American Horticulturist

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WETLAND NATIVES
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TOM SEAVER

Gardener, Baseball Hall-of-Famer

Gardening is an important part of my life. I'm often out in my garden by seven.

I love the smell in the air, the early morning light.

My wife Nancy gave me a bronze plaque.

It says "He who plants a garden plants happiness." That's the way I feel.

I use Miracle-Gro to make everything in my garden look its best.

I learned that secret back when I was a rookie gardener.

Tom Seaver

American Horticulturist

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ARTICLES

DEPARTMENTS

APRIL'S COVER

Photographed by Jessie M. Harris

Blackberry lily (*Belamcanda chinensis*), a native of China and Japan, was brought to this country by our earliest settlers. It gets its common name from the shiny black seeds it produces in clusters once its long-lasting flower show is over in late summer. For many years, this easy-to-grow member of the iris family flourished primarily as a "folk plant," being passed from gardener to gardener. The blackberry lily is among plants being propagated at the Thomas Jefferson Center for Historic Plants, which is attempting to revive interest in plants popular in the 19th and early 20th centuries. Learn more about the center beginning on page 33.

COMMENTARY

My view of the Potomac River from the second story of the main building at River Farm has been a favorite since I first saw it in 1973. Today the view is enhanced by visitors—almost 100 Canada geese, all standing along the river about three feet apart, all facing southwest. Together they form a pattern that looks very much like a landscape that has been staked prior to planting.

Plants, unlike geese, can't find their own way into a pattern. In nature, plants often crowd each other out. In time, a landscape emerges, but the redundancies in the result, the thickets that are created, and the invasive plants that may win the competition are not always pleasing.

Gardeners usually can't wait for this process to complete itself or permit the untidiness that nature uses to re-landscape their spaces, nor will most neighbors tolerate transitional stages that accumulate litter, fail to keep the soil within defined spaces, or create hazards that jeopardize the safe movement of people in urban spaces.

Gardeners must become the active architects of their own personal landscapes. Under the confusing and often conflicting concepts of sustainable gardening, they have many decisions to make. But regardless of modes of design or changes in style, the major decision affecting their enjoyment and maintenance of that garden is in their selection of plants.

I have given hundreds of lectures on "tough plants for tough times." It was the driving theme during my years as a research horticulturist at Beltsville, Maryland, for the U.S. Department of Agriculture and as director of the U.S. National Arboretum. The USDA Plant Hardiness Map, *The National Arboretum Book of Outstanding Garden Plants,* and the Plant Performance Guide (a joint project of the American Horticultural Society and the USDA) helped to define these principles.

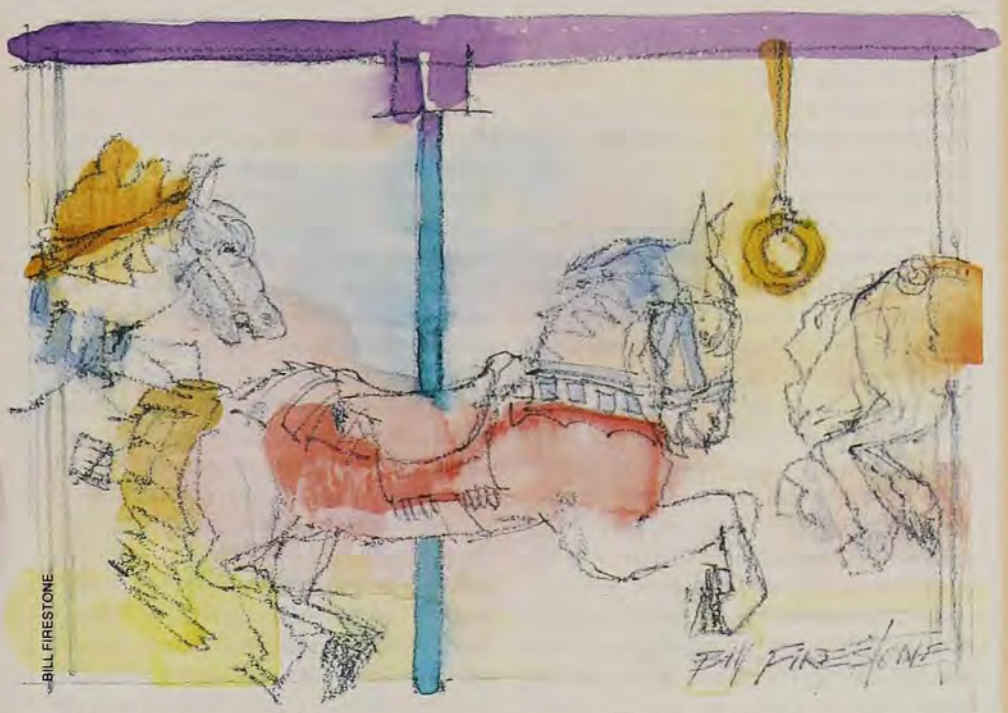
When the colonists arrived in this nation about 400 years ago, the Wye Oak on Maryland's Eastern Shore was already a mature giant. If we choose our plants carefully, they too can thrive for centuries. When choosing any plant, I always consider the full array of species available, their known clones, and their various provenances, in view of the particular stresses the plants are likely to suffer.

Illustrating these considerations is this month's article by Richard E. Bir, who recommends native trees and shrubs—and improved selections from American breeders—that withstand damp or even flooded conditions. The theme is expanded in our "Gardening Challenges" series, with a visit to Hull, Massachusetts, a barrier island where gardens are lashed by wind and salt spray. In another feature, *Noah's Garden* author Sara Stein tells how she researches whether native plants are useful and available for her home garden, where wildlife—including geese!—are made welcome.

Our green industries strive to make their plants the most successful they can be, and they continue, species by species, to use basic research and improved production methods to make both familiar and unfamiliar plants more garden-worthy.

H. Marc Cathey, AHS President

OFFSHOOTS



What Goes Around

By Art Ode

An old saying I've heard most of my life is "What goes around, comes around." I never really understood its meaning, and often thought of it in terms of the brass ring on the merry-go-round, coming up once each revolution, a prize for the child bold enough to reach out and grasp it.

Real life, however, is not a circular world with painted steeds going up and down while a calliope plays a sparkling tune; the brass ring seldom presents itself with such predictability, and once we let it go by, seldom does it return to give us a second chance. And in real life, if our reach exceeds our grasp, we are likely in for a much nastier spill.

So I have usually thought of "what goes around, comes around" in more sinister terms, such as catching the flu. If it's going around, it will come around to me.

Imagine, then, how surprised this cynical old tiller of the soil was to find a pleasant, even uplifting example of something good coming around to me, and I didn't even have to lean out of my saddle to catch it. All I had to do was ask.

Contemporary history is usually cast in symbolic terms: the Cold War, Women's Liberation, Reaganomics, New Democrats. Our family has its own symbol—the moving van. Five homes in 25 years is indeed a merry-go-round, but not many more revolutions than average, I am told. For a gardener, that also means a new garden every five years.

I have gotten pretty adept at transporting plants, whether across town or across the country. Moving means not only loading up the furniture and the dishes but also the perennials and the house plants. Even some trees. A few years ago, when we moved to Nebraska, I took with us a nine-foot mountain ash that I had been growing in a tub in New York. Planted, it loved the prairie climate and soon was 15 feet tall.

On that same move I was in quandary about how to transport house plants. I finally decided to smuggle them aboard the

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moving van in a very large garbage can to which I added a gallon of water before clamping the lid down. I rather assumed that after they spent a July week in a closed truck I would have something between soup and sauerkraut. They arrived unscathed, as though they had spent the time in a terrarium.

But neither the mountain ash nor the garbage can full of house plants were the pleasant surprise that "came around." They just went one way. It was a dwarf iris that went the full circuit.

My mother was more of a farmer than a gardener. Even in her 80s, she attacked garden weeds with a vigor and determination that she learned, I am sure, as a child hoeing corn and cucumbers on a sand-county farm in central Wisconsin. She did not really have a green thumb—that mythical anatomical wonder possessed by a very few individuals who can coax any plant into health and beauty. She *commanded* nature to do her bidding, like shaking a stern forefinger at a recalcitrant child. And nature usually obeyed.

She gave us some rhizomes of a favorite flower of hers, a dwarf blue and white iris, some old-fashioned variety of *Iris pumila,* for our first garden in Milwaukee. They grew happily for one season when, hardly acclimated, they were unceremoniously dug up and moved across town to a new home. "Don't worry, they'll grow," my mother said in her most commanding voice. And they did.

A few years later we dug the dwarf iris up again, put a sufficient number into the trunk of our old Plymouth, and took them a thousand miles east to the rocky, wooded hills of Westchester, New York. It was hard to find a sunny place for them, but they seemed to like being nestled among the spikes of granitic schist that thrust from the bowels of the earth. When Grandma visited, she eyed them sternly, and they prospered.

When we moved from New York to Nebraska, what was by then our old Pontiac decided to bite the dust after it was loaded for the 1,500-mile journey. So the iris offshoots made the trip from New York to the Nebraska plains in a plastic bag in the air-conditioned comfort of a rental car.

Grandma didn't come to visit our new home on the prairie. She came to live there, now 90 years old and unable to live alone in her home of 50 years. She pulled the weeds around her iris when she could, and picked their short blooms for diminutive flower arrangements. She commanded everything to grow, pointing with her cane to plants that needed watering or pruning, and maybe poking those that she deemed lazy or perhaps unwilling. And they grew.

Grandma died at 93 on a beautiful September morning in her room in our Nebraska home, from where she could see oak trees and climbing roses. She went home to Milwaukee and the family cemetery plot, and perhaps on from there to some other place where she can fix her steely blue eyes on a garden and command things to grow. When we moved back to Milwaukee, the iris stayed in Nebraska, the victims of a quick sale and even quicker move. I contemplated either a midnight raid to spirit them away or an appeal by telegram to the new owner, but did neither.

Now instead of a mother living nearby, I have my mother-in-law, Agnes. She, too, is a no-nonsense woman, a trait honed by being a mother of eight. But she actually does possess that singular human trait, a green thumb. I think her secret is that she very closely observes each plant and treats it as an individual. Her preparation of the soil is meticulous, and when she plants any plant she places a small stone at the base of the stem "to make it feel at home."

Noticing some dwarf irises in her garden, I asked her one day where she got them. "Why from your mother, 24, 25 years ago," Agnes answered. "Do you want some? They grow like weeds."

I'm a good gardener, but I make no claims to having a green thumb. I guess you might say I'm a gambling gardener, betting that if something will grow in one place it will grow somewhere else that is similar. I figure the odds are usually 80 or 90 percent in my favor if I play the game right, and that's good enough for me. But I secretly admire those few who have the magic, and steal from them the secrets that I can. Since Agnes is no longer able to do her own gardening, I guess I'll be doing it for her, and maybe my thumb will get greener by and by. But I'm also going to remember my mother's approach, and if no green-thumb magic comes my way, I'm going to tell those plants in no uncertain terms to wake up and get growing.

But whether or not I improve my odds, I now know the optimist's meaning of the old saying "What goes around, comes around." My mother gave her plants freely to many people, and her old irises have spread a thousand miles in each direction. They also stayed home, and when we returned, they were there to greet us. The irises went around, we went around, and all finally came full circle. And the next time the flu comes around, I'll bet it passes me by.

Dr. Arthur H. Ode Jr. is president of Quercus Associates, Inc., fund-raising and planning consultants for environmental institutions and historic sites.

GARDENERS' INFORMATION SERVICE

Q: *When I look through the tomato section of different seed and plant catalogs, I see the letters "VFN" after some tomato varieties. What does this mean?*
—A. H., Willoughby, Ohio

A: These letters indicate that the tomato variety has been specifically bred to be resistant to verticillium wilt and fusarium wilt—the two most common tomato diseases—and nematodes. In addition to these three letters, you may also see a "T" after a tomato name, indicating that it has inbred resistance to tobacco mosaic virus.

Q: *Last month I started seeds for a new petunia variety and got no germination. I planted the seeds about an eighth of an inch deep in a soilless mix and made sure the seeds had plenty of moisture. What might have gone wrong?*
—G. C., Wilmington, Delaware

A: You should have left the seeds uncovered. Petunia seeds need light to germinate. You don't mention temperature, but hybrid petunia seeds prefer their germinating media warmed to about 80 degrees. Perhaps you had the seeds germinating by a chilly window or other cool area. Try again in a sunny location or apply bottom heat under your seed-starting flat or container.

Q: *When should I prune my tamarix tree?* *—J. C., Alexandria, Virginia*

A: The answer depends on whether you have a summer- or spring-flowering species. The summer-flowering species, *Tamarix pentandra,* blooms on the current season's new growth. The spring-flowering species include *T. parviflora* and *T. tetrandra* and they flower on the previous season's growth.

According to Peter McHoy in his recently published book, *Pruning: A Practical Guide,* if you have a spring- flowering species growing as a shrub you need to prune it in midsummer if you want to achieve a bushier, balanced, and more compact-looking shrub. It can be pruned back by as much as one-half to two-thirds after flowering. For summer-flowering shrubs you should cut shoots back hard, to two to three inches from old wood, in early to midspring. Taller summer-flowering species can be pruned back by a half to two-thirds anytime between midfall and late winter.

McHoy recommends that if you plant a tamarix in the spring, you should prune the branches back to within two inches of the old wood before new growth begins. If you plant at any other time of the year, then you should wait until the following spring to prune.

Q: *Last year I planted spinach seeds and had very poor germination. How can I get better results this year?*
—L. T., Des Moines, Iowa

A: Without more detail it's hard to know what you did wrong, but here are some common mistakes:

Sowing seeds too late. Spinach is a cool weather crop and will not germinate well in hot weather. Seeds should be direct sown into your garden in early spring and kept moist until seedlings emerge and mature.

Using old seeds. Buy fresh seed each year from reliable seed companies; the packet should guarantee certain germination percentages.

Lack of fertilizer. Either work generous amounts of aged manure, bloodmeal, or fishmeal into the soil before planting the spinach, or feed it high-nitrogen fertilizer once it has germinated.

