diversity of form and size that may be had from the *Zephyranthes* still to become common in gardens, and to a degree how they differ from the forms of such as we do have in gardens now.

The losses in the garden proper followed the expected patterns. *Z. grandiflora* which has fine, large rose pink flowers and more or less evergreen leaves, had given poor bloom after the cold winter of 62/63, quite contrary to the usual performance. The plant we have as P.I.

**Uppermost and left, the common
*Z. grandiflora***

**Right: *Z. miradorensis*
About 1/2 natural size as reproduced.**



116289, is dependable for crop after crop of fine pale pink flowers with a white star like a pattern in the throat. Dr. Flory wrote that this matches *Z. miradorensis* as he collected it in Mexico. Here, the plant self-sows freely and the seedlings come to maturity without special care. *Z. rosea* survives only in a few places and does not even approximate its appearance farther south. Nelson's 8-2-A, more commonly known among gardeners as 'Panama Pink' is quite dead.

Z. citrina seems not to be reduced in numbers but only in vigor. There were few flowers in 1963, but more as the season developed. The very common (here), *Z. candida*, like the last with evergreen foliage, suffered a comparable reduction in vigor, in the common form and in the finer form reported as from the Argentine. These bloom in late summer only.

An old garden hybrid, 'Ajax' has grown well in the garden for many years, and has seeded sparingly, but this is not an advantage, as the resulting seedlings as might be expected, rarely reproduce the 'Ajax' itself, but various modified plants, some with yellowish blooms, never as yellow as in the parent *Z. citrina* and none pure white as in *Z. candida*, but various in between hues, and various shapes, not one so far of any value. The foliage is slender, and more or less evergreen, but not enough so to be counted upon.

The pale yellow zephyranthes that made its debut in trade as *Z. sp.* 'Valles' from Dr. Howard has done better than usual, with several crops of its pale yellow flowers that fade to near white in sun and a fine recovery of its foliage that was frozen completely. If one had this by the hundred, it could be a fine sight and as it seeds freely, this should be easy.

Careful watering has brought up signs of life on Dr. Howard's 'Ruth Page' which flowered sparingly last summer, with blooms that suggest a smaller *Z. grandiflora*. This lost its leaves again in the winter of 63-64 but at this writing is coming back well.

No care of any kind has induced more than a single bloom from the zephyranthes, collected in the spring of 1963 with the help of Mr. Horder, in Bucatanua, Miss., on request of Dr. Flory, who knew it only as herbarium material. This is a nice thing in nature, with dark green



Three hybrids from Dr. Howard.

Upper left, 'Marcia'

Upper right, 'Alamo'

Center and lower, 'Pink Champion.'
About 3/5 natural size as reproduced.

foliage, apparently evergreen, erect scapes and rather good sized flowers, white stained on the outside of the tepals with rose pink and with dark green at the base above the ovary. It is Dr. Flory's decision, based on chromosome count, and other details, that this must be a remote colony of *Z. simpsoni*, a Florida species that we had never had. All leaves disappeared in the winter of 63/64 but they are coming again in late March 64, and one hopes for bloom in April, if it follows pattern. In a way, the carriage suggests that of the blooms of *Z. atamasco*, as a gardener views it.

No garden discussion of *Zephyranthes* should be closed without mention of the

allied genus *Habranthus*. The most commonly met species is *H. robustus* which is now available in some quantity. Here, it is in a class with the more common self-sowing weeds. The severe winters of 61/62 and 62/63 ruined the leaves to the ground level, and seemed to have reduced vigor but no other damage was noted. If the season of 1963 had been normal in rainfall, recovery would have been more rapid. Here one may consider it as perfectly safe, and of great value as it produces quantities of its large, somewhat funnel-shaped and only slightly tilted flowers. These are variously described by gardeners, but carry in garden effect as light pink, with a variable white throat pattern. One flower after another follows in well established plants but the total season of bloom in this garden is about one month, usually from late April. Seeding is tremendous, and the seed if sown at once, germinate with alarming speed.

The other species more commonly met, is *H. brachyandrus*, comparable to the former, save that the color is deeper, and flushed with purplish rose from the base. The flower does not open as widely. Here it seeds sparingly and is definitely more tender to cold and slower to recover. One colony died completely and the other has finally recovered but not yet bloomed.

