

February 1987

# American Horticulturist

The background of the cover is a detailed photograph of pansy flowers. The flowers are in various stages of bloom, showing a mix of bright yellow and deep red or maroon colors. The petals have a distinct, almost feathered or streaked pattern. The green leaves are dark and appear to be part of the same plant, providing a natural, textured backdrop for the text.

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# Contents



At the northeast corner of New York City's Central Park is a remarkable garden hidden away from busy Fifth Avenue. There, clipped yew hedges, crab apple allées and perennial borders flourish. New Yorkers from all walks of life come to enjoy the respite the garden provides from the hustle and bustle of city life.

Until recently, this green oasis was neglected and overgrown. To learn about its remarkable transformation, turn to "Miracle on 104th Street" on page 14. Photograph by Lynden B. Miller.

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**On the Cover:** What better way to take the chill out of February than to dream about new plants to add to the garden? Our annual selection of "what's new" this year begins with a sensational pansy from Thompson & Morgan, *Viola 'Flame Princess'*. For more on new plants to brighten up your new year, turn to page 18. Photograph courtesy of Thompson & Morgan.

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# AHS Moving Forward

The American Horticultural Society is very fortunate to have River Farm, our beautiful and historical property on the banks of the Potomac River in Virginia. River Farm was donated to the Society by Mrs. Enid J. Haupt in 1973, and houses the Society's administration offices and library. As many of you know, the buildings on the property are also used for horticultural meetings, lectures, demonstrations and flower shows.

Today, River Farm is also used in a variety of ways to encourage and advance the science and practice of horticulture. Our intern program is a good example of how the River Farm grounds are used to help give horticulture students the opportunity to obtain practical experience in the art of gardening. A number of plant societies throughout the country also take advantage of testing their particular plants of interest at River Farm. These demonstration/display areas are educational for our visitors and also give the various societies the opportunity to test plants—both new cultivars and old garden favorites—in the Washington area. Just recently, the Perennial Plant Society has consented to contribute a perennial border to our ever-growing display.

Each year, the board and staff of the Society look for more ways to help members become more efficient in gardening. This year, the board has added a new committee, the Professional Horticulture Advisory Council, headed by Mr. Richard Hutton, President of the Conard-Pyle Company, and Dr. Marc Cathey, Director of the U.S. National Arboretum. This committee will help us serve our professional members more effectively and will also encourage them to be more active in our Society.

Many of our members are not aware of the many activities carried out by the American Horticultural Society and the benefits of membership in the AHS. In addition to maintaining our beautiful River Farm property, AHS serves its members

and the gardening public by publishing our bi-monthly publications, *American Horticulturist* magazine and news edition, holding annual meetings in various parts of the country, providing our free Gardener's Information Service, conducting our annual seed program, publishing the Endangered Wildflowers Calendar and related information about our nation's rare and endangered native plants, and sponsoring horticultural tours, both national and international. Your membership also entitles you to free access to the Society's headquarters at River Farm, and the opportunity to purchase gardening books at a discount through our book buyer's service.

By sponsoring such a wide variety of programs and activities, the Society is able to bring together gardeners with a wide range of interests. Our diverse membership is one of the Society's greatest strengths.

Managing and promoting these programs takes time, skill and energy. Your Society has most of the tools needed to achieve these goals. We have a dedicated board of directors and a loyal and efficient staff, as well as the property for hosting events and displaying plants. The Society is indeed fortunate.

What is currently and eagerly needed today is funding to carry out the Society's immediate goals. The board and staff would like to start this New Year off on a financially sound basis.

I know members want the Society to fulfill the goals required to keep the organization moving successfully. Please won't you grow with us by renewing your membership at a higher level, or by becoming a member of the Society's President's Council? Remember, we are a non-profit organization and a commitment in the way of a contribution would be greatly appreciated. Let's make 1987 a banner year for *your* American Horticultural Society.

May you all have a fruitful year.

—Everitt L. Miller  
*President*



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# Garden Illusions

Every gardener I know loves hearing stories about gardens created out of nothing. Like castles spun from air and incantations, there is something almost magical about Sissinghurst, grown from romantic ruins, or Inverewe Gardens, built on a once-barren, windswept site on Scotland's northern coast.

Few of us are actually rescuing castles or taming the wilderness. However, as gardeners, we're all in the business of creating illusions, whether it is a moment of hesitation or heightened expectation in an established, staid landscape; a bit of quiet solitude in a hemmed-in city lot; or a sense of space in a small suburban back yard.

A garden's limitations or assets, or both, (there is often a fine line between the two) can help establish its character or provide a jumping-off point for a design. In a city back yard, a wooded lot on a rocky New England hillside, or a flat, open lot in a dense suburb, part of the art in designing is to accept the existing features but not let them solely determine the outcome.

For example, it is all too easy to think that there can be no surprise or sense of expectation within the narrow confines of a city garden, and to fill the whole thing with pachysandra. Yet there are many ways to create the illusion of space in a small garden. In a well-designed Japanese garden, rocks, sand and a few carefully clipped trees or shrubs can be used to evoke mountain landscapes and the movement of great rivers. The Japanese technique of "borrowed scenery" can also create the illusion of space. In the gardens of Nomura Villa in Kyoto, nearby hills and mountains are framed by the outline of a pond, the curve of a stream or groupings of trees. More than just pretty background scenery, these mountains are drawn in to become part of the garden's design.

One of the best small gardens I've seen, in the English style, was created in a narrow back yard that measures about 15 feet wide by 75 feet long. The only way into (and out of) this garden, which lies at the back of a modest row house in Oxford, England, is through the living room's French doors. The garden's layout is extremely



A stairway and door at the end of this garden in Oxford, England, draw the visitor along a narrow path that is lined with a wide variety of plants.

simple: a paved seating area a step down from the living room, and a narrow stone path down the middle, between raised beds.

According to a good many gardening books, with all their "do's and don'ts" on distances between plants and the inevitable dogma about grouping plants in threes, this garden—with its hundreds of different plants—shouldn't even exist. But the owner knew what she wanted, ignored all the best

advice and simply set about planting one of these and two of those, sometimes almost on top of one another, letting the plants work it out themselves under her artful supervision.

Densely planted with a complex layering of vines and plants growing up trellises, walls, background evergreens and one another, these borders begin blooming in early spring. The plants closest to the walls bloom



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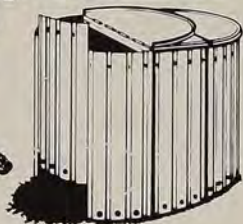
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## THE DESIGN PAGE

first, followed by climbing roses and a variety of perennials so intermingled you can't tell where one plant ends and another begins. In late summer the rose canes, perennials and some rigorously pruned trees become supports for dozens of *Clematis* plants. Like a good Persian rug—so rich in detail, colors and textural contrasts that it is easy to forget it is only an inch thick—this garden's size becomes irrelevant as you walk through.

At the end of the paved path, in a shady corner highlighted with variegated hostas, are steps and a door. A door? you may ask. But where does it lead? And that is the point. The fact that it doesn't open is unimportant. From the moment one first steps into this tiny garden, the stairway and door are a focal point and give the path a purpose.

Many gardeners have narrow city gardens that could benefit from a few illusions, but an even larger number have flat, treeless suburban sites surrounded by neighbors' garages, driveways and barbecue pits. On a recent project, I had just such a site. About 100 feet by 175 feet, the back yard of a large Victorian house was bordered on the south by a road and rows of small, modern houses; on the east and west sides, one had an unobstructed view into the neighbors' living rooms.

One of my client's first requirements was privacy, a sense of enclosure that would make the space her own. Evidently, the previous owners had felt the same way, for they had made some effort in that direction by planting a privet hedge along the south side. (Unfortunately, this is the kind of immediate and simplistic solution most people come up with. It doesn't matter if it is a hedge, a stockade fence or a line of arborvitae, the result is always the same—simply a visual barrier.) The garden's boundaries were so rigidly defined, there was no room for illusions, no wondering where the garden ended. Without mystery or expectations, the garden appeared smaller still.

The solution I came up with was to plant that same south boundary with a mixture of deciduous and evergreen trees and shrubs so that the different foliage textures and colors, branch structures, forms and heights would create a feeling of depth and movement. The viewer's eye would move from the horizontal branches of *Cornus alternifolia* and *C. kousa* to the spires of European larch and across masses of shiny-leaved *Ilex* × *aquifernyi* 'Brilliant' (a self-

fertile holly with lots of red berries and a growth rate of about 10 feet in as many years), and drifts of the lower-growing *Ilex crenata*. In autumn, the scarlet-orange leaves of sumac become a focal point.

A keen gardener, the owner also wanted some good-sized perennial borders—another opportunity for creating spatial illusions and exaggerating the size of the site. Designed to be seen from inside the house through a set of French doors opening onto a stone terrace, these 40-foot borders divided the garden in half lengthwise. A grass path ran down the middle, while another cut across the borders midway, dividing the entire garden into four quarters. At the end of each cross path, white wooden arches were placed as entrances to vegetable garden and compost pile. Planted on either side of the latter's entrance were various French hybrid lilacs in blues and purples, along with groups of *Philadelphus* 'Silver Showers', which has arching branches and bears fragrant, single flowers.

To increase the apparent length of the borders when seen from inside the house and the terrace, I placed the majority of the warm- and hot-colored perennials—yellows, oranges, reds and shades of pink and apricot—nearest the house. The blues, which have a tendency to appear more distant, were concentrated in the second half of the garden. Along with the blues were pink and mauve flowers, as well as red flowers with blue undertones. Plants with silver foliage were used to provide a unifying ground color throughout. The actual dimensions of the borders and the path separating them help increase this illusion of distance; the borders are designed to be about 2 1/2 feet narrower at the far end, and the path is laid out about two feet narrower at the end away from the house.

What we called the "woods" would, in time, become the background for the borders. A white metal gate was placed at the beginning of this background shrub border, between a pair of *Juniperus chinensis* 'Mountbatten', a 20-footer with silver-green foliage. From the house, this little composition would eventually look like the entrance to another garden area. As the trees grew, the viewer's eye would group them with those in surrounding yards and streets, extending the garden's imaginary boundaries even further. ♣

—Margaret Hensel

Margaret Hensel is a writer and landscape designer living in western Massachusetts.



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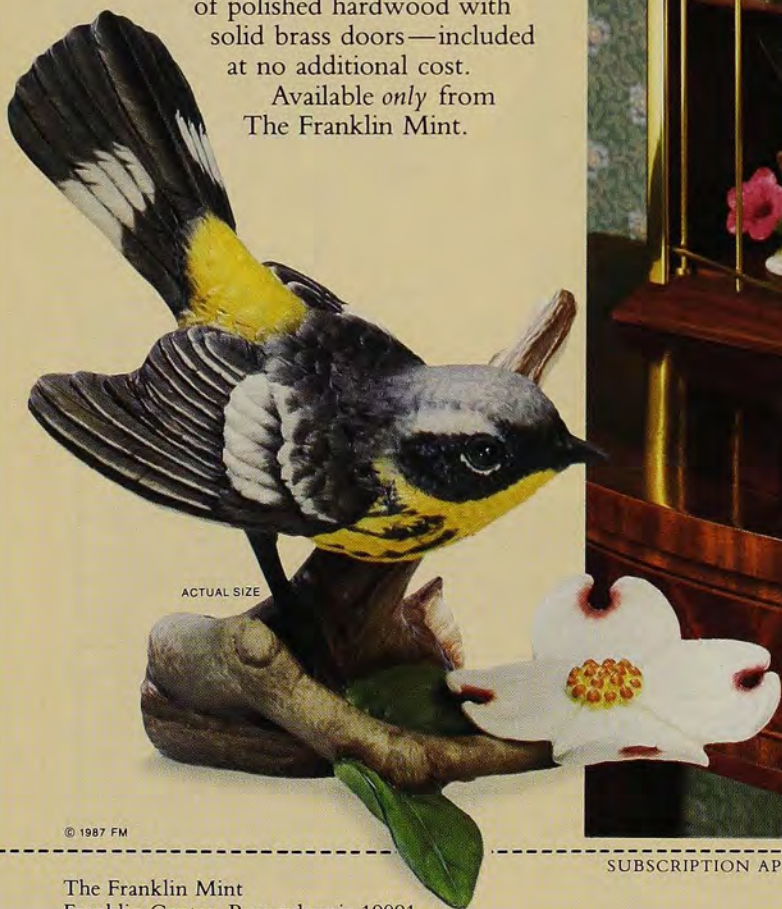
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—Marion Couthouy Smith,  
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There is nothing like a bit of shade in a garden on a hot summer's day—not the solid shade provided by an overhanging roof or a building's edge, but open and airy shade, a cool spot formed by the shadows of a shrub or tree heavily laden with leaves. A bank of hostas or a peony bush is fine as a high-noon resting place for weary garden gnomes, overheated squirrels or wandering voles, but the gardener needs more.

And the garden, too, needs more. Adding shrubs and trees to the perennial border not only helps create those small shady nooks for plants that need protection from the sun, it also provides a sense of scale to what might otherwise be just a boring row of all-the-same plants and flowers.

Garden centers usually provide only the most common plants—unless you are fortunate enough to live near a shop run by both a businessperson and a plantsman. Most often your choices will be limited to common red maples, dwarf fruit trees, or yews and more yews.

The firms listed below are far from average. The shrubs and trees listed in the pages of their catalogues—whether diminutive dwarf conifers or species that will attain great heights—are all decidedly unusual. True, some will be of short stature



Jean Jenkins

when they arrive at your door, and it will be several years before the Village Smithy will be able to stand beneath their arching branches. But as Alexander Smith said, "You have planted it, and that is sufficient to make it peculiar amongst the trees of the world."

