

American Horticulturist

April 1992

A Publication of the American Horticultural Society

\$2.50



WOODLAND DELIGHTS
HONORABLE, ANCIENT TREE PEONIES
INVESTIGATIONS IN AUSTIN
TURNING KIDS INTO GARDENERS



HELEN HAYES

Gardener, Actress



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American Horticulturist

Volume 71, Number 4

April 1992

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APRIL'S COVER

Photographed by John A. Lynch

John Lynch grows pink turtlehead, *Chelone lyonii*, in a moist spot at the lowest point in his wildflower garden. Native to the mountains of the southeastern United States, it is one of the best *Chelone* species for the garden. A profile of Lynch's woodland wildflower collection begins on page 14.

American Horticultural Society

The American Horticultural Society seeks to promote and recognize excellence in horticulture across America.

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COMMENTARY

Anyone involved with children—raising, teaching, or simply watching them—cannot help noticing their attraction to nature. Yet contact with natural areas has diminished for most children. Just as animals suffer when removed from their natural environments, so do humans. Gardens are often the most accessible places for children to learn about nature's interconnections, power, fragility, and solace.

Through regular activity in natural areas, children come to grasp two vital concepts about nature. One is that plants, animals, rocks, water, soil, and rainbows are very different from things that are manufactured and that they can fill wild imaginative longings far better than the seductive toys of society. The second is of nature as a totality, a cycle of changes into which we are born, with natural laws that, if interrupted or abandoned, will lead to unhappy consequences.

Learning these concepts at a young age not only fires the imagination, but influences future decisions. Today's youth will face unbelievably difficult environmental issues. They need our help to develop the knowledge, attitudes, and technical skills to cope with these issues. We need to raise the standard of teaching children about nature and gardening. We must help them develop critical thinking skills and a profound appreciation of the natural world and their place within it.

Our education program at the American Horticultural Society is geared toward ensuring that educators obtain a vision and perspective of horticulture as essentially important to human well-being and survival. Teachers need to see how horticulture can integrate science, engineering, economics, management, design, literature, history, and art.

We have created a teacher work-study program to inspire and enable teachers to develop more creative ways to use gardens and plants as bridges across their curricula. For example, the garden could be a place for informal science classes on the history and techniques of plant genetics. Students could design and build living laboratories to study endangered native plants. Schools could set up seed exchanges with other schools to grow endangered or economically or medicinally valuable plants. Ethnobotany, with its association with folklore, shamans, and compelling botanical detective stories, would be a fascinating way to teach the use of plants as medicines in the past and as potential cures for AIDS, cancer, and other diseases.

AHS is also coordinating a national children's gardening symposium to direct awareness to the underused, yet limitless educational opportunities and positive psychological and social effects of plants and gardens.

As we approach our annual meeting this October, we will report our progress with these important new activities. However, we need the support—both moral and financial—of our members. If you have ideas on children's gardening, or know people who would be interested in supporting us with suggestions or donations, please write to us. And don't forget to respond to our 1992 Annual Appeal.

George C. Ball Jr., AHS President





LETTERS

Excellent "Chimeras"

I was intrigued by the excellent article "Attainable Chimeras" by Robert Geneve in the December *American Horticulturist*. The importance of chimeras goes beyond fascinating horticultural selections because this type of somatic organization found in plants and rarely animals can shelter numerous mutations. Edward J. Klekowski Jr. has even written *Mutation, Developmental Selection, and Plant Evolution* (1988), documenting this profound difference as it affects evolution in plants versus animals. Horticultural variegations have also given rise to our understanding of transposons (jumping genes).

I applaud articles of this sort that attempt to interpret complicated botanical and horticultural science for the average gardener. Keep up the good work!

Arthur O. Tucker
Dover, Delaware

Snackable *Houttuynia*

Thank you, thank you, thank you for the insert in December on *Houttuynia*. For several years I've been trying to run down the edible qualities and uses of *H. cordata* after the experience of a nursery owner friend. He had left a crew of Vietnamese to pot up hundreds of *H. cordata* and on his return was dismayed to find that the workers had practically decimated the lot by eating most of the leaves! The article by Adelaide Rackemann assuaged my curiosity.

H. cordata is one of my favorite plants. It's a great filler in flower arrangements and, because I live right on the Pacific Ocean, its imperviousness to the salt air is another plus.

Kudos too for Elizabeth Sheldon's slightly acidic writings. I always enjoy her articles.

Jinny Jacobs
Yachats, Oregon

Operatic Cultivars

The plant on the December cover was identified as *Caladium* 'Freida Hempel'. I have

always imagined that this caladium was named in honor of the opera soprano Frieda Hempel in which case your spelling of the cultivar name is incorrect. In catalogs the name is usually spelled 'Frieda Hempel', which would also be incorrect.

Hempel was born in Leipzig in 1885 and died in 1955 in Berlin. She was active from 1912 to 1919 at New York's Metropolitan Opera and in the 1920s gave a series of concerts in North America called "Jenny Lind Concerts." These were replicas of mid-nineteenth-century concerts by the Swedish soprano Jenny Lind, after whom, incidentally, a well-known melon is named. Hempel would perform the identical program dressed in costumes identical to Jenny Lind's. Hempel recorded extensively in the early part of this century, and some of her recordings are available on modern transfers.

Robert J. Hoffman
Greenwich, New Jersey

After speaking with members of the International Aroid Society and caladium growers in Florida, we still don't have a definitive answer about either the correct spelling or origin of the cultivar name. George Summerall of Joyners Caladiums in Lake Placid, Florida, has also seen it spelled 'Freda Hempel'. Vivian W. Holmes, who along with her late husband ran the company Summerall purchased—Joyners Caladium Specialists, one of the earliest and largest caladium nurseries in America—says they always sold it as 'Freida Hempel'. Perhaps one of our readers knows the history and correct spelling of this enigmatic cultivar. This was such an interesting story we decided we'd also love to hear about other cultivars—of any species—named after opera singers.

European Beech Pests

Susan Sand states in her December article "A Tree History: The American Beech" that the American beech, *Fagus grandifolia*, is pest free. This excellent article should inspire many to plant beech trees. However, they ought to know that the

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European beech is not necessarily pest free. The *Fagus sylvatica* 'Tricolor' on my front lawn hosts the aphid *Phyllaphis fagi*. Regular spraying with insecticidal soap controls this pest so that there is little observable damage. The beech blight aphid, *Prociphilus imbricator*, is a potential pest and beech bark disease can sometimes be found. Nevertheless, beech trees flourish and no one should hesitate to plant one. They will be rewarded when the passerby stops to ask, "What is that beautiful tree?"

Henry John Buggeln
Gloversville, New York

How Many Boone Beeches?

I am a long-term member and a long-term fan of *American Horticulturist* and I would like to express my hearty approval of your new series on trees by Susan Sand. Her articles have been concise, very readable, and full of interesting tidbits of useful information. Regarding the tall tale sidebar in her American beech article, I believe the trunk of the "D. Boon cilled A BAR" tree was salvaged and is on display in a historical society museum in Louisville, Kentucky. I saw it there about fifteen years ago, and the inscription was still reasonably legible. I don't remember the name or address of the museum.

Guy Sternberg
Petersburg, Illinois

We located the tree you mention, but it's not the same Boone beech. The trunk of the Daniel Boone beech at the Filson Club Historical Society (1310 South Third Street, Louisville, KY 40208) has the inscription "D BOONE KILL A BAR 1803 ZOIS" (or "LOIS") This is supposed to have been cut by Boone while on a trip to Green River, Louisiana, to testify in a land suit. The tree stood in Iroquois Park, Louisiana, until it was cut down on April 2, 1932, at an age of approximately 300 years. "ZOIS" or "LOIS" may have been an abbreviation for Louisiana. We have no way of knowing if this was a copycat carving or the real McCoy; at least this time his last name was spelled correctly.

Bodarking up the Right Tree

In your "Letters" section in December, I was attracted to the letter from Jerald M. Duncan, M.D., concerning Osage orange or *bois d'arc*. I've always known it to be called "bodark" not "bodock." I've also heard it called hedge apple or horseapple. In my back yard I have the most beautiful staminate (or male) *bois d'arc* that I have ever seen. It is insect and disease free as Dr.

Duncan states. It is approximately thirty feet tall and I prune it back every year so it is very compact, giving excellent shade with lush green foliage and, because it is a male, no apples.

Herman J. Hoffman
Panhandle, Texas

Mammoth Fruits

Susan Sand's article on the Osage orange doesn't address the real enigma of the tree. Why does it have such large fruits? What happened to its related genera or species? I've heard intriguing speculations that the plant's natural range was more widespread when mastodons and mammoths roamed the continents and that they were the natural dispersers and fertilizers of the fruit-bound seeds.


R. Mitchel Beauchamp
National City, California

Daniel Janzen, biology professor at the University of Pennsylvania, has theorized that over 10,000 years ago seed dispersal by large mammals was common and likely to determine the distribution of many large-fruited, large plants such as the Osage orange, honey locust, persimmon, Kentucky coffee tree, pawpaw, mesquite, hawthorn, prickly pear, yucca, and acacia.

Big mammals were abundant in the New World until they died out during the Pleistocene, when human hunters swept through North America. North America was rich in native horses, mammoths, mastodons, camels, and other large, fruit-eating animals. Janzen speculates that after the extinction of the large mammals, coyotes, foxes, raccoons, and opossums may have devoted attention to the fleshy fruits—persimmon, prickly pear, pawpaw—while the horses and cows of European migrants may have eaten and distributed the honey locust. However, the fruits of plants like the Osage orange and the Kentucky coffee tree are only rarely eaten by livestock and their distribution remained extremely limited. Now, of course, when Osage orange or honey locust fruits fall to the ground, they remain under the tree, unless a human decides to pick them up.

For more information see "Fruits for Famished Mammoths" by Daniel H. Janzen in *Garden*, July/August 1982 and "Neotropical Anachronisms: The Fruits the Gomphotheres Ate" in *Science*, January 1982.

Osage orange is a member of the mulberry family, *Moraceae*, which does have several genera. *Cudrania triloba*—another *Moraceae*, has been hybridized with *Maclura pomifera* and some have considered it a species of *Maclura* (*M. tricuspidata*).



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AHS's 1991-1992 Annual Appeal has still not reached the targets set for this year's programs. The Society is operating on a minimum budget and is determined not to compromise the quality of member services.

WE NEED YOUR SUPPORT

The American Horticultural Society strives to inform, educate, and inspire people of all ages to become successful, environmentally responsible gardeners. *American Horticulturist* magazine and News Edition, AHS's educational programs, information services, and career internship program are designed to accomplish that mission.

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OFFSHOOTS



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About Time— and Pens and Labels

by Peter Loewer

Last September an advertisement appeared in the *New Yorker* featuring an expensive watch called the IWC Da Vinci, really an automatic chronograph with a perpetual calendar and moon phase indicator. So far, not bad. But the ad continued with: "It will be a reminiscence of Leonardo da Vinci's ingenuity for entire generations of watch connoisseurs to come—at least until the year 2499." Included with the watch (total cost: \$19,995) is a "century slide," a special metal chip that the owner must insert within the works sometime in the year 2200.

Now forget the use of the word "reminiscence" in connection with da Vinci's ingenuity—after all, when is the last time you or yours have sat down at the dinner table and talked about the good old days with Leonardo? But zero in on the bit regarding the century slide, forgetting about what happens on January 1, 2500, when the watch supposedly stops, but just thinking about finding that chip in the year 2200—much less next week.

I can hear it now: "Honey, remember that watch your great-great-great-great-great-Uncle Everett left to the family? I think it's running down. Where's the century slide?"

"Darling, do you expect me to keep track of everything?"

"Well, it's making funny noises and I think we should replace the insert."

Now I know that for me the idea of such a watch would be patently ridiculous. That's because I often misplace, in the following order, my wallet, my trowel, my glasses, and any newspaper that I want to keep because it contains an especially interesting article. (The wallet is usually retrieved by my wife, the trowel shows up in an hour or so, my glasses have just been left next to the kitchen sink when I came in from the garden for water, and the newspaper invariably proves to be the one section I grabbed out of a whole week's worth to use for drying paint brushes or to wrap up cast-off vegetable peelings.)

But the major items of loss that continually plague my existence are those white plastic plant labels and accompanying marking pens that actually mark. Every spring I send off for marking pens and labels to use in the garden, usually six pens

and 400 labels. Three weeks after they have been delivered, do you think I can ever find either one—much less one of each?

And the dialog is the same. Yelling against the wind or down the hall to my wife, a plea goes out:

"Honey, have you seen any of my plant labels or marking pens?"

The answer is a terse, "No." This is because I have been losing such items for almost twenty years.

"Well, this is a rare plant and if I don't label it, I'll never remember where it came from."

"Look in the potting shed," she says.

So I rush to the potting shed and pick up and poke through old and dirty pots since the special clean pot meant to hold such garden items as pens and labels was used for a newly propagated geranium some weeks ago.

I open the drawer in the old and crusty work table that sits against the wall. I am astounded by the seed husks, moldy paper, remembrances from a mouse or two, and a whole set of rusting bolts whose past or potential use I can't begin to fathom—but no pens or labels.

A quick trip to the greenhouse results in the knowledge that this area could certainly benefit from a good cleaning but there are no pens or labels in view.

Finally I go out to the garden and pull a label from a rock garden plant that died after being denied rain for weeks and find an old ballpoint pen stuck in the kitchen calendar.

For the life of me, I can't find where they all went. Perhaps it's the little people, present-day members of the Hobbit clan or folks from another dimension, who also garden and also lose labels but have the ability to reach across time and space in search of more. Perhaps it's a horticultural Captain Kirk and a plant-loving Engineer Scotty who have beamed my marking pens to the Klingon Empire.

But whatever the cause, what chance would I or anyone like me have with the IWC watch?

Peter Loewer is a frequent contributor to American Horticulturist and a member of its editorial advisory board. His most recent book is The Wild Gardener.

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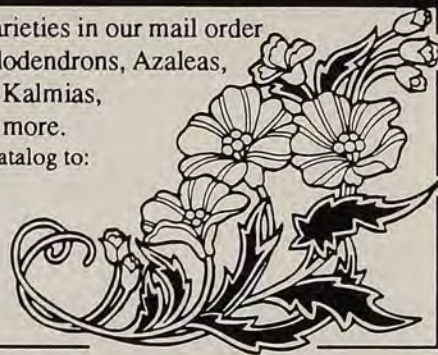
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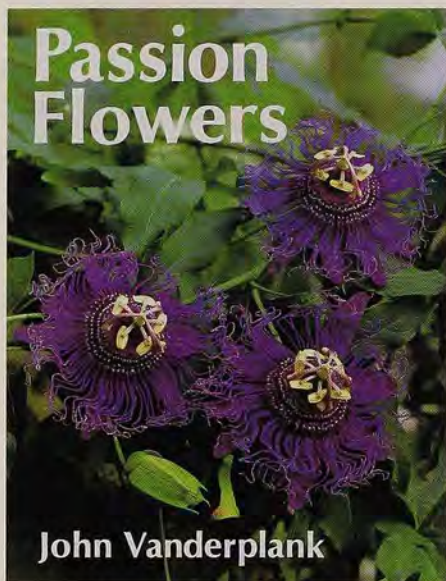
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BOOK REVIEWS



Passion Flowers

John Vanderplank. MIT Press, 1991. 176 pages. 7⁵/₈" × 10¹/₂". Color photographs, black-and-white line drawings. Publisher's price, hardcover: \$35. AHS member price: \$30.

Passion flower (*Passiflora* spp.) is a plant group whose time has come. In 1991, the International Passiflora Society formed and the first International Symposium on Passiflora was held in Colombia. John Vanderplank, a commercial nurseryman and keeper of the United Kingdom's National Collection of Passiflora, has produced a timely illustrated guide to 100 of the more than 400 known species of *Passiflora*.

Given the incredibly surreal, almost alien beauty and the endless variation of the genus, it is surprising that passion flowers have not made a greater splash in American horticulture. To quote botanist F. Lamson Scribner, "a plant is not wanting admiration save in its native land" and passion flowers have to a large extent remained the realm of specialists and fanatical enthusiasts. Now for the first time, that enthusiasm and expertise are distilled into a detailed, informative, yet readable and

personal book—a book that will no doubt turn curiosity into passion for *Passiflora*.