From the mating of these two species, have come various named clones, all of which seem to this writer to be more like *H. robustus* than the more colorful *H. brachyandrus*. 'Primo' originated by the late Grace Primo of Mobile, Ala., 'Floryi', a hybrid, from our friend Flory, and 'Sparkman's Beauty' from Mr. Hayward, all nice things, but none survived our winter of 62/63, in the frames in pots. They must be tried again.

The South American species, *H. cardenasiana*, flowered in the greenhouse, but did not survive the cold in the frame. The flower as seen here, is like a pale *H. robustus* but it is often described as white.

The two Clint collections have been already discussed but a word must be said for the Texas native, that here is infallible and invaluable, although as compared to all others it is a pigmy. *H. andersoni* var. *texanus* makes small bulbs, with almost evergreen foliage, dark green and hugging the ground, from which emerge on four to six inch

scapes, and in vast numbers, each bearing one coppery yellow nodding flower. The inside color is almost a pure orange, with some coppery red shadings in the throat; the outside is stained in various amounts with the same coppery red and on toward bronze. There is considerable variation among them and there is reported to be a rose-colored form.

There is no spot in this garden where the sun is too hot for it. Every bloom makes seed and the seeds take care of

themselves *in situ*. If one wants to plant them in flats, they are almost miraculously swift. If the season is dry, hose watering will produce bloom; but rainfall is even better. Crop after crop from mid-summer on.

Its only rival here is the plant formerly known as *Cooperia pedunculata* but presently to be transferred to *Zephyranthes*. This makes winter foliage, that will endure considerable damage with no damage to the bulb itself. In spring with rains, the foliage grows more lush, and the flowers appear, crop after crop, after each rain, pure white, and shining like stars, with a sweet and pervasive scent that fills the evening air. Seeds are commonly produced and easy to grow.

If the flowers were equally large. *C. smallii*, that is sometimes listed correctly in trade as *Z. smallii*, would be a rival. To repeat, here its blooms are rarely larger than those in the drawings, but Mrs. Clint writes that in nature, it grows in heavy soil, with ample water; in fact, she adds, "best bloom in the wild (is) when fields have standing water," and further, "the size of the flowers varies from one to two and one half inches, but the bulbs like heavy soil or moderately heavy, and lots of water to bloom well." In response to my comment that here, many flowers seemed distorted, she replied that this "might be due to insufficient water." This last would be difficult to maintain on our sandy soil. The plants have had ample water, speaking in normal terms, have grown well, flowered repeatedly each season, and self-sown.

The bulbs bought as *Cooperia drummondii* have evergreen foliage, that is always injured no matter how mild the winter. As yet, after about ten years, there is no bloom. This may be due to too acid a soil, or not enough sunlight although the spot gets at least five hours daily and in summer, much more. One can almost suspect that the bulb is some other thing.

Most nurseries will ship bulbs at any time of year. On arrival, some have roots, some none. It seems to make little difference and response seems quick with foliage and roots at once, and in the proper season, bloom. The major errors here seem to relate to the wrong pH of soil, and possibly wrong location for sunlight. For whatever successes I have had, thanks must go especially to the Clints!

Upper left: Clint M 2211

Upper right: Clint M 30

**Lower: Two flowers of *Z. insularum*.
About 3/5 natural size as reproduced.**



Postscript, Spring 1964

With a drought that should have made them feel at home, the zephyranthes in the garden delayed all major activity until there was a week of intermittent rains. From then on, flowering began and continued to date, early July.

This happening gives the opportunity of adding more drawings to the collection, not for the sake of the drawings but to emphasize the differences in size and the shape of blooms.

Purely as a comparative, drawings of the familiar, *Z. grandiflora* are shown, in two stages: the lower flower newly opened, and somewhat elongated, and the perianth lobes flattened and drooping. The color is a Deep Rose Pink, darkening toward the center, with the inner part of the tube almost white. This last does not show as a color pattern. The whole color lightens somewhat on the second day.

On the same sheet, is shown *Z. miradorensis* which is the second most plentiful and successful zephyranthes on the place. This is almost uniform here, with Light Mallow Purple flowers that show an almost pure white star in the center. The color in the bud, shown as darker than the bloom is almost Amaranth Purple. These hues carry in the garden as pink, not as lavender. The bract that ensheathes the developing flower in this species was green in some flowers, brown and more papery in others. It is reported (letter) by Dr. Flory that this species varies somewhat in color in nature and tends to lighter rather than darker hues. Here it selfsows and behaves like a native.