• **Appalachian Gardens** is found in the beautiful mountain country of southern Pennsylvania. Their catalogue is small but interesting. The plants offered are at least two years old, and all are well established in four-inch pots. Among the more unusual items is the Franklin tree (*Franklinia alatamaha*), which bears large, creamy, cup-shaped flowers. This is the famous tree that was found in the wild, lost, and then found again. Today, it only survives in cultivation. They also carry that marvel of western China, the handkerchief or dove tree (*Davidia involucrata*), which bears blossoms that wave like squares of linen in the

breeze. For city dwellers, they also have a cultivar of the ginkgo tree (*Ginkgo biloba*) called 'Autumn Gold', which turns a brilliant gold in the fall. It is more compact in growth than other ginkgos and bears no smelly fruit, so it is perfect for the backyard garden.

• **Bernardo Beach Native Plant Farm** is located 4,000 feet above sea level in USDA Zone 6 in central New Mexico. This firm offers a large selection of drought-tolerant native trees that usually grow to between 15 and 25 feet high when mature. The native shrubs attain a height of less than three feet to more than 12 feet. All are perfect for residential use. "And we won't send out plants to the wrong zone," says owner Judith Phillips. To brighten up your wish list, they stock a new Russian olive (*Elaeagnus angustifolia*) called 'King Red', which bears red fruit and is beloved by birds. They also feature false indigo



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## A CATALOGUE REVIEW

(*Amorpha fruticosa*). In cultivation since 1724, this species produces a multiple trunk if it is given plenty of water while young, and bears blue-black flower spikes and dark green compound foliage. For gardeners in Zones 8 through 10, there is bird-of-paradise shrub (*Caesalpinia gilliesii*), naturalized from Argentina and hung with clusters of pea-shaped yellow flowers with red stamens in June and July.

• **The Bovees Nursery** of Oregon has been selling rhododendrons and azaleas for many years. In addition to these old standbys, they carry a wide selection of trees and shrubs, including amur maple (*Acer ginnala*). This native of China and Japan can be grown either as a many-trunked shrub or as a single tree, and is hardy to -30° F. Its bright green, three-lobed leaves turn a vivid crimson in the fall. Bovees also stocks the beautiful Japanese snowdrop tree (*Styrax japonicus*), a deciduous native of the Japanese woodland. Also hardy to -30° F, this tree bears pendulous clusters of faintly fragrant white flowers that appear in June. It eventually reaches a height of 30 feet, but can be kept smaller if you wish. In addition, they sell the wheel tree (*Trochodendron aralioides*), which reaches 60 feet in Japan and Korea but usually grows to a height of about 20 feet in this country. The leaves are similar to those of a large-leaved rhododendron with gentle scallops, and green flowers appear in May. This species is only hardy to 0° F.

• **Camellia Forest** of North Carolina is fairly new on the garden scene. Their list is small but growing steadily. Included are many camellias, most of which are suitable only for Zones 7, 8 and the warmest part of 6. (A Zone 6 camellia, imported from the islands off the coast of Korea and reputed to withstand 0° F, will be offered soon.) They also have some unusual bushes and trees, including Chinese quince (*Pseudocystodonia sinensis*), a hardy, fast-growing tree that will eventually reach 40 feet. It provides a beautiful show of color in autumn, and bears flowers as well as fruit for jelly or jam. (Be sure to order two trees for pollination.) Camellia Forest also grows Japanese angelica (*Aralia elata*), a small deciduous tree that produces fern-like leaves and large clusters of flowers in midsummer.

• **Cascade Forestry Service** of Iowa will actually ship trees that are five feet tall or larger. Shipping is bare root by truck, or the smaller specimens are sent by UPS. They carry northern hardwood trees, including black walnuts (*Juglans nigra*) and black cherries (*Prunus serotina*). They also feature shade trees in fiber pots, which can be planted as soon as the frost leaves the ground. These include paper birch (*Betula papyrifera*) and red oaks (*Quercus rubra*). There is a package deal of native nut trees, including northern pecans (*Carya illinoensis*), shagbark hickory (*Carya ovata*) and the hazelnut (*Corylus americana*), so

## Mail Order Addresses

Send for the catalogues of the companies mentioned in Peter Loewer's article at the addresses listed below.

Appalachian Garden, Box 82, Waynesboro, PA 17268. Catalogue free.

Bernardo Beach Native Plant Farm, Star Route 7, Box 145, Veguita, NM 87062. Send four First Class stamps for list.

Bovees Nursery, 1737 Southwest Coronado, Portland, OR 97219. Catalogue \$2.00.

Cascade Forestry Service, Route 1, Cascade, IA 52033. Catalogue free.

Forestfarm, 990 Tetherow Road, Williams, OR 97544. Catalogue \$2.00.

Foxborough Nursery, 3611 Miller Road, Street, MD 21154. Catalogue \$1.00.

Camellia Forest, 125 Carolina Forest Road, Chapel Hill, NC 27514. Send two First Class stamps for list.

Girard Nurseries, P.O. Box 428, Geneva, OH 44041. Catalogue free.

Greer Gardens, 1280 Goodpasture Island Road, Eugene, OR 97401. Catalogue \$2.00.

Kelly Brothers Nurseries, Dansville, NY 14437. Catalogue free.

Louisiana Nursery, Route 7, Box 43, Opelousas, LA 70570. Catalogue \$3.50.

Miller Nurseries, Canandaigua, NY 14424. Catalogue free.

Waynesboro Nurseries, Route 664, Box 987, Waynesboro, VA 22980. Catalogue free.

Weston Nurseries, East Main Street, Route 135, P.O. Box 135, Hopkinton, MA 01748. Catalogue free.

Woodlanders, 1128 Colleton Avenue, Aiken, SC 29801. Send two First Class stamps or 39¢ for list; catalogue \$1.50.

you can grow your own toppings for all kinds of desserts.

- **Forestfarm** has a catalogue that lists many diverse items, including American native plants, plants for wildlife to enjoy, and unusual ornamentals and conifers. This Oregon nursery's selection is legion. One can find the Canadian serviceberry (*Aamelanchier canadensis*)—also called the shadbush because it flowers in early spring, when shad swim upriver to spawn—as well as the dwarf bog rosemary (*Andromeda polifolia* 'Nana'). For those gardeners who want to grow a medium-sized shrub in a place that could be considered inhospitable, there is the skunkbush sumac (*Rhus trilobata*). Hardy to Zone 5, this distinctive plant sports glossy compound leaves and yellow-red colors in the fall. The leaves have a skunky odor when crushed. Forestfarm also stocks quaking aspen, *Populus tremuloides*. A grove of these lovely trees in the early light of autumn is wondrous to behold.

- **Foxborough Nursery** in Maryland has an inventory of over 500,000 plants covering 10 acres, as well as approximately five acres of field stock. They produce over 20,000 grafts and 300,000 cuttings per year. Their catalogue lists a bewildering selection of dwarf conifers, but they also have 32 cultivars of the Japanese maple, *Acer palmatum*, and 28 of European beech, *Fagus sylvatica*. In addition, they carry that wonderful weeping tree for small yards, the Camperdown elm, *Ulmus glabra* 'Camperdownii'. For conifer lovers, Foxborough has 99 cultivars of our native American hemlock, *Tsuga canadensis*.

- **Girard Nurseries** of Ohio sells rhododendrons, azaleas and broad-leaved evergreens, and has a long list of seeds available for conifers, trees and shrubs. They also carry flowering trees and shrubs, including eastern redbud, *Cercis canadensis*, in three- to four-foot sizes. This tree's lavender-to-rose flowers appear in early spring, and its golden autumn foliage is beautiful. They also stock a forsythia from Ireland, *Forsythia* × *intermedia* 'Lynwood Gold', which has an erect growing habit and produces branches covered with blossoms. In addition, Girard Nurseries offers a personal favorite, the weeping white pine, *Pinus strobus* 'Pendula'. The unusual form (all of the branches droop toward the ground) makes this tree look like a large green caterpillar.

- **Greer Gardens** is another nursery that takes advantage of the beneficent climate



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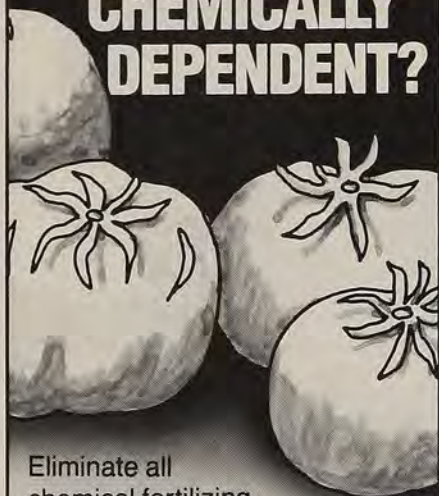
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## A CATALOGUE REVIEW

of Oregon, and is another famous showcase of rhododendrons and azaleas. But they also carry an imposing selection of ornamental trees and flowering shrubs. A list of dogwoods (*Cornus* spp.) covers one whole page of their catalogue. They even have *Gunnera manicata*, which does not technically belong in the tree or shrub category but is eminently qualified because of its size. They also list another favorite of mine, the Korean abelia-leaf or white forsythia (*Abeliophyllum distichum*), which bears small white clusters of flowers with a sweet honey-like smell that appear in early spring before the leaves.

- **Kelly Brothers Nursery** of Dansville, New York, has been in the horticultural business for 107 years. I remember passing the nursery on family Sunday afternoon drives when I was a small child summering in the Finger Lakes. This is not the place to go for the rare and the exotic, but if you are interested in a native shrub like the fringe tree (*Chionanthus virginicus*) or a sourwood or sorrel tree (*Oxydendrum arboreum*), their catalogue is well worth a look. They also feature a fine tree wisteria, *Wisteria sinensis*, clipped and ready for you to continue the training. Or if you are interested in trying a few fruit trees in the back yard, take a look at the apples listed.

- **Louisiana Nursery** of Opelousas is well known to many gardeners in the South. Would you believe they stock over 325 different species and cultivars of magnolia? The best sizes to ship are either their special packing pot or their one-gallon container, but that only limits you to about 150 selections. They also have 14 types of bamboo, including the beautiful black bamboo (*Phyllostachys nigra*), which sports two-inch green canes that turn jet-black with age. On other pages of their catalogue are hundreds of ornamental shrubs and small trees, and—for those who can handle the temperature requirements—a selection of bananas. Finally, for the southwestern gardener, there is a whole page devoted to cacti and succulents, including agaves.

- **Miller Nurseries** of Canandaigua, New York, is another family-owned company that has been in business for generations—in this case, 109 years. In addition to a large number of fruit trees, their catalogue features the sunburst locust (*Gleditsia triacanthos* 'Sunburst'), with spineless stems and bright yellow bursts of young foliage that appears throughout the growing season. And if you really want a fast-growing tree, their line of hybrid poplars can't be

topped. The annual growth rate of these trees is five to eight feet per year for the first five years, but they do slow down a bit after that. The evolution of this tree began at the Royal College of Science in Dublin, Ireland, and was continued by the New York Botanical Garden. Then, in 1936, the U.S. Forest Service stepped in and continued the tree's development.

- **Waynesboro Nurseries** of Virginia has been growing and developing fruit trees and ornamental plants since 1922. They stock pink, red and white flowering dogwoods (*Cornus florida*), and have nine cultivars of flowering crab apples (*Malus* spp.). They also offer Kwanzan double pink flowering cherry (*Prunus serrulata* 'Kwanzan'), which is so often admired in the spring. In addition, they stock 11 different maples (*Acer* spp.).

- **Weston Nurseries** of Hopkinton, Massachusetts, is a giant firm that has been moving trees about since 1923. Among the plants they have introduced are the double flowering quince (*Chaenomeles speciosa* 'Double Appleblossom'), whose fully white flowers change to pink as they mature, and the white weeping crab (*Malus baccata* 'Edna Mullins'), named for a Weston employee who retired in 1975. The latter tree grows to 15 feet. Its pendulous branches are covered with double white, fragrant flowers in May. Weston also stocks the cut-leaf staghorn sumac (*Rhus typhina* 'Laciniata') in sizes up to seven feet in height.

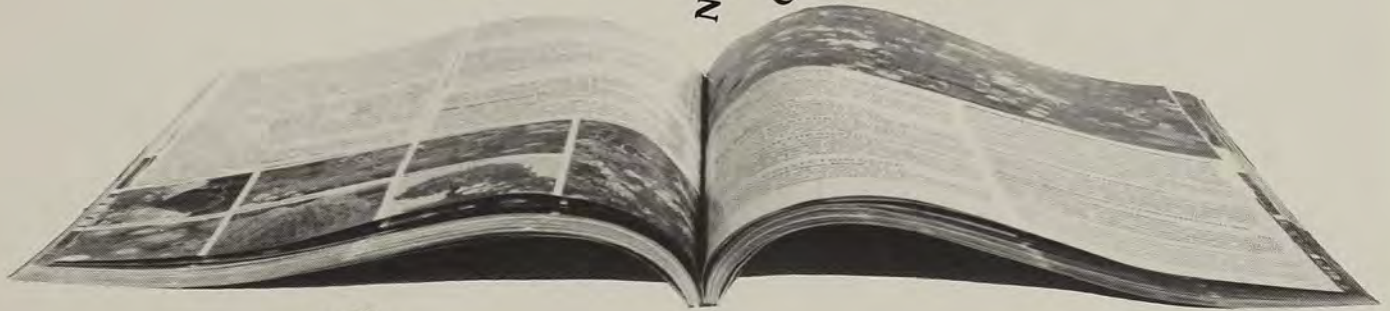
- **Woodlanders** is located in South Carolina. Even though most of their offerings are native to Zones 7, 8 and 9, many are hardy to Zone 4 and are carefully listed as such in the firm's catalogue. Among the trees they list are over 75 natives of North America; an additional 50 that are not native and are listed as "exotic"; well over 100 native shrubs; and an additional 75 non-native shrubs. In these pages you will find Mexican yellow pine (*Pinus patula*), turkey oak (*Quercus laevis*), stinking cedar (*Torreya taxifolia*) and toothache tree (*Zanthoxylum clava-herculis*). They also have a special page of "odds and ends," a few choice species available on a first-come, first-serve basis. These selections, some of which are very rare, come in containers ranging from one quart to one gallon in size. Woodlanders publishes a descriptive catalogue in addition to the main listings.