Some gardeners find that germination rates improve greatly if they wrap the seeds in a damp paper towel and store them in the refrigerator for four to five days before planting them.

Q: *I plan my vacation travel around gardens and gardening events. Where can I get information about different and specialty garden shows and events around the country?* *—J. G., Portland, Oregon*

A: *The Garden Tourist* is a very useful travel guide published and updated each year by the Garden Tourist Press in New York City. It contains information on garden tours, garden days, flower and garden shows, and special gardening events in the United States and Canada. It lists all of the above information categories by state with addresses and phone numbers for each event. For most events, it also lists admission prices and hours of operation.

The guide is available for AHS members through the AHS Horticultural Book Service at a discount price of $10.15 plus postage. To order, call (800) 777-7931.
—Maureen Heffernan, Education Director

HOMEMADE PESTICIDES

The American Horticultural Society's Gardeners' Information Service has developed a new informational bulletin, "Homemade Recipes for Organic Pest and Disease Control." It gives directions for inexpensive, environmentally safe mixtures to control common pests and diseases on garden and house plants, and lists sources of environmentally safe pest and disease controls, and books and organizations from which to obtain more information on the subject. To order, send $2 plus a self-addressed stamped envelope to Sprays, GIS, 7931 East Boulevard Drive, Alexandria, VA 22308-1300.

NATURAL CONNECTIONS

The Divine Witch Hazel

The next time you're in an eastern forest, hunt for witch hazel (*Hamamelis virginiana*). A small tree reaching perhaps 20 feet in height, the witch hazel haunts woodland over practically the entire eastern half of the continent, from the Canadian Maritimes to northern Florida. It grows in open woods and deep shade; it thrives on both dry and moist sites, although it seems to prefer the latter. It hosts an unusual group of insects, and its winter flowers invite speculation on the mysteries of late-season pollination.

The quickest way to find a witch hazel is to look for a certain kind of growth habit, rather than for a certain shape of leaf. Witch hazel isn't interested in growing up as much as out: after several yards of skyward progress, it forages for patches of light with crooked, zig-zag, lateral growth. In dense shade, it's often gangly, but a plant that's had its fill of light is worthy of a Japanese ink painting. Eventually, a satisfied witch hazel can spread to nearly 30 feet. Once you've identified one, you'll quickly recognize others. You may even find yourself in the midst of a sparse congregation, since witch hazel spreads by runners, in the same haphazard way it grows above ground.

During the growing season, the witch hazel's leaves are nondescript. They're flimsy, medium green pointed ovals with a coarse serration that looks like the work of an impatient artist. By midsummer, some of them will be chewed, folded, and curled—the work of a remarkable community of insects that depend upon the tree.

On some leaves, you may find a tiny gall shaped a little like a shark's tooth. This is the egg case of the aphid *Hormaphis hamamelidis*. When they hatch, the aphid's young will fly off in search of birch. It will take four generations of life among the birches before their descendents feel the hereditary call to seek out another witch hazel leaf. In the northern part of its range, birch is a frequent companion of the witch hazel, and at least one other aphid takes advantage of this association. *Hamamelistes spinosus* is the author of a flower bud gall, visible in winter. The progeny of this gall usually pass three generations among the birches before returning to the witch hazel.

Another summer guest is the larva of the tortricid moth (*Cacoecia rosaceana*). It converts the leaf into a sleeping bag by rolling itself up in the tip. Still another moth larva, the witch hazel leaf folder (*Episimus argutanus*), folds itself up in a bit of leaf near the petiole. There's no need to think of these bugs as pests. If in return for food and shelter they offer the tree nothing that we can see, they don't seem to do it any harm either.

As summer wears into fall, the witch hazel comes into its own. It colors yellow; the best specimens warm to a soft, translucent gold. As the leaves begin to drop, the tree opens its flowers, each with four little ribbonlike yellow petals. Usually the flowers outlast the leaves, and then the tree is at its best—its bare, splayed limbs festooned with tiny ribbons that suffuse a spicy fragrance into the cool autumn air.

Off and on all winter, whenever there's a thaw, the tree may bloom again—and it may continue flowering sporadically into spring. Perhaps the strangest feature of these fits of bloom is that they issue from the same buds, according to Richard Kirpas, technical director at the Dickinson Witch Hazel Company, a distiller of witch hazel extract in Essex, Connecticut. "We know because we've gone out into our groves and marked the buds," he says. Sometimes when the weather warms after an especially cold period, a whole grove will burst into bloom at once. "It won't be as intense as for-

sythia," Kirpas says, "but it's close."

At least in the northern part of its range, the witch hazel is the last native plant to flower, so it must be a valuable source of nectar. But who is being summoned to this winter communion? Witch hazel watchers report that the flowers seem strangely unattended. But if you stake out a witch hazel flower long enough, you may discover the principal agents of pollination: gnats, especially fungus gnats of the genus *Bradysia.* Some wasp species also visit the flowers and Kirpas reports that in the Dickinson groves, spring bloom attracts bees.

The work of its mysterious pollinators takes a year to bear fruit. So in late fall, just as the tree is coming into flower, last year's seed pods are ripening. Once the pods are dry, they split open with an audible pop and spit two shiny black, rice-sized seeds a good 15 feet or more. In *Growing and Propagating Showy Native Woody Plants*, Richard Bir writes that being hit by a witch hazel seed is like being hit "by a small stone or flying insect."

The habit of bearing fruit and flower at the same time won the witch hazel its generic name: "hamamelis" means roughly "together with the fruit." What "witch hazel" means is a mystery. The term was first applied to several European trees, including a true hazel (*Corylus avellana*), a hornbeam (*Carpinus betulus*) and an elm (*Ulmus glabra*). "Witch" might derive from an Old English adjective meaning "springy" or "lively." But it could also refer to witches, since the *Corylus* especially was used in the occult practice of "divining" for underground springs or gold. Whatever it meant, the name seems to have conferred mystique, since our witch hazel became the wood of choice for divining the New World's hidden springs.

The tree also has long been used to make an external tonic. Native Americans are said to have boiled the inner bark to obtain a solution that they applied to sore eyes, inflammations, bruises, scratches, and tumors. Commercial production of the tonic began in 1866, when Thomas Newton Dickinson, the founder of the Dickinson company, set up his distillery. Medicinal use may once have been redolent of magic too: one Dickinson ad relates that witches brewing the potion knew it was ready "when the phantomlike shape of a beautiful young woman could be seen rising through the steam."

So keep your eye out for this phantom of the woods. If its winter flowers and explosive seeds aren't enough to recommend it to you, perhaps it will lead you to hidden water or gold. —*Chris Bright*
Assistant Editor

NATIVES AT RISK

MARYL

Gentian Pinkroot

In the 1800s, the Apalachicola River area of northwest Florida was a haven for wildflowers. "Apalachicola was heavenly," Asa Gray wrote in a letter to a fellow botanist. To another he wrote: "The botanizing was delicious, very many nice things which I had never seen growing before."

For nearly half a century, physician Alvan Wentworth Chapman, a leader in southern botany and author of *Flora of the Southern United States,* traversed the area on medical calls, often collecting plants along the way. In May 1834 he was traveling along the river on the way to perform an amputation when he spotted an unfamiliar wildflower. He first named the plant *Spigelia floridana,* but later renamed it *S. gentianoides*.

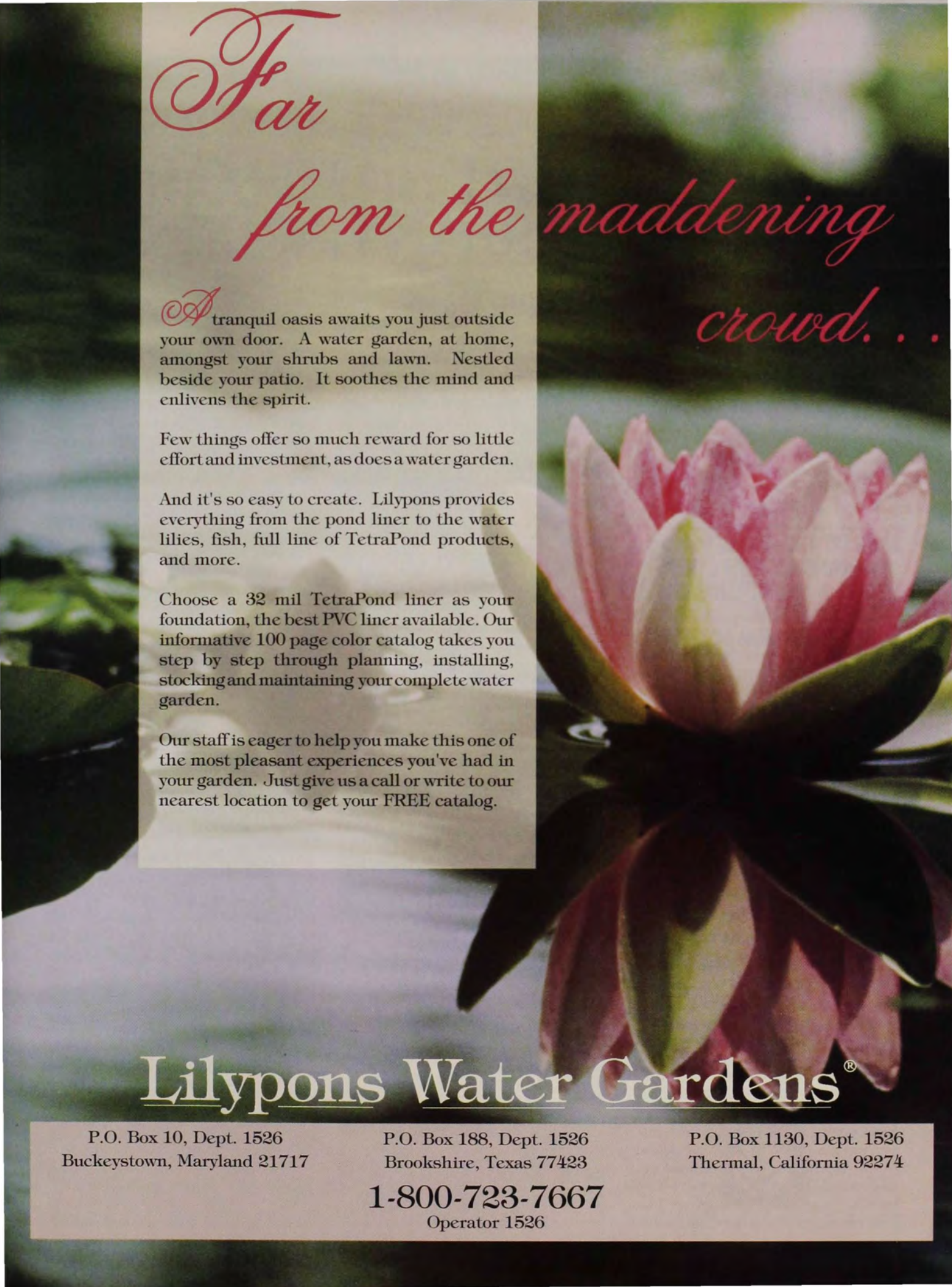
Although Chapman's notes indicated that the plant was "common," botanists today think that *S. gentianoides* was never widespread. The species was once found in five Florida counties, but searches in the late 1980s turned up only three small populations in the northwestern part of the state. Two of those sites are oak-pine woods where the gentian pinkroot grows with flowering dogwood and blueberries in the shade of loblolly and longleaf pines, water oaks, laurel oaks, southern red oaks, and blackgum. The third and largest population thrives in a fire-maintained, sunny, dry pineland with an understory of wiregrass (*Aristida stricta*) and other grasses. There are also a few populations in Alabama.

The *Spigelia* genus is one of the largest in the strychnine family, Loganiaceae. Like other family members, *Spigelia* species produce numerous poisons and drugs. In China a species has been used to commit murders and suicides and to carry out executions. Touching one South American species causes a severe skin reaction. Native to our southeast and south central states is *S. marilandica,* or Indian pink, which was a popular 19th-century folk remedy for intestinal worms; unfortunately, the remedy seems to have killed more people than it cured. *S. gentianoides* is known to be powerful—it is poisonous to lifestock—but it has never been tested for medical potential.

The pale pink flowers of gentian pinkroot appear in May and June, but like the bottle gentian (*Gentiana andrewsii*) from which it derives its common name, it keeps its petals nearly closed, with only slits showing between its five lobes. It is pollinated when moths probe between these slits searching for nectar.

The U.S. Fish and Wildlife Service listed *Spigelia gentianoides* as an endangered species in November 1990. (A relative, *S. loganoides,* is under review for protection.) As with many Florida natives, habitat destruction is the main threat to the gentian pinkroot's survival.

While the future of the gentian pinkroot isn't entirely rosy, it isn't totally bleak, either. Botanists affiliated with the Missouri Botanical Garden, through its role in the nationwide Center for Plant Conservation network, collected seeds of gentian pinkroot in the late 1980s. Several of the plants are now thriving in the Missouri greenhouse and more *S. gentianoides* seeds are in storage there. —*Mary Beth Wiesner*
Managing Editor



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THE URBAN GARDENER

Flora of the Big Apple

One of the least-studied plant communities on the continent is yielding its secrets to a botanist at the Brooklyn Botanic Garden (BBG). Steven Clemants, a taxonomist in the garden's science department, has set out to learn the secrets of plant life in New York City.

Most Americans now live in cities or suburbia, but we know very little about the floras of our urban areas. "Most of the work on urban floras has been done in European cities," says Clemants, who has spent the last decade studying the plants of New York State for the state's Natural Heritage program, the U.S. Fish and Wildlife Service, and the BBG.

The New York Metropolitan Flora Project, which Clemants directs, is the most comprehensive botanical study ever undertaken of the region. It's intended to cover everything growing within a 50-mile radius of Central Park—that's all five boroughs of the city, all of Long Island, a bit of upstate New York, northern New Jersey, and one Connecticut county. The region's last complete flora was published in 1915. Clemants says an up-to-date, detailed flora is essential for understanding the city's environment. "Without this, we can only guess about the effects of urban- and suburbanization on our region."