Passion flowers explode in diversity in the American tropics, with 95 percent of all passion flowers originating from South America. Two species occur in temperate North America: *P. incarnata*, the maypop, apricot vine, or common passion flower, and the diminutive Southern woodland denizen, *P. lutea*. Though commonly associated with the South, *P. incarnata* is hardy in much of the United States. Vanderplank tells us that it is known to survive in "the central Connecticut valley of Northampton, in Massachusetts, when planted near buildings, and is reported to have survived winters with temperatures down to -16°C (-2°F) in Bad Soden, West Germany." Here at my Arkansas Ozark home, in unprotected wild haunts, it survives temperatures as low as 25 degrees below zero.

This species is the exception—most passion flowers are subtropical or tropical and will withstand only a brief light freeze. Nevertheless, many tropical species or hybrids lend themselves to greenhouse, conservatory, or even house plant culture. Many produce edible fruits, some the size of a pea, some larger than a cantaloupe. Some, like *P. edulis*, are grown commercially for their fruit. Others, like *P. incarnata*, are the source of a commercial sedative.

Whatever your level of interest or curiosity, Vanderplank has provided the information for further exploration. Separate chapters explain the classification and structure of passion flower, the legend and etymology, cultivation, propagation, hybridization, pests and diseases, and the unique interactions of butterflies and passion flowers. The bulk of the book provides detailed information on 100 taxa, including specific botanical descriptions, along with a narrative covering their discovery, distribution, and the author's experience with these species or hybrids. Appending the text is a useful identification key in chart form, lists of addresses and suppliers, a glossary, and a brief bibliography. Whether your interest in *Passiflora* is passing or permanent, John

Vanderplank's *Passion Flowers* is the most comprehensive work on the subject in more than fifty years.

—Steven Foster

Steven Foster is the editor of *Botanical & Herb Reviews* and co-author of *A Field Guide to Medicinal Plants*.



Narcissus

Michael Jefferson-Brown. Timber Press, 1991. 224 pages. 6¹/₄" × 9³/₈". Color photographs and black-and-white line drawings. Publisher's price, hardcover: \$34.95. AHS member price: \$30.

In 1966 Michael Jefferson-Brown wrote a book entitled *Daffodils, Tulips, and Other Hard Bulbs*. Published in England, it somehow found its way to a used book store in the United States where I purchased it in the early '70s. The author was so obviously knowledgeable on this topic that it was clear he had more to share. With the publication in this country of *Narcissus*, his knowledge of daffodils and their history is available and more readily than in second-

hand book stores.

Daffodils are, along with tulips and crocuses, one of the big three of spring-blooming bulbs. They lend themselves to both formal and informal designs and multiply from year to year rather than fading away. Additionally, daffodils are not eaten by mice, deer, or other garden pests.

This clear, concise text begins with a review of daffodils today, then examines the wild species from which our garden hybrids were developed. Following chapters detail the relationships and ancestry of different species, and the history of breeding efforts, mostly in England (only a page each for Holland and the United States). His discussion of cultivation is lucid, and covers planting in beds and borders, rock gardens, and containers. For example, he explains why to plant four to six inches apart, four to six inches deep, which allows an understanding of the habits of the plant rather than blind acceptance of an arbitrary dictate. Potting, forcing, and especially exhibiting daffodils at shows are covered in the same careful detail.

The main portion of the book is devoted to separate chapters on the different types of daffodils—trumpet, long-cup, short-cup, double, split-corona, and so on. In each chapter the history and development of modern cultivars is explained and parentage and breeding is traced, often from the early part of this century. A chapter on breeding and hybridizing daffodils retraces the pedigrees of a handful of cultivars for five to seven generations, revealing the dedication and selection that is behind the round, brown bulbs we so happily purchase each autumn to brighten our gardens in spring.

The fascination of this book lies in the graceful explanation of the way modern daffodils have been developed. It will be of most interest to the breeder, to show judges, and to garden historians. For the average home gardener, *Narcissus* will be somewhat abstruse.

—Judy Glattstein

Judy Glattstein is the author of *Garden Design With Foliage* and the editor of *Gardener's World of Bulbs*.

Garden Tales

Photographs by Jane Gottlieb. Viking Penguin, 1990. 102 pages. 8 1/4" x 7 1/4". Color photographs. Publisher's price, hardcover: \$12.95. AHS member price: \$11.

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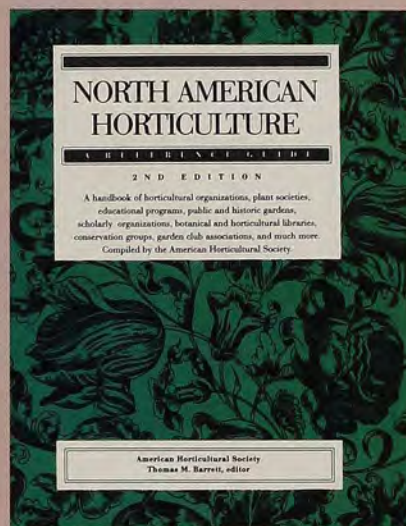
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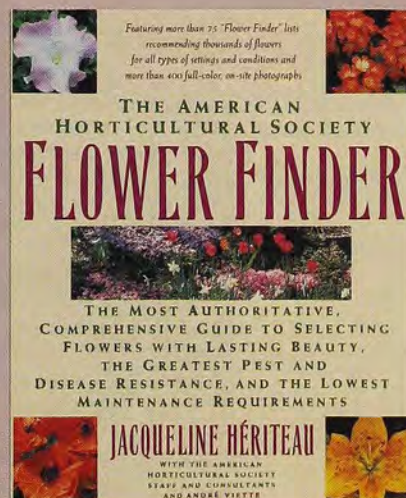
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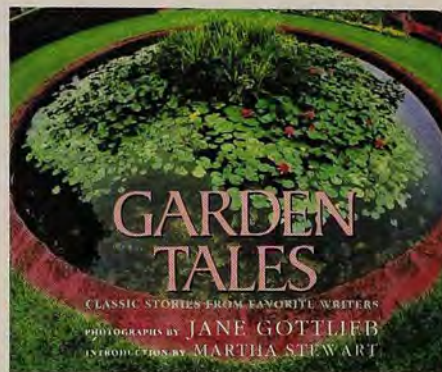
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—Pat Stone

Pat Stone is editor of *GreenPrints*, a quarterly publication of garden fiction and essays. It is available for \$13 a year from P.O. Box 1355, Fairview, NC 28730.

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It All Started With Mr. Conover

A woodland wildflower garden of more than 100 species began—and continues—with the act of sharing.



STORY AND PHOTOS BY JOHN A. LYNCH

When I was eight or nine and living in the Midwest, a neighbor that I knew only as Mr. Conover displayed along his back fence a small, tidy wildflower gar-

den that I particularly remember for large-flowered *Trilium grandiflorum* and Jack-in-the-pulpit (*Arisaema*

triphyllum). They were common wildflowers then, but I didn't know that. What I did know was that Mr. Conover was often puttering around in his yard and that if I hung around long enough and showed enough interest, I might persuade him to give me a couple of his flowers. One Saturday morning I was peering through his fence and we struck up a conversation. It turned out that the trilliums and Jacks were his favorites too, and I eventually walked home with two of each. They became the nucleus of my first wildflower garden. At that time I didn't know anything about transplanting, so I dunked the roots in our bathtub to wash off the soil and carefully planted the flowers in our yard. As I recall, they survived for many years.

It would be many years later when,

living with my wife and children in New England, I became serious about wildflowers and established a woodland garden that would eventually include 110 kinds. The slope on which I began to plant them was treeless at first, seemingly an unlikely spot for woodland flowers. But because it was on the north side of the house, the sun did not reach it until summer. Meanwhile I planted three mountain ashes, a gift from a neighbor's lot, none more than five feet tall, and a red pine from a site being cleared for a warehouse. As the trees grew, the wildflowers were transplanted from beside the house into their shade, where in recent years the garden has grown so vigorously that—shades of Mr. Conover!—I have been able to thin out and pot up dozens of plants to give to



Jack-in-the-pulpit (left) was one of the natives that enticed Lynch into wildflower gardening. His woodland garden now contains 110 kinds of wildflowers, including great Solomon's-seal and columbine.



Lynch's unusual bloodroot (top) bears multiple flowers. Coltsfoot (above) blooms in late March, producing dandelionlike flowers.

other gardeners who were either beginning or expanding gardens of their own. It has also been the source of a great many plants produced through various trial-and-error methods of propagation.

Friends and relatives near and far are on my list to receive plants and, when necessary, instructions on how best to handle them. (Don't wash the roots!) Flowers from my cold frame and small nursery, as well as the garden itself, are thriving in a dozen Massachusetts towns and in Connecticut, Vermont, Michigan, Pennsylvania, and Washington.

For each of the past several years, I have potted and donated more than 150 plants to two local sales. Some go to the New England Wild Flower Society, headquartered here in Framingham, Massachusetts. In June it holds a marvelous sale at which member-donated plants are sold along with plants propagated at the society's well-known Garden in the Woods. Others are sold at the May plant sale and arts fair of the Weston (Massachusetts) Arts and Crafts Association.

Although I obtain a few of my plants from commercial sources, most come from exchanges with local gardening friends,

growers in distant states, the Garden in the Woods seed program or plant sales, or the American Horticultural Society Seed Program.

In the early years, my garden was a new home to many "rescued" plants, saved literally from the path of the bulldozer. As Interstate 89 was being built through sections of central and northern Vermont, its route yielded many woodland species, as did the site of a pumped-storage power plant in New York, where a reservoir was scraped out of a mountaintop. A coal-mining region in West Virginia, where entire hillsides were being slashed away, gave up more southerly plants, and from a parking lot under construction in Indiana I dug localized trilliums a day ahead of the excavators.

Although many woodland natives flower in pastel shades, I also have spotless whites and flaming reds to turn the eye, and an inconspicuous brown flower, blue cohosh (*Caulophyllum thalictroides*), which gets its name from the attractive blue fall fruit that rewards us when nearly all else has passed. Among those that I constantly have to pot up and share is large-flowered bellwort (*Uvularia grandiflora*), which started as a clump of six or seven stems and now has jumped to other garden spots. Three-foot great Solomon's-seal (*Polygonatum commutatum*) from a friend's Milford, Michigan, woods, planted as a backdrop, migrates in all directions with its thick rhizomes. Every other year or so errant plants must be dug and directed back to the border, with some of the more adventurous ones going into pots.

The Solomon's-seal has now made a 1,600-mile round trip, traveling to my sister's home in Deckerville on Michigan's Lake Huron shore along with wild ginger (*Asarum canadense*), whose heart-shaped leaves she has used to cover a once-eroding bank. In return she has given me Dutchman's-breeches (*Dicentra cucullaria*) and squirrel corn (*D. canadensis*), which resembles a low white bleeding-heart. Starflower (*Smilacina stellata*), which has a zigzag stem to two feet, topped by a raceme of small white flowers, I found growing wild in my sister-in-law's back yard in Birmingham, Michigan, and brought it east.

My garden has no fewer than fourteen violet species and half a dozen intriguing hybrids whose parentage I haven't begun to understand, including an albino violet with green veins on the petals instead of

blue. Pale violet (*Viola striata*) seeds within the garden as well as in my lawn. But because it is not a New England native, but came from Indiana, the extra plants are welcomed by other local wildflower gardeners. Long-spurred violet (*V. rostrata*), on the other hand, is native to rich New England woods, but mine was dug from the lawn of a friend in Gauley Bridge, West Virginia.

Both of the latter are stemmed violets, the leaves and flowers borne on the same stem, as is Canada violet (*V. canadensis*), a white species often a foot tall with a yellow eye and tinge of lavender on the back of the petals. This one is not easy to keep in the garden, perhaps because it really prefers Canada and colder climes. American dog violet (*V. conspersa*), which is also stemmed, forms long-lasting mounds of pale blue flowers.

Among stemless violets—those with leaves and flowers growing on separate stalks with the flowers usually rising above the leaves—are two small species, northern white violet (*V. macloskeyi* var. *pallens*) and sweet white violet (*V. blanda*), the former often only one inch high. In northern Vermont, I have seen it rampant in moist grass, along with dark-eyed, marsh blue violet (*V. cucullata*), which is also stemless. The earliest of the genus to bloom is round-leaved yellow violet (*V. rotundifolia*), not more than five inches high and more likely two or three, with small, roundish leaves that finally grow much larger after the blossoms have faded. Downy yellow violet (*V. pubescens*) and smooth yellow violet (*V. pubescens* var. *eriocarpa*) are look-alike stemmed species that bloom later and can be a foot high.

The genus that I have found both hardiest and most attractive are the trilliums, of which the garden has seven species and two botanical varieties. These members of the lily family get their name from the fact that most of them have leaves, petals, and sepals in threes. But plants of some—the prairie and toad trilliums (*Trillium recurvatum* and *T. sessile*) from that Indiana parking lot—produce four of each. An unusual group of toad trillium has parts in whorls of three, four, and five. Red trillium (*T. erectum*) can also belie its name, since in addition to its normal red or maroon, it is found in pink-striped and yellow forms, both from Vermont. I have divided all three of these since I obtained them, and two years ago I separated a clump of fifteen large-flowered trilliums into seven paired



The last of all flowers to bloom for Lynch, never earlier than October, is the soapwort gentian (left). The bottle-shaped flowers, which continue through November, are pollinated by bumblebees but snubbed by honeybees. The nodding trillium's glossy, scarlet, seed-filled berry (above) hangs towards the ground. Lynch rescued his from the construction site for a parking lot in Indiana.

GARDENING NATURE'S WAY

The trend toward using native plants in naturalistic landscapes represents a view of gardening “as a relief from, and antidote for, the horrible, homogenous landscape with which we have surrounded ourselves,” suggests Dr. Richard Lighty, director of the Mount Cuba Center for the Study of Piedmont Flora in Greenville, Delaware.

In a lecture at the American Horticultural Society’s River Farm headquarters last September, Lighty observed that this change has taken centuries. In ancient Persia, gardens were very obviously manmade, as a way of showing dominance over a hostile landscape. Italian gardens were still highly structured, while later French formal gardens, while generally geometrical, included “little woods,” or bosques.

In the increasingly industrialized and urban landscapes of nineteenth-century England, however, “nature stopped being the enemy and our own productions began to be regarded as detriments to our happiness.” In the 1920s and ’30s, the work of Danish and German landscape architects and in the United States, Jens Jensen, Frank Lloyd Wright, and Aldo Leopold, championed the need for nature in our daily lives and told us to look around ourselves for inspiration.

By the 1960s, Lighty said, our culture was ready for “soft edges as well as hard lines; green vegetation as well as macadam, concrete, and glass; and surprise and variety as well as the predictable urban grid and mowed pasture.”

Inspirations for our garden designs should be drawn by observing nature—as we travel, of course, but especially close to home. However, while a natural setting such as a forest or meadow can be awe-inspiring, such landscapes can be too visually complex. Preferences are still evolving from formal to informal gardens, and on some level, most of us still seek some order and balance.

“Remember,” Lighty said, “that naturalistic gardens are every bit as contrived and artificial as formal gardens.” The secret to creating a naturalistic landscape, he advises, is to simplify and organize nature while avoiding the unconscious inclusion of human interference. For example, such elements as plant forms and fall color always show a certain level of unpredictability. Forces such as gravity, water, wind, light, and temperature create irregular, changing patterns. Gardeners should try to orchestrate a personally pleasing level of excitement or rest by striking a balance between harmony versus contrast, regularity versus irregularity, and symmetry versus asymmetry.

Some of Lighty’s rules of thumb:

- Never employ straight or vertical lines and edges.
- Create patterns on the surface by mixing ground covers that differ in height, form, color, and season of interest. These should be alternated with leaf litter—not mulch—spread on the surface, rather than dug in.
- Avoid abrupt transitions.
- Isolated plants are rare in nature. Plant them in small groups of odd numbers.
- Likewise, nature rarely spaces plants equal distances apart. Space plants at uneven distances from each other.
- Natural plant forms are seldom regular. Nursery grown trees are symmetrical because they are grown in open fields with careful spacing and abundant resources. The naturalistic gardener should consider planting trees that are misshapen, have multiple trunks, low or high crowns, and a mix of towering canopy-sized trees and saplings.
- Objects used in a naturalistic garden should be attuned to their surroundings. They should not stand out as “foreign” because of an odd shape, texture, color, or other attribute. (This is often obvious with stonework.) However, it is possible to use symbolic groupings to suggest a larger scene from the natural world. For example, a few rounded boulders, a pool, a mat of pine needles, and a small fern can suggest an Adirondack mountain retreat.