—Peter Loewer

Peter Loewer is a botanical artist and scientific illustrator who writes and illustrates his own books.

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TEXT AND PHOTOGRAPHY BY  
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“Herbaceous borders in Central Park? Perennials in East Harlem? You’ve got to be crazy!” That’s what they said in the fall of 1982, when the major restoration of the perennial section of the Conservatory Garden in Central Park was begun. Four years later, 4,000 perennials now thrive there and provide spectacular bloom from late March to early November. Because of the garden’s success, perennial plantings are rapidly springing up all over New York City.

The six-acre Conservatory Garden is located in the northeast corner of Central Park, adjoining the poor community of East Harlem. Designed for the New York Parks Department to resemble the great estate gardens of Long Island and Westchester County, the garden, which has three separate sections, was officially opened to the public in 1937.

As visitors enter the Conservatory Garden at Fifth Avenue and 104th Street, they immediately leave the noisy city behind them. The tall, ornate wrought-iron gates, originally designed in Paris for the Vanderbilt Mansion, open onto a peaceful velvety lawn ringed with clipped yew hedges and flanked by allées of crab apple trees. The half-acre of grass encircles a fountain that spouts a 30-foot jet of water and is backed by semi-circular tiered hedges and a lovely old pergola that is densely covered with wisteria. In the tradition of good garden design, the other two sections of the garden, located on either side of the lawn, are hidden from first sight. It is these two sections that contain the colorful plantings for which the Conservatory Garden is so appreciated.

To the right of the lawn, hidden from view, is a colorful classical garden in the French style. Two levels of concentric beds surround a fountain with three dancing women sculpted in bronze. The beds nearest the fountain are designed as a French parterre (literally, a design “on the ground”) and are filled with gray-leaved santolina and seasonal annuals. The outer beds present two dazzling floral displays each year: 20,000 Darwin hybrid tulips in the spring, and 5,000 chrysanthemums in the fall.

The third section of the garden is located to the left side of the lawn. Often called the “secret garden,” it is hidden by a circle

of several hundred lilacs whose powerful scent in May reaches passers-by on Fifth Avenue. This garden features large horseshoe-shaped perennial beds and a tiny pool filled with water lilies. A small bronze statue of a boy and a girl stands in the middle of the pool. Sculpted in 1927, the statue is dedicated to the memory of Frances Hodgson Burnett, the author of the classic children’s book, *The Secret Garden*. The two children in the sculpture are Mary and Dickon from the famous story.

Like the garden in Burnett’s book, this “secret garden” had also been forgotten and neglected for many years. In fact, the Conservatory Garden had suffered the same fate as that of all 840 acres of Central Park during the 1960’s and 1970’s, when New York City experienced a severe fiscal crisis and few funds made their way to parks, much less to a high-maintenance formal garden adjoining a poor area of the city.

During the late 1970’s, this untended spot was discovered by the Garden Club of America, whose New York Committee valiantly planted annuals in the Conservatory Garden each spring and raised the funds to restore the little statue. But the Parks Department could not provide regular maintenance for the flowers during the rest of the year (only five gardeners were available for all of New York City), so each summer, marigolds, ageratum and other annuals struggled to survive.

Finally, help came in 1979, when Elizabeth Barlow Rogers became the park’s first administrator. Rogers founded a non-profit organization called the Central Park Conservancy to work in partnership with the Parks Department to restore the great life-enhancing soul of New York City. Major restoration work on the Conservatory Garden began in the fall of 1982 with funds donated by Rockefeller Center.

When the restoration began, gardeners found the hedges overgrown, the perennial beds choked with iris and buddleias, and only a few ‘Betty Prior’ roses still blooming by the empty graffiti-scarred pool. Gardeners went to work immediately, pruning trees, fixing fountains, removing graffiti and planting new shrubs. The half-acre lawn was also re-sodded. Much of the garden’s former elegance had finally been restored.

Despite the general improvements, however, the Conservatory Garden failed to attract visitors. (In fact, according to a visitor’s survey of the park made in 1982, the garden was one of the two “most avoided” places in Central Park.) Furthermore, the restoration had not greatly altered the condition of the little “secret garden,” which was still deserted and overgrown.

TOP LEFT: In the Conservatory Garden in New York City’s Central Park, the airy blossoms of *Thalictrum* mirror the shapes of the New York skyline. FAR LEFT: A composition of hollyhocks, delphiniums, *Artemisia* ‘Silver King’ and baby’s-breath in one of the perennial borders at the garden. LEFT: Each fall, local school children help to plant bulbs in the Conservatory Garden.

In the winter of 1982-83, plans were made to re-design the perennial beds to resemble an English-style garden, and the Central Park Conservancy raised \$26,000 from neighbors, friends and several foundations to provide full-time horticultural supervision for the first time in decades.

First, the overgrown perennials were dug up and given away. Then the large beds were rejuvenated with a six-inch layer of rich leaf mold from Central Park's own compost heap. Finally, in the spring of 1983, gardeners planted 3,000 perennials, all of which were carefully chosen to provide bloom from late March to early November. More important, the beds were designed so that combinations of plants with contrasting shapes and foliage would please the eye throughout the year.

Great drifts of flowering perennials were interspersed with clumps of plants with silvery foliage, such as *Santolina*, *Artemisia*, *Stachys* and *Perovskia* (Russian sage), to give a feeling of permanence and to add a romantic air to the garden. About 175 different kinds of perennials were used in all.

The overall effect of the perennial plantings is natural. The plants are allowed to spill over the boundaries onto the flagstone paths, and the color scheme is soft—all pastels, interspersed with gray and white.

There are five main perennial beds, each of which averages 15 feet wide by 90 feet long. Both well-known and unusual plants have been included. Besides peonies, phlox, delphiniums, foxgloves, daylilies and Japanese anemones, there are four kinds of perennial geraniums: *Geranium* 'Johnson's Blue', *G. platypetalum*, *G.* 'Wargrave Pink' and *G. sanguineum* var. *prostratum* (often listed as *G. lancastrense*). Many different types of salvias grace the gardens, including *Salvia uliginosa*, *S. × superba*, *S. officinalis* 'Purpurea', *S. argentea* and *S. sclarea* var. *turkestanica*, and *S. guarantica*. *Iris siberica*, *I. kaempferi*, *I. tectorum* and *I. pallida* 'Variegata' have been planted for interest.

In addition, the "secret garden" boasts attractive combinations of fat-leaved hostas and delicate astilbes. There are also five different types of *Thalictrum*, including the tall, spectacular *T. rochebrunianum* 'Lavender Mist', which bears elegant sprays of tiny purple flowers in July and August, and lush clumps of blue-green columbine-like foliage. The many flowers of *Lythrum virgatum* 'Morden Pink' and *Phlox* 'Bright Eyes', as well as various types of coreopsis and veronicas, add zest to the overall composition of shapes and textures. Big clumps of ornamental grasses such as *Miscanthus sinensis* 'Gracillimus', *M. sinensis* 'Varie-

gatus', *M. sinensis* 'Purpurescens' and *M. sinensis* 'Zebrinus' not only enhance the surrounding plants, but also provide interest in the winter. Large groups of *Baptisia australis*, *Amsonia tabernaemontana* and *Aruncus dioicus* lend a solid look to the borders, and several old shrub roses (such as *Rosa rubrifolia*), as well as *Hydrangea quercifolia* and *Berberis thunbergii* 'Atropurpurea', provide contrast.

Along a serpentine hedge of *Ilex crenata* that parallels the perennial beds are many annuals, including big drifts of white cosmos, ageratum, rocket snapdragons and *Salvia farinacea*. The garden's staff is now experimenting with less common annuals such as *Agrostemma*, *Sanvitalia*, *Osteospermum*, *Layia* and *Oenothera* 'Miss Primrose', along with many poppies and thistles. All are carefully chosen to complement the perennials and to add color during the hottest months, when many herbaceous plants go somewhat dormant. Grown for the garden by the Parks Department or by volunteer horticulturists, the annuals are planted each spring by local school classes or community groups. In the fall, neighboring children plant bulbs in the same area.

Despite predictions to the contrary, very few plants are stolen each year. If someone picks a flower, volunteers and staff politely explain that the garden belongs to everyone and was restored with hard-earned neighborhood funds, a message that is reiterated on signs in both English and Spanish. The presence of the Conservancy's uniformed horticulturists helps to show visitors that the garden is well cared for. Friends of the garden have discovered that when things look clean and well-cared for, the public rises to the occasion. A Parks Enforcement Patrol officer gets to know regular visitors, discourages rambunctious children from climbing in 50-year old crab apples and generally enforces the rules of the garden.

Each year, dedicated volunteers not only help with the demanding work of maintaining the large perennial garden but also conduct guided tours. The garden staff has discovered that the more people know about the history of the site, the plants, and the restoration and maintenance work involved, the more they respect the garden. Staff members have taken slides and plants to local schools to introduce students to the garden and to enlist their help in protecting it. Several neighboring schools now have programs in which students work in the garden in exchange for school credit. In the summers, local teenagers are also hired to work in the garden.

Neighborhood residents keep an eye on

the Conservatory Garden, which is now the center of much activity. For instance, museum workers eat picnic lunches there, and handicapped children in wheelchairs are brought in from a nearby hospital. Many people come to admire the drifts of flowers and the long allées of pink and white crab apples with their gnarled trunks, or to just sit in the shade. Wedding parties arrive each weekend to have their photographs taken in the elegant setting. Occasionally, the garden is rented for special events, such as small wedding ceremonies. This once-avoided spot in East Harlem now hosts garden parties under striped tents that look out over the lush expanse of green lawn and back to the buildings of the city. To increase people's enjoyment of the garden, free chamber music concerts are also held here each year. As hummingbirds dart among the flowers, people sit around the water lily-filled pool and music overcomes the distant sound of traffic.

The continuing success of the project can be attributed to two main factors: good maintenance with high horticultural standards, and active volunteer and community participation. But more than anything else, it is the plants themselves that make the garden so successful. The perennials and annuals not only provide visual pleasure, but also show city dwellers what can survive and even thrive with good maintenance in an urban setting. Once visitors have discovered the garden, they return again and again to observe both the permanent beauty and the constant changes taking place in this urban oasis. Annual displays can be dazzling, but once the visitor has enjoyed them, there is little reason to return many times. People come into the "secret garden" to greet "old friends" in the border and to exclaim over new plants that have come into bloom since their last visit.

Although the design of the plantings was originally inspired by English gardens, The Conservatory Garden has become a unique American experiment. Seemingly far removed from the crowded, noisy city, it offers beauty as well as a message of hope and renewal to residents and other visitors, who respond by protecting the garden and sharing its wonders with others. ☉

American Horticultural Society members will visit the Conservatory Garden in Central Park during the Society's 42nd Annual Meeting, May 13-16, 1987, in New York City. For more information on the meeting, write or call Elizabeth Smith, P.O. Box 0105, Mount Vernon, Virginia 22121, (703) 768-5700.

Lynden B. Miller is the Director of the Conservatory Garden. She will be a speaker at the American Horticultural Society's 42nd Annual Meeting in New York City.



The Conservatory Garden features a statue of Mary and Dickon, the two children from Frances Hodgson Burnett's famous book, *The Secret Garden*. Here, surrounded by water lilies, they contemplate the skyscrapers of New York City.

# New Plants for 1987

Once again the early-spring flood of catalogues has begun, and the mailboxes of gardeners across the country are filling up with publications featuring all sorts of interesting plant temptations. Hybridizers have been busy developing a host of new plants to tempt gardeners, including a carefree shrub rose that won an All America Rose Selections award; a Lotus that holds its flowers well above the foliage; several *Rhododendron* cultivars; and a new zinnia cultivar that is resistant to powdery mildew.

The following is just a small sampling of the many exciting new plants that garden centers and nurseries will be offering this season. Look for the catalogues filling your mailbox for more on this season's new plants.

- **Rosa 'Sequoia Gold'**. A miniature rose suitable for growing in pots or in the garden, 'Sequoia Gold' bears fragrant, deep-yellow flowers that retain their bright color from bud to open bloom. The plants bloom abundantly and bear shiny, dark green foliage. 'Sequoia Gold', which is available from Sequoia Nursery, was awarded the American Rose Society's Award of Excellence at the Society's 1986 national conference.
- **Pumpkin 'Munchkin'**. This novelty produces miniature pumpkins that are four to six inches in width and three to four inches in height. Each tiny pumpkin is bright orange and deeply ribbed. 'Munchkin' is available from Harris Seeds.



ABOVE: *Rosa* 'Sequoia Gold'. RIGHT: *Viola* 'Flame Princess'.

- **Nelumbo 'Charles Thomas'**. Water gardeners will want to make room for this striking new lotus from Lilypons Water Gardens. While the blossoms of most lotuses are borne amongst the foliage, 'Charles Thomas' holds its lovely fuchsia-pink blossoms well above its attractive large leaves. This new introduction can be grown in a full-size pond or a small patio tub garden.
- **Primula 'Double Old Rose'**. Double carnation-style flowers characterize this striking new primrose from André Viette. The blossoms are deep pink or light red, and each plant produces a mound of flowers in spring. 'Double Old Rose' is hardy at least as far north as USDA Zone 7, and is a perfect plant for the shady garden.
- **Iris 'Silverado'**. Iris fanciers will want to make room for this new tall bearded iris from Schreiner's Gardens. Its pale lavender-blue flowers have heavy substance and are also highly ruffled. 'Silverado' bears fine exhibition-style stems with

seven to eight buds each, and stands 37 inches in height.

- **Begonia 'Tiara'**. A lovely new rex begonia from Logee's Greenhouses, 'Tiara' has a compact habit and reaches about eight to 12 inches in height. Its gray, purple, lavender and cream leaves are very attractive, and each leaf exhibits slightly different markings. In addition to its ornamental foliage, 'Tiara' also blossoms regularly, a characteristic that is unusual for rex begonias. This new cultivar also shows excellent resistance to mildew and is one of the easier rex hybrids to grow.