The BBG expects to produce at least five handbooks over the course of the project. Possible titles include *Grasses, Sedges, and Rushes; Aquatic Plants;* and a "definitive" *New York Metropolitan Flora.* A publication schedule has yet to be worked out, but Clemants thinks he's several years away from a full draft of the first work, a treatment of woody plants.

One obvious effect of urbanization is the introduction of exotic species on a massive scale. These immigrant plants can tell us much about the city in general. Why, for instance, are there two members of the amaranth family (Amaranthaceae) growing only in Yonkers—and apparently nowhere else in the country? "Around the turn of the century, there used to be a lot of wool mills in Yonkers," Clemants explains, "and all kinds of odd things would turn up in the wool waste, including seeds." The amaranths—one from Australia, the other from Argentina—presumably sprouted from the waste.

Ballast heaps were another point of entry. "The sailing ships that brought immigrants over would dump their stone and dirt ballast in swamps along the shore, and then take on goods for the trip back," says Clemants. Areas where ballast was dumped were seeded with a variety of exotics. The descendants of these and other immigrants now dominate the city's vacant lots and other waste areas.

Another effect of urbanization is the loss of native species, but Clemants' work is showing that the city still harbors some surprises. Take the seabeach amaranth (*Amaranthus pumilus*). A candidate for federal endangered species status, it once inhabited the coast from Rhode Island to South Carolina. It hadn't been seen in New York for 40 years—until it turned up on a Long Island beach in 1990. Last year, Clemants found another specimen, also on Long Island. Clemants encountered another endangered native, *Polygonum glaucum*, a member of the smartweed genus, on Coney Island.

The BBG expects the project to be useful in landscape restoration, environmental advocacy, and larger research efforts like the 14-volume *Flora of North America* project coordinated by the Missouri Botanical Garden. "I think it's important that we study these urban regions, because they've been largely overlooked," says Clemants. "We need to start teaching people in places like these about the plants around them." —*C. B.*

PLANTING THE FUTURE

SHARON LOVEJOY

Carrot Capers

By Sharon Lovejoy

Children don't need fancy tools and a big yard to be gardeners. Some of my best gardens have been in pots and tubs and boxes, and my favorite gardening tool has always been a big kitchen spoon I borrowed from my mother. Gardeners of any age *do* need good soil, water, sunshine, seeds, and a sense of humor. Anyone who doesn't think gardening is funny hasn't seen how I grow carrots.

Everyone has heard all the rules about growing good carrots: You must have sandy soil. You must space the seeds out just so. You can't have any lumps or pebbles in the ground. And so on. Growing carrots my way is one of the easiest projects I know, and one of the most fun for children or grown-ups.

First, of course, you'll need seeds. Those who think a carrot is a just carrot will be in for a surprise when they start looking at how many kinds of seed are available from garden centers and catalogs—'Nantes', 'Caramba', 'King Midas', 'Little Finger', 'Thumbelina', 'Baby Long', 'Belgian White'—and lots more. Some of these are long and skinny, some short and chubby, and some are almost as round as radishes. They come in all the colors of the sunset, from pale creamy gold to deep red-orange. Children will have a lot of fun deciding which ones to get, but no matter which ones they choose for their carrot caper, they'll taste better than the ones from the store, which are so often bitter or woody.

When children open a packet of seeds, they're often surprised to see how tiny they are. It's hard to imagine those wee specks growing into long, fat, orange snacks!

As a carrot farm, use a big pot, a barrel, or a little plot in the garden. Add plenty of compost, plus pebbles and rocks. That's right, pebbles and rocks . . . and clods and gravel, too. Not just on top of the soil, but mixed all through it.

At this point, veteran vegetable gardeners are probably muttering to themselves: "She sure doesn't know how to plant carrots. Anyone knows that you have to get rid of rocks and pebbles and clods or the carrots won't grow straight." But wait a minute—who's to say what's proper for a carrot?

Sow the carrot seeds in this rich, rocky soil, just barely covering them with it. A good way to sow any tiny seeds like these is to mix them with a little sand and shake them out of a salt shaker so they'll have plenty of space between them. Then water the soil gently but thoroughly. Someone will have to make sure the soil doesn't dry out during the time that the first roots and shoots are forming.

In a few weeks, there will be a small forest of two-inch carrot tops all over the pot or plot. They're sure to be too crowded, so next comes the hard part—thinning them out. Children's small fingers should be able to gently pull up the ones that are crowding their neighbors, without disturbing the ones they want to leave behind. These "victims," tiny as a snip of thread, are still great tasting, or they can be put to good use in the compost pile.

To help the remaining carrots along, this is a good time to apply fish emulsion fertilizer. This smelly concoction, available from most garden centers, is mixed with water and poured around the edges of the pot, if that's how you're growing your carrots, or around their roots. Remind children that even a "natural" fertilizer shouldn't be poured on plants' leaves!

After a few more weeks, the plants will begin to look big and feathery on top. Children—and maybe their adult helpers as well—may become curious about what's going on underground. There's no rule that says they can't peek. Have them grab one of the carrot tops close to the ground and tug gently. With luck, they'll find that carrot capers are underway.

When my husband, Jeff, was young, he loved his carrot patch the best of any part of the garden because of the "gnarly" looking carrots that grew there. "It was like reaching into a grab bag," he says. "You never knew what you were going to get."

Because of those rocks and pebbles and clods that you mixed with the soil, you won't find the kind of neat, straight, boring carrots that come from the store. Instead, you'll find dancing, bending, twisting carrots, no two alike. You might find a carrot with two "legs," or even three, or a carrot sitting down, or two carrots in love and dancing cheek to cheek.

The only problem with growing carrots this way is that they have so much personality, their growers might not want to eat them.

Sharon Lovejoy, a featured speaker at the AHS children's symposium last year, will speak again at the AHS-Montessori symposium in Arlington, Virginia, August 5 through 7. Lovejoy lives in Cambria, California, where she tends special gardens for children and their parents. "Carrot Capers" is adapted from her new book, Hollyhock Days: Garden Adventures for the Young at Heart *(Interweave Press, 1994) and appears here with permission of the publisher. She is also the author of* Sunflower Houses: Garden Discoveries for Children of All Ages *(Interweave Press, 1992).*

Wetlands provide a haven for both animals and plants. Above, a beaver dam in Maryland. Right, the bald cypress, a native of southeastern swamps, can adapt to drier and colder conditions.

LEFT, JESSIE M. HARRIS; RIGHT, PAMELA HARPER

Woodies From the Wetlands

Quit thinking drainage tiles, and take your pick of these wonderful waders.

BY RICHARD E. BIR

Envision your favorite wetland. What do you see? Lilypads, cattails, and redwing blackbirds? Herons stalking their prey near the shore of a marsh as gulls glide over grasses that stretch to the horizon? Skunk cabbage melting its way through cat ice? Cypress knees seeming to bob in blackwater alongside dozing turtles or alligators? Bogs abuzz with insects above orchids and pitcher plants? Riverside meadows of pinkish Joe Pye weed and royal purple ironweed, crowned with dancing butterflies?

My storehouse of such memories began with the New England swamp surrounding my childhood home. It grew with subsequent jobs that took me to the Great Dismal Swamp of Virginia and North Carolina, the marshes along the Santa Fe and Suwannee rivers, and to Florida's Paynes Prairie, Big Bend Gulf Coast, and Cedar Key. Today, as an extension horticulture specialist at North Carolina State University, I feel fortunate to be paid to roam that state's diverse terrain. All these wetlands compose a vast network vital to our nation's environmental health, as well as giving us humans endless opportunities to enjoy the natural beauty they harbor. Few places are as alive as those with water, whether it's crashing over boulders or standing still.

Whenever I recall one of these wetlands, I see it framed by shrubs and trees, for months at a time bearing fruit and flowers both ornamental and critical to wildlife. And in nearly every vision, the plants are native to the area, or have become naturalized from a similar habitat. Some of these wonderful North American native shrubs and trees may be perfect for your garden, regardless of its size.

Where does a soggy spot end and wetland begin? Since I'm not concerned with legal definitions here, I suggest that you think in terms of selecting well-adapted, interesting plants for your poorly drained garden. For any place that you have water lingering periodically, such as at the bottom of a hill, along a stream, a pond, or even in the brackish water along inlets of the meandering Atlantic coastline, you can choose plants that will survive the worst climatic conditions they are likely to face.

An old landscaping axiom seems to apply here: "Plants native to wet places will often *grow* in dry places, but plants native to dry places often *die* in wet places." If you think about a specific plant, this begins to make sense. If you plant mountain andromeda, *Pieris floribunda,* or most rhododendrons where their roots are consistently wet, you will

probably become an expert on *Phytophthora*, *Pythium*, and other organisms that cause root rot.

But let's look at the opposite situation. In my New England boyhood home, we had swamp maples galore. Later I learned that these trees were *Acer rubrum*, more commonly called red maple.

So what do you think the beautiful 'October Glory' and 'Red Sunset' maples being planted along so many roadsides might be? That's right—they're selections of *Acer rubrum*, made respectively by Princeton Nurseries in New Jersey and J. Frank Schmidt & Sons Company in Boring, Oregon. They flower crimson in early spring, providing one of the first important sources of pollen for honeybees. By May these maples are adorned with red and green seeds. In summer, red maples provide cool, dense shade; in fact, both their shade and roots are so dense that the easiest thing to grow under them is a bench from which to view the rest of your garden. And in fall, it's obvious where they got their colorful names as their leaves change color and take their time dropping off the tree.

Will a swamp maple grow in a wet spot? Of course it will. But look around, and you will see them thriving in all but the hottest, driest locations. No wonder they perform so well in variable climates in so much of the country: 'Red Sunset' north to USDA Zone 4, 'October Glory' south to Zone 8, and both in Zones 5 to 7.

Other trees have risen out of our river bottoms and swamps to enhance both public and private landscape situations. Bald cypress, *Taxodium disticum*, is a conifer that drops its leaves every winter, then provides soft, ferny, chartreuse new growth the next spring. We all have biases regarding certain trees, and bald cypress is no exception. You may think it will only grow in swamps. Maybe you object to its knobby knees, thinking they will ruin your lawn mower. But in fact, I have only once seen bald cypress produce knees when growing on consistently dry land. The knees are a characteristic of bald cypress in regularly flooded areas, reportedly as a means of alleviating an oxygen deficit.

Perhaps you think that as a plant of southeastern swamps, it simply wouldn't be hardy where you live. But I've seen bald cypress shivering in December winds along the Mississippi River in Illinois. University of Georgia tree expert Michael Dirr writes that some bald cypresses have withstood temperatures of 20 to 30 degrees below zero, a USDA Zone 4 winter. Being cautious, I would say they can certainly survive winter in Zones 6 through 9, and probably much of Zone 5. And if you have to contend with brackish water, they can tolerate that too.

In the same places where I saw bald cypress in Illinois, I saw river birch, *Betula nigra*, skirting the edges of swampland. Few birches tolerate consistently wet sites. Even fewer tolerate the tight clay soils and summer heat of the Southeast, but river birch can be found growing in northern Florida, as well. The selection 'Heritage' has wonderful whitish tan exfoliating bark and thrives where its roots are under water for weeks at a time. Yet here in North Carolina, we have it in a dry courtyard where brick walls and a concrete patio reflect summer heat to create a desertlike condition. This makes it an excellent choice for areas where soils go from soggy to occasionally parched within a few months.

Another southeastern native of wet soils is often rejected for some biases I consider justified. If you have ever walked barefoot in fall near a sweet gum, *Liquidambar styraciflua*, you know that the fruit capsules it strews on the earth can be a painful experience. But there's a fruitless selection, 'Rotundiloba', so-named because the lobes of its leaves are round, rather than pointed. It has wonderful fall color, varying from dark burgundy to yellow, often with the outer leaves dark and the inner leaves yellow. It can be grown into Zone 6, perhaps even farther north, and likes dry land as well as swamps.

If you want a more traditional flower—

The 'Winter Red' winterberry holly, below, is a consistent performer in the wettest conditions. River birch, below right, grows from Illinois river banks to the hard clay of the Southeast.

MICHAEL S. THOMPSON

GALEN GATES

or a smaller tree—consider the serviceberries—the *Amelanchier* species. The species are somewhat confused in both botany and the nursery trade right now, but there is no confusing their worth in the landscape. The white or pink flowers are among the first to bloom in spring, at a time when the fish called shad run in eastern rivers—thus the common name "shadblow." A bonus is the *Amelanchier* fruits, called Juneberry or serviceberry, which hang in clusters looking like blueberries until the birds find them. A birding friend tells me he has seen more unusual songbirds in "sarvice" trees than anywhere else. Many selections have been introduced recently, with natural hybrids and others of uncertain parentage listed as *A. grandiflora*. Very popular here in North Carolina is the hybrid 'Autumn Brilliance', introduced by Illinois breeder Willet Wandell, who likes it because it resists the leaf spot that sometimes defoliates the species. In addition to its late fall crimson color, it also flowers and fruits dependably. *Amelanchier* is also reputed to tolerate brackish water.

For areas that are moist but not constantly soggy, perhaps because they are just a few feet higher than standing water, consider a couple of our native magnolias.

The southern magnolia or bullbay, *Magnolia grandiflora,* can be found growing wild in hummocks and other slight rises in southern swamps. But it has the potential to move out of swamps, as well as much farther north. The waxy white flowers and unmatchable fragrance of beautiful old bullbays are being enjoyed on summer evenings as far north as southern New England, and research has shown that some selections, such as 'Bracken's Brown Beauty' and 'Edith Bogue', will withstand temperatures as low as 25 degrees below zero without being killed.

If the big leaves and flowers of the southern magnolia are less subtle than you desire, consider sweet bay, *Magnolia virginiana*. This semievergreen species rarely goes totally naked in Zones 8 and 9, but might drop its leaves in Zones 6 and 7. There are two botanical varieties: *M. virginiana* var. *virginiana* and *M. virginiana* var. *australis*. The latter is more evergreen but somewhat less cold tolerant, although some excellent new selections should change that. Watch for one named 'Green Bay', to be available soon via Don Shadow's wholesale nursery in Winchester, Tennessee.