Lighty ended his talk on a more upbeat note than he began it. “As our daily lives become more controlled and homogenous, we will turn more frequently to nature for our inspiration,” he predicted. “In so doing we will come to a greater appreciation of nature’s complexity and fragility. The real habitat for mankind may just be the kind of earth that gardeners are now making.” —Kathleen Fisher, Editor

plants and one single. Some went back into the yard and some to spring sales.

White, drooping trillium (*T. flexipes*) also came from the Indiana lot and has lived in my garden with the other transplants for twenty-one years. Although it hasn’t multiplied, the others have. I have given away thirty of the prairie trilliums in the past several years and still have twenty. It spreads by rhizome offshoots, while the toad trillium self-seeds.

T. maculatum was dug from a Tallahassee, Florida, gardener’s back yard four years ago in March while in full bloom and transplanted in April after the last snowfall here. Among all my plants, it is the farthest from home, and responding to its Florida-influenced botanical clock, it is the first trillium up each spring, five inches high by April 1. Oddly, as if confused by the northern spring, it holds its sepals tightly over its petals until the first week of May.

Of all the species, nodding trillium (*T. cernuum*) bears the most eye-catching fruit, a glossy, scarlet, seed-filled berry nearly an inch in diameter.

The standout among all the individual plants in the woodland garden would have to be a prolific sport or mutant of bloodroot (*Sanguinaria canadensis*). Some of its root buds produce two flower stems, although texts say only one is normal. Even more unusual, sometimes a smaller third flower has grown as an offshoot halfway up the stem of the second flower. The sport blooms as much as two weeks later than the species, has as many as sixteen petals of pure white instead of the usual eight off-white petals, holds them much longer, and has pale yellow stamens instead of gold. It grows in tight clumps of as many as fifty blossoms. Without noticeably lessening their overall appearance, I have been able to propagate dozens of new plants through root division. Its provenance is unclear. I date it to a visit to Cabot, Vermont, in 1983, but I did not realize for several years that it was “different.”

Due special recognition for beauty is the large yellow lady’s-slipper (*Cypripedium calceolus* var. *pubescens*), which remains one of the most sought-after plants for a wildflower garden, first because it is a member of the orchid family and second because it is actually quite easy to transplant and keep alive. My first lady’s-slipper came from the site of the New York power plant, and a later one was given to me by the New England Wild Flower Society. Division has yielded six plants



The tufts of black cohosh (left) tower atop seven-foot stems in early July. Red baneberry (above) bears its small cherry red berries on slender stalks in July and August.

with from two to five flowers each. One plant, never divided, first produced one bud, then three, five, nine, sixteen, twenty-three, twenty-six, and last spring, thirty-nine buds.

Early on I tried to divide a lady's-slipper in the fall and managed to set all of the divisions back a year. I've found that clumps should be divided in spring, when the flowers are already strongly budded. I've potted up nine singles and four double plants to give away, and there is enough stock to go even further. This and the small yellow lady's-slipper (*C. calceolus* var. *parviflorum*) are the only lady's-slippers I have attempted to grow. The others are tempting but almost impossible to naturalize.

Woodland gardens are thought of as spring-flowering gardens, and in mine, this is generally true. Nine years ago I began recording the first bloom date of each species and variety. Of seventy-nine different plants, one bloomed first in March, thirty-one in April, twenty-nine in May, ten in June, six in July, and two in August with flowering carrying over into fall. Although there has been some variation when springs are warmer or colder, wetter or drier, subsequent years have tended to follow that pattern.

Sharp-lobed hepatica (*Hepatica acutiloba*) has always bloomed first, usually the last week of March, its silky-hairy flower buds wintering over beneath last year's leathery three-lobed leaves. The new season's leaves appear after the flowers—actually sepals—which may be white, pink, or shades of blue. Round-lobed hepatica (*H. americana*) blooms within a week of the sharp-lobed.

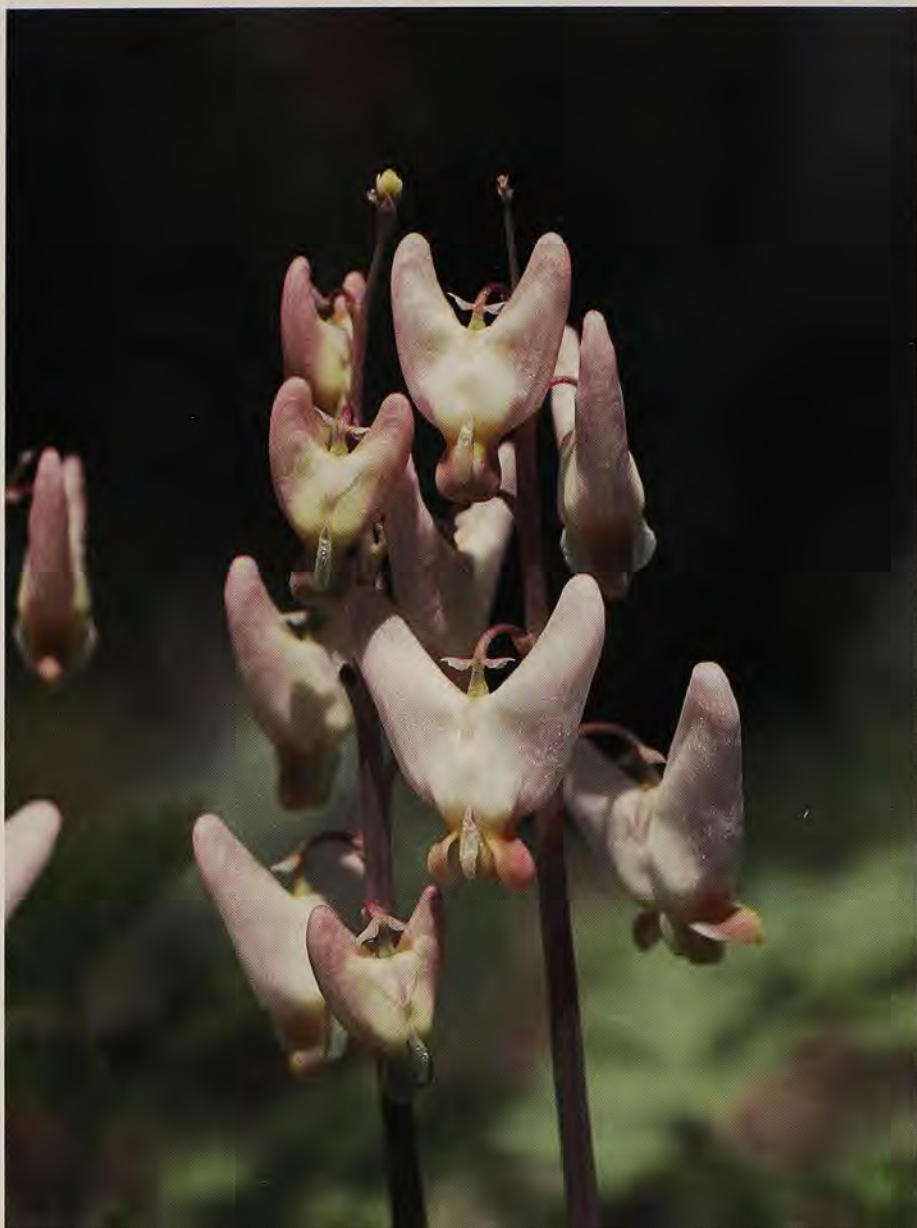
Trailing arbutus (*Epigaea repens*) is usually second, its white or pink flowers at ground level at the end of evergreen-leaved stems. Some years Dutchman's-breeches (*Dicentra cucullaria*), named for its inverted white pantaloons on arching stems, has come in second by a day. Two springs ago, when several mid-March days reached the 70s and the *Hepatica* bloomed on St. Patrick's Day, second place was taken on March 19 by a surprise entrant, coltsfoot (*Tussilago farfara*), which displays its dandelionlike flowers ahead of its leaves. That same year, and again last fall, the trailing arbutus bloomed again in November from buds that otherwise would have remained closed through the winter.

Red baneberry (*Actaea rubra*) blooms between May 2 and 11 with round clusters

of small white flowers held above leafy, branched stems that can be up to two feet high. The red berries mature throughout July and August, and plants from seed will bloom the second year. Its relative, white baneberry (*A. pachypoda*), blooms about two weeks later, and the white berries or "doll's eyes" (another common name) begin to ripen in mid-July. Two-inch-high partridgeberry (*Mitchella repens*) opens the third week of June, with two flowers uniting to form a single red berry that may well be liked by partridges, but in many places hangs on all winter. A creeping ground cover, it needs room to expand.

On either July 9 or 10, I see the busy tufts of black cohosh (*Cimicifuga racemosa*) on their seven-foot spikes. It doesn't need support, but definitely goes in the rear of the border.

The last of all the flowers to bloom, never earlier than October, is soapwort gentian (*Gentiana saponaria*), which I only recently bought from a commercial nurseryman who didn't know what it was or where he had obtained it, so sold it in bud for a dollar a plant. Its bottle-shaped blue flowers, paler than the other bottle gentians, continue well into November. It is fertilized by bumblebees, which are heavy



The inverted white pantaloons of Dutchman's-breeches appear in late March. It is native from Nova Scotia to North Carolina and west to Kansas.

enough to force their way down into its "bottles." The honeybees in my garden just fly on by. In December or January we gather its seeds.

To gain an extra week or more of color, the bloom time of some plants can be manipulated to a degree. The season for sharp-lobed hepatica can be extended by keeping certain plants in sun and others in full shade. A few plants with stocky roots can be held back for late flowering by planting them deeper in the ground than one otherwise would. A group of large-flowered trilliums planted eight inches deep will be just breaking ground when others planted five inches deep are already in bud.

Other flowers are frustratingly transient. My one twinleaf plant (*Jeffersonia diphylla*) has never retained its white, eight-pe-

taled flowers for more than a single April day. Last year it never did open, but merely dropped its rain-soaked, unfurled blossoms. The plant's common name derives from its large split leaves, which are as admirable in the garden as the flowers are fleeting.

There have been many changes in my woodland garden since I began establishing it on the treeless slope. After the flowers were relocated under the ashes and red pine, I planted the north side of the house with ferns, eventually raising the bed and building around it a stone wall that serves as a barrier between the ferns and the wildflower gardens.

At the lowest point in the garden I contoured the ground to make a moist spot, and here I grow such plants as pink turtlehead (*Chelone lyonii*) and cardinal

flower (*Lobelia cardinalis*). The ground gave up a number of large stones, which were strategically placed so that now one can move anywhere in the garden by keeping to the stones. A separate path of flat stepping stones runs the length of the garden below the fern wall.

It was some years before I realized that, to the garden's good fortune and mine, the soil was becoming increasingly fertile beneath the mountain ashes. Thousands of berries drop to the ground every fall, making their own special humus. The drunken robins and blue jays don't get them all. Carpets of tiny trees sprout each spring, but soon are overshadowed and die.

Just as a cold frame became necessary once I began a propagation program, a potting shed became essential once I began transferring the seedlings into four- and five-inch pots. The shed is built against the back of the house with east and south exposures, and a stone foundation, which visually suggests "rock garden."

Once I began potting in earnest and plants were multiplying faster than I could handle them, there was nothing to do but have a nursery. On the slope that is my back yard, I used discarded cedar fence rails to terrace two nursery plots along a north fence in the shade of two red pines and a third under wooden slats along a south fence where there are no trees. Also along the south fence is an open plot for sun-loving plants.

From the western end of the garden, where the sun warms the season's first *Hepatica*, past the May stand of yellow lady's-slippers, the pendant red spurs of columbine, and the greenish bells of Solomon's-seal, the flowers bring light and life to what was once only a patch of filled suburban earth. I watch the garden from my bedroom window on spring mornings and there, and there! I spot the newest green shoot pushing up, the newest flower in bloom—phlox and waterleaf and foam-flower and celandine and twisted stalk and anemone and toothwort and trout lily and saxifrage and shooting-star and Mayapple and fairy-bells. And I imagine that, if Mr. Conover could peer through my fence, he would see flowers of which even he had never dreamed.

John A. Lynch, a photographer living in Framingham, Massachusetts, was the 1991 recipient of the New England Wild Flower Society's award for outstanding service to the society.

Increasing Our Native Intelligence

The nine-year-old National Wildflower Research Center is working hard to earn the “national” and “research” in its name.

BY ERIN HYNES

It's another rainy day during a rainy December week, and Dr. Alison Hill is reluctantly stuck indoors. “I have a field mentality,” she laments, “so when I wake up to the sound of rain in the morning, it just says, ‘stay in bed.’”

But Hill has not stayed in bed. She is at the National Wildflower Research Center in Austin, Texas, entering data into a com-

puter in one of the many room additions that have been pieced together in a zigzagging maze since the center was founded in 1982 by Lady Bird Johnson, the former first lady. Hill, a community ecologist, joined the center's staff more than a year ago and has been developing a long-term, multifaceted study of options for restoring native plants in grasslands.

“This research is for people who want to increase the diversity of species on their land and do it with low-labor intensity and

low cost,” Hill explains, pushing back from the terminal. “The idea is not to go in with a lot of herbicides and big machinery and all that, because most small landowners don't have those available. They want to do something that's environmentally conscious but is also practical.”

Were it not for the rain, Hill would be setting a torch to a ten-acre pasture of Bermuda grass (*Cynodon dactylon*), an exotic perennial that is aggressive enough to displace most other species in areas where it



COURTESY OF THE NATIONAL WILDFLOWER RESEARCH CENTER

Research horticulturist Elinor Crank studies the relationships between wildflowers and mycorrhizae.

TAMING WILDFLOWERS

Wildflowers can make an attractive addition to any landscape, even those too small for a wildflower meadow. If you're just getting started with wildflower gardening, Beth Anderson, one of the National Wildflower Research Center's resource botanists, suggests starting out slowly by replacing a failed garden plant with an appropriate native plant or choosing a native tree or shrub over a non-native selection. For example, replace crape myrtle (*Lagerstroemia indica*) with serviceberry (*Amelanchier* spp.) or redbud (*Cercis canadensis*) or replace boxwoods (*Buxus* spp.) with bayberry (*Myrica* spp.) In this way you can gradually work up to a formal bed filled with wildflowers, a miniprairie, or a full-scale wildflower meadow.

For a more formal look, choose wildflowers that are compact and don't spread. If you'd like a wildflower meadow but don't have the space, Anderson suggests planting a miniprairie, interspersing shorter prairie flowers with some of the smaller grasses. Choose five or six species native to your area. Most natives have large root systems, so don't crowd too many together.

The center's clearinghouse has fact sheets to help you get started. An introductory packet includes state-specific lists of commercial sources for native plants and seeds, recommended species, tips on landscaping and gardening with native plants, and a regional bibliography. A habitat gardening packet has fact sheets on creating a wildlife garden, and butterfly and wildlife gardening bibliographies. Wildflower center members receive these and other fact sheets free. Membership (\$25 a year) also includes a subscription to a bimonthly newsletter and a biannual journal and discounts on center merchandise.

—Mary Beth Wiesner, Assistant Editor

To obtain either the introductory packet or the habitat gardening packet, send \$2 (each) for postage and handling and a self-addressed mailing label to: Clearinghouse, National Wildflower Research Center, 2600 FM 973 North, Austin, TX 78704.

has been planted for lawn or pasture or has invaded from a neighbor's lawn or pasture.

Hill wants to see what it takes to weaken Bermuda grass enough to allow the reestablishment of native species. The previous winter and spring, Hill used a herd of Texas longhorn cattle to graze the foot-deep thatch to a few manageable inches. "The thinking was to get the grass to a uniform stage of growth so the burn would affect it more evenly," Hill says.

The postponed burn, which will imitate the fires that happened naturally before grasslands came under human influence, will further weaken the grass and get rid of scrubby shrubs and standing mesquite trees (*Prosopis glandulosa*). A few weeks after the burn, Hill plans to plant two cool-season grasses—Texas needlegrass (*Stipa leucotricha*) and Canada wild rye (*Elymus canadensis*)—to give them a head start before the warm-season Bermuda resumes growth in May.