- **Osmanthus heterophyllus 'Maculifolius'**. This rare cultivar of holly osmanthus, imported from Japan by Glasshouse Works, displays spectacular variegation. Although still in limited supply (and therefore quite expensive), it is being offered by that firm for the first time this year. Holly osmanthus, an evergreen, is hardy to USDA Zone 6.

- **Rosa 'Bonica'**. The first shrub rose ever to receive an All-America Rose Selections award, 'Bonica' is a vigorous, disease-resistant shrub that produces arching canes that grow up to five feet in length; in three to four years, a single plant will reach five feet across. The plants produce masses of fully double, pastel-pink flowers from early spring until frost. The blooms, each of which has 50 or more petals, hold their color even in the heat of summer. Glossy-green foliage and attractive orange-red hips are other features of this outstanding new rose. 'Bonica' is winter-hardy from Wisconsin to Colorado, and can withstand the heat of southern states from Texas to California. The Conard-Pyle Company, which introduced 'Bonica' in this country, recommends this new cultivar for use in groups or as a hedge in the home landscape or in public plantings. 'Bonica' will be available from garden centers, nurseries and mail order firms across the country.

Two other new roses received the coveted All America Rose Selections award: 'Sheer Bliss', a hybrid tea with a strong, very sweet fragrance and creamy-white flowers brushed with pink; and 'New Year', a compact grandiflora rose that boasts above average disease resistance and striking orange blossoms.

- **Viola 'Flame Princess'**. This sensational new pansy from Thompson and Morgan produces unique bright yellow blossoms with orange-red "faces." The flowers are very large, and the plants reach a height of about six inches.



- **Acorn Squash 'Swan White Table Queen'**. This exceptional new acorn squash from Stokes Seeds is a must for every vegetable gardener. 'Swan White Table Queen' produces silvery-green, bi-colored foliage and snow-white fruits that are exceptionally good to eat. The flesh is smooth and pale yellow, and has no pumpkin taste. Furthermore, the fruit of this new cultivar has 10 times the calcium content of normal squash. (Squash also contains potassium and vitamin A.) Stokes recommends that each plant be allowed to develop three runners. From two of the runners, gardeners can harvest five to six 1½-pound mature acorn squash. The third runner will produce lots of immature fruit, which can be eaten as "summer squash" when it is still less than three inches long.

- **Rhododendron 'September Song'**. Trusses of warm orange blossoms characterize this new rhododendron, which grows to about four feet in 10 years. Hybridized by the late Dr. Carl Phetteplace of Leburg, Oregon, 'September Song' was named and is being introduced by Greer Gardens. A cross between *R. 'Dido'* and *R. 'Fawn'*, this new cultivar bears medium-to-large, olive-green leaves and is hardy to about 0° F (Zone 7).

- **Ornamental Cabbage 'Color-up' Mix**. Brightly colored ornamental cabbage are a fine source of late-fall and early-winter color for garden beds, borders or pots. 'Color-up' ornamental cabbage, a new introduction from Park Seed, produces attractive red, pink or white heads that are 10 inches high and 12 inches across. They are also resistant to heat and cold.

- **Rhododendron 'Hot Ginger & Dynamite'**. A large-flowered cultivar of *R. arborescens* (our native sweet azalea) 'Hot Ginger & Dynamite' bears bouquets of attractive blossoms in June and early July. Gardeners will especially appreciate its intensely fragrant blossoms, which perfume the



Pumpkin 'Munchkin'



*Osmanthus heterophyllus* 'Maculifolius'

air for a considerable distance around each plant. This new cultivar, which is being introduced by Carlson's Gardens, is hardy to USDA Zone 5 and will reach approximately six feet in height by five feet across in 18 years.

- **Plumeria 'Jean Moragne'**. Gardeners in the tropical regions of the country will want to take a close look at a series of handsome new *Plumeria* cultivars developed by the late Bill Moragne, one of the few modern hybridizers of plumerias. All of the Moragne cultivars will produce 4½ to

six-inch blossoms and will bloom reliably from cuttings. They can be grown in containers or, in USDA Zone 10 gardens, in the landscape. 'Jean Moragne' and the other Moragne cultivars are available from The Plumeria People.

- **Zantedeschia elliottiana 'Green Goddess'**. This new cultivar of the commonly grown calla lily makes a superb pot plant when grown in full sun. It bears unusual variegated flowers that are set off nicely by bold green foliage. 'Green Goddess' is available from Spring Hill Nurseries.

- **Ocimum 'Purple Ruffles'**. The benefits of this new basil cultivar will endear it to gardeners everywhere. It has a dwarf habit and glossy, reddish-black foliage that is very ornamental. Its strongly aromatic leaves are excellent for use as an herbal seasoning. An All-America Selections winner for 1987, 'Purple Ruffles' not only has ornamental value, but can also be used as an herb. This versatile cultivar will be available as plants or seed from garden centers and nurseries across the country. Seed will also be available from mail order seed companies.

- **Zinnia 'Rose Pinwheel'**. Gardeners will welcome this new introduction from Burpee Seed Company; 'Rose Pinwheel' is the first powdery mildew-resistant zinnia cultivar available. According to Burpee's Flower Research Manager, Dr. Denis Flaschenriem, 'Rose Pinwheel' represents a building block for future mildew-resistant zinnias. This new cultivar bears single, 2½- to three-inch flowers. The plants grow 18 to 24 inches in height, and can be grown in hot, dry, sunny spots or where mildew is a problem.

- **Acer negundo 'Flamingo'**. Although box elder is often considered a troublesome weed tree, this new cultivar from Wayside Gardens will be welcomed as an attractive ornamental. 'Flamingo', which has been grown in European gardens for some time, produces stunning foliage that is light pink when it opens in spring. At maturity, the leaves are green and are variegated with white and pink. 'Flamingo' can be grown as a shrub or small tree, but should be maintained at a height of 10 to 12 feet. Occasional pruning in summer will keep the branching compact and the foliage color bright. Hardy in USDA Zones 5 to 8, 'Flamingo' prefers a location in light shade, especially in the southern portions of its range.



*Acorn Squash 'Swan White Table Queen'*



*Plumeria 'Jean Moragne'*



*Rosa 'Bonica'*



*Acer negundo 'Flamingo'*



*Ocimum 'Purple Ruffles'*



*Primula 'Double Old Rose'*



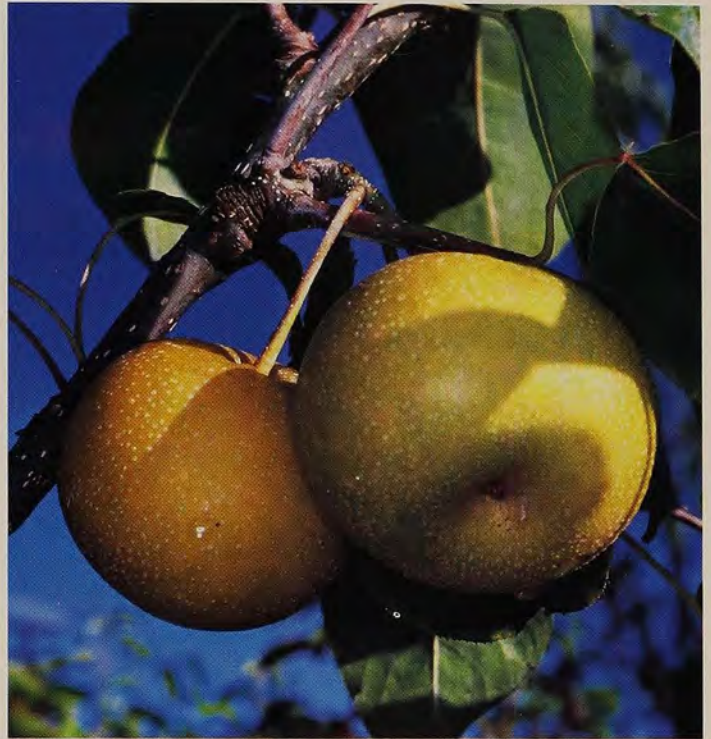
*Begonia 'Tiara'*



*Zinnia 'Rose Pinwheel'*



*Nelumbo* 'Charles Thomas'



*Pyrus pyrifolia* 'Kikusui'



Ornamental Cabbage 'Color-up' Mix



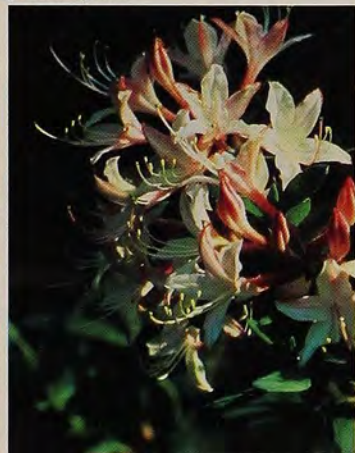
*Echinacea* 'White Swan'



*Rhododendron* 'September Song'



*Iris* 'Silverado'



*Rhododendron* 'Hot Ginger & Dynamite'



*Saintpaulia* 'Love Stripes'



- **Echinacea 'White Swan'**. This new white-flowered cultivar of our native purple coneflower will flower in only four months from seed. The plants grow only 12 to 15 inches in height, and each plant produces many striking four-inch flowers with dark centers. 'White Swan' is available from Thompson and Morgan.

- **Pyrus pyrifolia 'Kikusui'**. Although Oriental pears are not new, they are new enough to the American market to be newsworthy. The Japanese have grown these fruits (sometimes called "pear apples," although they are actually true pears) for centuries. 'Kikusui' is one of the new Japanese cultivars being introduced by Greer Gardens. Like other Oriental pears, 'Kikusui' is ornamental as well as practical. It produces an abundance of white flowers in spring, followed by a late summer crop of sweet, tasty fruit. The fall foliage color is also attractive.

- **Antirrhinum 'Princess White with Purple Eye'**. One of four All-America Selections winners this year, this new snapdragon is a prolific bloomer that sends up new spikes of blooms all summer long. The six- to eight-inch spikes make excellent cut flowers. 'Princess White with Purple Eye' will be available as plants or seed at garden centers and nurseries across the country. Seed will also be available by mail from major seed companies.

- **Saintpaulia 'Love Stripes'**. Pinwheel-shaped, single blooms are the outstanding characteristic of this lovely new African violet from Lyndon Lyon. The striped white and light lavender blossoms are set off by medium green foliage.

- **Styrax 'Pink Chimes'**. This new cultivar from Wayside Gardens was discovered recently in Japan by Barry Yinger, Curator of Asian Plants at the U.S. National Arboretum in Washington, D.C. (For more on Barry Yinger, see "Careers in Horticulture" in the December 1986 issue of *American Horticulturist*.) A



*Zantedeschia elliptiana* 'Green Goddess'



*Antirrhinum* 'Princess White with Purple Eye'



*Styrax* 'Pink Chimes'

shrub or small tree suitable for virtually any landscape situation, 'Pink Chimes' presents a spectacular display of pendulous, pinkish-white flowers in June. This new *Styrax* cultivar is hardy in USDA Zones 5 to 8, and thrives in a location with full sun or light shade. It prefers a moist, acid, well-drained soil enriched with organic matter.

For more information on the new plants available for the 1987 gardening season, look for a follow-up article in the March 1987 News Edition.

Most of the plants we have chosen this year are available only from the sources listed in the descriptions. For more information or to obtain a catalogue, write these companies at the addresses listed below.

All America Selections winners and All America Rose Selections winners will be available from local garden centers and nurseries, and from major mail order firms, some of which are listed below.

- W. Atlee Burpee Company, Dept. AH, 300 Park Avenue, Warminster, PA 18974. Catalogue free.

- Carlson's Gardens, Dept. AH, Box 305, South Salem, NY 10590. Catalogue \$2.00.

- Glasshouse Works, 10 Church Street, Dept. AH, P.O. Box 97, Stewart, OH 45778. Catalogue \$1.50

- Greer Gardens, Dept. AH, 1280 Goodpasture Island Road, Eugene, OR 97401. Catalogue \$2.00.

- Harris Seeds, Moreton Farm, Dept. AH, 3670 Buffalo Road, Rochester, NY 14624. Catalogue free.

- Lilypons Water Gardens, 1500 Amhort Road, P.O. Box 10, Lilypons, MD 21717, or 1500 Lilypons Road, P.O. Box 188, Brookshire, TX 77423. Catalogue \$4.00.

- Logee's Greenhouses, Dept. AH, 55 North Street, Danielson, CT 06239. Catalogue \$3.00.

- Lyndon Lyon Greenhouses, Dept. AH, 14 Mutchler Street, Dolgeville, NY 13329. Catalogue \$1.00.

- Moore Miniature Roses, Dept. AH, Sequoia Nursery, 2519 E. Noble Avenue, Visalia, CA 93277. Catalogue free.

- Geo. W. Park Seed Company, Dept. AH, P.O. Box 31, Greenwood, SC 29647. Catalogue free.

- The Plumeria People, Dept. AH, P.O. Box 820014, Houston, TX 77282. Catalogue \$1.00.

- Schreiner's Gardens, Dept. AH, 3625 Quinaby Road, NE, Salem, OR 97303. Catalogue \$2.00.

- Spring Hill Nurseries, Dept. AH, 6523 North Galena Road, Peoria, IL 61632. Catalogue free.

- Stokes Seeds, Dept. AH, 737 Main Street, P.O. Box 548, Buffalo, NY 14240. Catalogue free.

- Thompson and Morgan, Dept. AH, P.O. Box 1308-AM, Jackson, NJ 08527. Catalogue \$2.00.

- André Viette Farm and Nursery, Dept. AH, Route 608, Fishersville, VA 22939. Catalogue \$1.50.

- Wayside Gardens Company, Dept. AH, Hodges, SC, 29695. Catalogue \$1.50.



# CAREEERS

## IN HORTICULTURE

BY RICHARD M. ADAMS, II

If you are interested in horticulture—or any other field, for that matter—the decision whether to pursue an education is a complex one. Before deciding, you should ask yourself several questions: What are my goals? How will education help me achieve my goals? How much will it cost, and how will I finance it? How much income will I forfeit by attending school instead of working? Are achieving my goals and earning a potentially higher salary worth the educational costs and forfeited income?