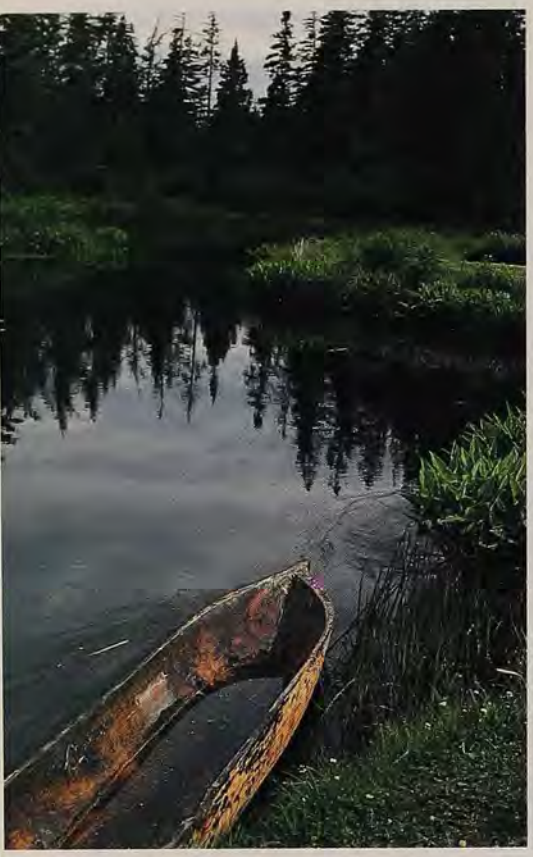
M. virginiana is the perfect size for even the smallest garden—you can consider it a large shrub and use it in a large, informal screen or hedge. It may appeal to you for its three-inch, cream-colored, lemon-scented flowers, which are borne throughout the summer. Maybe it strikes your fancy to see leaves lifted in a breeze, flashing silvery white like an accidental show of petticoat. Or you may choose it for the scarlet seeds that emerge from cones to attract mockingbirds and squirrels. No matter what charms you most, this is a native tree that will thrive in personal wetlands throughout much of the United States.

While trees may provide the framework, background, or even focus in a landscape, shrubs can draw the eye with seasonal interest, make a landscape seem "finished," and set a scene apart from its surroundings. For moist and even wet spots, native shrubs should be at the top of your selection list.

Choosing shrubs is of course a matter of personal taste as well as sound gardening principles. But with shrubs as with trees, personal biases can get in the way. Our won-

ROB AND MELISSA SIMPSON

Fothergilla major, ***a relative of the witch hazel. A smaller species,*** **F. gardenii,** ***has produced cultivars with blue foliage and even larger flowers.***



The model for a wetland garden could be a southern swamp or a heavily shaded wood, like this forest pond area near Brooklin, Maine, above. Below, the spicy-sweet swamp azalea, which can grow five feet high and just as wide.

derful deciduous native azaleas are a good case in point. They tolerate shade as well as the evergreen varieties, but lose respect by being naked a few months a year.

And yes! There are azaleas that tolerate wet feet. The Choptank hybrids are a natural strain that has stabilized along the Choptank River near Marydel, Delaware, where they are occasionally flooded during the winter but continue to thrive. Choptanks are offspring of our *Rhododendron atlanticum*, the dwarf or coastal azalea, and *R. periclymenoides*, or pinxter bloom. One of my personal favorites is 'Marydel', selected and named by Martha's Vineyard plantswoman Polly Hill. Each spring my plant is covered with deliciously fragrant pink flowers. However, gardeners should be warned that in moist, organic soil 'Marydel' will stake out territory by suckering, like *R. atlanticum*.

While Choptanks tend to stay small, the spicy-sweet swamp azalea, *R. viscosum*, can grow to five feet high and just as wide, and the heliotrope-scented sweet azalea, *R. arborescens*, can achieve the proportions of a small tree. One of my favorite selections with swamp azalea genes, introduced by Weston Nurseries of Massachusetts, is named 'Pink 'n' Sweet', which describes it perfectly.

An excellent streamside complement to springtime azaleas is the unusual flower of *Fothergilla*, the shaving brush bush or witch alder. There are two species of this witch hazel cousin normally available in nurseries: *F. major* and its smaller cousin, *F. gardenii*. The *F. gardenii* selection 'Blue Mist' won a Gold Medal from the Pennsylvania Horticultural Society for its glaucous blue foliage and creamy white spring flowers. But for my area, an even better performer has been Dirr's selection, 'Mt. Airy'.

ABOVE LEFT: RICHARD QUATAERT; RIGHT: JESSIE M. HARRIS

'Mt. Airy' appears to be a natural hybrid of *F. major* and *F. gardenii* that will probably have a mature height of five to seven feet. The flowers are prolific and up to three inches around—at least half again as large as those of 'Blue Mist'. Beyond that is the brilliant kaleidoscope of fall foliage colors encompassing yellow, orange, pink, burgundy, and scarlet—sometimes on the same bush. In our North Carolina garden, this fireworks display occurs in November, after most maples and other fall celebrities have dropped their leaves.

Fothergillas will take quite a bit of shade, although they're upland plants that need sun for the best bloom and fall color.

More shade tolerant and ideal for land that's soggy and sometimes flooded would be a clethra. Summer-sweet, *C. alnifolia*, is a tough, dependable summertime bloomer from the southeast United States north into New England. Peak bloom is usually July and August in native wetlands, even where the water is brackish and the air is tinged with salt spray. Most bloom white, but there are two good pink-flowering forms, 'Pink Spires' and 'Rubra'. All of these will grow as tall as most adults and then some. If you desire a smaller summer-sweet and don't want to prune, look for *C. alnifolia* 'Hummingbird', which won a Gold Medal Award from the Pennsylvania Society this year. This compact form has kelly green leaves and covers itself with white flowers. Fred Galle, former director of Callaway Gardens in Georgia, found it growing among some seedlings he had planted near a body of water called Hummingbird Lake.

All of these wetland shrubs attract bumblebees and butterflies. If you want to attract birds, a surer bet are the wetland berry bearers.

One shrub that will withstand some of the wettest conditions—I first saw stems bearing its brilliant red berries poking out of ice I was skating on in New England—is the winterberry holly, *Ilex verticillata*. Among shrubs a head high or more, 'Winter Red' from Bob Simpson of Vincennes, Indiana, has been a consistent performer, and the U.S. National Arboretum winterberry hybrid 'Sparkleberry' is equally spectacular, with slightly smaller scarlet berries. If you want a smaller shrub, you might choose 'Red Sprite' from the National Arboretum or 'Carolina Cardinal' from the North Carolina State University Arboretum. All of these make excellent cut stems for winter holiday decorations, if you can beat the birds to the berries.

Another native deciduous holly, *I. decidua* or possumhaw, can actually develop into a small tree. The best of these—although I've seen no bad ones—has been 'Warren's Red'.

Since the main reason to have deciduous hollies is for the berries, you'll need both males and females. In most landscapes, deciduous hollies take a while to settle in and start producing berries, and the reality is that most folks buy one of the females and wait three years to see if there is an obliging male nearby. But my advice is to buy suitable males when you buy the females—one of the former for every four of the latter—and your wait will be shorter.

Please don't think that hollies are the only source of wetland berries for your landscape, or that berries have to be red. The swamp dogwood, *Cornus amomum,* has fruit that turns from blue to black. The fruit of Carolina buckthorn, *Rhamnus caroliniana,* turns from red to black, and that of witherod viburnum, *Viburnum cassinoides*—which really needs a more appealing common name—has fruit that changes from green to an iridescent pink to red and then becomes blue in late summer or early fall before turning black. Sometimes all of these colors are present in the same fruiting cluster. And of course another common name for the highbush blueberry, *Vaccinium corymbosum,* is swamp blueberry.

But while flying and furry wildlife are quite able to find fruit of any color, red berries are most eye-catching for humans and my favorite berry bearers tend to have red fruit. The last one I'll encourage you to work into your wet woodland may be hard to find in a local nursery, but it is wonderful in a number of ways. Plant mountain spicebush, *Lindera benzoin,* where you walk with your children or grandchildren so you can share a few delights of nature while expanding both your reputation as an entertainer and their sense of wonder. Its flowers appear in early spring as bright greenish yellow balls, and develop into scarlet, bird-attracting oval fruit by fall.

But that's just part of the story. Brush against the foliage or intentionally crush it and it releases a delightful fragrance reminiscent of many spices but exactly the same as none. For centuries the bark has been used as a folk remedy for dysentery, coughs, colds, and treating respiratory ailments in general. Clear yellow fall foliage is another pleasing attribute. But one bonus is often unseen: mountain spicebush is the food source for the beautiful spicebush swallowtail butterfly. If you do choose this representative of our native shrubs for your own garden and your soil is naturally acidic, throw an extra handful of dolomitic limestone in the soil before you plant, since mountain spicebush does best in slightly sweet soil.

With shrubs, as with trees, I've just scratched the surface of possible choices, but I hope I've piqued your curiosity enough that you will look for more of our native wetland wonders.

Richard E. Bir is the author of Growing and Propagating Showy Native Woody Plants.

SOURCES

Most of the plants mentioned in this article are widely available from mail-order sources specializing in woody plants. Sources for some a bit more hard-to-find include:

Arthur Weiler Inc., 12247 Russell Road, Zion, IL 60099, (708) 746-2393. Catalog free. 'Red Sunset' maple, 'Heritage' birch.

Fairweather Gardens, P.O. Box 330, Greenwich, NJ 08323, (609) 451-6261. Catalog $3. 'Rotundiloba' sweet gum, 'Hummingbird' clethra, 'Red Sprite', 'Sparkleberry', and 'Warren's Red' hollies.

Niche Gardens, 1111 Dawson Road, Chapel Hill, NC 27516, (919) 967-0078. Catalog $3. 'Hummingbird' clethra, native azaleas.

Roslyn Nursery, 211 Burrs Lane, Dix Hills, NY 11746, (516) 643-9347. Catalog $3. 'Autumn Beauty' amelanchier, 'Mount Airy' fothergilla, *Lindera benzoin,* 'Marydel' rhodendron.

ABOVE RIGHT: DICK KEEN; RIGHT: MICHAEL S. THOMPSON

While most summer-sweets produce white flowers, there are exceptions like 'Pinkspire', shown above in its dazzling fall dress. Some selections of the southern magnolia, below left, which grows naturally in hummocks in southern swamps, can withstand temperatures of 25 degrees below zero.

Life in Hull

On this Massachusetts peninsula, if plants aren't gone with the wind, they may go with the ocean's flow.

BY NORMA JANE LANGFORD

When I first moved to the Massachusetts shore from farther inland, a logical book to consult before I began any serious landscaping seemed to be R. Marilyn Schmidt's *Gardening on the Eastern Seashore*. I knew at once that her urbane advice ". . . periodic thinning of deciduous canopies minimizes wind resistance . . ." would not do. Not when the first nor'easter wove my neighbor's lawn chairs and bird bath into the branches of my maple, and sent a black and white checkered picnic cloth sailing over the rooftops, headed for Oz.

I realized as I battened down my bedroom that I needed advice closer to the hurricane's eye. Across Hingham Bay I could see the lights of Hull, the thin barrier beach that keeps the Atlantic from pounding my side of the bay into gravel. Surely people there could tell me how to cope with the challenges of our shared environment.

Hull stretches like a giant sandy "7" out into the ocean, just south of Boston Harbor. A long beach forms the main stem, anchored at top and bottom by drumlins—huge piles of gravel and clay left by melting glaciers 14,000 years ago.

Hull's weather is so remarkable that residents have their own dating system. Events on Hull occur before or after "the hurricane of '38," "the winter of '78," or "the spring storms of '93."

Hull's location has also made the peninsula famous for storm-driven shipwrecks. During two terrible days in November 1888 ("the Great Blizzard of '88"), six sailing vessels ran aground, and Hull's fledgling life-saving team spent 36 hours rowing into the surf to rescue their crews.

Much earlier, the people of Hull had built huts on deserted beaches and outer islands so shipwreck survivors who managed to reach land would not freeze before help arrived. This so impressed the United States Congress that in 1871 it voted to establish a new service, the Coast Guard.

"Seaside"—Schmidt's term for this ecosystem—didn't seem quite right. The word conjures up visions of sunshine, sailboats, picket fences, and roses. "The seaside garden's distinction lies primarily in . . . the treatment of the site's periphery, where the informal merges with the indigenous," Schmidt wrote. But in Hull, both the informal and the indigenous tend to get blown into the street. Salt spray peels paint off fences, and roses have to be roped to houses. New Englanders are compulsive gardeners, but growing even a radish on Hull's windswept causeway requires wild-eyed fanaticism.

Still, there are gardening advantages in Hull: plenty of sun; a growing season that, while it doesn't start until two weeks later than the rest of Massachusetts, doesn't quit until after Thanksgiving; and moderate temperatures—when you can get out of the wind.

Schmidt had suggested "buffering, not blocking" as the best way to deal with wind, and a screen allowing just 40 percent wind penetration that would "create a protected area seven to eight times its height on the lee side."

To find out how this might translate into real life, I talked with several Hull gardeners, starting with Debra Kirby, who commutes by ferry from Hull to her job as a researcher at Harvard Medical Center. Kirby's garden lies directly in the path of Hull's famous wind on a south-facing curve of Telegraph Hill, just before the

Spectacular storms, like the one below in December 1992, characterize life on the Hull peninsula. Marsha Zosack's home is at the left of the scene below. Her garden, at left, never recovered from a Halloween storm in '91.

TOP, COURTESY OF MARSHA ZOSACK; BOTTOM, COURTESY OF SALLY CHISHOLM

Hull's weather is so remarkable that residents have their own dating system. Events occur before or after "the hurricane of '38," "the winter of '78," or "the spring storms of '93."