A possible rival to these two pinks, may be, 'Clint M. 30', a collection that has not been classified as yet, to our knowledge. The drawing shows the type of bloom, with its wide spreading perianth segments, and erect carriage. The scapes rise to about 8 inches here, and it has lived through all vicissitudes of climate out of doors in the border. The color is Pale Amaranth Pink, that lightens on the second day to a paler hue. The leaves are about three eighths of an inch wide and fairly abundant, though not making a mass as in narcissus.

In contrast, the flowers of *Z. insularum*, again from the garden border, are small things that do not open widely no

matter how sunny the day, nor how hot. They are a glistening white, sharply accented by the base of the tube which is Scheele's Green, a rich "mossy green" of character. This year none of the flowers have shown the faint pink tint that was recorded earlier in this piece.

For the last contrast, there is here a record of the first flowering here, of seedlings raised from the collection known as 'Clint M 2211'. The leaves are slender and grassy, or even sedge-like, but fragile and the scapes rise to about ten inches. The flowers are white faintly tinted with a color paler than Rose Pink. The color on the buds is between Mallow Pink and Light Mallow Purple, and the base of the tube is tinted with Light Yellow Green. The ovary is Scheele's Green, darker than the scape. The pistil is always below the level of the anthers or stamens. When this has multiplied into a quantity sufficient to make a mass, it will be a grand addition to the border, provided it likes it there. Its life so far has been in the greenhouse.

Three of Dr. Howard's seedlings are recorded on the final sheet: 'Alamo', 'Pink Champion', and 'Marcia'. This last was lost in the freeze and the present flowers are from newly bought bulbs.

Alamo is one of the kinds that will have to compete with all other "pinks." The petals are self color, paler than Rose Pink and definitely fading in intensity on the second day. The lower part of the tube, outside, is Lumiere Green, a light yellowish green, that makes a good contrast.

'Pink Champion' if one saw it only on the second day would be another contender among the "pinks." The bud, however, shows a dark hue with a hint of yellow, that indicates the distinction. The open flower in color, lies between Deep Rose Pink and Alizarine Pink. This last is the color that gives the salmony quality to the pink, even if it fades as do many of the yellows in this genus. The base of the flower tube is Scheele's Green and the ovary and scape are even darker. The bracts are papery, semi-transparent, and brownish. The leaves that are three eighths of an inch wide, seem to be plentiful and if so, and if the flowering continues as abundantly as now, this will be a very good addition to the pinks that all have the hint of yellow.

'Marcia,' is again a vigorous plant with equally wide leaves in some pro-

fusion, and many blooms. The scapes, eight to ten inches high overtop the dark green leaves. The buds are dark, almost a Pompeian Red, but the flower opens to a hue between Venetian Pink and Alizarine Pink, each with a hint of yellow in them. On the second day, the color has faded to a hue much paler

than Rose Pink, but still a fine color. The pollen when the anthers open, is conspicuously yellow. These and the deep green base of the tube, make a vivid contrast with the clear color of the perianth segments. If this too, will accept our growing conditions, it will be needed en masse.

A Book or Two

Landscape Vocabulary

Warner L. Marsh. Miramar Publishing Company, 1300 West 24th Street, Los Angeles 7, California, 1964. 316 pages. Illustrated.

This publication is a listing of definitions employed by the present-day Landscape Architects. However, all of these terms are not used exclusively by the Landscape Architect. They are drawn from other arts and sciences such as Botany, Horticulture, Geology, Engineering and Architecture. In other words, they are terms used by people in all professions concerned with human environment.

The terms that are listed take on a little different meaning and have an impact not necessarily apparent to the laymen. Mr. Marsh has made his definitions very clear and to the point. Where necessary, he has gone into great detail to support his definition. Many charts, tables, photographs and graphic illustrations are used to help provide for a better understanding of the definitions.

Mr. Marsh has also included a listing of publications from which his definitions were formed and which he feels would make an excellent library for any Landscape Architect.

This would be an excellent publication for the student in Landscape Architecture.

Darrell L. Neumann

Create New Flowers and Plants—Indoors and Out

John James. Doubleday and Co. 1964. 212 pages. Illustrated. \$4.95. (Library).