"I'm hoping the cool-season grasses will shade out the Bermuda," Hill elaborates. "The grazing and burning will have hit it pretty hard, so it will be in a low-vigor state. But we may need another year of hammering on it." Once the Bermuda grass is in retreat, Hill will try different

methods of introducing other grasses and some wildflowers, to see which species and methods work best.

Because prairie plants take a year or two to establish roots before putting great energy into top growth, Hill—who joined the wildflower center after finishing a doctoral program at New Mexico State University—plans to give them several years to establish themselves before moving on to a monitoring phase, which might last a decade or longer. By trying several techniques for maintaining the native plants, Hill hopes to find a variety of options that landowners can use to increase the ecological diversity of their land.

Hill admits that her approach is not the quickest. "You can go in and completely denude an area, start from scratch, and say, 'I'm going to plant these native plants and build a prairie.'" But besides being costly, that can cause soil erosion and upset the balance of soil microorganisms that promote fertility. "This is not a project to look at the fastest way to work on land," she says. "It's for people who believe in a more sustainable agricultural system."

Hill's effort to provide alternatives to "plowing and planting" for people who want to change the vegetation on their land

reflects the wildflower center's emphasis on plant communities. "All of our research relates to the interaction of different species in our plant communities," says Dr. John Averett, who's been the center's research director since leaving his post as biology department chairman at the University of Missouri in St. Louis four years ago. "We're thinking about the general community structure, rather than just reestablishing wildflowers on some arbitrary basis."

While Hill's study looks at competitive relationships within the plant communities, research horticulturist Elinor Crank is focusing on the interdependence of some community members. Among her projects is an ongoing study of the relationships between native plants and mycorrhizae—soil-borne fungi that grow on roots and help plants take up water and nutrients. Crank works in the center's greenhouses and growth chambers, free from the tyranny of weather.

"The way I look at it, our goal is to reestablish native plants in the environment," Crank reflects. "If you're going to plant native plants, you need to include the things that allow them to survive in nature." Since an estimated 90 percent of all plants grow symbiotically with mycorrhizae, it's reasonable to assume that Crank would find an association between the fungi and most plants she studies. But by using a soil mixture devoid of nutrients, she plans to find which species must be inoculated with mycorrhizae to survive and which merely benefit from it. Crank hopes that nurseries will begin inoculating the plants they sell, to hasten establishment and reduce plants' need for water and fertilizer. "It negates the benefits of native plants if you're still watering and fertilizing them," she points out. She currently uses a nonspecific commercial inoculant—sold in fifty-pound bags, in case you'd like some for your potting shed—but hopes someday to begin isolating mycorrhizae strains specific to their hosts.

In research targeted to the nursery industry, Crank studies the parasitic relationships of wildflowers in hope that elucidating their growth requirements will encourage their commercial production.

One genus she's looking at is *Castilleja*, whose 150 species of bright red, yellow, or purple flowers would be a hit among gardeners but for one problem: they cannot be easily grown commercially. Wild-collected seed of the annual *C. indivisa* is available,



but costs about \$500 per pound.

Crank had read reports that some perennial species of *Castilleja* developed better when potted with a plant of a different genus than they did growing alone; she had also observed Indian-paintbrush (*C. indivisa*) growing in nature with Texas bluebonnet (*Lupinus texensis*). Aided by a grant from the Texas Department of Agriculture, Crank decided to investigate whether *Castilleja indivisa* might be a facultative parasite of bluebonnet—that is, capable of surviving on its own but benefiting when drawing water and nutrients from the bluebonnet.

Crank found that *C. indivisa* did indeed benefit from the pairing. After four months, sixty-three of the 100 plants she'd potted with bluebonnet had flowered, while none of the solitary specimens had. The results were similar when she grew *C. indivisa* with evening primrose (*Oenothera speciosa*). The fresh weight of the *Castilleja indivisa* grown with the evening primrose was more than five times greater than that of *C. indivisa* alone. Crank is now trying the perennial *C. purpurea* with two grass species and with Missouri evening primrose (*Oenothera macrocarpa*).

Crank's results have a clear message for commercial seed producers: sow *Castilleja* species with a host and reap profits. To further help potential producers, Crank is running germination tests to see what temperature *Castilleja* seeds prefer and to learn whether a cold treatment breaks seed dormancy. Hill is also conducting yield studies to give commercial growers an idea of how large a harvest to expect per acre.

The emphasis on uncovering methods applicable to commercial growers isn't coincidental. For native plants to find widespread use in public and private landscapes, they have to be available. For them to be available, nursery professionals have



Top: Community ecologist Alison Hill, far right, directs volunteers during a practice burn on the center's reconstructed prairie before setting alight the research pasture.

Middle: A growth chamber is used in a germination study of ashy dogweed, an endangered species.

Bottom: As a part of Hill's research, Texas longhorn cattle grazed the Bermuda grass research pasture to make it more manageable.

to know how to grow them. But they also must be convinced that someone will buy them. "It gets to be a circle," research director Averett says. "People say, 'I would buy it if it were available,' and growers say, 'I would grow it if people would buy it.'"

Getting consumers to request native plants is the aim of the center's education program, which, combined with the research program, makes up a third of the center's \$1.3 million annual budget. These native plant advocates reason that if people know established native plants require less water than exotics, have fewer pest problems, survive their region's weather, and provide habitat for wildlife, they'll make the effort to seek out natives when it's time to landscape.

"One of our goals is to make people more aware of the importance of native plants beyond just the beauty of wildflowers. We want them to appreciate the whole range of native plants, and to appreciate them for their environmental importance," emphasizes Elizabeth Carmack, the center's public information coordinator. "They're part of the ecological balance that we need to work toward repairing."

In addition to the usual education efforts—a bimonthly newsletter, biannual journal, articles for magazines and newspapers, posters for children, lectures, and exhibits—the wildflower center operates a clearinghouse that collects and distributes information on commercial sources of native flowers, shrubs, and trees, and their uses and culture. The clearinghouse offers about 200 different fact sheets, many for specific states and regions—not just for Texas or the Southwest. After all, it's not the Austin Wildflower Research Center, and the center strives to live up to the "national" in its name. Although researchers use local natives in field studies, they design their

Continued on page 43

THE TREE PEONY

King of Flowers

*True-to-name cultivars seem expensive,
but admirers think that they're worth
a king's ransom.*

B Y P A T R I C I A K I T E

During China's Tang Dynasty, it is said, there was a tree peony called 'Pe Leang Kin', meaning 100 ounces of gold, the amount for which it sold. If this is true, the tree peony's cost has gone down somewhat in the past 1,400 years. But the "King of Flowers" still commands a steep price.

Only two nurserymen in this country—Roy Klehm of Klehm Nursery in South Barrington, Illinois, and Dr. David Reath of Reath's Nursery in Vulcan, Michigan—have been consistently successful in grafting true-to-name tree peonies. This relative scarcity keeps catalog prices between \$35 and \$100.

"If there's only 200 of something in the entire world," asks Klehm, "what price should it be?"

Tree peonies—which are not trees, of course, but woody shrubs that do not die back to the ground each winter as herbaceous peonies do—are certainly available in many places besides nurseries, and often at much lower prices. "But if you go to a hardware store and buy something labeled 'red tree peony' and you don't get it, the peony is worth almost nothing," says Klehm. "If you want to be sure of getting a red semidouble with gold underneath the petals, you order 'Banquet'."

Not only is flower shape and color, overall habit, and foliage appearance a matter of guesswork when buying such plants, but they are often only one-year-old grafts. "They are not going to have a very large root system," says Klehm. Tree peonies usually take three to four years to bloom.

COURTESY OF ROY KLEHM





"The Japanese flood America with small tree peonies and only a small percentage are true to name," agrees Reath. "Brokers go to Japanese farmers and ask them only 'Are these pink, white, or purple?' Then they get thrown in a bin and labeled with names randomly."

Tree peonies are native to China and Tibet but were known as cultivated plants long before their existence in the wild was verified. Even the oldest Chinese written references call the tree peony "a flower long cultivated." They distinguished the herbaceous "sho yo" peony from the "mow tan," "muh tang," or "mew tang," most commonly spelled "moutan." The word means "male scarlet flower": scarlet tree peonies were considered the finest and "male" referred to the fact that propagation had to be by division rather than seed.

The sho yo was raised primarily for the purported medicinal value of its roots but the moutan was prized as an ornamental. The latter was the "King of Flowers," while the former was relegated to the role of the "King's Ministers" or "Prime Minister of All Flowers."

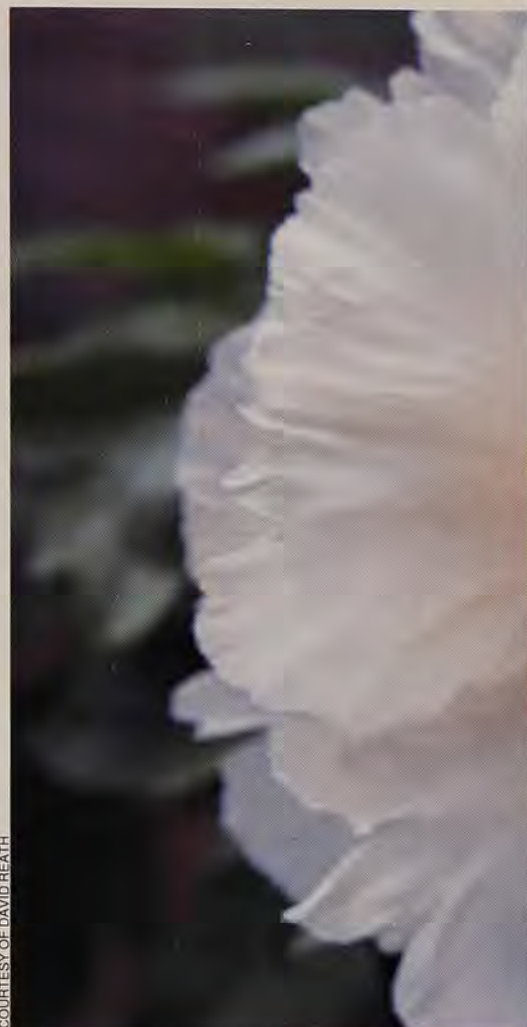
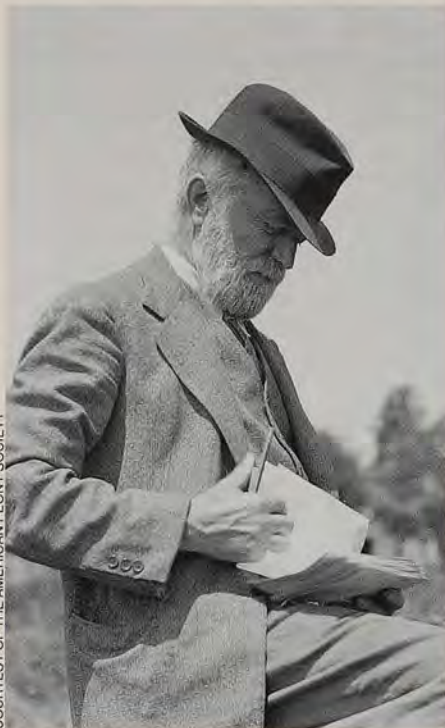
Emperor Yang Te, who ruled from 605 to 616, began the widespread distribution of moutans for garden use, and within 100 years, references say, "they were found about the huts of the lower classes as about the noble seats of the great." As their ornamental bush and espalier uses became increasingly recognized, experiments began producing flowers of increasingly larger size.

Tree peony culture became a favorite *divertissement* of royalty and scholars. Some exquisite varieties were included in marriage dowries; their dispersal was specified in wills.

In Chinese art, each month is represented by a flower. The moutan is the flower of March, but it is also used to signify the spring season. From the twelfth century through the eighteenth, peonies and peacocks were often used together as symbols of splendor in Chinese tapestries, woodblock prints, paintings on silks and screens, and porcelains. The phoenix, too, was frequently linked with the moutan—the king of birds with the king of flowers. Peonies were embroidered on the exquisitely detailed trousseau items of the imperial princesses.

"Buddhist monks are believed to have

Left: 'Shintenchi' (New Heaven and Earth) is Roy Klehm's favorite moutan tree peony.



brought the tree peony to Japan in the early part of the eight century," says Reath, along with apple, orange, and cherry trees. The moutan, which became "botan" or "bhotan," was an immediate favorite. Extensive hybridization produced flowers with clearer coloring, elegant lines, and lighter weight so that they held themselves upright on the bush, instead of hanging down in their foliage. Explains Reath: "The Chinese varieties of the time were large and heavy doubles that required a lot of staking to keep from drooping."

The peony became known as the flower of prosperity, since initially, only the rich could afford them. Unlike the Chinese, the Japanese did not mix them with other plants in the landscape, but would display a collection entirely of peonies in large pots or long beds, the latter often near the women's living quarters.

In Japanese art too, the tree peony was inseparably associated with the peacock, painted on temple and palace walls and intertwined in legend and folklore. In the home the botan was always placed alone in the principal recess, a position of reverence and honor. It was often called "the flower of twenty days" for the time it lasted when cut and placed in water.

A horticulturist visiting Japan in 1899 wrote that tree peony culture "amounts to a regular worship" with each plant grown outdoors having its own individual protec-

tive straw thatch.

In July of 1656, the Dutch East India Company sent its first representatives to what we now call Beijing. Upon returning home, one of them described flowers similar to roses but twice as large and without thorns. Few people were excited. For yet another century, no European took a serious look at the use of tree peonies. Then about 1786 Joseph Banks, the noted plant hunter from Kew, read the account and sent an emissary to secure a specimen plant. Described as having a very double magenta bloom fading to pink at the edge, it was a *Paeonia suffruticosa* cultivar sometimes called *P. moutan* 'Banksii' in historic accounts. It remained in the Kew gardens until 1842, when it was destroyed during a building project.

Robert Fortune, explorer for the Royal Horticultural Society, was said to have discovered the best of the Chinese tree peonies, which he brought back from a 1846 expedition. By the 1860s, the moutan was enjoying a tremendous popularity wave. But this soon ebbed because of the difficulty in propagating the plants, the resulting high prices, and the disappointing performance of the more inferior plants.

In 1712, representatives of the Dutch East India Company recorded the first reference to tree peonies in Japan, when writing of the generic "*Paeonia major*" with a "stem." Later European travelers to Japan

didn't mention the tree peony at all, nor did they seem to think it worthwhile to send specimens home. Apparently, the erroneous assumption was that the Japanese varieties were similar to the Chinese varieties already tried and found somewhat lacking.

But in 1844, tree peonies were imported from the imperial gardens of Tokyo and Kyoto. Four years later, they bloomed and began winning awards. One horticulturist wrote: "I can state they are very fine things, and for the most part are different from anything sent to the Horticultural Society by Fortune."

By 1832, tree peonies had made their way from England to America, but while they attained some status with horticulturists, in 1864 naturalist Charles Mason Hovey wrote: "The tree peony is yet rare in our gardens. It is too slow a plant for us Americans. We must have something like a verberna which can be had in full bloom and sells cheap." Not only was the tree peony slow to flower, but it remained extremely difficult to propagate.

The moutan tree peony was not verified growing wild until 1910, when William Purdom sent a botanical variety of *P. suf-*



COURTESY OF DAVID REATH

A. P. Saunders (far left) created an American-style tree peony by crossing the Japanese semidouble *Paeonia suffruticosa* and the yellow *P. lutea*. William Gratwick (center), who did Saunders's grafting, carried on the tradition. White 'Joseph Rock' (top) is an old but hard-to-obtain selection. Above: 'Banquet'.

fruticosa to the Arnold Arboretum. Four years later Reginald Farrer wrote of finding a white specimen in the mountains along the border of Tibet and China's Kansu Province.

However, the discovery in 1888 of another species, *P. lutea*, by French missionary Father Jean Marie Delavay, had more of an impact on the breeding of the tree peonies that are highly prized today.

This long-sought yellow peony was crossed with the Chinese moutan by the French hybridizers Louis Henry and Victor and Emile Lemoine to produce tree peonies of colors never seen before. But although beautiful in hue, they remained heavy headed.

In the late 1920s an American chemistry professor, A. P. Saunders of Clinton, New York, began crossing *P. lutea* with Japanese semidoubles to obtain yellow tree peonies with sumptuously large blossoms held high above their foliage on strong stems. Most also had crimson or maroon flares, or blotches, on their petals, radiating from the center. William Gratwick, whom he hired to graft the peonies for his nursery, wrote of their shapes: "In form some of them are like magnolia blossoms; others remind one of lotus flowers or great anemones."