Wild blackberries are legendary on Hull for vicious thorns and voluptuous fruit. Debra Kirby, below with her son Ryan, beat a jungle of them back to manageable proportions. Kirby's house offers protection for an old pink climbing rose, right.

PHOTOS BY NORMA JANE LANGFORD

"If I had to condense advice into a take-home message, I'd say, go with tried and true stuff—perennials from your neighbors."

—Debra Kirby

ruins of a Revolutionary War-era fort. Winds there have been clocked at 120 miles per hour before the anemometer cable snapped. Winds of 50 to 60 miles per hour aren't unusual. To survive, plants must have aerodynamic designs, or strong root systems.

Wind-pruned pear and apple trees—perhaps once part of the fort's food chain—survive. But a pine tree trunk 18 inches thick snapped off during a recent storm, five feet above the ground.

Still, says Kirby, garden phlox you would expect to get whipped to shreds does very well. She can't have tall marigolds, but settles for dwarf varieties.

"I used to plant cleome, but ended up with cleome that would grow like this"—she stands to demonstrate, head cocked, body angled at the waist. "I got sick of trying to prop it up. Cosmos just get obliterated. You have to rope them together. I continue to try putting them up against the blackberry bushes."

Blackberries are a source of wonder to local people, who speak in reverential tones of remembered pies and jams. Three-fourths of the Kirby lot was covered with a blackberry-and-wild-rose thicket that climbed into the fruit trees—an impenetrable jungle—until Kirby and her husband beat it back.

Garden survival on Hull depends on growing rugged, time-tested, often heirloom plants, Kirby says: lilacs, irises, peonies, daylilies, lily-of-the-valley, "things you can't kill if you try, old-fashioned varieties."

Kirby ordered a pink 'Simplicity' hedge rose from Jackson & Perkins, and found this patented hybrid as low-maintenance as advertised. "I threw it out there and it's doing fine." An unidentified old pink climber and a thick-trunked lilac that predated her stewardship have continued to thrive. Feathery astilbes seem to roll with the wind's punches and do well in the shade, although they demand plenty of water. "Otherwise you get these astilbe corpses."

One 1994 catalog says of *Polygonum aubertii*: "One of the fastest growing vines in cultivation, it succeeds where few others will grow." Here again, the catalog didn't lie. "The silver-lace vine I planted on the dog's kennel grew like The Vine That Ate Cleveland," says Kirby. "The whole thing explodes into this beautiful white."

Other climbers—two kinds of clematis and a wisteria—also perform admirably, perhaps because they have something to cling to. French hydrangeas are a traditional seaside plant, but Kirby finds them a struggle. "They're so big, so leafy. Unless I water them every day, they wilt. They're on probation."

Low-slung coralbells (*Heuchera sanguinea*) have a long blooming season here and multiply quickly. Bearded irises, on the other hand, go down in the rain, but Kirby keeps growing them to clip and bring indoors. Kirby has considered that other perennials might do better if she mulched them, but she never sees a leaf from their wind-swept trees. She depends on snow for insulation.

"If I had to condense advice into a take-home message, I'd say, go with tried and true stuff—perennials from your neighbors. We have a pretty good trading system here. Keep it simple. Use hardy plants. Use annuals—you get a lot of color for your dollar. Buy top quality. Don't mess around with cut-rate stuff."

Polly Feinberg's garden lies on an ancient railroad bed atop a sandbar that links Telegraph Hill to Allerton Hill across the top of Hull's "7." Feinberg, who teaches dancing in Braintree, grew up in Boston and Brighton, and spent summers in Hull as a kid. But she didn't become a gardener until she married and moved to the peninsula to live. "My parents wouldn't know a philodendron from a melon," she says. "A lot of what I tried was just sheer ignorance."

Officially, Hull lies in USDA Zone 6A. But Feinberg says her 976-square-foot lot, where gardens occupy two small strips of land in front and in back of her house, has "two climate zones—Connecticut on one side, Maine on the other." The back is protected from the wind and waves. The front receives afternoon sun, but is protected from the crashing surf by only a low sea wall.

"I tried lilacs in front and they wouldn't grow. I'm the only one in the world who can't grow hosta. I can't grow bulbs on the north side. Can't grow corn. Can't grow viney things. I tried watermelons and that didn't work. Tried carrots, potatoes, peas, green beans. I grew two pea plants—and ended up with two pea pods.

"I tried mugo pines, Austrian black pines. They didn't make it. I tried shelters, desiccants. Nothing worked. Tried 'Betty Prior' roses. . . . Even daylilies wouldn't grow on the north side." Feinberg has embraced what some might insist on calling weeds. Beach peas (*Lathyrus japonicus*), chicory, and Queen Anne's lace, she observes, have at least a fighting change, adding, "We've learned to love goldenrod."

But gradually, by trial and mostly error, Feinberg evolved an herb and salad garden that does work. Tomatoes, cucumbers, and lettuce will grow on the Connecticut side, and an if-you-can't-beat-'em-join-'em combination of herbs and annuals will grow on the Maine side. Basil, sorrel, tar-

"I tried lilacs in front and they wouldn't grow. I'm the only one in the world who can't grow hosta."

—Polly Feinberg

PHOTOS BY NORMA JANE LANGFORD

Polly Feinberg, left, in her vest-pocket garden on Hull's windy causeway. Above: Cars act as portable windbreaks shielding herbs and annuals on the seaward side of the Feinberg home.

"You have to look at it as an opportunity. . . . Most people who garden get attached to plants and it's very hard to see them destroyed."

—Marsha Zosack

PHOTOS BY NORMA JANE LANGFORD

ragon, chives, and nasturtiums thrive there, where there's sun, if little else.

"Perennials? Not in a dream," she says. "The only ones that survive are daylilies and lilacs on the south side, and minicarnations and herbs on the north."

Rosa rugosa, the beach rose, survives against all odds: the Great Storm of '78, the Halloween Storm of '91, and winter storms in December '92 and March '93. When it gets blown into the street, Feinberg just goes out and pushes it back.

The only way to cope with the wind is to use wind-resistant and low-growing plants, or take heroic measures, she's convinced. "Delphiniums you would have to tie to a two-by-four. My roses are trellised to within an inch of their lives—espaliered roses. We just tied some ropes across the house and tied them to it."

Hanging plants don't make it a week. On especially windy days, Feinberg parks her car in front of the basil, or if she has small seedlings, shields them with a wastebasket.

Occasionally salt water washes over the sea wall and into the garden, but it drains away quickly in the sandy soil, and eventually rain and snow rinse the salt out. Sometimes Feinberg soaks the garden with fresh water.

"My advice? Go with the flow. Don't fight it. Grow really nice wild roses and lots of them. My husband mows the weeds down so the ground looks greenish."

Sea water, according to R. Marilyn Schmidt, is two-and-a-half percent salt—which is one percent more than necessary to kill most plants. Among Hull gardeners, Marsha Zosack has a reputation of being able to grow anything anywhere. But even her expertise wasn't enough for what her friends call "total abuse"—three feet of salt water that sat on her garden for two weeks.

Originally, the Zosacks felt confident they could make their back yard a garden because it was one of the few places on the peninsula low enough to be out of the wind. It was protected by a concrete sea wall on the ocean side and kept moist by a marsh on the other.

But during the storm of 1978, a thick layer of rock and gravel washed across the street. Zosack dug this out, replaced it with purchased topsoil, and added horse manure and wood shavings, the gift of a friend with a barn. "I always believed you could improve any soil," she says, "but in this case, there's nothing but sand. The only thing that grows in it is 'lobster grass'"—

Hull's value-added name for crab grass.

Next the Zosacks built raised beds to keep ground water from swamping the garden. "We've had ducks swimming in the back yard—a lovely mallard couple—and a great blue heron." Zosack planted flowers that had traveled with her everywhere: peonies, lilies, columbines, lupines. And asters. "All my friends have them. I couldn't divide them fast enough."

It seemed that things were looking up. Then came the Halloween Storm of '91. Sea water backed up when drains became blocked with debris, and didn't budge for two weeks. In the spring some of the tougher perennials did come back, but not the big 'Betty Prior' rose, not the delphiniums, not the *Gallardia*. . . . Zosack's voice trails off as she describes the devastation.

"You have to look at it as an opportunity," she says. "When all your plants die, you have to get new ones. That's not altogether facetious. You can redo something and it will be better. Most people who garden get attached to plants and it's very hard to see them destroyed." You can only keep things as healthy as possible, she says, to help minimize the loss.

Sally Chisholm lives just up the hill from Zosack, protected somewhat from the wind by neighboring houses and a new board fence, but still close enough to the ocean to

Far left: Marsha Zosack in the new hillside garden created after her first was wiped out in 1991. Sally Chisholm's heaths and heathers flourish in March, below, and in July, left, in spite of constant salt spray.

be affected by salt spray. Sometimes there's so much salt on the windows "we have to hose 'em off," says Harry, her husband. "The whole yard is covered with salt."

Chisholm's daunting goal: find a plant that "likes" salt, hugs the ground, and won't die during a New England winter. When she and Harry spent two weeks in Scotland, she decided she'd found her plants. Back home she tracked down the Rock Spray Nursery in Truro, Massachusetts, which specializes in heaths and heathers. Then she punched bloom dates into her computer and drew up a chart to ensure that she would have a succession of winter-blooming heaths and spring-blooming heathers. Now with 60 plants of 12 different species, she has a tapestry of color in the bleakest months.

"They laughed at me when I put them in," she says. "The heathers looked like a poor hair transplant at first. There's a great difference between a three-inch pot and a five-inch pot in price, but in one year, they catch up. So it's worth getting the smaller plants."

Heathers like moisture, but they also like sandy soil, so Chisholm actually brings in sand and mixes it with acidic pine-needle mulch. "You kill them if you give them lime," she observes.

Like other seaside growers, Chisholm has found that gray green plants can take ocean abuse. These plants tend to be tomentose, with short, dense hairs that help to hold salt away from more easily damaged leaf surfaces. Among those that have proved tough are artemisia, yarrow, lamb's-ears, thyme, dusty-miller, Russian sage (*Perovskia atriplicifolia*), and veronica. Among shrubs and trees, she's had good luck with creeping juniper and Russian olive. She's chosen other plants—such as sedums, heathers, and herbs—because they don't take much irrigation and hold up well in drying winds.

Roses grew on the property when the Chisholms moved in, but most of them died during the storm of '79. The survivors reverted to other forms, apparently because the graft died and the root stock took over.

Still, Chisholm remains willing to experiment with other plants. "Asters are beautiful in the fall," she reflects. "Marsha made me think they would be fun to try. I don't think you're as limited as you think."

They may be wind-whipped and waterlogged, but Hull gardeners rarely throw in the towel.

Norma Jane Langford is a teacher and a free-lance writer living in Quincy, Massachusetts.

"They laughed at me when I put them in. The heathers looked like a poor hair transplant at first." —Sally Chisholm

Tracking the Natives

You see a tantalizing mystery plant growing alongside the road. Now what?

BILL FIRESTONE

BY SARA STEIN

Traveling back from Maine to our home in southern New York at the end of our vacation late last summer, we passed a stretch of highway veiled in lavender bloom. The soft haze, which proved to be the pollen-dusted flowers of a delicate grass, went on for miles along the inhospitably hot and dry median that separated the six lanes of a major interstate. It was just what I was looking for. But what was it?

It's lucky my husband does the driving. In my constant search for native species to add to our gardens, I can't seem to keep my head turned toward the road, much less an eye on the rearview mirror, which one ought to consult before crying, "Stop! I see a plant!" This one interested me for a particular reason. I was planning a fieldstone terrace to be planted with native species in beds among the stones and in the cracks between them. I was looking for shrubs as well as flowers, and most important, the grasses through which forbs and small bushes naturally grow in sunny habitats. My exemplar was New England balds where huckleberries and lowbush blueberries mingle with wild strawberries, asters, goldenrods, and grasses in just the drought-prone environment that sun-baked stone provides. But the only indigenous grass I was familiar with that thrives in such conditions was little bluestem (*Schizachyrium scoparium*), and it grows too tall for a terrace from which one would like to view the meadow beyond, the pond below, and one's guests as well. The grass along the highway seemed an answer.

Grasses are difficult to identify. Even my county agents, who have given me the names of many plants I've come upon over the years, must forward grass samples to an expert at Cornell University for $25 per identification, compared to the usual $3. The grasses I feel most secure about are those weeds that occur on our own place and that can usually be found in *Common Weeds of the United States,* a U.S. Department of Agriculture handbook now published by Dover. I checked it first: if a plant is in that book, it shouldn't be in one's garden. Next, I turned to Lauren Brown's *Grasses: An Identification Guide,* published by Houghton Mifflin. This book is for amateurs like me. It is logically organized, and the grasses, described in terms of outstanding traits that anyone could notice, are exquisitely illustrated. Best of all, it contained my quarry: *Eragrostis spectabilis,* purple lovegrass.

This is in general the method I use to track down the name of a species found in the wild: I look in field guides first, and if I can't find it there, I send the specimen to my county agent—more formally, my Cooperative Extension agent, usually listed in the blue pages of the telephone book under the name of one's county. Not even experts, though, can reliably identify plants by leaves alone. I try to send each specimen in bloom, or failing that, in seed or fruit. I pack them in plastic bags to preserve them, and when sending more than one at a time, I label them with a number or letter.

So that I remember which was A, B, or C, I keep duplicate specimens, labeled the same way, either pressed in a book or kept among the salad greens in the refrigerator for the two weeks or so it takes to get an answer.

Knowing the name of a plant is only the first step in deciding whether or how to use it. Is it, in the first place, native? Field guides usually give that information, but county agents usually don't. If it is a native, is it indigenous to your area? I found and easily identified in Peterson's *Field Guide to Eastern Trees* a striking shrub that I saw blooming this July along the roadside in a neighboring town. It was a bottlebrush buckeye (*Aesculus parviflora*), which occurs naturally over an extremely limited range in the southern Appalachians. Obvi-

Knowing the name of a plant is only the first step in deciding whether or how to use it. Is it, in the first place, native?