The author has written to encourage interested gardeners to do some plant breeding and selection. He does this by first telling how new varieties are produced—by plant hunting, sports, selection and by breeding. A chapter is devoted to the Living Cell and what goes on in it. Next a description of pollination and techniques used, the ways of making crosses and what may be expected. Sterility or failure to produce viable

seed is discussed. The production of a fertile seed is the immediate objective in hybridizing and the author tells about the problems of seed germination and ways that may be used to get the highest percentage of germination. Sports or mutation often occur and may be selected for further trial. Many of our present cultivars have come from this rather uncontrolled source.

In all of the discussions, well-known garden plants and cultivars are mentioned which adds interest for the general reader. The author has used technical terms where necessary but has done it in a simple manner and included a glossary and bibliography for added information.

Conrad B. Link

The Complete Book for Gardeners

Rachel Snyder—Editor. D. Van Nostrand Co., Princeton, N. J. 1964. 508 pages. Illustrated. \$9.95. (Library).

This book fulfills its title. The first chapter is a series of short articles on gardening in the various areas of the United States, commenting on climate, soils, temperature variations and important types of plants that are grown. The Plant Hardiness Zone Map is used as a basis of discussion (also included on the inside of the cover). Other chapters in the first section are basic to good landscaping and planting. The more advanced gardener will find much of interest in the chapters in the specialty plants and gardens section. The fourth section is a group of chapters on pruning, general care, pest controls and propagation. For the handyman, the section "Gardening with Saw and Hammer," has chapters on building walks, steps and paths, or fences and the construction of cold frames and hot beds. A section on the use of flowers and plants indoors considers house plants, plants for tub growing, and general use. A final miscellany section contains many things that are of help such as garden tools and care; lists of plants for special purposes; and a glossary of plant names.

Conrad B. Link

How to Control Plant Disease in Home and Garden

Malcolm C. Shurtleff. Iowa State University Press. 1962. 520 pages. Illustrated. \$4.95. (Library).

This 520 page hardback contains up-to-date information about plant diseases and their control. Prof. Shurtleff is a recognized authority in the field of plant disease control. He has had wide experience in agricultural extension which he uses well to translate the language of the plant pathologist for the layman. His book will be useful to the gardener who wants to know why his plants do not grow well and wants to do something about it. Soil preparation, testing for acidity, fertilization practices, pruning trees and shrubs, treatment of tree wounds, watering, and other cultural practices and environmental effects on the health of plants are discussed. Comprehensive information is given about the various kinds of foliage, stem, flower and fruit, and root, bulb and corm diseases. Prof. Shurtleff ranges widely in the plant kingdom from Aaron's-rod to *Zygopetalum*. He describes symptoms of diseases, names causes, and recommends control methods for each disease if known. A valuable feature is the section devoted to fungicides and to spraying equipment and its maintenance. A reference chart on page 446 shows compatibility of fungicides, insecticides, and miticides. The glossary and the 178 black and white illustrations are helpful. Gardeners from coast to coast can use this book profitably.

C. M.

Other Books Added to the Library

American Tomato Yearbook—1964

John W. Carncross—Editor. C. S. Macfarland, Jr. 114 Elmer Street, Westfield, New Jersey. 4 pages. \$2.00. (Library).

The Lily Yearbook—1964 North American Lily Society

Society, Geneva, New York. 1963. 160 pages. Illustrated. (Library).

Botany, An Introduction to Plant Science, 3rd Edition

W. W. Robbins, T. E. Weier and C. R. Stocking. John Wiley and Sons, Inc., New York. 1964. 614 pages. Illustrated. \$8.95. (Library).

The Water Relations of Plants

A. J. Rutter and F. H. Whitehead. John Wiley and Sons, Inc., New York, January 1964. 394 pages. Illustrated. \$10.50. (Library).

Fertilizer Nitrogen: Its Chemistry & Technology

Vincent Sauchelli. Reinhold Publishing Corp., New York. June 1964. 424 pages. Illustrated. \$17.50. (Library).

An Introduction to Genetics

A. H. Sturtevant and G. W. Beadle. Dover Publications, Inc., New York. 1962. 391 pages. Illustrated. \$2.00. (Library).

The Gardeners' Pocketbook

Ornamental Basil 'Dark Opal'

In an effort to obtain a good purple basil for our herb garden, a search was conducted among seed houses and commercial herb growers here and abroad. Our efforts were unsuccessful; but while scanning a list of United States Department of Agriculture plant introductions, we came across a listing of a purple basil (*Ocimum basilicum*) with Plant Introduction Number 182246.