The following two examples illustrate how goals and interests may vary from one person to another and ultimately influence one's decision to pursue an education.

Bob Robinson (not his real name) is a high-school student with a part-time job at a national nursery chain. As a general clerk, Bob puts merchandise out on the shelf, loads heavy items into customers' cars, runs a cash register, and performs many other tasks.

Management is so impressed with Bob's efficiency and willingness to work that it has offered him a position as a manager-trainee. If he accepts, he will forgo college and start at an annual salary of \$14,500 after graduating from high school—the same salary the company offers college graduates. After finishing the training program, Bob would be well on his way to a long-term career with the company, with many opportunities for promotion.

Bob enjoys working at the nursery and knows enough about the products to help customers. He is not really interested in horticulture as an academic subject. He doesn't like school very much, and would

rather work than study. For Bob, accepting the company's offer instead of attending college may be a wise decision.

Rich Wilson (also not his real name) recently graduated from high school and works at the same nursery chain, where he is head of the house plant department. Rich has been interested in plants since he was a youngster, and maintains his family's two hobby greenhouses.

Rich's job at the nursery requires considerable skill. He must be able to identify the hundred or more house plants the nursery stocks, help customers with questions, figure out which items sell best, order merchandise several weeks ahead, and keep a balance between empty shelves and too much inventory in the back room. Rich is good at all these jobs, and is considered one of the company's top house plant department heads. Nevertheless, he is starting to get bored with his job. He has no say in the kinds of plants stocked or the way they are displayed, since these decisions are all made at company headquarters.

Like Bob, Rich has been offered a manager-trainee position. However, he realizes managerial work would take him further away from the plants he loves. Thus, he is thinking about pursuing an education in horticulture. He feels the cost of college would be more than offset by the chance for a more rewarding career.

There are many opportunities available to someone like Rich Wilson who has decided to pursue an education in horticulture. For example, Rich could take some courses in horticulture at his local vocational college. He could also take plant materials courses at a botanical garden, if he is fortunate to live near one. Or he could attend an institution that offers a curriculum in horticulture, such as a land-grant university.

After obtaining a bachelor's degree, Rich could pursue graduate studies, enrolling in a master's degree program, which would involve one to three years of additional study. Then, if he wanted to continue, he could spend three to five more years pursuing a doctor of philosophy degree.

What do all of these choices mean to the person interested in horticulture? It depends on what that person specifically plans to do. As the first two parts of this series made clear (see the October and December 1986 issues of *American Horticulturist*), some horticulturists work mostly with their hands—for example, planting bulbs, re-potting house plants or spraying pesticides. Others work more with their minds—for instance, designing bulb plantings for landscapes, deciding when a house plant needs re-potting, or selecting pesticides and mixing and applying them properly. Finally, some horticulturists work a great deal with people—organizing volunteers or developing horticultural therapy programs for the disabled, for example. Although practical experience and the ability to work with one's hands are both important at almost all levels of horticulture, the more you work with your mind or with people, the more important education is in helping you achieve your goals.

Horticulture is a diverse field. The more you know about the educational programs that are available, the better you will be able to invest your time and money and plan your career.

### **Non-Degree Programs**

**Continuing Education Courses**—Many botanical gardens and arboreta offer educational programs as a community service. Generally, these courses are designed for amateur horticulturists and do not lead to a degree, unless they are offered in conjunction with a university. Many of these

An intern at Longwood Gardens in Kennett Square, Pennsylvania, furthers her education with some practical experience in caring for zinnias.

courses, however, are as challenging and stimulating as university offerings. (I once took a plant materials course at a major botanical garden, and found it to be much better than a comparable course at a state university, simply because the instructor had access to a several-hundred-acre arboretum from which he could take specimens for his class.) Botanical garden courses are a good way to explore your interest in horticulture, and normally require a smaller commitment of time and money than do regular college courses.

Many county cooperative extension offices also offer short courses geared toward the general public or the nursery trade. The Master Gardener Program, now available through many extension offices, provides amateur gardeners with basic training in horticulture in exchange for volunteer work in extension programs. There are also short courses and seminars for professionals offered by county extension offices.

**Internships**—Some botanical gardens also offer internships for students working toward horticultural degrees. These provide valuable practical experience that is difficult to acquire in the classroom. Some internships are intended for students enrolled in college, while others are self-contained programs that lead to special certificates. (For information on how to obtain a list of internship programs, see "Sources" on page 38.)

**North American Certificate in Horticulture (NACH)**—Many botanical gardens, parks, nurseries and other horticultural employers have had difficulty finding skilled horticulturists. This difficulty is partly due to a lack of emphasis on practical skills in colleges and universities in the United States, says Gregory Armstrong, former chairman of the North American Certificate in Horticulture (NACH) program of the American Association of Botanical Gardens and Arboreta (AABGA).

The AABGA inaugurated the NACH program to help certify the competence of horticulturists in practical skills. The program is based on a booklet, *Study Guide for the North American Certificate in Horticulture*, which includes a list of fundamental topics in practical horticulture. After studying the booklet and its extensive bibliography, candidates apply to take a written and practical exam, which is administered throughout the year at various locations, as announced in the *AABGA Newsletter* (see "Sources" on page 38). The NACH can be an important profes-

sional credential for the person interested in working as a gardener or horticultural foreman, since it certifies that the person has attained the equivalent, in education and experience, of a two-year degree or a botanical garden internship.

### **Associate and Undergraduate Degree Programs**

Most horticulture degree programs in the United States are offered through state land-grant universities, which were provided for by the federal government through the Morrill Act of 1862.

At the time the Morrill Act was written, the predominant industry in this country was agriculture. Many people, including Abraham Lincoln and Professor Jonathan Turner of the Illinois Industrial University (now the University of Illinois), began to realize the need for a national system of education in agriculture that would help farmers increase yields, improve soil structure and develop better crop plants. Lincoln promised that, if elected president, he would sign a bill that would establish such a system.

In 1862, Lincoln fulfilled his promise. The Morrill Act was passed, and the federal government donated land in each state for the establishment of a college for "the special teaching [as defined by the state legislation] of such branches of learning as were directly related to agriculture and the mechanic arts."

The state universities created through the Morrill Act have a three-fold purpose: research, teaching and extension. They conduct research to discover new knowledge in the applied sciences, including horticulture, agriculture and animal science; they pass the knowledge gained from this research on to students through courses taught at the university; and they interpret this knowledge for practical application by farmers, nurseries and other citizens through extension agents.

**Choosing a School**—Choosing an educational program involves a great deal of research. Be sure to allow plenty of time to explore your options before you apply for admission. (You should be concluding the research on which colleges or programs interest you about a year and a half before the semester you plan to start school.) Talk with professionals in the field, send for catalogues and brochures, and visit campuses. Many schools have "visitor overnight" programs that permit prospective applicants to stay overnight in a dormitory

and get a feel for the college's atmosphere, social life and other intangible factors important to a happy experience.

Some factors to consider in selecting a college include location, cost, course offerings, professors, size, independent study opportunities and extracurricular activities.

**Location.** How far away or close to home do you want to be? Can you save money on living expenses by commuting from home? What kinds of plants are native to the college's region? If you want to study tropical plants, you might consider the University of Florida or the University of Hawaii. If you are more interested in studying the cold-hardiness of trees and shrubs, the University of Minnesota would be worth considering.

**Cost.** Keep in mind that land-grant universities generally charge less tuition to in-state residents (usually defined as living in the state a year or more) than to out-of-state residents.

**Course Offerings.** Some colleges offer specialized courses. For example, the University of California at Riverside offers several courses in citrus fruits, while the University of California at Irvine offers courses in molecular biology. Check college catalogues for course listings.

**Professors.** What is the quality of instruction like? Professors vary in their knowledge of the subject and ability to present a well-organized, interesting and even entertaining course.

**Size.** How large and diverse is the student body? What is the faculty-student ratio? Large schools generally offer a greater selection of courses and extracurricular activities, while smaller institutions can offer smaller classes and greater opportunities to get to know professors and classmates.

**Independent study opportunities.** At some universities, undergraduates have access to specialized equipment like electron microscopes, while at other universities, only graduate students are permitted to use this type of equipment. Similarly, some schools encourage independent study by giving professors the time to work individually with students, while others do not.

**Extracurricular activities.** Extracurricular activities vary according to the college's location and the attitude and interest of the students.

**Associate's Degree**—An associate's degree involves a two-year program of study that generally stresses technical, or "how-to," aspects of a specialized field. For example,

the State University of New York at Farmingdale offers the following associate in applied science (A.A.S.) degree programs related to horticulture: Agricultural Business, Agronomy, Arboriculture, Floriculture, Horticultural Management, Landscape Development, Nursery Management and Turfgrass Management. These programs are intended for the student who wants to enter the horticultural field at a technical or middle-management level—for example, as a practicing farmer, tree expert, flower grower, florist shop manager or golf-course superintendent. However, many students begin their education with an associate's degree, then transfer into a four-year bachelor's degree program.

**Bachelor's Degree**—A bachelor's degree program requires four years of study. Generally, it is more intensive than the associate's degree program, and involves more course work in such basic areas as chemistry, physics, botany, business, English and social studies. Bachelor's degrees offered at Cornell University that are related to horticulture include Landscape Architecture and Plant Sciences. Those students who specialize in Floriculture and Ornamental Horticulture (both of which fall under "Plant Sciences") may choose an "emphasis" in Greenhouse Crop Production Management, Retail Florist Management, Horticultural Business, Horticultural Therapy, Interiorscaping, Landscape Horticulture, Nursery Crop Production Management, or Extension, Teaching and Research. Most horticulture students pursue a general program that includes course work in most or all of these specialized areas.

**Admission to Undergraduate School**—Keep in mind that you are not the only one investing time and money in your education; the institution will also be investing in your career. (On the average, tuition pays about one-third of a student's educational expenses; the rest comes from government support, endowment earnings, private contributions, grants and other sources.)

Thus, the selection committee of any educational program will look for some assurance that its investment in you will pay off; that is, that as a well-educated student, you will successfully apply your knowledge in a career. Specifically, the committee will be looking for such indicators of success as good grades and good scores on standardized tests like the Scholastic Aptitude Test. Evidence of interest and



At Brooklyn Botanic Garden, intern Naoko Saito from Tokyo, Japan, helps out with the Harvest Fair.

achievement, such as previous work experience, may also be considered. If you apply to a program that requires an interview, you should bring along some evidence of your achievements, such as pictures of gardens you have planted or maintained, landscape plans you have drawn, a list of plant species you have grown or a list of botanical gardens you have visited. This kind of evidence will help convince the committee that the institution should invest in your career.

### **Graduate Degrees**

**Choosing a Graduate School**—Many of the same factors that are important in choosing an undergraduate school also apply to graduate programs. However, a graduate program involves working closely with an individual professor. Therefore, the professor is the most important factor in choosing a graduate school and program.

**The Professor.** Who will direct your graduate program and help you with your research and thesis? What is his or her reputation in the field? How accessible is he or she? Will you get along? How many other students does the professor have? What ideas for research projects does he or she have in mind? How open to *your* suggestions for projects is he or she? How many students of this particular professor have graduated in the last five years? On the average, how long do his or her students take to finish a graduate program?

**Facilities.** How much space and equipment does the department have for research or teaching? How modern are the facilities? Will you have access to expensive equipment like electron microscopes, electronic balances, computers, mass spectrometers and so on? How extensive are the plant collections and gardens? Will you have access to cooperating institutions

Lucy Jones, courtesy of Brooklyn Botanic Gardens

such as museums, botanical gardens and hospitals?

**Degree requirements.** What kinds of courses, credit hours and thesis projects are required for the degree? Are there many bureaucratic requirements set by the institution, or is the program flexible enough to be tailored to each student?

**Financial aid.** Unlike undergraduate students, most graduate students are funded by "assistantships" that allow them to teach or do research part-time in return for a tuition waiver and a stipend of several thousand dollars a year for living expenses. Assistantships are often limited, however, so it is wise to check with the department or professor before applying.

**Courses.** Does the graduate school offer the courses you want to take?

**Master's Degree—**A master's degree program usually involves one to three years of study beyond the bachelor's degree. The master of science (M.S.) degree emphasizes research training and usually requires the candidate to do an original research project and to write a thesis. Depending upon

the university, the candidate may also be required to complete a minimum number of course credits. Professional master's degrees like the master of professional studies (M.P.S.), master of agricultural science (M.A.S.) and master of landscape architecture (M.L.A.) are intended for students wishing to acquire additional technical knowledge primarily through courses. Original research is usually not required, but the student may be asked to do a special project, which is normally less involved than a thesis.

**Doctor of Philosophy—**The doctor of philosophy (Ph.D.) degree is intended primarily for those students who want to do research and teach at universities or work with private companies. Most research at this level is highly specialized and may be only remotely related to the concerns of the amateur or practicing professional horticulturist. (See the description of Kenneth Mudge's work in Part I of "Careers in Horticulture" in the October 1986 issue of *American Horticulturist*.) A Ph.D. degree generally requires a minimum of three

to five years of study. In addition to course work, candidates must complete a satisfactory research project and thesis, which usually takes two or more years.

## Horticulture Courses

What is it like to study horticulture in college? The following is a small sampling of classes I observed recently. If you are considering attending college in horticulture, why not visit a school that offers courses in horticulture and see if you can sit in on the classes that interest you? While you're visiting the campus, you may also want to stop in at the bookstore and look over the textbooks for the courses.

**Advanced Floral Design—**Flower arranging is an important course for anyone interested in pursuing a career as a florist or floral designer.

The day I visited Professor John Martin's class at Delaware Valley College in Doylestown, Pennsylvania, the topic was flower arrangements for funerals. "Some florists think that because a funeral piece will be around just a few days, they can use any old flowers they want to get rid of," said Professor Martin. "When you design a funeral piece, though, you should use good material, not only out of respect for the occasion, but also because it is one of the few types of arrangements that will bear your signature as the designer."