Both Klehm and Reath offer more than thirty Saunders cultivars. Some are among the most affordable true-to-name tree peonies available. These include 'Banquet', which is strawberry red with gold undersides; satiny black-crimson 'Thunderbolt'; dark mahogany 'Black Pirate', which Klehm calls "very easy to grow"; and possibly Saunders's most well-known, 'Age of Gold', camellia shaped, yellow with red flares, and "a good starter tree peony" according to Klehm.

When Saunders died in 1953, Gratwick continued expanding his collection of rare cultivars. He did not make crosses, but he found a skilled hybridizer in a most unlikely way. In 1938 during a trip to New York he had bought a painting from impressionist Nassos Daphnis, whom he then invited to visit his home and garden in Pavilion, New York. Daphnis, whose horticultural experience had been limited to some grafting he had done as a child in Greece, began painting tree peonies, and when he was discharged from the U.S. Army in 1945, began hybridizing them as Gratwick's partner.

Daphnis discovered that the second-generation hybrids were not sterile, as had been believed. The fertility of the plants

PEONY CULTURE

Although containerized tree peonies can be purchased from March through November, bare root tree peonies should be planted in the fall when the plants are dormant. This gives the peony's roots time to become anchored during the winter. Soil is a paramount consideration. "We have silt loam," says Roy Klehm. "Clay is acceptable, but tree peonies have absolutely no tolerance for poor drainage." Organic matter should be incorporated into the existing soil to at least eighteen inches deep and three feet wide to encourage roots to move through the soil freely. Roots will spread up to five feet horizontally and five feet deep. Choose your planting site carefully, since tree peonies don't like to be transplanted.

"You should try from the beginning to approximate their natural surroundings," Reath says. Since these are mountainside forest regions, there should be some high shade protecting the plants from strong afternoon sun, low shade protecting the roots, and protection from wind. They should not be planted so close to trees or other shrubs that their roots will have to compete for nutrients, however.

"You must be well aware of climate limitations," Klehm notes. "Peonies are a cold climate plant, generally USDA Zones 3 through 7. They like cold winters, deep rich soils. They love snow country—growing areas like Wisconsin, Illinois, Iowa, Michigan, and western New York. After all, peonies originated in the mountain passes of Tibet."

It has been suggested that peonies prefer a soil pH between 6.5 and 7. Klehm recommends incorporating a slow-release high phosphorous fertilizer in the top of the soil and below the foliage during the growing season. Grafted tree peonies need at least two years to get a firm footing, and a third or fourth year for a large number of good-sized blossoms to appear.

—Patricia Kite

made it possible for him to begin backcrossing them to increase the percentage of genetic material from the moutan, and to decrease the percentage from the *P. lutea*. While the *lutea* gives blossoms otherwise unobtainable yellow pigment and the ability to tolerate a bit more sun and heat, it also can impart its weak stems and tender foliage. Several years ago, Daphnis attained his goal of breeding moutans that were seven-eighths moutan and one-eighth *P. lutea* in their genetic make-up. Their reproductive cells are also more compatible than those of previous generations, which makes it easier to develop new hybrids.

"We have more chances now to create new qualities because we can better access the whole gene pool," says Daphnis. He has about twenty new hybrids that he expects to bloom within the next two to three years. It takes an average of ten years for a new hybrid to produce flowers.

Among Klehm's favorite Daphnis hybrids are 'Nike'—Daphnis names most of his plants after Greek gods and goddesses—which is coral peach with rounded blossoms, red flares, and yellow anthers. Reath likes 'Leda', a mauve pink semi-double with plum-colored streaks and veins and flares of an even deeper color.

Like Daphnis, David Reath had not been a professional horticulturist when he began propagating peonies. A graduate of Michigan State University, he was a veterinarian with a large- and small-animal practice in the 500-population town of Vulcan, Michigan. His primary plant interest was in irises and it was at an iris breeder's garden that peonies first caught his attention. "They make such wonderful companion plants for iris," he thought at the time.

Reath and his wife Eleanor began corresponding with Saunders's daughter, Silvia Saunders, who in 1965 invited them to her father's extensive nursery. "A year later, she asked if we were interested in taking over the propagation of the tree peonies, as she was getting ready to retire. In the previous few years, we had bred peonies, but only herbaceous ones."

The Reaths received a nearly complete collection of Saunders's cultivars. Silvia Saunders made several visits to authenticate the tree peonies while they were in bloom. Forty-five acres of Reath's 160-acre nursery, run by his son R. Scott and daughter-in-law Elizabeth, are now devoted exclusively to peonies. David Reath's most recent efforts involve using col-



COURTESY OF DAVID REATH



JOHN ELSLEY

David Reath (left) and Roy Klehm (right). Reath was an amateur who was attracted to peonies as companions to irises. Klehm represents the fourth generation in a family nursery, which also specializes in daylilies. 'Nike' (opposite page, left) is a fragrant hybrid from Nassos Daphnis. Opposite, right: Daphnis collecting pollen.



chicine, a substance derived from the autumn crocus or meadow saffron (*Colchicum autumnale*), to double peony chromosomes and thus give breeders additional access to the wealth of genetic material found in this genus.

Although Roy Klehm was only eleven years old when A. P. Saunders died, he too benefited from his legacy. He made his first successful graft, while in high school, with Saunders's cultivar 'Age of Gold'.

Roy Klehm's great-grandfather, John Klehm, came from Germany to Buffalo, New York, where he worked as a bricklayer before moving to Chicago and taking up the nursery trade in 1852. Like many of this country's early nurserymen, Klehm began by selling edible and holiday plants, such as the traditional German Christmas tree. "My grandfather Charlie took the business over in 1892, then my father Carl, then me. And I was the one who brought the tree peonies into our company."

Klehm tried to propagate tree peonies as a child helping his father in the nursery. "I was just so attracted to them. The knock-out, pure beauty of the blossoms is staggering. But for the first few years I failed. I didn't know what I was doing. And as a child, I didn't have the patience."

Tree peony grafting and growing can be complex and time consuming. Arno and Irene Nehring wrote in their book *Peonies, Indoors and Out*: "We should like to in-

clude a mild warning about mortality in grafting. A nursery that has less than 50 percent deaths the first year and another 50 percent the second counts that it is doing pretty well."

The greatest risk in the procedure, explains Reath, comes from *Botrytis paeonia*, a fungus that causes young shoots to suddenly wilt and turn black.

"This is an operation" requiring surgically sterile conditions, Klehm emphasizes. "What hurts results is the pathogens. Sanitation is extremely important. You have to have a clean work surface and use an antiseptic surgical knife. We sterilize everything thoroughly."

The grafting is done by inserting the scion—a wedge of the tree peony to be reproduced—snugly into the rootstock of a herbaceous peony. Both cambium layers—the vital layer of cells just under the surface—must match exactly.

"We bind this with a rubber band," says Klehm, "and then use rose wax to seal the graft. We place the tree peonies in outdoor field beds for a year. Then they go into a container for another year."

Among the qualities Klehm and Reath look for in deciding whether a tree peony is worth the effort it takes to reproduce it are blossom color, blossom size, foliage color and shape, disease resistance, strong stems and heavy petals to help them stand up to wind and rain, and fragrance, which

Scott Reath describes as "lemony."

Of all Klehm's current offerings, the white semidouble 'Joseph Rock' is the rarest. It was named after a plant hunter who in the 1930s collected seeds of what he believed to be a tree peony from a lamasery garden and sent them to the Arnold Arboretum. Its blossoms are fluffy and pure white with purple inner flares. "The gardeners at Sissinghurst Castle tried to find one of these for eighteen years," says Klehm. "When I told them that I had one, they almost fell over."

In the 1920s and 1930s, catalogs of Japanese nurseries listed 200 or more varieties of tree peonies. But nearly all of them went out of business during World War II. Now, notes Klehm, Japanese gardeners who prize verified tree peonies are contacting his and Reath's nurseries.

"We ship tree peonies anywhere we find customers," says Klehm. That includes China, which is where this story began.

Patricia Kite, a free-lance writer living in Newark, California, has been writing about gardening for sixteen years.

The Klehm Nursery catalog is available for \$4 (refundable on first order) by writing Route 5, Box 197, Penny Road, South Barrington, IL 60010-9555.

The Reath peony catalog is available for \$1 by writing County Road 577, Box 247, Vulcan, MI 49892.



BRIAN HOLLEY

Wiggly Creatures & Amazing Mazes

*There are wrong ways
and right ways
to garden with children.*

BY BRIAN HOLLEY

I'm probably not alone in having wonderful memories of childhood encounters with gardens. I still remember with pleasure and a little nostalgia the fragrant purple lilac in my grandmother's yard and the cozy hiding place in the niche between the giant granite boulder and the sprawling sumac in my family's garden.

My memories of *gardening*, however, are not so pleasant. It always seemed that I was just about to start a ramble through the ravine or had my baseball mitt in hand when my parents conscripted me to cut grass, weed, or worst of all, pick beans.

My transition into a gardener began with my experiences homesteading in northern British Columbia and continued when I became a homeowner simply trying to create a pleasant garden. Even so, when



MURIEL WEINERMAN / COURTESY OF THE NEW YORK BOTANICAL GARDEN

I joined the staff of the Royal Botanical Gardens (RBG) in Hamilton, Ontario, after graduating from forestry school, it wasn't as a gardener but rather as a supervisor of RBG's extensive natural areas. After a few years I was offered an opportunity to try my hand at a new position. Consequently, and with a certain amount of irony, I became supervisor of RBG's Children's Garden. One of my responsibilities was the Junior Gardeners Club, a gardening program for 8- to 13-year-olds that had been running for thirty-five years.

Unfortunately I either forgot or ignored my childhood memories of gardening. During the first season I spent a great deal of time teaching lessons about proper gardening techniques. After the formal session in the classroom, the kids would go to their gardens to practice what I had preached.

For the rest of the class I would bounce around the garden from one cry of "Mr. Holley!" to the next, at each stop offering help and trying to muster some enthusiasm for a crooked row of beet seedlings or a particularly interesting Gordian knot of unthinned carrots. In between bounces I would roust out wandering weeders from behind the raspberries and under the apple trees. The two-hour sessions were exhausting, and even worse, by late summer the attendance had shrunk from thirty-six to seventeen. Something had to be changed.

During the next decade the program went through many changes, but perhaps the most important was a change in attitude. Now our emphasis is on the garden as a special place, full of miraculous living things—living things that are beautiful, tasty, wriggly, smelly, and creepy. Our class-

es are full of games, stories, crafts, and cooking, as well as weeding and watering.

Today the Junior Gardeners program has between thirty-six and forty participants, and I continue to spend a great deal of time helping and admiring. The attendance rarely falls below thirty and over half of the class each spring is made up of returning gardeners.

The evolution of the children's gardening programs continues each year. This year we expanded the program to morning and afternoon sessions and reduced the number of children per session to thirty.

Below: Youngsters are fascinated with huge plants like corn, which can be attractive at the back of a border.

Far left: Small children like to dress scarecrows in their own old clothes.



Three years ago we added two more gardening programs: Cockleshells and Silverbells for 2- to 4-year-olds and Sow and Grow for 5- to 7-year-olds. And we're not just for kids these days. Now we have community gardens, horticultural therapy programs, and a variety of adult education programs. The Children's Garden is now the Teaching Garden.

Each Junior Gardener tends his or her own plot of land. I inherited beautiful, precise plans for eight-foot by twelve-foot gardens, but it soon became apparent that they were far too large for most of the kids to keep up with. For several years now each child has tended a three-and-a-half by ten-foot bed mounded up with soil excavated from the pathways. We have found that if they are any wider it is difficult to reach the center of the garden without stepping into it. Next year, however, we will probably try things a little differently.

During the past year I have had the opportunity to share ideas with several other people who are gardening with children. One visit was with Jane Taylor, the driving force behind the development of a new garden for children at Michigan State University. This garden will have many features but my favorite is the pizza garden. It is divided into slices, each filled with a plant used in making pizza. Catherine Eberbach, supervisor of the Children's Garden at the New York Botanical Garden, gave me some wonderful ideas about using low hedges of annuals such as basil to define a child's proprietorship. On Chicago's south side I visited third-grade teacher LaDonna Brody, who is trying to get her students off the streets and into the garden during the summer. Her efforts are part of the Chicago Botanic Garden's extensive Urban Horticulture Program. I also had a chance to watch my own daughters' reactions as they explored the Children's Garden at Longwood Gardens near Philadelphia. They were fascinated by the tunnels and nooks and niches of the garden and delighted by its topiary creatures.

Now I don't feel that we have to be confined to rectangular plots. Next year we'll try squares or circles with a narrow access and an open area in the middle, sort of a little garden fort. Perhaps some of the young gardeners will add a bean tunnel or a tepee for added privacy. We have grown a variety of beans on this sort of structure. The favorites are hyacinth bean (*Dolichos lablab*) for its flowers; scarlet runner bean

(*Phaseolus coccineus*) for its tasty flowers and beautiful seeds; and the yard-long bean (*Vigna unguiculata* subsp. *sesquipedalis*), which almost lives up to its name.

Each year we create a labyrinth or maze at the Teaching Garden. Most children are delighted by the idea of a puzzle garden, even if the plants aren't tall enough to create a visual barrier or the plan isn't particularly complex. Twisting pathways, dead ends, and small open spaces left in the corn patch at planting time create a maize maze. We usually plunk a scarecrow Minotaur in the middle of ours. Last summer a student rescued some temporary traffic signs left over from a festival and posted them around the maze. The kids thought they were hilarious.

Planting a garden is quite a bit different when you are working with younger children, especially 2- to 4-year-olds. We start off by setting out marigold transplants. Voila! Toddling gardeners have flowers and a simple way to locate their gardens. The next step is to plant some onion sets in a little circle around the marigold. The child can screw them in just like light bulbs. Within a few days there will be a palisade of little green shoots emerging around the marigold. From there we plant in clumps radiating out from the center. The garden should be only about thirty inches wide. Larger crops such as potatoes or sunflowers can be planted off to one side.

The first time I sowed seeds with very young children I put some seeds in their hands and then showed them the planting area. They all looked up at me with wide-eyed innocence, opened their hands, and dropped the seeds. We had fifteen little forests of lettuce. As a result, when planting seeds with preschoolers we now mix the seed with sand and place the child at the planting spot before we give them the sand-seed mixture.

Because preschoolers can't read, we mark the seeded area with a picture of the flower or vegetable cut out of a seed catalog. These are laminated with plastic film and fastened to ice-cream bar sticks.

It is important that kids have gardens that are big enough to be interesting but small enough to cope with. Barrel gardens and window boxes are viable options if space is limited. We also build bag gardens. These are made by filling shopping bags with a soilless growing medium. The bag openings are tied, planting holes cut in the top, and drainage provided by making short slits in the bottom. We have grown

everything from begonias to beets in these. The other nice thing about container gardening is that it's accessible to youngsters in wheelchairs.

Kids love making scarecrows as well. If we don't have any straw on hand, we stuff them with balls of newspaper. Young children seem to have a special fascination with little scarecrows dressed in their own old clothes. I don't worry about taking them down in the fall; they are great snowball targets and familiar garden faces in the winter.

While scarecrows are easy for preschoolers to relate to, scientific principles are not. One of my students, Charles, is a wonderfully bright child who has become a very skilled young gardener. However, he is also one of the most obstinate children that I have ever encountered. One day several years ago, when Charles was three



PHOTOS IN THIS ROW BY BRIAN HOLLEY



ALLEN ROKACH / COURTESY OF LONGWOOD GARDENS

or four, I received a call from his mother. She asked me to please explain to Charles that he didn't have to feed the plants his own breakfast, lunch, and dinner. Charles was adamant that I had said that plants needed food to survive and he didn't want his plants to die so he was feeding them. Needless to say, Charles's obduracy and his mother's frustration escalated to almost cataclysmic proportions. It is difficult to explain photosynthesis to even a precocious 4-year-old and Charles wouldn't accept a simple "plants eat sunshine and soil and water." We finally found a compromise. He could compost the leftovers and then feed them to his plants.