Although there appeared to be no improvement in color over those already observed, P. I. #182246 showed promise for improvement by breeding. Variability within this line was quite extreme. With continued inbreeding and selection, we obtained an improved uniform line which was called, 'Dark Opal.' It was submitted for trial and won a Bronze Medal for "its meritorious record and

high average scoring in the official North America test-gardens." It was "entitled to introduction as an All-America Selection," and was introduced to the public in 1962.

'Dark Opal' is a bush of a very uniform plant habit with an average height of 12-15 inches and a spread of 12 inches. The foliage is an attractive dark purplish-bronze shade somewhat iridescent. Small lavender flowers are borne on slender spikes and make a striking contrast with the foliage. It is excellent for borders and mass plantings. The plant is pleasantly aromatic and has the added value of being a culinary herb.

To keep the fresh rich color of 'Dark Opal' the flowering spikes should be pinched off. Basils are true annuals and they will complete their growth cycle after flowering and seed production.



JOHN SCARCHUK

Ornamental Basil 'Dark Opal'

Ferry-Morse Seed Company was given the exclusive rights by the University of Connecticut to grow 'Dark Opal' for seed production and distribution. In return the University of Connecticut was paid royalties. All royalties derived by the University of Connecticut through wholesale purchases of 'Dark Opal' for the first three years will provide for a new all-America Selections Scholarship Fund for graduate assistanships in plant breeding.

John Scarchuk and Joseph Lent, Department of Horticulture, College of Agriculture, University of Connecticut, Storrs.—JOHN SCARCHUK, *Storrs, Connecticut*.

Acer oblongum Wallich

Acer oblongum, a maple native of the Western Himalaya mountains to central China, might well be voted the most unmaple-like maple of a large and various clan. A member of the section *Integrifolia*, it is in cultivation a tree of modest size, perhaps twenty to thirty feet tall. The entire leaves are of leathery texture, three to five inches long, shining green above and beautifully gray-glaucous beneath. In some respects the foliage is more like a large-leaved evergreen viburnum than a maple. In Seattle the leaves are persistent in all but the most severe winters, further south on the Pacific Coast they seem to be completely evergreen.

Despite its origin, it seems to be reasonably hardy. A seedling raised from Chinese seed at the University of Washington Arboretum has survived outside in a somewhat sheltered location since 1951. Although it was badly cut back by unseasonable cold in November, 1955, it recovered and was a vigorous fifteen feet tall when it was nearly de-limbed by a falling tree this spring. Again it seems to be recovering well.

Acer oblongum is in cultivation in the British Isles and on the Pacific Coast of North America, in botanic gardens and arboreta at least. B. O. Mulligan's *Maples Cultivated in the United States & Canada* (1957) lists no source of it on the south eastern seaboard of the U.S., where it might be expected to grow as well or better than it does in Seattle. Young plants propagated from plants at the University of Washington Arboretum have been distributed to the National

Arboretum, Washington, D. C., and several similar institutions in that general area. There seems no obvious reason why this interesting and attractive maple will not succeed well in the warmer sections of the southeast.—J. A. WITT, *University of Washington Arboretum, Seattle, Washington*.

Himalayan Plant Collecting Notes—Prunus cerasoides D. Don

A unique flowering cherry was encountered by Dr. Francis deVos and myself several times during our 1962 plant collecting trip to Nepal. This is *Prunus cerasoides*, a winter-flowering cherry that has been mentioned by every plant collector who has entered the Himalayas. Hooker (J. D.) on p. 128¹ of his report on the climate and vegetation says "The *Bucklandia* flowers in this month at 6000 to 7000 feet, a magnificent tree as regards form and foliage; *Wightia*, a scandent Bignoniaceous tree, also blossoms profusely, bearing no leaves, and forming immense masses of red in the forest; *Pittosporum* blooms, and a *Prunus* like *Padus*, whose leaves are excellent fodder for cattle." This was during November and while we did not see the other plants mentioned in western Nepal, *Prunus cerasoides* was fairly common in the hills north of Pokhara near Machhapuchhare. This is an isolated spur of the Annapurna Himal, towering 22,958 ft. over the town of Pokhara. Pokhara is the starting point for all expeditions to western Nepal and everyone relies on the kindness of the small mission hospital located here as a last contact point before departure.