"Two basic shapes found in funeral arrangements are fan-shaped and triangular," Professor Martin continued, pointing to an arrangement of maroon snapdragons he had made earlier in the week. He discussed containers, then turned the 12 students loose to design their own arrangements.

The classroom was designed like a florist's shop, with its own cooler, display window and back room with ribbons, tape and other supplies. A blackboard listed the prices of supplies, including each type of flower, greenery, container and accessory.

Each student was free to choose from the wide selection of flowers. One student started with a background of palm leaves



LEFT: Students at Delaware Valley College in Doylestown, Pennsylvania, learn about designing and pricing funeral pieces in Professor John Martin's Advanced Floral Design course.

ABOVE RIGHT: At the University of Delaware in Newark, Delaware, students crowd around a flowering tree during a plant materials laboratory while Teacher's Assistant Roger Phenicie describes the important characteristics of the species.



and made a fan of yellow mums and daffodils. Another started with leatherleaf fern and added purple flowers, including a spray of moth orchids (*Phalaenopsis*). Professor Martin walked around, offering suggestions. He wanted to see more of a focal point in the yellow arrangement, and thought the purple one needed more height and width.

Finally, each student added up the cost of the materials used and decided on a price for the arrangement. Professor Martin graded the arrangements on how well the students had used good design principles.

During the semester, the students also learned how to design arrangements for the table, for weddings, and for personal wear (for example, corsages, boutonnieres and hair pieces). They also studied design styles. After taking the course, the best students are well prepared to design in florist shops.

**Plant Propagation**—If you like to start plants from cuttings and seeds, you will learn in a plant propagation course that these methods are but two of many propagation techniques. In contrast to the more aesthetic flower-arranging course, plant propagation exposes students to scientific research and experimentation.

Students in the plant propagation course taught by Dr. Kenneth Mudge (see “Careers in Horticulture,” Part I, in the October 1986 issue of *American Horticulturist*) at Cornell University perform at least seven experiments with cuttings and four with seeds. They also do exercises in budding and grafting, as well as micropropagation, or plant tissue culture.

In one experiment, students compare several brands and formulations of commercial rooting compounds and their effect on both easy- and difficult-to-root species. High concentrations of the auxin found in these products are required to induce rooting of such difficult-to-root woody plant species as evergreens, while the same concentrations may actually inhibit rooting of easy-to-root plants.

In another experiment, the class assesses the effects of kinetin, a shoot-stimulating growth regulator, on leaf cuttings of rex begonias. As one might expect, treatment with kinetin encourages early shoot growth from these cuttings.

This plant propagation class also includes several laboratory sessions on tissue culture, or micropropagation. The students learn to work under a clean air hood, using sterile procedures to cut off, or “excise,” the microscopic shoot tip of a plant and place this “explant” into a test tube of a solid nutrient medium. Micropropagation is used not only for rapid propagation of plants, but also to rid plants of pathogens that may be transmitted by cuttings, to overcome seed germination problems, and for germplasm storage.

**Plant Materials**—As students entered the woody plant materials laboratory of Professor James Swasey at the University of Delaware in Newark, Delaware, one day, they paused to look at twigs of flowering cherry, quince, forsythia, and other spring-blooming trees and shrubs—a preview of what they would soon see outside.

“Today we’ll be covering 17 new plants,” began teacher’s assistant Roger Phenicie, a junior who earns course credit for in-

structing one of three laboratory sections, each with about seven students.

“The first plant is flowering quince, *Chaenomeles speciosa*. This is a large shrub, usually six to 10 feet in height, with many erect-to-spreading, spiny branches,” he continued. The students hunched over their laboratory benches, intently filling in the data on mimeographed forms with blanks for the common name, scientific name, family, habit, height, flowering season, flower color, and other ornamental and cultural characteristics. (Although students who take the course have a textbook with all the information, such forms are commonly used to help them sort out and learn the important data for the 200 to 300 plants they will be studying.)

After filling out forms for each new plant, the students viewed slides of the species. Then they went outside to view live specimens.

Like many colleges offering plant materials courses, the University of Delaware has a small, but diverse collection of woody plants on campus. Some larger universities have arboreta or botanical gardens that serve as laboratories for these and other courses.

Although plant materials courses involve learning a staggering amount of information, they offer the student a chance to learn, in one course, what could take years to learn on one’s own. The acquired information can become the landscape designer’s palette or the nurseryman’s tool-in-trade.

**Plant Taxonomy**—“Spring Wildflowers” may sound like a fun and easy course, but as some of my students at the University of California at Riverside discovered, there is a lot of hard work involved. However, if you are interested in horticulture, some hard work in a taxonomy course can save you a lot of work later on, when you have to identify plants. If you know the most common plant families (of which there are fewer than 100), you will be able to identify landscape plants all over the world.

The course textbook, *A California Flora* by Philip A. Munz, contains a few pictures, but it is illustrated mostly with line drawings. Most of its nearly 2,000 pages are filled with descriptions and keys. If you want to identify a California lilac, for example, you start with the Rhamnaceae, or buckthorn family. The key then helps you determine the genus by asking you to choose among successive pairs, or couplets, of de-

*Continued on page 36*

# Cacao Beans & Cola Nuts

One of the largest commercial food manufacturing enterprises in the United States centers around a tropical tree native to the Americas and known to all the world as the source of chocolate. The tree is cacao, *Theobroma cacao*. Often called "food of the gods," it is among the best known of all the plants originating in America.

The history of cacao and chocolate dates back to the time of the Incas, Mayas and Aztecs of Central and South America, who cultivated cacao and made a bitter-tasting drink called *xocolatl* (pronounced chocolatl) from the roasted beans. The Incas, in whose territory the cacao tree was first cultivated, exploited the tree both for the beverage and for its seeds, which were used as currency and as the basis of the Peruvian financial system.

William H. Prescott's *History of the Conquest of Mexico* records that chocolate was the national drink of the Aztecs. Hernando Cortés found chocolate at the court of Montezuma and introduced the beverage to Spain. There, sweetened, flavored with cinnamon and vanilla, and served hot, the recipe remained a Spanish secret for almost 100 years. Later, in the 17th century, chocolate became very popular, and chocolate houses spread throughout Europe.

During the 16th and 17th centuries, the Spanish established cacao plantations in their colonies in Central and South America. The Dutch took the trees to Indonesia, Ceylon and the islands off equatorial Africa; from there, cacao was introduced to the Gold Coast in late 1870. Today, Ghana and Nigeria are the world's leading cacao growers; Brazil is the next largest producer. Cacao trees are cultivated in large orchards, pruned to a size that keeps their fruits within easy reach of the pickers.

The cacao tree is an evergreen that can attain 40 feet in height. Its leathery, long-stalked leaves are coppery in color and hang limply when they first emerge, then stiffen and become green. Insignificant flowers appear in clusters on small, rounded "cushions" that protrude from the trunk and branches. Dung flies are attracted to



*Theobroma cacao*, commonly called cacao, is best known as the source of chocolate. Each 10- to 14-inch fruit contains from 25 to 50 seeds, or beans. The beans are fermented and dried before being processed into chocolate.

these malodorous flowers and attend to pollination. The fruit is a 10- to 14-inch-long red pod that resembles an elongated acorn squash. As many as 25 to 50 seeds, or beans, are embedded in the mucilaginous pulp in the pod. (The word "cacao" is used to refer to the seed or bean, as well as the pod or the tree.) A good tree will bear 60 or 70 of these fruits, and is continuously in bloom and fruiting. The beans are extracted, fermented and dried before being processed into chocolate or cocoa.

The cacao tree belongs to the Byttneriaceae, or byttneria family, although some taxonomic authorities classify it as a member of the Sterculiaceae, or sterculia family. (Willis's *Dictionary of Flowering Plants and Ferns* classifies *Theobroma* as belonging to the Sterculiaceae, as do many other sources.) These two closely related families include tropical trees, shrubs, and a few vines and herbaceous species, some of which are of economic or ornamental value.

*Dombeya* species are perhaps the best-known ornamentals in the Byttneriaceae. This genus from Africa and Madagascar

includes some beautiful shrubs and small trees. The name *Dombeya* commemorates Joseph Dombey, a French medical botanist who accompanied many 18th-century Spanish expeditions to Chile and Peru as a plant collector and eventually died in a Spanish prison.

The flowers are the outstanding feature of *Dombeya* species. Usually showy and sometimes fragrant, they bear five petals and are held in dense heads that are either erect or pendulous. The large leaves are velvety-hairy. There are several attractive species and hybrids, some of which are grown as ornamentals in the tropics or subtropics, including USDA Zone 10 in Florida and southern California.

Most notable of *Dombeya* species is *D. wallichii*, a small tree with showy, scentless balls of one-inch pink or red flowers that hang like Christmas ornaments and appear at Christmastime among the dense foliage. *D. burgessiae*, a six- to 12-foot shrub, has fragrant white or pink flowers. A hybrid of this species, *D. × cayeuxii*, sports handsome rose-pink flowers with yellow anthers.

The largest genus in the sterculia family is *Sterculia*. The name—from the Latin word *stercus* (meaning dung) and the name of the Roman God of Privies, Sterculus—alludes to the foul odor of the flowers of many species in the genus. The 300 *Sterculia* species include deciduous or evergreen trees of the tropics or subtropics of the Americas and the Old World. The flowers of these trees have no petals, but the calyx is often very ornamental, and its segments are enlarged and colorful. Seeds are produced in woody pods that radiate like spokes of a wheel from a central stem.

*Sterculia foetida* is especially malodorous, as suggested by the species name, which means stinking. It is native to the coastal regions of tropical Africa, Asia and Australia. Four-inch-long, boat-shaped seed pods radiate in a star-like fruit and open to release shining edible seeds that may be roasted or consumed raw. This flavorful seed is known as Java olive or Indian almond.

*S. apetala* is the Panama tree. Explorers





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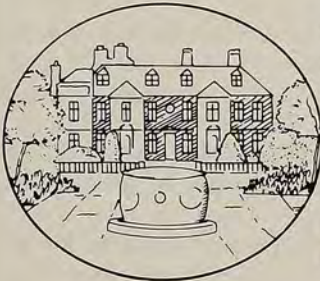


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**Chocolate Facts**

**C**acao beans contain a great deal of fat, in addition to minute amounts of mildly stimulating alkaloids, including theobromine and caffeine. Cocoa is made by removing most of the fat from the beans, which are then roasted and ground up. The fat that is removed is called cocoa butter; it is an important ingredient in pharmaceutical and cosmetic preparations. White chocolate consists of cocoa butter mixed with sugar. Regular chocolate is made by adding extra fat (cocoa butter) to ground-up beans. All chocolate that meets U.S. federal standards is classified as "real chocolate." All "real chocolate" contains cocoa butter. Other chocolate products, which are usually made from cocoa, substitute vegetable oil for cocoa butter, and must be labeled "chocolate-flavored."

Although both cocoa and chocolate are rich in calcium, they are also high in oxalic acid, which apparently interferes with ab-



Photographs courtesy of Hershey Foods Corporation

sorption of calcium in the body and therefore offsets the potentially positive effects of this mineral.

found the villagers on the Isthmus of Panama chewing seeds produced by this tree. The popularity of the seeds led to the name of the republic and to the adoption of the Panama tree as the national emblem. The tree provides much-needed shade in a land where the sun's rays are intense. When its ill-smelling flowers open, it is shunned, as are other members of the genus. The seeds from the tree's hard brown pods are edible. *S. apetala* is also used as a timber tree.

Several other cultivated species of Sterculia are planted for shade or ornament in southern Florida and in Hawaii. However, they are used with discretion because of the odor of the flowers.

Another genus in the sterculia family is *Cola*. Like the cacao tree, the cola nut tree has great commercial value. In fact, next to the oil palm, *Cola* is the most important nut crop in Africa. This African native is widely grown and has special uses in social and religious customs. Nuts of *Cola nitida* and *C. acuminata* are collected from both wild and cultivated trees, and sold fresh at the market. Cola nuts of commerce come chiefly from wild trees in Africa and cultivated orchards in the West Indies. The trees are also sometimes planted in tropical gardens.

The *Cola* species—*C. nitida*, *C. acuminata* and *C. vera*—are all modest-sized trees that bear simple, lobed or compound glossy leaves and small clusters of red or yellow flowers; egg-shaped pods contain about eight reddish seeds or nuts each. According to 16th-century accounts, people of the Cape Verde region chewed the seeds to enable them to go without food, to quench thirst and to improve the quality of drinking water. Today, cola nuts are chewed in West Africa and elsewhere as a stimulant or to suppress feelings of fatigue or hunger. The nuts or seeds, which contain about two percent caffeine as well as other alkaloids and flavorful oils, are also used in the preparation of medicines and beverages.

Cola drinks, made by boiling the pulverized dried seeds in water, are known all over the world. Many of these are prepared with added extracts from coca leaves (*Erythroxylum coca*) from which the cocaine has been removed. The best known cola drink, Coca-Cola®, is a carbonated soft drink flavored with extract from coca leaves, cola nut, sugar, caramel, and acid and aromatic substances. The recipe for Coca-Cola® is a closely guarded secret, and rival beverage companies have not yet suc-

ceeded in analyzing or duplicating the product.

Another tree in the family, *Brachychiton*, commonly called bottle tree, is so similar to *Sterculia* in botanical features that the 11 species in this genus are sometimes listed as *sterculias*. Native to Australia, brachychitons are used as ornamental trees in Zone 10, particularly in California.

*Brachychiton acerifolius*, flame tree, is a magnificent 60-foot deciduous tree that produces flowering panicles of rich red, bell-shaped calyxes. It is leafless when in flower. Its leaves are deeply lobed, resembling those of maples; hence its specific epithet. The tree's inner bark is used in making cordage, mats, hats, bags and baskets.

*B. populneus*, commonly called kurrajong, is characterized by poplar-like foliage and provides excellent fodder for livestock. A deep-rooted species, kurrajong retains its greenness even in droughts. In California, it is used as a windbreak.