Charles's brother Robert taught me that children, like adults, may want to have some say about what they grow. Last May I was showing a group of young gardeners

how to plant onions when suddenly Robert burst into tears. He didn't want to plant onions like the others. Ideally, the children should be able to choose what they plant. At the Teaching Garden we have to compromise on choice, at least initially, in favor of providing concrete directions. It gets pretty confusing for everyone if forty kids are trying to figure out how to plant forty different flowers and vegetables at the same time. However, once the framework of the garden is in, we let them make their own choices. (Incidentally, within a few minutes the only evidence of Robert's despair was a smudge of dirt on his cheek where he had wiped away the tears and an extra row of carrots in his garden.)

At home you could involve your children from square one in choosing plants and seeds from the garden center or catalog. A



PHOTOS IN THIS COLUMN COURTESY OF THE CHICAGO BOTANIC GARDEN



The Urban Horticulture program of the Chicago Botanic Garden (top, middle, above) strives to bring children off the street and into gardens. At the Royal Botanical Gardens in Ontario (from upper left), Simon makes an herb book, Katie puzzles over a gigantic "spoon," and Steven harvests a treasure-trove of potatoes. Left: Children delight in mazes, like this one at Longwood Gardens. Such "puzzle gardens" don't have to be tall or complex.



BRIAN HOLLEY

Recycled containers play a major role in "gardening with garbage" at the Royal Botanical Gardens.

word to the wise: children can be just as readily seduced by catalogs as adults. I still blush at the memory of buying seeds for "Presto Pickle." To this day I don't know what kind of plant it was but I do know that it didn't produce any pickles.

There are more and more vegetable cultivars available that are fun for kids to grow. Radishes are available in pink, purple, green, and white as well as red. There are blue beans and red potatoes as well as fat little carrots and spaceship-shaped purple kohlrabi. We try to select crops that will mature at various times during the growing season so that there is always something new developing. Kids love harvesting potatoes and peanuts—it's like digging for buried treasure.

The Junior Gardeners' gardens usually contain a mix of herbs, vegetables, and flowers throughout. We mix them up not because of any particular faith in companion planting but rather because the gardens look more attractive and the herbs and flowers are useful for bringing the garden indoors. Most kids seem to prefer the sweet-smelling herbs like anise, lemon basil, or mint. We also grow a variety of flowers as transplants for the gardens. Many are everlastings such as statice, *Salvia farinacea* 'Victoria', and strawflowers that can be dried, but there are always nasturtiums, marigolds, pinks, zinnias, and cosmos available as well.

The most difficult plants to deal with are the giants—corn, pumpkins, and sunflowers. One solution for growing corn is to include clumps of it at the back of a flower border. It can actually look quite attractive. Perhaps that's not too surpris-

ing, since grasses are integral to the New American Garden.

It's easy to be tempted to grow gargantuan pumpkins. Be warned, however, that they do take up an enormous amount of space. A better bet for the average back yard might be one of the new dwarf forms. Each child can scratch his or her name on a little pumpkin in midsummer and then watch it get larger as the pumpkin grows.

Every garden should have some corner where 'Mammoth Russian' sunflowers can be grown. It's fun when you have to climb up a ladder to look at your flower. Sunflowers are hard to beat for attracting birds to the garden as well.

One of my fondest memories of gardening with children is from a couple of years ago. The kids in the Sow and Grow program had made scarebugs to put in their gardens. I have to admit that a rock painted by a 6-year-old to look like a giant ladybug isn't likely to keep too many insects at bay, but it sure was fun. They seemed to be a million light-years away from video games as they wandered through their garden, debating with great gravity about the best location for scaring insects.

The garden can be a wonderful place to learn about nature. Those innocent-looking yellow dots left on your cabbage by a white butterfly become pesky caterpillars. One sip of a fuchsia flower and you can understand why hummingbirds love them. Pill bugs and millipedes hide in the compost heap while toads canvass the garden in camouflage. Every new insect is inspected to see if we want to keep it in the garden. The caterpillar on the parsley is deemed acceptable because it is going to become a beautiful black swallowtail butterfly.

Real insect problems are surprisingly few and far between. Garlic sprays may repel a few and hand picking egg masses helps to get rid of some, but by and large the pests are left unchecked. If there is a serious infestation of insects, staff members will apply a soap spray. We also manipulate planting dates and plant second crops to reduce the impact of insect pests. For example, we plant two crops of onions, one to be harvested as scallions before the onion maggots are active and the other after the first batch of maggot eggs have been laid. The gardens aren't perfect but there is always plenty of produce to take home, with some left over for the food bank.

The garden becomes a whole new world when a child looks at it through a magnify-

ing glass. The tip of a stigma is shiny and sticky, just waiting for a grain of pollen to land on it. Earwigs become prehistoric monsters with great scary pincers. Each insignificant flower on a dill plant becomes a beautiful blossom. Many toy stores now have little magnifier boxes that are wonderful for studying insects. If you don't have a magnifying glass, try using a three-inch piece of a paper-towel roll. Looking through a tube at an object isolates and seems to magnify it.

It isn't difficult to get the kids into the kitchen when they are preparing their own produce. Even the youngest gardeners have fun making garden pizzas and salads. They also enjoy making chutney, jam, spaghetti sauce, zucchini bread, muffins, and pies.

We use many herbs from the garden in our cooking as well. Salad dressings and herb vinegars are simple to make but offer plenty of opportunities for experimentation with different flavors. We also bake little cakes flavored with sweet cicely (*Myrrhis odorata*) or lemon geranium leaves. The food processor has been a real boon; the kids love pushing the buttons and I don't have to worry about them losing fingers.

The garden provides materials for all sorts of crafts as well. There are traditional favorites such as potpourri and corn-husk dolls but we also have fun making tussie mussies and dying T-shirts with marigolds or beads.

During the winter in Canada most of our activities move indoors but the gardening doesn't stop. We "garden with garbage," planting seeds from oranges, kiwis, and papayas in margarine tubs. Pickle jars become terrariums, ivy is trained along a wire formed in the shape of a whale, and cuttings are rooting inside plastic bags recycled from the produce store. In a corner, a composter filled with red worms keeps us busy doing battle with fungus gnats, and a stack of catalogs promises hours of pondering over which seeds to buy for next year's garden.

Gardening can be a great hobby to share with children. It provides opportunities for creativity, discovery, and developing self-esteem that few other activities can match. A child's garden may not be pretty or neat, but it is a place where young gardeners can make their own decisions and learn about the world around them.

Brian Holley is supervisor of the Teaching Garden at the Royal Botanical Gardens in Hamilton, Ontario.

The American Yellowwood

First collected as a source of yellow dye, it's a nearly flawless but rarely found ornamental.



AL BUSSEWITZ: PHOTONATS

The smooth bark of yellowwood caught the eye of French plant explorer André Michaux. Left unpruned, the trunk of a young tree will fork close to the ground.

BY SUSAN SAND

The American yellowwood (*Cladrastis kentukea*) is a beautiful, rare, and little-known American tree, discovered by a keen-eyed plant explorer of North America. André Michaux (1746-1802) arrived in New York in 1785, commissioned by the French government to find and introduce American trees of possible use to the royal navy. Eleven years later he was completing his final expedition and returning to his Charleston, South Carolina, nursery. While riding horseback through snow in northern Tennessee, he noticed an unusual tree with smooth, silvery gray bark. Unable to gather shoots because of the snow, he continued the twelve-mile journey to Fort Blount, just recently built by the government to protect the settlers from the Cherokee. He related in his journal:

“The 1st of March 1796 arrived at Fort Blount situated on the Cumberland River. Snow continued to fall during a part of the day.

“The 2nd remained over in order to pull young Shoots of a new Sophora [*C. kentukea*] I had remarked in the vicinity of Fleen’s [Flinn’s] creek about 12 Miles from the Fort. Snow covered the ground and I was unable to get any young Shoots but Captain Williams, the young [officer] stationed in the Fort cut down some trees and I found some good seeds.

“I also pulled up some roots of those trees to replant them in my garden in Carolina.

“The same day I had occasion to write to Governor Blount.”

In his prompt correspondence to the

ANDRÉ AND FRANÇOIS ANDRÉ MICHAUX

André and François André Michaux were considered to be among the best-trained botanists of their time. They introduced American trees into Europe on an unprecedented scale.

André Michaux began his career at age 17 as a farmer at Satory, Versailles, after the death of his father. In 1769 he married Cecilia Claye, who died only eleven months later, shortly after giving birth to François André; Michaux never married again. He decided to become a plant explorer and received formal training at the nearby Trianon gardens under its director, Bernard de Jussieu, one of the most respected botanists of that era. In 1780 he accompanied Jean Baptiste de Lamarck on an expedition to the mountains of Auvergne, and two years later made a three-year collecting trip to Persia. Michaux had intended to return to Persia but the French government sent him to America.

In November of 1785, he arrived in New York with his 15-year-old son François André, journeyman gardener Pierre Paul Saunier, and a domestic, Jacques Renaud, and armed with a commission from Louis XVI and a letter from Lafayette to George Washington. Four days later, Michaux began collecting plants, and within a few months he had purchased land for a nursery in New Jersey. Leaving the nursery to the care of Saunier while he traveled, he gathered plants from regions around New York City. Michaux journeyed to Charleston in September, 1786, thinking about establishing a second garden in the South. Finding Charleston's climate ideal for year-round gardening, he purchased a 111-acre tract ten miles from the city.

Saunier continued to manage the New Jersey garden, and for the following ten years Michaux traveled widely throughout the eastern United States in search of new plants—from Hudson's Bay to Florida and west to the Mississippi—with the Charleston botanical garden as his headquarters. There he and his son carefully maintained plants and seeds until their shipment to Europe. Unfortunately, most of Michaux's plants did not receive the same care in France. His collections were most frequently shipped to the Park of Rambouillet where they were planted or distributed to members of the aristocracy, some of whom neglected them. The nurseries of Rambouillet were destroyed during the French Revolution, and Queen Marie Antoinette sent many of Michaux's discoveries away to her father, Francis I, emperor of Austria.

Upon his return to France in 1796, surviving a shipwreck on the Dutch coast, Michaux learned the outcome of his years of exploration and collecting—few of the 60,000 living trees he had sent from America had survived. (He had also sent ninety boxes of seed.) In addition, the post-revolution French govern-

ment paid him only a small portion of his seven years of back salary. Disappointed but tireless, he lived as economically as he could and began writing about American flora, publishing a well-regarded book on American oaks, *Histoire des Chênes de l'Amérique*, in 1801. He had even hoped to return to America and join Saunier, to begin his work all over again. However, while on an expedition to Madagascar in 1802, he became ill and died of a malignant fever at the age of 56. He had not yet completed his magnum opus, *Flora Boreali-Americana*, but his son, aided by an unnamed collaborator, completed and published the work the next year.

Michaux's journal, often written by campfire as he traveled, formed the basis of his *Flora Boreali-Americana*. It contains extensive lists of the North American plants he examined and collected, including *Cercis canadensis* (eastern redbud), *Cornus florida* (flowering dogwood), *Magnolia acuminata* (cucumber tree magnolia), *Acer rubrum* (red maple), *Liriodendron tulipifera* (tulip poplar), and *Ilex opaca* (American holly).

Besides sending American trees to Europe, Michaux added trees from Europe and Asia to his Charleston nursery, introducing to the United States such well-known ornamentals as *Ginkgo biloba* (ginkgo), *Lagerstroemia indica* (crape myrtle), and *Albizia julibrissin* (mimosa).

François André Michaux continued his father's work, traveling in America and introducing its native plants to Europe. The year before his father died, he was commissioned by the French minister of the interior to study the forests and agriculture of the United States. His catalog of seeds sent from Charleston to Paris in 1802 included *Gordonia lasianthus* (loblolly bay), *Pinus palustris* (longleaf pine), *Nyssa aquatica* (water tupelo), *Ilex cassine* (dahoon), and *Diospyros virginiana* (common persimmon).

In 1804 he published the journal of his travels, *Voyage à l'ouest des Monts Alléghanys*. Translated into English one year after publication, it quickly became popular in America. His descriptions of the American people and their movement west showed insight and optimism concerning America's future.

After making two collecting trips in America and sending more than twenty-five boxes of seeds to France, François André made his final trip back to France in 1808 and began writing his monumental work, *Histoire des Arbres forestiers de l'Amérique septentrionale* (published in Philadelphia in 1859 as *North American Sylva*.) This book long remained the standard work on the trees of the eastern United States. François André died at his home in Vauréal on October 23, 1855, and was buried in the midst of a grove of exotic trees, mostly American.

—Susan Sand

governor, he referred to the tree's bright yellow heartwood, which he thought might serve as a source of yellow dye. According to the journal of his son, François André, who wrote about his own collecting trip six years later:

"We found particularly, in these forests, a tree which, by the shape of its fruit and the disposition of its leaves, appears to have great affinity with the *Sophora*

japonica, the wood of which is used by the Chinese for dyeing yellow. My father, who discovered this tree in 1796, thought that it might be employed for the same use, and become an important object of traffic for the country. He imparted his conjectures to Mr. Blount, then governor of this state, and his letter was inserted in the Gazette at Knoxville on the 15th of March, 1796."

It is not known whether Michaux's seeds

and roots ever produced trees. He died of a tropical fever while on a collecting trip to the island of Madagascar in 1802 and the yellowwood was not included in his *Flora Boreali-Americana*, published posthumously in 1803. However, his son, who had searched the Carolinas with him, carried on his father's work, and the year Michaux died, François André found more yellowwood trees and collected seeds that



he brought to Europe. As he described in his journal, the younger Michaux was responsible for American yellowwood's introduction to Europe:

"The epoch of my stay at Nashville being that when the seeds of this tree were ripe, I gathered a small quantity of them, which I brought over with me, and which have all come up. Several of the plants are at the present moment ten or fifteen inches high. It is very probable that this tree may be reared in France, and that it will endure the cold of our winters, and more so, as, according to what I have been told, the winters are as severe in Tennessee as in any parts of France." It has been claimed that descendants of those trees still grow in the Tuileries gardens in Paris.

François André described American yellowwood and named it *Virgilia lutea* in his 1810-1813, three-volume work *Histoire des Arbres forestiers de l'Amérique septentrionale*. In 1824, C. S. Rafinesque, a traveling naturalist always on foot with notebook in hand, published a new generic name, *Cladrastis*, for the yellowwood and changed its specific epithet to *tinctoria*. Another change occurred in 1869 when the German taxonomist and dendrologist Karl H. Koch renamed it *C. lutea* using Mi-

chaux's earlier specific epithet, and for years this was the accepted scientific name. However, in 1811, two years prior to Michaux's publication of the name *Virgilia lutea*, George Marie Louise Dumont de Courset had published a description of a young, nonflowering cultivated tree in France, calling it *Sophora kentukea*. In 1971 V. E. Rudd, a botanist at the Smithsonian Institution, found his description and renamed the tree *Cladrastis kentukea*. Although horticulturists at the Arnold Arboretum and the U.S. National Arboretum accept *kentukea*, others prefer to retain *lutea* as the specific epithet, because they believe that de Courset's description was incomplete and ambiguous and therefore perhaps was not in fact American yellowwood.

The genus name *Cladrastis*, deriving from the Greek *klados* for "branch" and *thraustos* meaning "fragile," describes one of yellowwood's features. The branches are actually no more fragile than those of most other trees, but if not carefully pruned to a single trunk when young, yellowwood can develop weak crotches that may split under the stress of heavy ice or high winds. *Lutea*, Latin for "yellow," is a reference to the tree's yellow heartwood, and *kentukea* in-

Its delicate white pealike flowers make yellowwood one of the loveliest native flowering trees. The drooping panicles resemble wisteria, a fellow legume.

dicates the origin of the tree that de Courset described. Other common names for this species include *virgilia*, yellow locust, yellow ash, and gopherwood.

This rare tree, a member of the legume family, is the only representative of its genus in the New World. Four other species are native to eastern Asia: *C. sinensis* and *C. wilsonii* of China plus *C. platycarpa* and *C. shikohiana* of Japan. *C. kentukea* is hardier and more ornamental than the other species. François André Michaux had suspected that the American yellowwood could survive winters even colder than those of France, and he was correct. It has been found to be hardy as far north as Ontario, even though its natural range is primarily in scattered locations in Kentucky, Tennessee, Arkansas, and Alabama. Yellowwood is also distributed in limited areas of North Carolina, Georgia, Oklahoma, Missouri, Illinois, Indiana, and Ohio. Although it occurs most frequently in Tennessee where it was found by both of the Michaux, this tree is not common



Yellowwood is a choice shade tree for small properties. The bright green pinnately compound leaves turn a clear, rich yellow in fall.

anywhere. It grows in two very different habitats—in the rich soil of limestone cliffs, often overhanging mountain stream banks, and in the openings of hardwood or hemlock cove forests.