The temperate forest of the Himalayas between 6,000 and 9,000 feet is delightful during the rain-free period of autumn except that few plants are in flower. The seed crops are abundant and this suited our purposes perfectly. Most of the trees are inhabited by orchids, mostly on the horizontal branches. The days are warm and sunny with bright, clear, cool mornings. About 2 to 3 p.m. the mist rolls in and lifts again about 8 p.m.

Our first encounter with *P. cerasoides* was as we reached 7,150 feet on a small ridge behind our camp. As we searched

¹Hooker, J. D. 1852. On the Climate and Vegetation of the Temperate and Cold Regions of East Nepal and the Sikkim-Himalaya Mountains. *Jour. Hort. Soc. of London* VII: 69-131.



J. L. CREECH

Prunus cerasoides in full bloom on the Rajpath roadside near Dhaman, Nepal, November 19, 1962.



F. DEVOS

A flowering branch of Prunus cerasoides showing both flowers and new leaves. November 4, 1962, near Machhapuchhare.



J. L. CREECH

Shining mission hospital at Pokhara with the sharp peak of Machhapuchhure in the rear. The Annapurna Range is far distant.

the vegetation down the faces of the ridge, a soft mixture of pink and bronze was our first awareness of *P. cerasoides*. It is a small tree with somewhat pendant branches, pink flowers and bronzy new growth. The flowers and new leaves appear on short side shoots during November and December. But the terminal branch buds remain dormant until some time in the spring. It should be noted that during the flowering period, there are light frosts every morning but I doubt if the temperature goes below 25°F. during the winter even at this elevation.

For those not able to make a trek to such an isolated locality, the hills above Kathmandu, near Godavari take on an almost spring-like appearance, so distinct are the trees of *P. cerasoides*. Their filmy beauty is likened to the flowering of *P. subhirtella* that I have seen so often on the Japanese hillsides. A specimen or two of *P. cerasoides* can also be found along the side of the Rajpath near Dhaman—the single road in Nepal joining it to India. One of the trees along the roadside is shown in the photograph accompanying this note.

Being a winter flowering species, the fruit matures in the spring. Fortunately

our good friend, G. A. C. Herklots, was kind enough to send us a small quantity of seed from the pinkest flowered trees above Godovarai and from these we have managed to obtain a small number of seedlings. How this species will perform in our country is pure conjecture, but the native habitat suggests it might be an excellent winter flowering species in the southern States. Its performance there will be one of our future objectives.

Years ago this cherry was catalogued in southern California indicating it flowered in November. One cannot be certain that this was not merely based on the literature. Although the USDA introduced seed a number of times from Darjeeling, *P. cerasoides* was never successfully established.—JOHN L. CREECH, U.S. Department of Agriculture, Agricultural Research Service, Crops Research Division, Beltsville, Maryland.

Allium triquetrum

Among the allium species that are now in the spotlight with interest not only in the garden flowering but their usefulness in dry arrangements, this species would make a poor showing. In fact,



IVAN N. ANDERSON

Allium triquetrum

it rarely is given much praise by any one and if memory is safe, even Miss Jekyll that most compassionate of gardeners, relegated it to the woodlands. From this one might surmise that the species is invasive, but this has not been so here.

As far as can now be told, there is little increase here beyond that from seeding. This came rather as a surprise since the seed heads seemed to carry poor capsules, and no thought was given to their removal. The scapes after blooming fell behind the clump, and the following spring there appeared a nice mass of small seedlings. These have grown on but have not come to flowering size under the routine care given the area.

The photograph shows, that the leaves are flat, and curve nicely about the scapes that rise to about ten inches at best. The scapes are triangular in form, giving the name to the species, and bear a head with from three to ten blooms, of pure white with clear but fine green lines in the back of each segment. The flowers are nodding, and can be picked and used in bouquets without discomfort from the onion scent.

Here again is a minor bulb that is well worth use in any semi-shady place. Here it is used on a border of a planting of *Danae racemosa* with companions of *Tritelia uniflora*, that blooms later, and a few bulbs of *Galanthus Elwesi* that have persisted for years, more or less unhappily, with only an occasional flower.—B.Y.M.