*B. rupestris*, narrow-leaved bottle tree, has a very swollen trunk above its constricted base, which gradually tapers to a bottleneck shape above. Bottle tree is an appropriate name, since the tree serves as a reservoir of water. Also stored between the inner bark and the wood is a sweet, edible jelly.

Five genera of Sterculiaceae are native to southern portions of the United States. One species of distinction is *Fremontodendron californicum*, from California, Arizona and Baja California. This attractive species is an evergreen tree or large shrub that is generally suited for ornamental planting in climatically similar regions but is reportedly hardy in the East up to Zone 6. Its thick, leathery leaves are densely felted beneath. The flowers lack petals; the bright yellow calyx of the two- to four-inch flowers is very showy. Often listed erroneously as *Fremontia*, the genus *Fremontodendron* was discovered by and named for John C. Fremont, who collected many notable trees and shrubs during four hazardous explorations in the far western United States between 1842 and 1848.

Whatever their precise botanic classification, or wherever they are encountered, plants belonging to the Byttneriaceae or Sterculiaceae constitute a valuable and fascinating assemblage of the world's flowering plants. ●

—Jane Steffey

Jane Steffey is an editorial advisor to *American Horticulturist*.



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# Book Reviews

## In an Irish Garden.

Sybil Connolly and Helen Dillon, Editors; photography by Walter Pfeiffer. Harmony Books, New York, New York. 1986. 160 pages; hardcover, \$40.00. AHS member price, \$30.00.

Like *The Englishwoman's Garden* and *The American Woman's Garden*, this book is a collection of personal essays by gardeners about their own gardens. The editors have selected a variety of gardens to feature (the majority of which are private), many of which have not been formally photographed before. Included are castle gardens, the gardens of stately Georgian mansions, plantings around small country houses and many cottage gardens. Although most of the gardens selected are clustered around Dublin, this book features gardens located in both northern and southern Ireland—from Glenveagh Castle in County Donegal to Knock-na-Garry in County Cork.

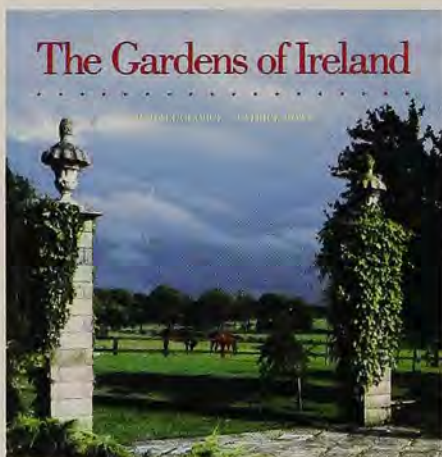
The essays about each garden are personal in nature; each gardener discusses the history of his or her garden, comments on particular plant combinations (many of which, alas, are not suitable for our harsher American climate), and describes the general layout of the garden or discusses particular projects undertaken throughout the years. A map locating all of the gardens is provided.

As with all books of this type, the photographs are stunning, and they provide a glimpse of traditional perennial borders and terraces that are designed with an Irish flair, gardens with spectacular views of the Irish countryside, or lovely combinations of exotic and common plants that are as unexpected as they are beautiful.

## The Gardens of Ireland.

Text by Patrick Bowe. Photographs by Michael George. Little, Brown and Company. Boston, Massachusetts. 1986. 189 pages; hardcover, \$39.95. AHS member price, \$35.95.

*The Gardens of Ireland* features 21 gardens, many of which surround palatial estates in the tradition of the great English country houses. This book differs from *In an Irish Garden* in that its presentation is more formal. Where *In an Irish Garden*



includes informal, personal text written by the gardeners themselves, and presents intimate photographs of the private gardens featured, *The Gardens of Ireland* has formal, carefully written text and photographs that illustrate the grand-scale style of the houses and gardens featured.

Both public and private gardens are featured, and the text about the gardens is interesting and well written. The author includes information about the design and focus of each garden, and also describes particularly interesting plant combinations. Also included is a discussion of the history and development of each garden.

The photographs, for the most part, are lovely. Many views taken from vantage points above the gardens show the layout and scale of the gardens. Others illustrate architectural features, perennial borders and particular plant combinations. Unfortunately, several photographs seem dark, and much of the detail of the plants in these pictures is lost.

Twenty of the gardens featured in *The Gardens of Ireland* are open to the public, and a map locating these gardens is provided.

## The Oxford Companion to Gardens.

Geoffrey & Susan Jellicoe, Consulting Editors. Oxford University Press. New York, New York. 1986. 635 pages; hardcover, \$49.95. AHS member price, \$44.95.

Essentially an encyclopedia of terms, people, places and events important in the development of gardens, *The Oxford Com-*

*panion to Gardens* contains a wealth of fascinating information on topics ranging from Swedish pomologist and garden architect Carl Abelin to zoological gardens. The approximately 1,500 entries—700 devoted exclusively to specific gardens—were written by a panel of experts, and include information on the history of gardens all over the world. General discussions of the development of gardens in particular regions—Africa and South America, for example—are included, along with entries on individual public gardens. In addition to British gardens, the editors have included entries for many major American gardens, as well as gardens in specific countries all over the world. Also included are biographies of a wide range of individuals from all parts of the world who are important in the study of garden history, and discussions of various garden styles.

This book would make a handy reference for anyone with a curiosity about garden history or gardens around the world.

## The Gardener's Handbook of Edible Plants.

Rosalind Creasy. Sierra Club Books. San Francisco, California. 1986. 420 pages; hardcover, \$25.00; softcover, \$12.95. AHS member price, \$21.88 (hardcover), \$11.35 (softcover).

There are hundreds of edible plants for gardeners to choose from, and who but Rosalind Creasy, author of *The Complete Book of Edible Landscaping*, is better qualified to write an encyclopedia of food-bearing plants for the home garden?

This is a fascinating, detailed look at a wide variety of food plants, ranging from tropical fruit trees such as pineapple guava and citrus, to hardy nut trees, herbs and such exotics as capers. The information in each entry is organized for easy reference; readers can quickly scan both the "effort scale" and a thumbnail sketch of the cultural requirements of each plant to see if it is suitable for their particular needs. The author has also included a detailed discussion of how to use each plant in the kitchen and in the landscape. "How to grow" information includes bulleted paragraphs on climate, exposure, soil, fertilizing, watering, pruning, pests and har-

vesting. Sections on how to purchase each plant include information on pollinators, lists of cultivars and sources. Finally, the author includes a discussion of how to preserve and prepare each plant and a sample recipe or two.

Although the majority of the book is devoted to the encyclopedia entries, the author has also included valuable information in "Part Two" on planting and maintaining the edible landscape. "Part Three" is devoted to lists of sources of edible plants, organizations and publications, as well as a glossary and an extensive bibliography. The book is illustrated with numerous line drawings.

### New In Paperback

#### Early American Gardens: For Meate or Medicine.

Ann Leighton. University of Massachusetts Press. Amherst, Massachusetts. 1970. 441 pages, softcover, \$14.95. AHS member price, \$11.95.

#### American Gardens in the Eighteenth Century: For Use or For Delight.

Ann Leighton. University of Massachusetts Press. Amherst, Massachusetts. 1976. 514 pages, softcover, \$14.95. AHS member price, \$11.95.

Anyone with an interest in the history of American gardens will be pleased to know that these two fine books are now available in paperback. *Early American Gardens* focuses on the use of plants in 17th-century New England. The author has unearthed fascinating information on the history of plant use in the New World, as well as garden design, nomenclature, the day-to-day use of plants in the home, and the use of plants in medicine and cooking. An extensive appendix includes discussions of plants of particular importance.

*American Gardens in the Eighteenth Century* continues the history of gardening in America with chapters on 18th-century American vegetables and fruits, George Washington's Mount Vernon estate, naturalists and botanists that explored this country during the 18th century, and the development of plant catalogues and lists.

Both books are copiously illustrated with black-and-white engravings, line drawings and garden plans. Indexes and extensive bibliographies are also provided. ♀

—Barbara W. Ellis

Barbara W. Ellis is Publications Director for the American Horticultural Society, and Editor of *American Horticulturist*.

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# AHS Travel Program

**Spain in Private Splendor** (April 12-26). A land of great beauty and history, the very name "Spain" provokes one's imagination. Our visit will encompass the four corners of this magical country—Barcelona, Galicia, Grenada, Sevilla and, of course, will include time in Madrid. Since many of this country's most interesting gardens are privately owned, we have enlisted two of Spain's leading horticulturists to help design this exceptional tour. Private is the best word to describe what we are offering: from Arab castles, ducal palaces and monasteries to bullfights, country houses and city gardens, much of what we will see will be opened to us exclusively. This trip will delight all those interested in a fine blending of culture and horticulture.

**Capability Brown's England and the Chelsea Flower Show** (May 18-June 1). The name Capability Brown is synonymous with the magnificent open parks and woodlands of England. His influence is also apparent in some of the great houses and surrounding gardens for which he was architecturally and aesthetically responsible. Our two-week tour will include visits to some of these treasures, with private tours conducted by the owners or head gardeners. We will also visit some smaller and more private estates, many of which are not known to the general public. A trip to the

Chelsea Flower Show on Press Day will round out this exciting tour.

**In Search of Gertrude Jekyll II** (July 7-22). Our search for the gardens of Gertrude Jekyll will take us to the English countryside to visit the many homes and gardens that speak to the genius of this outstanding gardener and her remarkable partnership with Sir Edwin Lutyens. Throughout our tour we will meet with English authors, landscape architects and horticulturists who will share with us their knowledge and affection for the work of Gertrude Jekyll. Leader: Mac Griswold, garden writer and historian.

-----  
**YES! Please send me more information on the tours I have checked below.**

- Spain in Private Splendor
- England and the Chelsea Flower Show
- In Search of Gertrude Jekyll II

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MAIL TO: Elizabeth Smith, American Horticultural Society, PO Box 0105, Mount Vernon, VA 22121.

## CAREERS IN HORTICULTURE

*Continued from page 29*

scriptions. In this case, your choice is "fruit fleshy, drupelike" or "fruit dry, capsular." If your specimen has a dry seedpod, you would choose the second alternative. Then you get another choice: "calyx-tube joined to base of ovary, the sepals deciduous in fruit; style not jointed" versus "calyx-tube free from lower part of ovary, the sepals persistent; style jointed." If the elongated part of the ovary, or style, of your specimen is bent, or "jointed" and the group of fused sepals, or calyx-tube, is attached to the ovary, you would choose the first. One remaining couplet in this short key brings you to *Ceanothus*, the California lilac genus.

Taxonomy has a reputation for being difficult, since the student must learn hundreds of new terms. A leaf tip, for example, can be acute, acuminate, cuspidate, obtuse or emarginate, depending upon how abruptly it tapers. Most courses include ongoing instruction in terminology so that students can key faster.

Students of plant taxonomy also learn how to recognize botanical families. (This skill saves time in keying, because if you recognize the family of an unknown plant, you do not have to use the lengthy family key.) All members of the bean family, Leguminosae, for example, bear the same kind of fruit (termed a legume), a pod that splits down both sides. The family is divided into three easily recognizable subfamilies. These include the Faboideae, whose members bear a bean-like, or "papilionaceous," flower with an upper petal ("banner"), two side petals ("wings") and two lower petals joined at their bases to form a boat-like "keel." The subfamily Caesalpinioideae includes many beautiful tropical trees, such as *Delonix regia*. Members of the Caesalpinioideae bear flowers whose upper petals are overlapped by the lateral petals. The Mimosoideae includes the acacias (*Acacia* spp.) and powderpuffs (*Calliandra* spp.). The flowers, each of which have many stamens, appear in dense clusters and look like a ball or powder puff of stamens. Once you learn to recognize these characteristics, you can spot the bean family anywhere.

**Landscape Techniques**—Once you have learned to propagate and identify plant materials, you can learn how to plant them in the landscape and take care of them. Courses like the one taught by Professor Frederick H. Ray at Delaware Valley College help students learn these very techniques.

On the day of my visit to the class, seven

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students were learning how to plant a tree. The group had previously dug up a specimen, and had learned how to ball-and-burlap the root ball. Now, they were preparing to plant the Stewartia tree (*Stewartia pseudocamellia*) along a new nature trail surrounding the pond at Delaware Valley College.

Our first stop was the shed to pick up tools, including shovels, rakes and a basket-like hand truck for carrying heavy root balls. "A truck like this would cost about \$250 retail, but this one was made by a welder with about \$75 worth of parts," explains Professor Ray. He held up a two-handed tubular frame that is used like a miniature sedan chair to transport root balls. "This other type of carrier can be used by two people to carry a small tree. We're having one built with four handles, which will be steadier." A class member tried to sit on it, while two others struggled to keep it from tipping sideways. Pointers like these help the students choose equipment and use it properly when they are working at a nursery.

Our next stop: the compost and mulch bins. Here, Professor Ray described the different types of soil amendments and their components. On this particular day, the students were going to use "Eagleite," composted wood shavings from a nearby kennel, to give the transplanted tree a boost of nutrients.

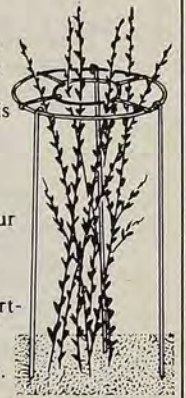
At the planting site (a slope bordering the pond), the class dug a hole and hoisted the tree into place. As they filled the hole in with a mixture of soil and compost, Professor Ray kept the tree straight and helped stamp down the soil to eliminate air pockets around the roots. As the last bits of fill were raked level, he sprinkled a pre-emergent herbicide over the soil to prevent weed seeds from germinating and to help the tree establish itself without competition. The students then watered in the tree and spread more Eagleite over and around the water basin as a mulch.

Professor Ray's course also includes units on planting design, turf, transplanting, pruning, diagnosis of pathogens and tree fertilization. Such courses go a long way in providing horticulture students with valuable practical experience. ●

Richard M. Adams, II has a Ph.D. in horticulture from Cornell University. He is the author of "Careers in Horticulture" Part I and Part II, which appeared in the October and December 1986 issues of *American Horticulturist*.