Yellowwood is one of the loveliest of the native flowering trees. Thirty to fifty feet tall at maturity, yellowwood flowers abundantly only every second or third year, and is beautiful in full flower. In May or June, fragrant and delicate white pealike flowers hang from the branch tips in twelve- to fourteen-inch long, pendulous panicles resembling wisteria. Bright green pinnately compound leaves fill the rounded, graceful crown, offering open shade in summer and becoming a clear, rich yellow in autumn. Its bark is beechlike, smooth and mottled gray, and in winter it traces a pleasing outline. Only the persistent fruit, a flattened brown legume, is of little ornamental value.

One cultivar of yellowwood, 'Rosea', has pale, rose pink blossoms. The original tree was discovered at the Perkins School for the Blind in Watertown, Massachusetts. It is no longer alive, but the Arnold Arboretum has several vegetatively propa-

gated offspring—one produced from a cutting made in 1979 from the original tree and five or six made by grafts from the cutting. In 1980, the arboretum obtained permission to pick all the seeds on the original 'Rosea', and staff members distributed about 150 packets of seed at a meeting of the International Plant Propagators Society. The seedling trees are now being carefully grown throughout eastern North America with the hope that one of the offspring will produce flowers with a richer or more saturated pink color than the original tree. Since yellowwood takes a minimum of ten years to bloom, early reports have just been received, and the seedling trees are indeed producing pink flowers.

This beautiful native tree is not common in cultivation, partly because it is so slow to reach maturity and flower. Yellowwood may grow as much as fourteen inches per year, but will not bloom until it is ten to twenty years old. Yet this tree is relatively easy to propagate by seed or root cuttings, is tolerant of a variety of soils, and resists both fungus and insect attack. Because of its deep root system, yellowwood tolerates moderate drought and will not compete with grass, underplanted flowers, or nearby trees.

The tree's one significant weakness has probably preserved it from extinction. Be-

cause the trunk of a young tree left unpruned will fork close to the ground, yellowwood is unsuitable for commercial harvest. The early pioneers did make small furniture from the wood and carve it into gunstocks, for it is a beautiful, close-grained, strong, and heavy wood that takes a high polish. The settlers also learned to chip the wood and boil it to make a yellow dye for their homespun cloth.

These early uses have become obsolete, however, and today yellowwood is valued primarily as an ornamental tree. Introduced into cultivation in 1812 and widely grown in Europe, it is available from American nurseries usually only in small quantities. Yellowwood should be transplanted as a small tree, balled and burlapped, and placed in a location with full sun and well-drained soil. The early pruning to a single trunk needed to make the tree more wind resistant should be done in the summer, for yellowwood bleeds profusely with winter or spring pruning. Insect and disease control measures are seldom necessary.

With its graceful form and year-round seasonal interest, yellowwood is an excellent choice as a specimen tree in home landscapes. While its wide-spreading crown makes it ideal as a shade tree, its medium height makes it suitable for small properties. If space permits, landscaping with a background of evergreens can provide a pleasing contrast with yellowwood's gray bark, bright green foliage, and clear yellow fall color. The many attractive features of this rare tree, discovered in the American wilderness almost 200 years ago, make it more worthy of attention in its native land.

Susan Sand has a master's degree in horticulture and is a horticultural and biology instructor at Damascus High School in Damascus, Maryland. This is the third in a series of tree histories by Sand.

SOURCES OF YELLOWWOOD

Forestfarm, 990 Tetherhasl, Williams, OR 97544. Catalog \$3.

Foxborough Nursery, 3611 Miller Road, Street, MD 21154. Catalog \$1.

Mellinger's Inc., 2310 West South Range Road, North Lima, OH 44452. Catalog free.

Woodlander's Inc., 1128 Colleton Avenue, Aiken, SC 29801. Catalog \$1.

A Member's Garden A SOUTH CAROLINA HERITAGE

Seventy-year-old plantings give this Aiken retreat special meaning.

BY HARRIETT WATSON AND JULIA LEISENRING

In an age when Americans move an average of every seven years, many of us have to settle for “instant” gardens of annuals and transient perennials. When we are fortunate enough to become possessors of established gardens, the plants have usually been selected by strangers whose history is not our history. Julia Andrews Bissell’s gar-

den in Aiken, South Carolina, is one of the rare ones that has not been the victim of multiple owners with multiple priorities. Many of the shrubs have been here since her parents, Mr. and Mrs. James Newman Andrews, first bought the property as a winter home seventy years ago.

Julia Bissell inherited the property, known as Louviers, from her parents in

1952. Her family had a long tradition of gardening. Her great-great-grandfather, industrialist Eleuthère Irénée du Pont, was also a botanist. He studied at the Jardin des Plantes in Paris, exchanged seeds and plants with botanists in France, and started a formal European garden at the same time he established his gunpowder works in Delaware in 1802.

Louviers is not a grand, sprawling estate. It is a twelve-acre private retreat, primarily a spring garden where azaleas, old and



COURTESY OF JULIA LEISENRING

The first of three descending garden rooms to the southeast of the Bissell house features a bronze statue of Narcissus.

new, billow in colonies planted so that their colors meld and blend and offer a sequence of bloom. Since Bissell took over its care, it has also been a show place for camellias, of which it contains countless cultivars.

The house sits on a gentle rise, one of the undulating sand hills that mark the boundary of ancient seas. Here remain many of the majestic longleaf pines (*Pinus palustris*), whose numbers are dwindling in its native South. From the house, a greenhouse and stable are readily accessible. The greenhouse still functions in its original capacity, offering protection to many of Bissell's prize-winning camellias. The stable offers storage space for such essentials as seed, fertilizer, wheelbarrows, lawnmowers, and a couple of vintage golf carts. The latter keep Louviers's owner, now in her vigorous eighth decade, mobile and in constant touch with the far reaches of her garden.

Louviers is a second-generation garden in more than one sense. Bill McCord, who directs the maintenance of the grounds on a part-time basis, is the son of the late Grady McCord, who came here in the 1950s to share his camellia skills. A bronze marker next to a path in the garden reminds visitors of the role Grady McCord played here.

The basic design was that of Julia Andrews, Bissell's mother. The present owner has enlarged on that arrangement, and designed many new growing areas and paths.

Giving entry to the driveway is a brick wall, weathered and mellow, which is shaded by tall pines and magnolias, and offers support for yellow jessamine (*Gelsemium sempervirens*), honeysuckle (*Lonicera sempervirens*), and *Wisteria sinensis*. One wandering branch of this wisteria, seventy years old and as thick as an axe handle, reaches through a design pierced in the wall and spirals upward.

The round courtyard is encircled by *Photinia serrulata*, laurel, *Rhododendron* species, and *Loropetalum chinense*, also seventy years old. Although they have long since left their youth behind, these plants display healthy wood, verdant foliage, and abundant bloom. One *L. chinense*, clipped into a sphere and fifteen feet through its middle, is a fat and showy spectacle when it is covered with the fringed blossoms identifying it as a member of the witch hazel family. Nearby a large *Cercis canadensis* forma *alba* reaches fifteen feet.

The southeast facade of the house opens



Above: Bill McCord and Julia Bissell in one of the vintage golf carts that help her keep up with her twelve-acre garden. Below: Azaleas, dogwoods, and other spring bloomers frame a sweep of lawn. Right, top: *Rhododendron* 'Snow' forms a backdrop for two figures. Right, bottom: Near the former stable, an ancient wisteria clanders into a pine.



to three descending areas. The first has a small pool with a bronze figure of Narcissus looking at himself in the water. Clipped boxwood (*Buxus sempervirens*), sweet olive (*Osmanthus fragrans*), and the yaupon holly (*Ilex vomitoria*) form this enclosure. Behind them is a heavenly bamboo (*Nandina domestica*) that has been around long enough to reach six impressive feet.

Heavenly bamboo is treasured here. For a while, chic gardeners declared it out of style, but here it was never neglected nor was it at the mercy of shears. It has burgeoned over the years and, in its maturity, displays canes topped with twice- and thrice-compounded foliage that turns bronzy red in the fall. Depending upon the variety, its winter berries are scarlet or ivory—a plant for all seasons.

A second area, rectangular with rounded corners, is a smooth stretch of greensward bounded by 'Stardust' azaleas. Their white blossoms hold their color in the semishade of sweet bay trees (*Magnolia virginiana*), Carolina cherry (*Prunus caroliniana*), a huge old *Ligustrum*, and Lady Banks rose (*Rosa banksiae* var. *banksiae*).

Steps leading to the last terrace circle another small pool, which faces a parterre centered with a sundial and outlined in boxwood. Some of these plants are ancient and incorrigible; some are fat, symmetrical replacements. Spring bulbs are well-established here—grape hyacinth (*Muscari* spp.), squills, and jonquils (*Narcissus jonquilla*).

This early garden also includes a sweep of lawn reached by uneven brick paths, gray with lichen, moss, and the scuff marks

of two generations of gardeners' feet.

Since Bissell has owned the property, these paths have led through her extensive plantings of camellias. Her interest in camellias, which began in 1953, quickly progressed to serious collecting and to the establishment of choice cultivars under the great old pines as well as to greenhouse culture. Her husband, Alfred Bissell, asked his Yale classmate Calder Seibles, then president of the American Camellia Society, to advise her. It was Seibles who suggested that camellia enthusiast Grady McCord, who had spent ten years at Fruitland Nursery in nearby Augusta, Georgia, and ten years at Magnolia Plantations and Gardens in Charleston, South Carolina, come to Louviers on a permanent basis.

Today, Bill McCord keeps the approximately 200 indoor and outdoor





PHOTOS COURTESY OF JULIA LEISNERING

Above: A swan motif is repeated throughout the garden and house. Blooming behind this pool is *Rhododendron indicum*. Opposite: Florida flame azalea.

camellia plants in good health, while Bissell continues to find more choice cultivars to which he can apply his propagating skills. Entries from Louviers are always among the winners at Aiken's annual camellia show and other shows throughout the Southeast.

Among her favorite *Camellia japonica* cultivars for growing outdoors are 'C. M. Wilson', 'Drama Girl', 'Doctor Tinsley', 'Lady Vansittart', and 'White Empress'. Those that she grows in the greenhouse include 'Amabel Lansdell', 'Charlie Bettes', 'Mrs. D. W. Davis', 'Lasca Beauty', and 'Pink Diddy'. She is attracted to camellias that are out of fashion, at least temporarily, or difficult to grow, because she likes a challenge.

McCord propagates replacements both for the garden and for his commercial nursery. It's no longer a secret that hard-to-find cultivars are for sale at his place of business.

Near the greenhouse, a small yard that once served the stables shelters a Lady Banks rose (*Rosa banksiae* var. *banksiae*), a trumpet honeysuckle (*Lonicera sempervirens* 'Sulphurea'), and a double yellow jessamine (*Gelsemium sempervirens* 'Pride of Augusta').

Here also is *Rosa chinensis* 'Mutabilis', the butterfly rose, propagated from one found in an old cemetery by Jane Symmes, who operates Cedar Lane Farm in Madison, Georgia. Bluestar (*Amsonia tabernaemontana*) blooms frosty blue along the east-facing outer wall of the stables. Like the shrub rose, it is an antique favorite being repopularized by Symmes, although its presence here predates the collaboration of these two gardeners.

Gardening fervor feeds on itself. The process of assembling horticultural treasures here led to the expansion of landscaped areas. Clearings have been opened in surrounding woods to accommodate shrubs lending themselves to life in the understory. Here, azaleas begin blooming in March and don't finish until the plum-leaved azalea (*Rhododendron prunifolium*) opens its orange-red petals in July or even later. The flowers were once mistaken for the premature reddening of autumn leaves.

Joining the early bloomers is flowering quince. Great colonies of an old white one, *Chaenomeles speciosa*, have recently been uprooted and replanted to form a backdrop for more vivid colors. Another one, *C. speciosa* 'Cameo', is a relative newcomer with blossoms of an improbable



rosy orange.

The wooded clearings are filled with spirea, *Pieris* species, and *Daphne odora*. The long, overlapping evergreen leaves of *Clematis armandii*, which blooms before its hybrid kin, almost conceal a small gazebo deep in the heart of the garden.

On one hillside is the Florida flame azalea, *Rhododendron austrinum*, which at twenty feet is twice its expected height, while flanking the other side is the pink Florida pinxter or hoary azalea, *R. canescens*. When in bloom, they attract hawk moths in the early evening.

Bissell is grateful to her mother for the large plantings of Japanese apricot (*Prunus mume*) that produce apricot flowers from January through February. They have been so rewarding that more were planted this year near the front gate.

There are many resting places. One bench bears a swan motif, a design inherited from an earlier generation and repeated throughout the house and also outdoors in the finials of hitching posts, faucet handles, and fountains. Small lead figures of other fauna decorate the garden—squirrels, rabbits, fish, and a great turtle propped against a stump, with its wrinkled head extending beyond its carapace as if for a better look. A pair of immobile frogs squat near a curve in the path, and a lead griffin rests in a bed of ivy.

None of these is large enough to be distracting. Like the garden, they are understated and private, quietly embellishing the natural beauty in which they are found.

Harriett Watson is garden columnist for the Aiken Standard. Julia Leisenring is Julia Bissell's daughter.

Louviere is open in the spring by written appointment only. Write to Mrs. Alfred Bissell, P.O. Box 587, Aiken, SC 29801.

Wildflower Center continued from page 23

experiments to answer fundamental scientific questions, which they believe makes the results broadly applicable.

Study design is one means of getting around regional constraints on research. Greenhouse experiments are another. For instance, Crank conducts germination studies on wildflower seeds collected nationwide in an effort to answer a question long neglected by researchers who are enamored of foreign imports: How do we start wildflowers in our very own gardens? Among the hundred or so seeds she's studied during her five years at the center are some endangered species, including ashy dogweed (*Thymophylla tephroleuca*, formerly called *Dyssodia tephroleuca*) and big red sage (*Salvia penstemonoides*).

Another means by which the wildflower center is attaining a national scope is through cooperation with institutions in other parts of the country. At present the center is working with the Desert Botanical Garden in Phoenix, the University of North Dakota, Southwest Texas State University, the University of New Mexico, the University of California at Berkeley, and Washington University in St. Louis.

"We have a nice project going on there," Averett says of the Washington University research. "This is the very latest kind of work. It's an analysis of population variation using macromolecular techniques—DNA analysis." Put more simply, the study is measuring the size of the gene pool of big red sage, the endangered species that Crank has been growing in the greenhouse. The center sends leaves to the university for analysis to see how much genetic diversity remains within the species. "One of the concerns when populations get down to such a small size is whether they have the genetic resources for long-term survival," Averett explains. If the DNA structure varies from specimen to specimen, there's probably enough genetic material to mix and match for many generations. But if plant after plant shows the same genetic make-up, its gene pool may be bankrupt when environmental changes signal a need for evolution.

The most ambitious goal for solidifying the center's national status is to establish regional offices. "We want to respond to people on a local basis," Averett says. The first opened in Minnesota in 1990 with two staff members. The wildflower center plans to open offices in the eastern and western United States when funding permits.

Ah, funding. The not-for-profit center depends on memberships, donations, grants, and corporate sponsorships for the bulk of its annual budget, which has grown from \$230,000 in 1983 to its current \$1.3 million. Averett is pleased with that growth but wouldn't complain if he had more money to lavish on research. "You always wish you had more money because there's always more work to be done—you always want additional people to do additional projects." A big part of his job is to capitalize on available resources. For example, Averett cites the Bermuda grass field Hill is using in her study. "That field could have been a real aggravation. On the other hand, it's an asset to use it to see how well we can replace that grass with native vegetation."

Working within these financial constraints, Averett's mission is to establish the fledgling center's reputation as a respectable research institution. He insists that their research must conform to standards accepted by the scientific community. "Quality is important to us," Averett asserts. "When we do things, we want to do them right. Part of establishing credibility is having 'real' research that follows a rigorous design. We want to see wildflower center studies published in mainstream scientific journals, not just the popular press."

Firsthand interaction with the rest of the scientific community is even more desirable. Michael Dana, a horticulture professor from Purdue University, recently finished a sabbatical at the center, using its clearinghouse to track down literature on the horticultural aspects of establishing and maintaining Midwestern wildflower species. Averett, who would like to see more such ties with outside researchers, concludes, "I think we have a pretty good reputation. As I go around, no one from the university community ever asks me who we are. They don't always know the details of what we're doing, but they certainly have heard of us."