Androstephium caeruleum

This is a native bulb with what might well be called "a very poor press." Miss Elizabeth Lawrence in her *Little Bulbs* mentions it as "Blue Bethlehem" or "Funnel-Lily" and describes the flowers as a pale French Blue "Crystalline and translucent." She quotes Mr. Claude Barr who supplied my bulbs as well as hers, with instructions "to plant them 4 to 5 inches to the base in a very good mellow soil." The reference in *Hortus II* is brief as usual, but of value in that it cites the range as "Kansas to Texas." This last helps to offset Sampson Clay in his *The Present Day Rock Garden*, when he writes: "* * * Great hardiness



IVAN N. ANDERSON

Androstephium caeruleum

is not to be expected of it, any more than of *Cooperia* or other bulbs which keep it company in the South-western States." Norman Taylor in Bailey's *Cyclopedia of Horticulture*: "Slender, 6 - 10 in: umbel 2-7-flowered, the flowers blue, 1 inch long, supported on stout ($\frac{3}{4}$ " pedicel; crown exceeding the anthers. Blooms in spring; pretty."

In this Mississippi garden, where all small bulbs that will live, persist and bloom are welcome, it has established itself, well enough, so that the writer intends buying more. The first year planted, gave only leaves, but the second, produced flowers as can be seen in the accompanying photograph. Here it did not reach the dimensions given, nor the number of flowers per scape, but on any March 26th, it is a welcome addition to the spring scene.

The soil here, is mellow, enriched well with peat moss, fed with bonemeal, and that is all. The planting is on the edge of a narcissus group, with a slight rise above the lawn level. The bed faces south and there is no protection other than foliage masses behind it to the north.

The foliage makes a nice tuft, of narrow leaves, above which the scapes rise. Here only to about 5 inches at best, and here yielding only 2 to 4 flowers. The color in Ridgway would be between Light Campanula Blue and Chicory Blue, but the color is not as strong and clear as in chicory. Each bloom lasted about three days with some lightening in color. No seed formed here. The foliage has entirely disappeared by early May.

In some text that the writer does not have at hand, the flowers were compared to those of *Brodiaea*, but it should be said that the *Brodiaea*, is of the type of *B. grandiflora*, and not one of many other types; i.e. more or less trumpet-shaped or funnel shaped. Not in the least like the starry blooms on *B. lactea*, which is another bulb that has accepted our local conditions and is permanent. This species will not supplant the not too distantly related, Blue Star flower, that we insist on remembering as *Tritelia uniflora*, but it will grow well in locations that seem a little too hot for this last.—B. Y. M.

***Narcissus tazetta* spp. *bertolonii*
(Jord.) Baker**

This small species of the Tazetta Group, I owe to the generosity of Mrs. Anthes of Encinitas, California, who offered me one bulb, when I had reported that those bought turned out to be quite a familiar friend, *N. t.* var. *italicus*. She warned me that the bulb would be small, but when it came it was small, round, compact looking with almost no "neck" and showed every sign of good development.

It was planted in an area devoted to a couple of other new tazettas, neither a species, however, and of much less interest botanically, though fine enough from the garden point of view. Historically of interest, one came with the already well known name of Seventeen Sisters, and the other, Seven Sisters.

It developed well in early spring, late winter really, with a fascicle of narrow leaves, and signs of fascicles developing from the one neck, as if there were off-sets still hidden within the one bulb. As it blooms here in a period when frosts may come, a bushel basket was kept standing nearby and many a night, the basket was put in place to assure the de-

velopment of the scape that soon showed between the leaves.

Interest in this species centers in the fact that it is a yellow self, with the cup only slightly deeper in hue than the perianth. In color, it is a little paler than the yellows of *Narcissus jonquilla* and in some ways, the blooming scape reminds one of the jonquils. The scent, however, is typically that of the Tazetta Group, with a pungent quality of their own, as distinct as the pungent scent of genuine Tea roses.

No attempt was made to pollinate the flowers, and they did not set seed from open pollination, which is perhaps just as well, until the plant is more used to the Mississippi climate, quite distinct from that of Encinitas, California. The foliage dies off early as does the foliage of many narcissus that bloom toward the end of winter or in very early spring. It was not harmed by any frosts, and apparently made a completely normal ripening.