Wooded areas, often advertised in real estate columns as "unspoiled," are anything but that hereabouts. The woodland on our place was second growth choked with alien buckthorn and barberry, and nearly overwhelmed with oriental bittersweet and Japanese honeysuckle.

ously, it had been planted as an ornamental. How far one wants to pursue such a find depends on how much of a purist one wants to be. Bottlebrush buckeye is an American native, but it is certainly not a New Englander. With the usual covetousness of gardeners, though, I follow the trail a little further to see where it will lead. My decision to turn back will be easier if I find out, for instance, that the bush needs the alkaline soil I can't provide, or is prone to disease, or has invaded and degraded local woodlands.

Sometimes good reasons may lead to bad choices. I wanted crabapple trees on the stone terrace so birds would have a perch between forays after insects and fruit to eat during fall migration. Naturally, I wanted natives: wild sweet crabapple (*Malus coronaria*) for example, or the prairie crabapple, *M. ioensis*. My thought was that, through my generous provision and the birds dispersing apple seeds in their droppings, the native species would spread again over a landscape in which they have become rare.

This Lady Bountiful fantasy was short-lived. The large fruits of our old apples were designed to be dispersed by large mammals like mammoths, not by little birds. And all crabapples, whatever their origins, are so promiscuous that even if Johnny Appleseed himself were to be resurrected for the planting, the progeny would be impure. A more rational choice—and one I found in a botanical garden rather than in the wild—was Sargent's crabapple, an alien species that birds love, and so do I. So much for purity.

For most wild plant finds, the information needed to make a decision about growing them is more likely to be found in horticultural encyclopedias than in field guides. I looked up the buckeye in *Wyman's Gardening Encyclopedia* and in *Taylor's Guide to Shrubs* and checked those brief descriptions against Michael Dirr's more expansive treatment in his *Manual of Woody Landscape Plants*. The only negatives I could find are that the shrub spreads by suckering—which could be a positive where there's lots of space to fill—and that in our zone there may not be enough time between flowering and frost for the nuts to ripen.

In the case of purple lovegrass, the essential information was in the field guide itself. The species is native. It is a short grass (I had feared it might have been artificially shortened by the summer's mowing). It grows in sandy soil, which, although not a common type in our clayey area, I would expect to have on my planned terrace, where the stones would be set in sand. It grows "in little tufts" and is perennial, common, and "beautiful." These last attributes were important because they meant to me that purple lovegrass wouldn't spread by rhizomes into places where it wasn't wanted, would be a permanent planting, had apparently held its own against incursion by alien weeds and, for aesthetic reasons, was probably commercially available.

I put bottlebrush buckeye on a page of my notebook headed by a question mark, but I put purple lovegrass at the top of the list of native species definitely intended for the stone terrace. This top position wasn't because the grass was the favored plant among many others, or that it happened to be in foremost alphabetical position. It was because so far, *Eragrostis spectabilis* was the *only* item on the list.

Less than half the native species entered in my notebook for consideration or on lists of items actually planted are ones I originally found in the wild. Of those that I did find on drives or walks, few were within even 50 or 100 miles of our suburban home. I can't trust local wetlands to tell me which species to use in restoring our pond shore because common reed (*Phragmites communis*) and alien purple loosestrife (*Lythrum salicaria*) have nearly obliterated the diversity that reigned here even a few decades ago, before development disrupted drainage patterns. Wooded areas, often advertised in real estate columns as "unspoiled," are anything but that hereabouts. The woodland on our place was second growth choked with alien buckthorn and barberry, and nearly overwhelmed with oriental bittersweet and Japanese honeysuckle. Three centuries of clearcutting for agriculture extirpated so many woodland species that only a small fraction of the diversity that theoretically is indigenous has actually reappeared.

Of those meadows that remain, all are descended from cropland, hayfield, or pasture. They, too, are mostly made up of aliens, including such pernicious weeds as horsenettle, field bindweed, and multiflora rose. Of the natives remaining in these habitats, many are as aggressive as the agricultural weeds or introduced ornamentals with which they have successfully competed. I think of fox grape, for example, which lies like a lethal blanket over strug-

BILL FIRESTONE

gling wooded roadsides, and Canada goldenrod (*Solidago canadensis*), which forms an impenetrable monoculture in abandoned fields. Being a native doesn't necessarily mean being a model citizen.

Nature preserves are more promising locales for seeing an array of native species. Most of the woody plants we chose when we were restoring the understory in our woodland are ones we first saw growing at nearby preserves. But preservation policy often forbids disturbance of any sort, which precludes planting species that might—but don't—arrive there on their own. Preserves that specialize in wildflowers, like the Garden in the Woods managed by the New England Wild Flower Society in Framingham, Massachusetts, or the National Wildflower Research Center in Austin, Texas, are less shy about propagating and planting because their work involves active restoration. Unlike shrubs and trees, though, wildflowers must be seen in bloom to be appreciated, and that means many trips over many months to choose among possible species.

So I indulge myself in a different sort of wandering: what might be called a research meander through lists, guides, books, and catalogs. An obvious place to begin is lists of suitable species published by native plant associations in your area. The New England Wild Flower Society, for instance, publishes handbooks that list species for various habitats, including wetland, woodland, and meadow. Membership in the National Wildflower Research Center gives access to their clearinghouse through which you can get not only lists of species by state—including shrubs, vines, trees, and ferns as well as wildflowers—but also bibliographies, sources, associations, and many other kinds of information. The species that are recommended in these lists are those that have proved successful for the average gardener, and that are known to be commercially available either as seeds or transplants. To see what they look like, of course, you have to thumb through field guides, and to learn about their cultivation, you have to refer to horticultural encyclopedias or gardening books. That's what I mean by wandering.

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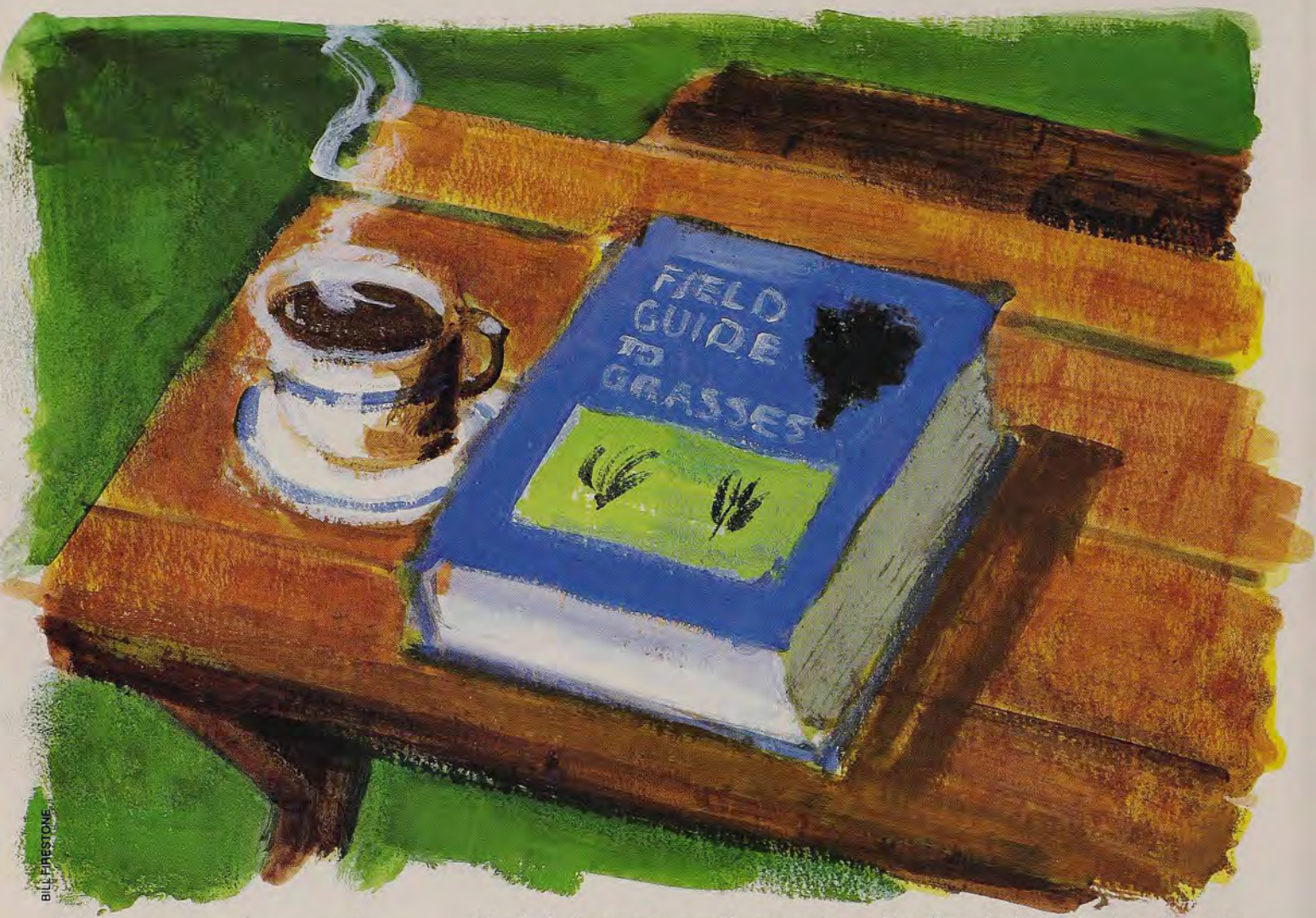

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This aspect of my early research was like groping in the dark: I blindly sent out dozens of requests for catalogs without knowing which might contain interesting species.

Nor is the journey over until a source is found. It would be nice if, having decided on a young buttonbush (*Cephalanthus occidentalis*) to add to one's woods, or a northern dropseed grass (*Sporobolus heterolepsis*) as the basis for a meadow garden, one could run right out to the local garden center and buy them on the spot. Local nurseries carry what local gardeners buy, and these are far more often exotics than native species. Commerce in natives is conducted almost exclusively by specialty nurseries, which for most of us means mail-order. Some of these, like Forestfarm in Williams, Oregon, are well-known because they advertise in national magazines. Others are almost as hidden from public view as the plants they sell. The best way to find sources for native plants you have already decided on is to look them up by their botanical names in the Andersen Horticultural Library's *Source List of Plants and Seeds*. Using this invaluable reference book, you can look up over 47,000 commercially grown plants and discover which of more than 400 nurseries offer them.

Equally valuable is Barbara Barton's *Gardening by Mail: A Source Book*, published by Houghton Mifflin. Although you can't locate a plant down to the level of species and variety in this volume, you can locate mail-order nurseries by specialty: "Cacti" or "Native Plants, Southeastern U.S.," for example. Theoretically, you can call likely nurseries to learn particulars, but the cost of a long-distance call is more than the cost of a catalog (many are free or the small price is deductible from the first order), and what can you ask when you know nothing at all? This aspect of my early research was like groping in the dark: I blindly sent out dozens of requests for catalogs without knowing which might contain interesting species.

As it turned out, none of the lists and guides I've ambled through have been as fascinating as catalogs. True, some that I received during that first blizzard of replies were from nurseries whose claim to specialize in natives was based on offerings as common and widely available as New England aster. But others listed hundreds of

species I would otherwise never have come upon, such as the dwarf serviceberry, *Amelanchier stolonifera,* that now edges a woodland path, or the short and drought-tolerant goldenrods and asters that, until I found them described in catalogs, were merely imaginary companions for the tufts of purple lovegrass on my stone terrace.

Eragrostis spectabilis was not on any of the plant lists I obtained from native plant societies. Nor, for that matter, was it in my encyclopedias. It was also not offered in many of the catalogs in my rather large collection. Andersen Horticultural Library's *Source List* mentioned one nursery that carried seeds. I sent off a query. It wasn't answered. But I'm not one to accept easily that a dead end has been reached.

There is a final resource that, to trackers of native species, is the equivalent of those unique characters from whom travelers extract the genius of the strange lands they wander. It is the growers themselves. In the larger world of horticulture, growers may be several times removed from retail sellers. But along the back roads, the growers of native plants and the owners of the nurseries that sell them are usually one and the same. You have only to read their names in the catalog and give them a call. Often, they answer the telephone themselves. Always, they are mines of information. It is they who have gathered the seeds and cuttings to propagate their stock, who have researched the species in tomes heavier than I care to pore through, who have managed them in cultivation and are intimate with them also in their wild habitats—and who, it happens, know each other as well.

Thus the final phase of tracking down that little purple lovegrass began with a call to a grower in Texas who offers southwestern wildflower seeds, who knew of a possible grass seed source in Connecticut, who suggested another in Vermont, and so on over the wires of America from the Appalachians to the Great Lakes, and to the end of the trail in Wisconsin.

The stone terrace is now, more than a year since I plucked that sample of grass for identification, home to some two dozen native species. Many of them were unknown to me on that late summer day when the terrace was still a back lawn waiting to be deturfed. They include a prostrate blueberry (*Vaccinium crassifolium*) as well as familiar huckleberries and wild strawberries planted as treats for the chipmunks that live in the terrace's supporting wall; the common trumpet vine for hummingbirds to sip from as well as salvias (such as lyre-leaved salvia, *Salvia lyrata*) that I'd never heard of and that butterflies frequent; and ordinary beebalm as well as the extraordinary silky aster (*Aster sericeus*) that happily basked through last summer's eastern drought. Out in the vegetable garden, where I can cosset them somewhat until they are old enough to transplant, grow seedlings of blue grama (*Bouteloua gracilis*), poverty oats (*Danthonia spicata*), path rush (*Juncus tenuis*), and of course, the purple lovegrass that set off this particular adventure.

But like travelers whose encounters lead them from one adventure to another, those who seek native plants to add to their gardens are continually diverted along new trails. Last weekend, weeding the seed plots, I came upon a group of tiny, bright green tufts no higher than my pinkie. Are they a grass? A sedge? A rush?

I will track them down. And while I'm about it, I think I'll take a detour along the trail of numerous and attractive sedges that crop up here and there on the pages of catalogs and, still namelessly, in our own shady woods.