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## CAREERS IN HORTICULTURE

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*North American Horticulture: A Reference Guide.* Compiled by the American Horticultural Society; Barbara W. Ellis, Editor. Charles Scribner's Sons, New York, New York, 1982. This reference guide, which is available in many public libraries, lists educational programs in the United States and Canada that lead to associate, bachelor's, graduate and other degrees. Entries for schools that offer programs in horticulture include address, admission requirements, degrees granted, other educational programs, library size and demonstration or test gardens available. Lists of correspondence, horticultural therapy, landscape architecture and landscape design programs are also included, along with a list of certificate programs.

*North American Horticulture: A Reference Guide* is available from the American Horticultural Society for \$50.00 per copy (hardcover). To order, write Robin Williams, AHS, P.O. Box 0105, Mt. Vernon, VA 22121.

*Student Employment and Internships at Botanical Gardens and Arboreta for 1987.* American Association of Botanical Gardens and Arboreta (AABGA). This directory lists over 400 intern positions at gardens across the country for students with and interest in horticulture. The directory lists the garden's address, a contact person, deadlines for application, position available, hours, salary and comments about the position and the educational benefits offered. To obtain a copy, send \$2.00 to AABGA, P.O. Box 206, Swarthmore, PA 19081, (215) 328-9145.

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*Directory of Colleges & Universities with Programs in Landscape-Related Fields.* Carl McCord, Editor. Associated Landscape Contractors of America. Published in 1981, this 37-page booklet lists schools with both two- and four-year degree programs. To obtain a copy, send \$3.00 to Associated Landscape Contractors of America, 405 North Washington Street, Suite 104, Falls Church, VA 22046, (703) 241-4004.

**Career Information.** The American Horticultural Society has general information on careers in horticulture, including a list of educational programs throughout the country and an article about careers in horticulture. To obtain a copy, send \$1.00 to cover postage and handling to Gardener's Information Service, American Horticultural Society, P.O. Box 0105, Mount Vernon, VA 22121.

**North American Certificate in Horticulture.** This certification program is administered by the American Association of Botanical Gardens and Arboreta (AABGA). For more information, write to them at the address below.

The AABGA also offers a job placement hotline and in its newsletter lists positions available. For more information, write AABGA, P.O. Box 206, Swarthmore, PA, 19081, (215) 328-9145.

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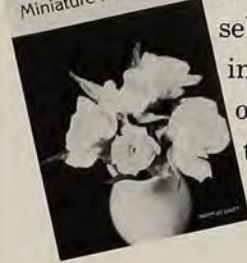
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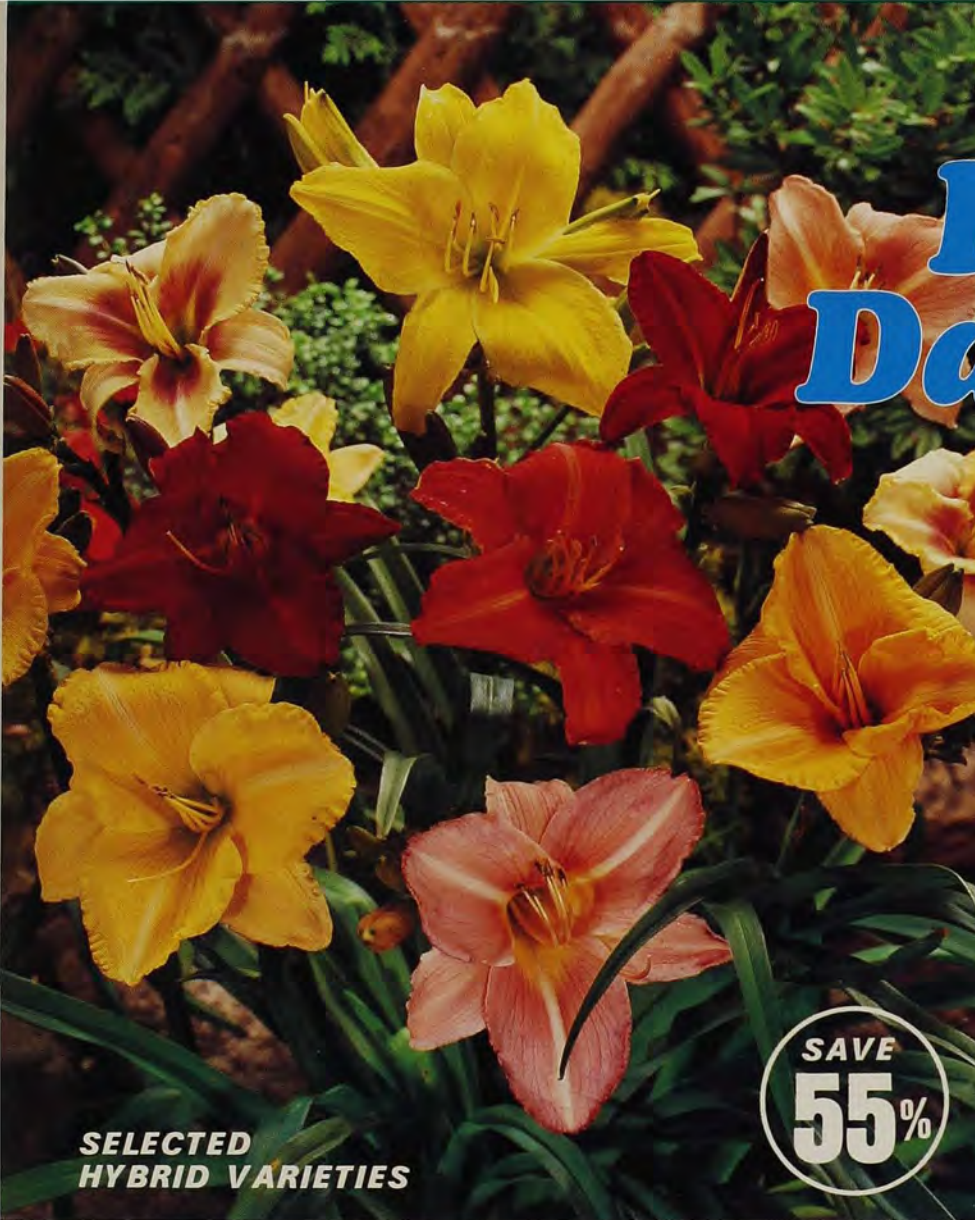
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- Acacia* ah-KAY-see-ah
- Acer ginnala* AY-ser gin-NAL-lah
- A. negundo* a. neh-GUN-doe
- A. palmatum* a. pal-MAY-tum
- Agrostemma* ag-row-STEM-ah
- Amelanchier canadensis*  
am-el-ANK-ee-er can-ah-DEN-sis
- Amorpha fruticosa*  
ah-MORE-fah froo-tih-KOE-sah
- Amsonia tabernaemontana*  
am-SO-nee-ah tab-er-nee-mon-TAN-ah
- Andromeda polifolia*  
an-DRAW-meh-dah  
poe-lih-FOE-lee-ah
- Antirrhinum* an-tih-RYE-num
- Aralia elata* ah-RAIL-yah ee-LAY-tah
- Artemisia* are-tem-EASE-ee-ah
- Aruncus dioicus*  
ah-RUN-kus dy-OH-ih-kus
- Baptisia australis*  
bap-TEE-zee-ah aw-STRAIL-iss
- Begonia* be-GOAN-yah
- Berberis thunbergii*  
BEAR-bear-iss thun-BERG-ee-eye
- Betula papyrifera*  
BET-you-lah pah-pih-RIF-er-ah
- Brachychiton acerifolius*  
brah-kee-KIE-ton ay-ser-ih-FOE-lee-us
- B. populneus* b. pah-PULL-knee-us
- B. rupestris* b. rew-PES-tris
- Caenothus* see-NO-thuss
- Caesalpinia gilliesii*  
see-sal-PIN-ee-ah GILL-eez-ee-eye
- Calliandra* kal-ee-AN-drah
- Carya illinoensis*  
CAR-ee-ah ill-ih-noy-NEN-sis
- C. ovata* c. oh-VAY-tah
- Cercis canadensis*  
SIR-sis can-ah-DEN-sis
- Chaenomeles speciosa*  
kee-NOM-el-eez spee-see-OH-sah
- Chionanthus virginicus*  
kie-oh-NAN-thuss vir-JIN-ih-kus
- Clematis* KLEM-ah-tiss/klem-AT-iss
- Cola acuminata*  
COE-lah ah-kew-min-AY-tah
- C. nitida* c. NIT-ed-ah
- C. vera* c. VARE-ah
- Cornus alternifolia*  
CORN-us all-ter-nih-FOE-lee-ah
- C. florida* c. FLOR-ih-dah
- C. kousa* c. KOO-sah
- Corylus americana*  
CORE-ee-lus ah-mer-ih-KAY-nah
- Davidia involucrata*  
day-VID-ee-ah in-vol-yew-KRAY-tah
- Delonix regia* deh-LON-icks REJ-ee-ah
- Dombeya burgesiae*  
DOM-bee-yah ber-jess-SEE-ay-ee
- D. × cayeuxii* d. cay-YOOKS-ee-eye
- D. wallichii* d. wall-EACH-ee-eye
- Echinacea* eck-in-AY-see-ah
- Elaeagnus angustifolia*  
el-ee-AG-nus an-gus-tih-FOE-lee-ah
- Erythroxylum coca*  
eh-rith-row-ZIE-lum COE-kah
- Fagus sylvatica* FAY-gus sil-VAT-ih-kah
- Forsythia × intermedia*  
for-SITH-ee-ah in-ter-MEAD-ee-ah
- Franklinia alatamaha*  
frank-LIN-ee-ah ah-lah-tah-MAH-hah
- Fremontia* free-MON-tee-ah
- Fremontodendron californicum*  
free-mont-toe-DEN-dron  
kal-ih-FORN-ih-kum
- Geranium platypetalum*  
jer-AY-nee-um plat-ih-PET-all-um
- G. lancastriense* g. lan-cass-tree-EN-see
- Ginkgo biloba* GINK-oh by-LOW-bah
- Gleditsia triacanthos*  
gled-ITS-ee-ah try-ah-CAN-thos
- Gunnera manicata*  
GUN-er-ah man-ih-CAY-tah
- Hydrangea quercifolia*  
high-DRAN-gee-ah quer-si-FOE-lee-ah
- Ilex × aquipernyi*  
EYE-lecks ak-qui-PER-nee-eye
- Iris crenata* EYE-riss kren-AY-tah
- I. kaempferi* i. KEMP-fare-eye
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jew-NIP-er-us chih-NEN-sis
- Layia* LAY-ee-ah
- Lotus* LOW-tus
- Lythrum virgatum* LITH-rum vir-GAY-tum
- Malus baccata* MAL-us back-AY-tah
- Miscanthus sinensis*  
mis-CAN-thuss sin-EN-sis
- Nelumbo* nel-UM-bow
- Ocimum* oh-KIE-mum
- Oenothera* ee-no-THAIR-ah
- Osmanthus heterophyllus*  
oz-MAN-thuss het-er-oh-FILL-us
- Osteospermum* oss-tee-oh-SPER-mum
- Oxydendrum arboreum*  
ox-ee-DEN-drum are-BORE-ee-um
- Perovskia* per-OV-skee-ah
- Phalaenopsis* fail-ee-NOP-sis
- Philadelphus* fill-ah-DELL-fuss
- Phlox* FLOCKS
- Phyllostachys nigra*  
fill-oh-STACK-iss NY-grah
- Pinus patula* PIE-nus PAT-you-lah
- P. strobus* p. STRO-bus
- Plumeria* plu-MARE-ee-ah
- Populus tremuloides*  
POP-yew-lus trem-yew-LOY-deez
- Primula* PRIM-yew-lah
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soo-doh-sid-OWN-ee-ah sin-EN-sis
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- Q. rubra* q. REW-brah
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row-doe-DEN-dron are-bore-ESS-ens
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- R. typhina* r. ty-FY-nah
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stir-CUE-lee-ah ay-PET-ah-lah
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stew-ART-ee-ah SUE-doe-kah-MEAL-ee-ah
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STY-rax jah-PON-ih-kus
- Thalictrum rochebrunianum*  
thah-LICK-trum  
row-shah-brew-nee-AY-num
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tey-oh-BROH-mah kah-KAH-oh
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toe-REE-ah tax-ih-FOE-lee-ah
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mis-CAN-thuss sin-EN-sis
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tro-koe-DEN-dron ah-rail-ee-OY-deez
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ULL-mus GLAY-brah
- Viola* vie-OH-lah/vee-OH-lah
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wis-TEER-ee-ah sin-EN-sis
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# AHS 42nd Annual Meeting

MAY 13-16, 1987  
NEW YORK CITY



**G**ardening in the city—penthouses, townhouses, community gardens and parks—will be the focus of the 42nd Annual Meeting of the American Horticultural Society. Enjoy special tours of the New York Botanical Garden, the Brooklyn Botanic Garden, Wave Hill Gardens, the gardens of the Cloisters Museum and the PepsiCo Sculpture Gardens. Take an in-depth look at the work of Olmsted with a special emphasis on New York's Central Park. Learn about the exciting work in the development of community gardens. There's something to interest any gardener or plant lover at heart. Plan to meet us in New York for "Parks, Penthouses and Windowsills: Gardening in the City!"

Please send me advance information on the 42nd Annual Meeting of the AHS, to be held in New York City.

Name: \_\_\_\_\_

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ABOVE LEFT: Participants in the upcoming Annual Meeting in New York City will enjoy an elegant reception in the breathtaking Enid A. Haupt Conservatory at the New York Botanical Garden. Photograph by Allen Rokach, courtesy of the New York Botanical Garden. ABOVE RIGHT: Sidewalks in Manhattan's colorful flower district are lined with flowers and plants. Photograph by Barbara W. Ellis.

MAIL TO: Elizabeth Smith, AHS, P.O. Box 0105, Mount Vernon, Virginia 22121.