If one had this by the hundred, or even by the dozen, it would make a stunning spot in the early border when only the winter blooming members of the group that is included under *cantabricus* are stirring. These are not in the Tazetta section, but would be fellow bloomers here, in late January or early February.
—B. Y. M.

Ornithogalum saundersiae

In the issue of this magazine for April 1963, a note was given about this tender bulb, that ended with the statement that a bulb would be left in the open, to determine its cold-resistance here. This was done, and although the winter of 1963/64 did not compare with the two winters just endured, it was cold enough. There was no sign of any growth from the bulb, until the ground was actually very warm, here this season in mid-April. This means that the plant will endure cold as low as 18°F. which was our record during the winter just passed.

To the original planting, which shows some increase, have been added the bulbs that had been left in pots, after the experiment in propagation mentioned in the same article, pages 124-125. They are not yet as advanced in growth as the bulbs left outside, and it will be interesting to discover if they meet, by blooming time.—B. Y. MORRISON, *Pass Christian, Mississippi*.



IVAN N. ANDERSON

Narcissus tazetta* spp. *bertolonii

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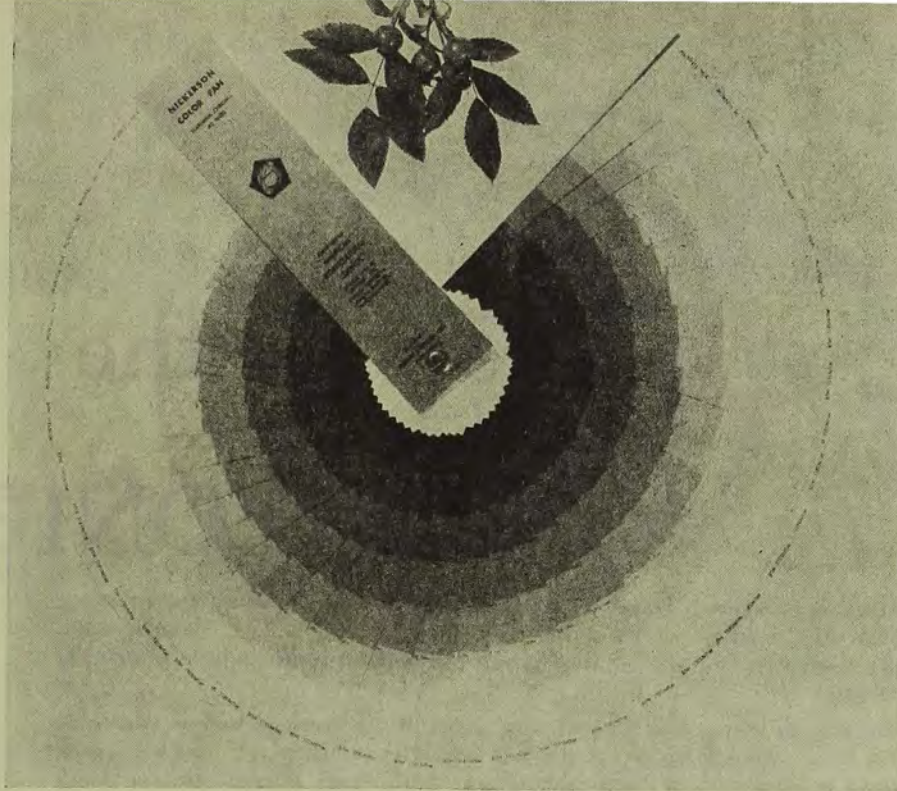
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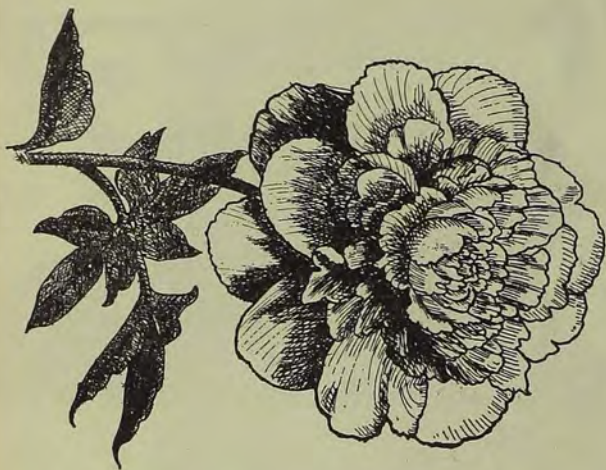
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