Sara Stein is the author of Noah's Garden: Restoring the Ecology of Our Own Back Yards. *She is restoring the ecology of five acres in Pound Ridge, New York.*

RESOURCES

Many of the books Stein mentions are available at a discount to AHS members. To order any of the titles below, phone (800) 777-7931 and ask for the book service. These prices do not include shipping.

Field Guide to Eastern Trees
$13.45 (HOU 302).

Gardening by Mail: A Source Book
$15.95 (HOU 008).

Grasses: An Identification Guide
$9.75 (HOU 301).

Manual of Woody Landscape Plants
$38.95 (STI 001).

Taylor's Guide to Shrubs
$15.95 (GAR 015).

Wyman's Gardening Encyclopedia
$46.75 (MAC 666).

Source List of Plants and Seeds is available for $34.95 from the Andersen Horticultural Library, Minnesota Landscape Arboretum, 3675 Arboretum Drive, Box 39, Chanhassen, MN 55317-0039.

Along the back roads, the growers of native plants and the owners of the nurseries that sell them are usually one and the same. You have only to read their names in the catalog and give them a call.

Heirlooms of a Revolutionary

The Thomas Jefferson Center for Historic Plants lets gardeners take a bit of our horticultural heritage home with them.

BY KAREN M. LASKI

"There is not a sprig of grass that shoots uninteresting to me," Thomas Jefferson once observed. Jefferson spent his career in public life, but he never ceased to be a farmer. His repeated attempts to abandon politics for plants show the strength of his botanical interests, which extended well beyond the realm of ordinary agriculture. Our third president was an avid gardener who readily exchanged seeds with friends and colleagues. In the process, he built up an extensive network of botanical expertise extending through eastern North America to Europe and beyond. With the advice and seeds of these acquaintances, he furnished the fields and gardens of his estate at Monticello, just outside Charlottesville, Virginia.

Jefferson did not garden in vain. His botanical efforts have been revived—and extended—by the Thomas Jefferson Center for Historic Plants (CHP). The center has its origins in Monticello's gardens and grounds department, which is restoring the estate's original landscape. "Some of the grounds crew had started packaging seeds and selling them in the museum shop," explains Peggy Newcomb, the center's director. The success of that enterprise led to the center's founding, in 1987. Today, visiting gardeners can choose from a selection of some 400 antique varieties. And for those who can't pick up their plants at Monticello, the CHP sells seeds by mail-order.

Gardeners will find some old standbys among the CHP's selections, like cockscomb (*Celosia cristata*), four-o'clocks (*Mirabilis jalapa*), and English lavender (*Lavandula angustifolia*). But blackberry lily (*Belamcanda chinensis*), woolly foxglove (*Digitalis lanata*), and the old sulphur yellow primrose (*Primula media*) are not so common. Even harder to find is the American twinleaf (*Jeffersonia diphylla*). "It's a rare woodland flower that blooms in early spring. It was found by Benjamin Barton in 1792 and he named it after Jefferson," says Newcomb. This was the famous botanist's way of honoring Jefferson's own botanical work. Few commercial growers carry the twinleaf because it takes four to eight years to bloom. "It's also difficult to propagate," Newcomb adds, "but we've been managing to propagate our own."

Newcomb has been running the CHP since 1992, after spending nearly a decade as Monticello's assistant director of gardens and grounds. She traces her love of gardening back to her childhood, when she toiled in her mother's large vegetable patch. At the University of North Carolina at Chapel Hill, where she studied botany and English, she developed an interest in native plants. Her interest in heirlooms dates from her first job,

OPPOSITE: JESSIE M. HARRIS; RIGHT: MICHAEL S. THOMPSON

Opposite: Jeffersonia diphylla, *a woodland native, was discovered by Benjamin Barton and named for Thomas Jefferson. Above: The west portico of Monticello seen through a planting of Joseph's coat, an amaranthus that was in cultivation by 1700.*

The cockscomb, below, was in cultivation by 1750 and has changed little since then. Other antiquities are more elusive. The breast-of-Venus peach, bottom, appears in early 19th century illustrations but researchers have yet to find a living specimen.

COURTESY OF THE THOMAS JEFFERSON MEMORIAL FOUNDATION

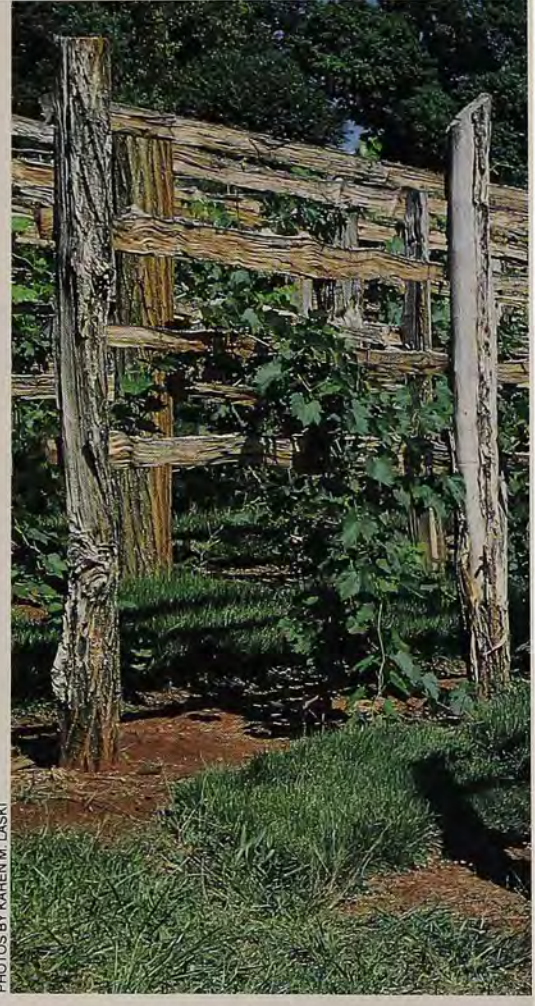
as assistant horticulturist at Old Salem, an 18th- and 19th-century village in Winston-Salem, North Carolina. Later she worked as head gardener at the Hanes Estates, also in Winston-Salem, then as superintendent of grounds at Oak Alley Plantation in Vacherie, Louisiana. The plantation gets its name from the famous live oaks that line the allée leading from the mansion to the Mississippi River.

The CHP is just the latest development in more than 60 years of effort to restore Jefferson's great estate. The grounds of Monticello had been Jefferson's retirement project, and he devoted a great deal of agonized thought to them. Few modern visitors would guess the depth of Jefferson's reservations about the land he had to work with. "You are sensible," he tells a correspondent in 1806, "that this disposition of the ground takes from me the first beauty in gardening, the variety of hill & dale, & leaves me as an awkward substitute a few hanging hollows & ridges; this subject is so unique and at the same time refractory, that to make a disposition analogous to its character would require much more of the genius of the landscape painter & gardener than I pretend to."

Subsequent owners were less than kind to Monticello, but the genius of Jefferson's achievement began to reemerge when landscape restoration started in 1927. Newcomb says the aim is to restore the grounds to the era of Jefferson's retirement, from 1809 to 1826. Much remains to be done. One of Jefferson's nurseries will be restored this fall, for instance, and mulberry trees will soon return to Mulberry Row.

From early April to early November, a yellow-and-white striped tent near the parking lot houses the CHP garden shop, where visitors can buy heirloom plants and seeds. But the heart of the operation is at Tufton Farm, several miles down the road, on land Jefferson once owned. It's not fancy: a renovated barn serves as office, storage space, lunch room, and greenhouse. Most of what the CHP sells is propagated at the farm, although a few items, like fruit trees, are grown for the center by other nurseries.

The atmosphere may be informal, but Tufton Farm is Newcomb's laboratory, just as Monticello's gardens were Jefferson's. And like Jefferson, the staff must often look far afield for plants, since little survives from the estate's original plantings. "A common misunderstanding that people have," says Newcomb, "is that we're growing plants directly descended from Jefferson's." But she says that's only the case for the tulip poplar (*Liriodendron tulipifera*) seedlings—the offspring of two Monticello specimens that are believed to date from Jefferson's time.



PHOTOS BY KAREN M. LASKI

The CHP interprets its historical mandate broadly. It doesn't confine itself to growing only those plants that Jefferson himself grew. "We go through the 19th and into the early 20th century," says Newcomb, "because we want to be as useful as possible to the public." The CHP's post-Jeffersonian selections include some types of rose, lilac, iris, and the scented violets so popular in the late 19th century.

Why bother preserving these early plants? After all, many of them are greatly at odds with modern horticultural tastes. "A lot of people have a certain notion about what a plant should look like," says Newcomb. "And the earlier varieties may seem more primitive looking." Gardeners afflicted with the bigger-is-better syndrome may, for instance, feel let down by the smaller blooms of some antique varieties. Occasionally, fashion has worked the other way as well. Earlier tastes in tulips, for example, ran to extremely gaudy variegation and feathering—much of it caused by viral infections. Jefferson grew tulips, but Newcomb says we can't be sure whether he went in for the faddish forms or not.

Left: Monticello's vineyards today would probably have pleased Jefferson, since he apparently never succeeded with grapes. Above: Peggy Newcomb examines a 'Champney's Pink Cluster' rose.

But Newcomb thinks the older varieties have much to teach us. "The plants link us to history," she says, "to famous people and special events that foster a deeper understanding of our heritage." For that reason alone, a taste for heirlooms is well worth acquiring. And plants can disappear forever because of neglect, severe winters, summer droughts, or trespassers who soon obliterate a garden. The more widely our heirlooms are cultivated, the greater their chances of survival.

Jefferson himself practiced a very acquisitive form of gardening. He seems to have collected seeds wherever he traveled, and he wasn't shy about asking his correspondents to do the same. Crops were his main concern. Jefferson's farming was an exercise in continual innovation, and he saw agricultural development as key to the prosperity of the infant republic. In 1790, for instance, he experimented with "a cask of mountain rice from the coasts of Africa." Would it grow on dry land, and produce as heavily as he had heard? "I have the success of this species of rice at heart," he writes, "because it will not only enable other states to cultivate rice which have not lands susceptible of inundation but because also, if the rice be as good as is said, it may take place of the wet rice in the Southern states, and by superseding the necessity of overflowing their lands, save them from the pestilential and mortal fevers brought on by that operation."

Jefferson seems to have wanted to acquire the entire plant kingdom. From Italy, he imported olives, grapes, poplars, and broccoli. He got figs and endives from France—he reports that the superintendent of the Jardin des Plantes in Paris was a "good friend" who regularly sent him seeds. And there were peppers from Mexico, vetch from England, and sesame from Africa.

But there was also much to admire nearby, and Jefferson wasn't always thinking about crop yields. On a trip to Vermont in 1791, for example, he found a host of trees and shrubs "either unknown or rare in Virginia," including "an Azalea very different from the Nudiflora, with very large clusters of flowers, more thickly set on the branches, of a deeper red and high pink-fragrance. It is the richest shrub I have seen. . . ."

Jefferson left an extensive record of his botanical efforts. He wrote long detailed letters to friends and associates requesting plants or describing the fate of those he already had. He kept annual "Kalendars" where he recorded such homely activities as manuring asparagus, harvesting peas, and sowing seeds. The diarylike *Garden Book* reveals his observations in the fields, in the gardens, and at table. On July 5, 1767, for example, he offers these notes on the succession of bloom: "Carnations in full life—Larkspur, Lychnis in bloom—a few hollyhocks remaining—Eastern mallow almost vanished. An indifferent flower."

One of the most appealing aspects of this record is Jefferson's fallibility. The author of the Declaration of Independence seems more human when visitors learn, for instance, that his vineyards apparently failed: despite years of effort, the diseases of our native grapes always seemed to overwhelm Jefferson's European vines. His attempts at maple syrup production fared no better. "He got the sugar maples to grow," says Newcomb, "but he couldn't tap them because the winters weren't cold enough for the sap to run properly." But the setbacks never seem to have discouraged him. "I have always thought," he wrote in 1790, "that if in the experiments to introduce or to communicate new plants, one species in an hundred is found useful and succeeds, the ninety-nine found otherwise are more than paid for."

It's this extensive documentation that underlies the restoration work at Monticello. But despite the richness of the record, there's still plenty of room for error. "You need to be careful of what you're interpreting," says Newcomb. "All restoration work is going to have inferences in it. Here,

for instance, we're not sure exactly what mulberries were used on Mulberry Row. But there are ways to narrow things down. You can look at local availability—other contemporary documents, newspapers, or letters that mention what was in the area."

Sometimes all the documentation can confuse the issue. A case in point is the breast-of-Venus peach, a fruit tree the CHP hopes, someday, to make available to the public. In 1802, Jefferson received four stones of the "poppe de Venere" peach, sent from Italy by Philip Mazzei, an Italian merchant who owned land next to Monticello. Notes on subsequent plantings of the peach indicate Jefferson's interest in it. Apparently the peach also gained some general popularity, since pictures of it appear in contemporaneous works. But Peter Hatch, Monticello's director of gardens and grounds, says the pictures don't entirely match up. For example, an 1817 work, the *Pomona Italiana* by Georgio Gulasio, shows the peach with a pronounced "nipple" at its base, opposite the stem. In some other illustrations, the peach lacks this distinctive feature. But since Gulasio's picture is supposedly of a peach growing in Mazzei's Italian orchard, Gulasio is obviously the best witness to what Jefferson's peaches looked like. So in 1979, on the strength of a U.S. Department of Agriculture source list of fruit cultivars, Hatch went looking for the breast-of-Venus peach in Italy.

Collecting in Jefferson's time could be hindered by naval blockades, piracy on the high seas, and slow transportation. But one obstacle that Jefferson did not face is quarantine regulations. Such procedures may be necessary but as Hatch discovered, they can also be frustrating. The peach stock he eventually dispatched from Italy was not certified virus-free and customs officials destroyed it upon arrival. A similar fate awaited a second shipment, from a French nursery. Another shipment, also from France, lingered eight years in quarantine at a Beltsville, Maryland, facility before Hatch rediscovered it.