The center, which celebrates its tenth anniversary in December, is too new to rival major universities in number of researchers, amount of high-tech equipment, or the size of its budget. But by focusing on native flowers and grasses that have been overlooked by the traditional research establishment, it has a head start in filling a niche that can only grow in importance as America's interest in conservation blooms.

Erin Hynes is a free-lance writer based in Austin, Texas.



PRONUNCIATIONS

- Acer rubrum* AY-sir REW-brum
Actaea pachypoda ak-TEE-uh
pak-ih-POE-duh
A. rubra A. REW-bruh
Albizia julibrissin al-BIZ-ee-uh
jew-lih-BRIH-sin
Amelanchier am-eh-LANG-kee-er
Ansonia tabernaemontana am-SOE-nee-uh
ruh-ber-nee-mon-TAY-nuh
Arisaema triphyllum ar-ih-SEE-muh
try-FIL-um
Asarum canadense AH-suh-rum
kan-uh-DEN-see
Buxus sempervirens BUK-sus sem-per-VY-renz
Caladium kuh-LAY-dee-um
Camellia japonica kuh-MEEL-yuh
juh-PON-ih-kuh
Castilleja indivisa kas-tih-LEE-yuh
in-dih-VEE-suh
C. purpurea C. per-PEW-ree-uh
Caulophyllum thalictroides
kuh-loe-FIL-um thuh-lis-TROY-deez
Cercis canadensis forma *alba* SIR-sis
kan-uh-DEN-sis forma AL-buh
Chaenomeles speciosa kee-NOM-eh-leez
spee-see-OH-suh
Chelone lyonii KEE-loe-nee lye-OH-nee-eye
Cimicifuga racemosa sim-ih-SIF-yew-guh
ruh-see-MOE-suh
Cladrastis kentukea klad-RAS-tis
ken-TUK-ee-uh
C. lutea C. LEW-ree-uh
C. platycarpa C. plat-ih-KAR-puh
C. shikobiana C. shih-koe-hee-AY-nuh
C. sinensis C. sye-NEN-sis
C. tinctoria C. tink-TOE-ree-uh
C. wilsonii C. wil-SOE-nee-eye
Clematis armandii KLEM-uh-tis
ar-MON-dee-eye
Colchicum autumnale KOL-chih-kum
aw-tum-NAY-lee
Cornus florida KOR-nus FLOR-ih-duh
Cudrania triloba kuh-DRAY-nee-uh
try-LOE-buh
Cynodon dactylon SIN-oh-don DAK-tih-lon
Cyrtopodium calceolus var. *parviflorum*
sip-rih-PEE-dee-um kal-see-OH-lus var.
par-vih-FLOR-um
C. calceolus var. *pubescens*
C. kal-see-OH-lus var. pew-BES-enz
Daphne odora DAF-nee oh-DOOR-uh
Dicentra canadensis dye-SEN-truh
kan-uh-DEN-sis
D. cucullaria D. kew-kew-LAIR-ee-uh
Diospyros virginiana dye-OS-pir-os
ver-jin-ih-AY-nuh
Dolichos lablab DOL-ih-kos LAB-lab
Dyssodia tephroleuca dis-OD-ee-uh
teh-froe-LEW-kuh
Elymus canadensis EL-ih-mus
kan-uh-DEN-sis
Epigaea repens ep-ih-JEE-uh REP-enz
Fagus grandifolia FAY-gus
grand-ih-FOE-lee-uh
F. sylvatica F. sil-VAT-ih-kuh
Gelsemium sempervirens jel-SEE-mee-um
sem-per-VEE-renz
Gentiana saponaria jen-shih-AY-nuh
sap-oh-NAY-ree-uh
Ginkgo biloba GING-koe by-LOE-buh
Gordonia lasianthus gor-DOE-nee-uh
lay-see-AN-thus
Hepatica acutiloba hee-PAT-ih-kuh
uh-kew-tih-LOE-buh
H. americana H. uh-mer-ih-KAY-nuh
Houttuynia cordata hoo-TYE-nee-uh
kor-DAY-tuh
Ilex cassine EYE-leks kas-SEEN-ee
I. opaca I. oh-PAY-kuh
I. vomitoria I. vom-ih-TOR-ee-uh
Jeffersonia diphylla jef-fer-SOE-nee-uh
dye-FIL-luh
Lagerstroemia indica
lay-ger-STREE-mee-uh IN-dih-kuh
Ligustrum lih-GUS-trum
Liriodendron tulipifera lir-ih-oh-DEN-dron
teh-lih-PIF-er-uh
Lobelia cardinalis loe-BEE-lee-uh
kar-dih-NAY-lis
Lonicera sempervirens lon-ISS-er-uh
sem-per-VEE-renz
Loropetalum chinense
lor-oh-PET-uh-lum chih-NEN-see
Lupinus texensis lew-PYE-nus teks-EN-sis
Maclura pomifera muh-KLUR-uh
pom-IF-er-uh
M. tricuspidata M. try-kus-pih-DAY-tuh
Magnolia acuminata mag-NOE-lee-uh
uh-kew-mih-NAY-tuh
M. virginiana M. ver-jin-ih-AY-nuh
Mitchella repens mih-CHEL-uh REP-enz
Muscari mus-KAY-ree
Myrica mih-REE-kuh
Myrrhis odorata MIR-iss oh-duh-RAY-tuh
Nandina domestica nan-DEE-nuh
duh-MES-tik-uh
Narcissus jonquilla nar-SIS-us
JON-kwil-luh
Nyssa aquatica NISS-uh uh-KWAT-ih-kuh
Oenothera macrocarpa ee-noe-THEE-ruh
mak-roe-KAR-puh
O. speciosa O. spee-see-OH-suh
Osmanthus fragrans os-MAN-thus
FRAY-granz
Paeonia lutea pee-OH-nee-uh LEW-tee-uh
P. major P. MAY-jor
P. moutan P. MOO-tan
P. suffruticosa P. suh-frew-tih-KOE-suh
Phaseolus coccineus fuh-SEE-oh-lus
kok-SIN-ee-us
Photinia foe-TIN-ee-uh
Pieris PYE-er-iss
Pinus palustris PINE-us puh-LUS-tris
Polygonatum commutatum
poe-lig-oh-NAY-tum kom-mew-TAY-tum
Prosopis glandulosa proe-SOE-pis
glan-dew-LOE-suh
Prunus caroliniana PREW-nus
kar-uh-lin-ee-AY-nuh
P. mume P. MEW-mee
Rhododendron austrinum
roe-doe-DEN-dron aw-STRY-num
R. canescens R. kuh-NES-enz
R. indicum R. IN-dih-kum
R. prunifolium R. prew-nih-FOE-lee-um
Rosa banksiae var. *banksiae* ROE-suh
BANK-see-ee var. BANK-see-ee
R. chinensis R. chih-NEN-sis
Salvia farinacea SAL-vee-uh
fare-ih-NAY-see-uh
S. penstemonoides
S. pen-steh-mon-OY-deez
Sanguinaria canadensis
san-gwih-NAY-ree-uh kan-uh-DEN-sis
Smilacina stellata smy-luh-SEE-nuh
stel-LAY-tuh
Sophora japonica suh-FOE-ruh
juh-PON-ih-kuh
S. kentukea S. ken-TUK-ee-uh
Stipa leucotricha STEE-puh
lew-KOT-rih-kuh
Thymophylla tephroleuca
thye-moe-FIL-luh teh-froe-LEW-kuh
Trillium cernuum TRIL-lee-um
SIR-new-um
T. erectum T. ee-REK-tum
T. flexipes T. FLEKS-ih-pes
T. grandiflorum T. grand-ih-FLOR-um
T. maculatum T. mak-yew-LAY-tum
T. recurvatum T. reh-ker-VAY-tum
T. sessile T. SES-il
Tussilago farfara tus-sih-LAY-goe
FAR-far-uh
Uvularia grandiflora yew-vew-LAY-ree-uh
grand-ih-FLOR-uh
Vigna unguiculata subsp. *sesquipedalis*
VIG-nuh un-gwih-kew-LAY-tuh subsp.
ses-kwih-peh-DAY-lis
Viola blanda VY-oh-luh BLAND-uh
V. canadensis V. kan-uh-DEN-sis
V. conspersa V. kon-SPER-suh
V. cucullata V. kew-kew-LAY-tuh
V. macloskeyi var. *pallens*
V. mak-LOS-kee-eye var. PAL-lenz
V. pubescens var. *eriocarpa*
V. pew-BES-enz var. ee-rih-oh-KAR-puh
V. rostrata V. ros-TRAY-tuh
V. rotundifolia V. roy-tun-dih-FOE-lee-uh
V. striata V. stry-AY-tuh
Virgilia lutea ver-JIL-ee-uh LEW-tee-uh
Wisteria sinensis wis-TEE-ree-uh
see-NEN-sis



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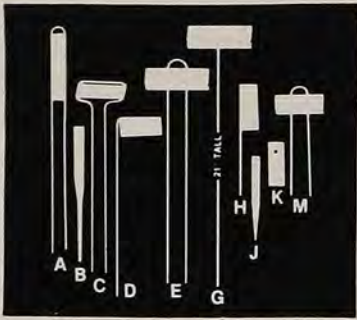


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The American Horticultural Society is often asked to refer individuals for horticultural positions around the country. As a service to our members, both jobseekers and employers, we would be very glad to receive résumés and cover letters of individuals seeking job changes and employers seeking candidates. All responsibility for checking references and determining the appropriateness of both position and candidate rests with the individuals. Inquiries and informational materials should be sent to: Horticultural Employment, American Horticultural Society, 7931 East Boulevard Dr., Alexandria, VA 22308-1300.

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APRIL 29-MAY 3, 1992 GARDENS OF BERMUDA

This once-in-a-lifetime program, offered in connection with the Bermuda National Trust, will feature numerous private historic homes and gardens, where our hosts will invite us for special luncheons and dinners. Included in the program will be Ramsbury, Mount Pleasant, Orange Valley, Aberfeldy, Orange Grove, and Greenfield, home of Lt. Col. Sir Jeffrey Astwood and Lady Astwood, whose garden contains specimens of almost every plant known to grow in Bermuda.

MAY 7-21, 1992 IRISH COUNTRYSIDE GARDENS AND THE ROYAL CHELSEA FLOWER SHOW

Join BBC celebrity David Wilson on an exploration of the finest public and private gardens in the Republic of Ireland, including Glin Castle, Powerscourt Gardens, Lismore Castle Gardens, and a side trip to subtropical Innacullin Garinish Island. The program concludes in London with Members Day at the Royal Chelsea Flower Show.

JUNE 18-27, 1992 GARDENS OF THE COLORADO ROCKIES AND THE GRAND TETONS

The Denver Botanical Garden's former director, Dr. William Gambill, and its senior horticultural advisor, Andrew Pierce, will lead a tour that begins in Denver, Colorado, and concludes in Jackson, Wyoming. The itinerary includes private gardens, Colorado Rockies National Park, Dinosaur National Park, Grand Teton National Park, Yellowstone National Park, and a float trip on the Snake River.

JULY 12-21, 1992 SUMMER GARDENS ALONG THE OHIO

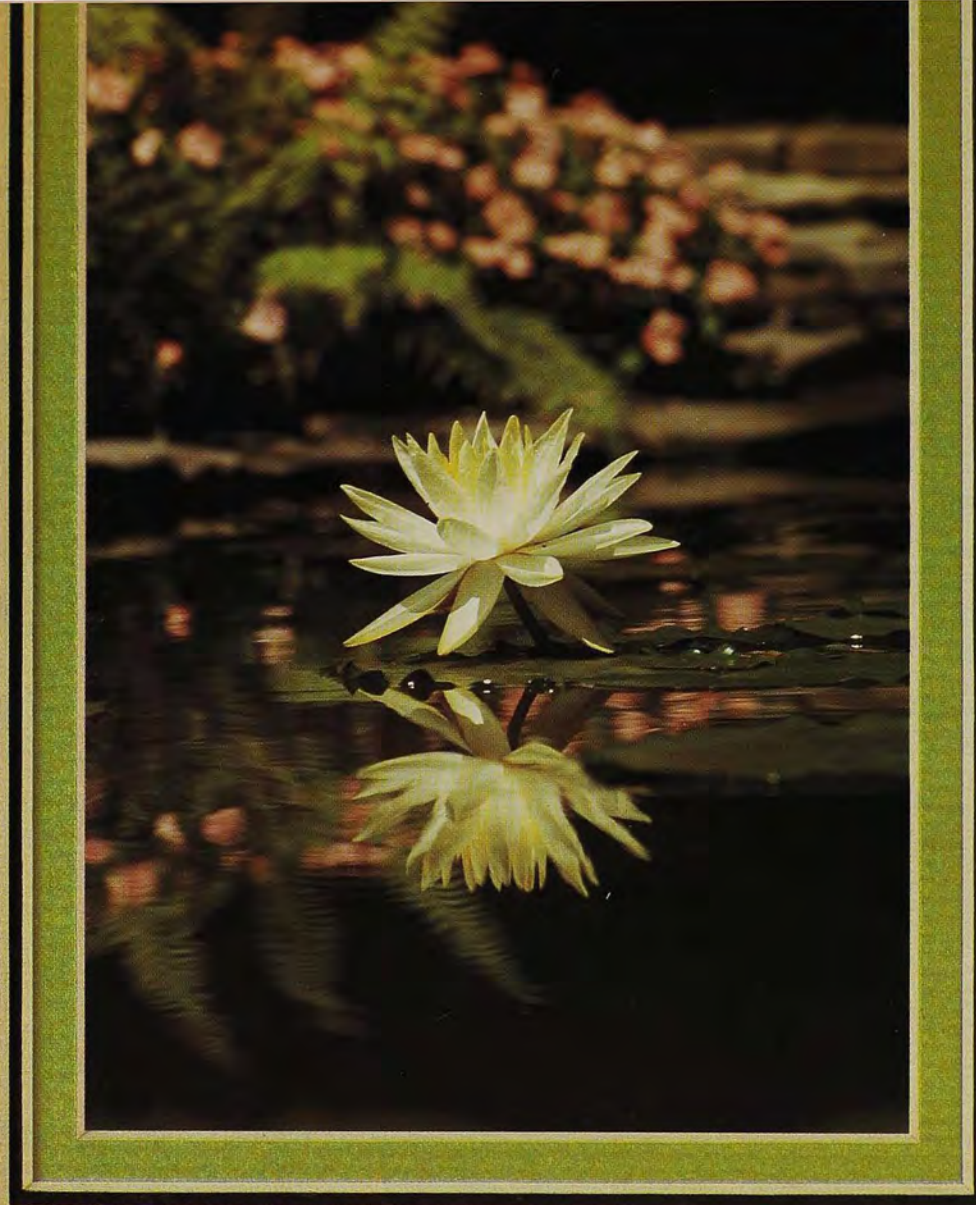
A steamboat voyage on board the magnificent *Mississippi Queen* will take participants along the Ohio River from Cincinnati to Pittsburgh. We are indebted to AHS members and friends who have opened their homes, gardens, and clubs to us. And what a splendid collage of gardens they are, ranging from the unique collections of trees and shrubs of Mr. and Mrs. Morse Johnson in Cincinnati to Mr. and Mrs. Arthur Motch's artful use of native plants in New Richmond to the English gardens of J. Judson Brooks in Seickley. Leading this program for AHS will be Mrs. Harry Van de Kamp of Paso Robles, California, a former AHS Board Member.

AUGUST 8-19, 1992 GARDENS OF FRANCE

This will be a most unusual exploration of the great private gardens of the French regions of Brittany and Normandy. Here you will find gardens ranging in style from Prince Wolkonsky's Mediterranean terraces in Keraldo to Princess Sturzda's wonderful use of ground covers at Le Vesterival. You will find each garden different, yet the incomparable French style has been used throughout to provide accommodating homes for many rare species of trees, plants, and shrubs. Leading this program will be long-time AHS Board Member Richard Angino.

Leonard Haerter Travel Company, 7922 Bonhomme Avenue, St. Louis, MO 63105, (800) 942-6666, (314) 721-6200 (in Missouri)

Members and friends of AHS will take a side trip to subtropical Innacullin Garinish Island during a May trip to Ireland and the Royal Chelsea Flower Show.



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