In 1991, Hatch took cuttings from the Beltsville stock, but the results proved disappointing. "The trees bore for the first time last summer," he says, "but the fruits

Below: The four-o'clock was a staple of the 18th-century garden. Right: Nursery manager Johanna Farmer arranges seedlings in a hoop house at Tufton Farm.

LEFT: JESSIE M. HARRIS; RIGHT: KAREN M. LASKI

don't look anything like the illustration." The peaches are darker than they should be and have no nipple. There are also differences in the leaf veins. "We're still looking," Hatch says, "but we're going to have to start all over again."

Even after you have the right plants, you can still run into problems growing them. At the CHP, too much rain once resulted in too few packets of the popular, sweet-scented four-o'clocks (*Mirabilis longiflora*) to meet demand. One year, too few rusty foxgloves (*Digitalis ferruginea*) germinated and the Johnny-jump-ups (*Viola tricolor*) weren't three-colored. Humans, not the weather, once nearly caused the undoing of the tennis ball lettuce. After James Bear, Monticello's former executive director, announced that this was the finest lettuce he'd ever eaten, a staff feeding frenzy left no seed plants for the following year. Now heirloom produce isn't harvested until next year's seeds are secure.

The leap from growing plants to marketing them isn't always an easy one—especially for horticulturists who'd rather propagate than promote. But the CHP is making solid progress towards solvency. "We're getting to the point where we're breaking even," says Newcomb. "We're trying to beef up the shop by selling more garden-related items like books, pottery, and T-shirts."

The CHP is expanding its mail-order operation too, by offering plants as well as seeds. This is the first year plants will be listed on the order form, which appears in the center's annual newsletter, *Twinleaf*. Currently, only four plants are available: the cardinal flower (*Lobelia cardinalis*), blackberry lily, Maltese cross (*Lychnis chalcedonica*) and the fleur-de-lis iris (*Iris pseudacorus*). "But eventually we'd like to have a good selection of perennials available," says Newcomb, "including, of course, the *Jeffersonia*."

"It is truly in the spirit of Jefferson that we pass along these seeds from one gardener to the next, and from generation to generation," Newcomb wrote in last year's issue of *Twinleaf*. No doubt Jefferson would find in the CHP a spirit closely akin to his own. For Jefferson, too, gardening was a form of constant discovery, tempered with occasional disappointments.

"No occupation is so delightful to me as the culture of the earth," he wrote in 1811, "and no culture comparable to that of the garden. Such a variety of subjects, some one always coming to perfection, the failure of one thing repaired by the success of another, and instead of one harvest a continued one through the year. Under a total want of demand except for our family table, I am still devoted to the garden. But though an old man, I am but a young gardener."

Karen M. Laski is a free-lance writer who lives in Marshall, Virginia.

SOURCES

For a copy of the 1994 *Twinleaf*, which includes the CHP's list of seeds and plants, send $1 to the Thomas Jefferson Center for Historic Plants, Monticello, P.O. Box 316, Charlottesville, VA 22902.

Visitors to Monticello will find the CHP garden shop near the Shuttle Station. It is open from April through October. Monticello is on Route 53, just south of Charlottesville. From March through October, it is open from 8 a.m. to 5 p.m. For more information, phone (804) 984-9822.

JESSIE M. HARRIS

Foxgloves were popular in 18th and 19th century gardens. The woolly foxglove, above, is native to Greece and the Danube River drainage but has naturalized along our East Coast.

Desert Diversity

Our drylands are teeming with life, but we don't always know how to interpret it.

BY KEN DRUSE

The very word *desert* conjures up images of a vintage-film scene in which soldiers of the Foreign Legion crawl toward a pool of water only to find it a cruel mirage. In reality, a desert is hardly a wasteland, but a complex (if initially somewhat difficult to interpret) community of plants and animals. All but the harshest of our deserts teem with life: loud-mouthed cactus wrens perching on an agave flower spike, iridescent hummingbirds darting from hot-colored chuparosa to brilliant red penstemon, lizards scuttling across the griddle-hot earth without apparent discomfort, and denizens that protect themselves from the environment by appearing only at night, or not at all. America's deserts rarely conform to the Saharan cliché of pure sand and unrelenting sun. The Sonoran Desert in Arizona and Mexico, for example, has one of the world's greatest amphibian populations—a class of cold-blooded invertebrates usually associated with wetlands.

In each of our home landscapes, there may be dry spots, or niches, that are especially tough on plants. Learning to cultivate them as such with appropriate native flora is much more sensible than insisting on planting a thirsty variety and then constantly irrigating it, wasting our own labor and the earth's resources.

The need to conserve water will increase. Scientists report that much of the nation, and the planet, is or will soon be facing drought and/or a shortage of clean, fresh water—and not just typically dry places. In Florida, where average annual rainfall is a generous 55 inches, some areas are already experiencing problems with salt water infiltrating the water supply, because of a too-great human demand.

PHOTOS BY KEN DRUSE

Above: The ocotillo drops its leaves in a drought but leafs out again days after a rain. Right: Some cacti, like prickly pear, are beautiful as well as spiny.

In an emerging landscape philosophy known as Xeriscaping, plants are chosen not just for regional suitability, but for use in specific microclimates. There is great wisdom in this approach, but in one aspect it falls short. Native plants that have evolved under local rainfall patterns are best adapted for Xeriscaping but are not always preferred. In California, in particular, gardeners concerned about water consumption tend to work with Mediterranean plants—although as far back as 1920 researchers warned against these incredibly successful interlopers, with their massive seedbanks and choking growth habits, which make them successful "weeds." In California's lower elevations, where most of the principal cities lie, the nonnative percentage soars as high as 75 percent. Australian and South American plants are also touted as well suited to the dry regions of North America.

In Phoenix, the situation is even more critical. In this, the largest city in the United States situated in a desert, 80 percent of the residents are from elsewhere, and too many of them brought their stereotypes of alien landscapes along with their golf clubs. Lawn sprinklers pour gallons of water onto hot pavement areas, beyond the confines of the grass, where it quickly enters the air like steam from an iron. Popular Mediterranean natives and heat-radiating still lifes of rock and gravel punctuated by a token cactus or two are not appropriate desertscapes, any more than are manicured lawns.

Residents might take note of the gardening conversion experience of Robert Breunig, director of the Desert Botanical Garden in Phoenix, who decided to remove the nonnative vegetation from his typical homesite and grow desert wildflowers instead.

"I took out the lawn and the nonnative trees," says Breunig, "and at first it looked like a lot of weeds. But the wildflowers really started coming in, the poppies and penstemons and campanulas and so on, my neighbors said, 'What are these?'

"All were native Sonoran Desert plants,

KEN DRUSE

Small leaflets like those on the fairy duster,* Calliandra californica, *reduce water lost through transpiration.

but not one of my neighbors recognized them. I realized at that moment the estrangement these people felt from the desert around them. I had to bring these native plants back into the city so that they could finally see them."

Kent Newland, a botanist and water conservation specialist who helps promote xeric landscape practices for the City of Phoenix, tells residents: "Living in a desert isn't a sacrifice; it's adaptation." And adaptation is what the botany and biology of the desert is all about.

From the cracks of an urban sidewalk, where life couldn't be much hotter or drier, to a tiny pocket of soil on a sunbaked rock cliff, or a vast stretch of true desert, the plants that thrive in extreme conditions have much in common. Brittlebush (*Encelia farinosa*), desert marigold (*Baileya multiradiata*), and desert mallow (*Sphaeralcea ambigua*) are just a few of the plants that first come to mind as typical desert plants. All have gray foliage—a common sight in sunny, dry places, and hardly a coincidence. Light-colored foliage helps the plants reflect some of the sun's rays. Another telling quality about the leaves of the plants is that they tend to be tiny or even nonexistent. The most obvious example is the cacti, which have evolved with a modified stem instead of leaves. They conduct photosynthesis in this green "skin." Likewise, the bark of palo verde trees (*Cercidium* spp.) is a brilliant green.

Less leaf surface means less transpiration of water, and leaves made up of tiny separate leaflets, as is characteristic of many leguminous plants, are a good defense against an uneven climate. Large leaves are more vulnerable to water loss through evaporation; also a plant with leaflets can shed some in response to drought and heat—reducing leaf surface, but retaining enough to survive. Shrubs like *Calliandra eriophylla* and *C. californica* (fairy dusters) and the *Dalea* species fit this description. One, *D. greggii,* the trailing smokebush, makes an outstanding ground cover with its blue gray leaves and purple flowers.

The arid zone landscape is generally of short stature, another adaptation to winds and limited water. Acacias (*Acacia* spp.), mesquites (*Prosopis* spp.), desert willows (*Chilopsis* spp.), and palo verdes and leadtree or golden ball (*Leucaena retusa*)—none of these trees gets very big. In the Sonoran Desert the tallest native trees are in the 20-to-30-foot range, meaning that the largest cacti like the saguaros get tree status, at least visually. Ocotillo (*Fouquieria splendens*) provides another sharply vertical accent, but generally little grows much above eye-level.

Drought-resistant and drought-tolerant plants are commonly known to gardeners around the country, but the desert has an even cleverer category of plants: drought-avoiders. Over time, they have developed mechanisms for not being there, or not being vulnerable, when the driest days roll around. Plants that drop their leaves in hard times and go dormant—a trait called drought-deciduous—include ocotillo and palo verde. Within five days of a rainstorm, an ocotillo that looked dead can be leafed out and green again, as if by a miracle. Many springtime wildflowers time themselves to bloom and fade before the dry season thwarts their procreative energy.

Some plants have devised protective coatings like powder, down, wax, or hairs on their leaves to reflect the sun and to conserve moisture. The hairy foliage of Texas silverleaf (*Leucophyllum frutescens*) comes to mind—the selection 'Texas Ranger', developed by the breeding program at Texas A&M University in Dallas, is prized for its consistent appearance. Another favorite: *Eriogonum crocatum*'s chartreuse flowers are positively breathtaking against its tiny silver leaves. Chuparosa (*Beloperone californica* or *Justicia californica*) has tiny, finely hairy gray green leaves and a brilliant display of red flowers that is irresistible to hummingbirds, hence the common name that is Spanish for the tiny, highly active birds.

Part of dealing with dry times is knowing how to take best advantage of wet times, which are often not just rainstorms but deluges. The giant saguaro cactus (*Cereus giganteus* or *Carnegiea gigantea*) of the Sonoran Desert can double its weight during a rainstorm. An intricate network of spongelike roots soaks up water before it rushes away in dry streambeds called washes, or arroyos, worn into the earth by years of runoff.

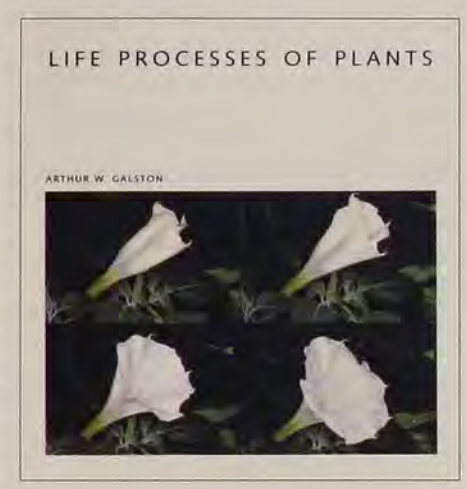
Even on the steep hillsides of the Saguaro National Monument, where runoff must be almost instantaneous, these giants stand watch between rainfalls. They can live 300 years, as was revealed when one called "Granddaddy" died in 1992. At over 40 feet tall, it had more than 50 arms. Most saguaros don't put out their first arm till they are 60 years old. At five years old, a saguaro may be only half an inch tall; by 20, barely a foot. At 30, it finally flowers, only at night—welcoming nectar-feeding bats that pollinate the white blooms. Fruit soon follows, attracting the many birds who appreciate its red flesh. The saguaro does even more to earn its keep as part of the complex desert environment: birds like Harris's hawks nest in cavities carved up high in its trunk. A model citizen, the saguaro is a symbol of what habitat-style gardening is about.

Ken Druse, an internationally known photographer and author, received the American Horticultural Society's 1993 Writing Award. This article is from The Natural Habitat Garden *by Ken Druse with Margaret Roach. To be published this month by Clarkson N. Potter, Inc.*

BOOK REVIEWS

Life Processes of Plants

Arthur W. Galston. Scientific American Library, New York, 1994. 245 pages. 8½" × 9½". Color photographs and illustrations. Publishers price, hardcover: $32.95. AHS member price: $29.50.



A book about plant physiology for readers who aren't plant physiologists? "Nah," would have been my immediate response. "Not enough sex and violence." Yet along comes Arthur W. Galston, who has attempted to write such a book "for the intelligent lay public," and I think he has succeeded very admirably.

Life Processes of Plants starts with "Photosynthesis: Food from Photons," which presents the intricate chemistry of the light and dark reactions of photosynthesis. "Light and the Life Cycle" discusses germination and flowering, while "Growth and Chemical Signals" and "The Movement of Plants" explore plant hormones and their action. "Coping With Stress" looks at temperature regulation, chemical and physical defenses, and response to injury. Finally, "Regeneration: From Cell to Plant," "Cooperation With Microbes," and "Improving the Green Machine" present some of the promises of biotechnology. But mineral nutrition and water relations (major portions of plant physiology texts in years past) receive only a passing reference.

Each discussion of a physiological phenomenon follows the admirable style of *Scientific American;* a transition from elementary knowledge proceeds smoothly to more esoteric information. For example, under photosynthesis, Joseph Priestley's experiment with mice and mints, published in 1772, eventually moves to a discussion of the latest knowledge of the photochemical reaction center. Illustrations are generally good and complement the text well. Just enough "gee whiz" examples, such as the sensitive plant and the Venus's-flytrap, are included to maintain the interest of the reader.

The eminent plant physiologist Arthur Galston is well suited to be the author of this book, number 49 in a series from the Scientific American Library, which includes books as diverse as the articles in *Scientific American.* —*Arthur O. Tucker*

Arthur O. Tucker is a chemical botanist and has taught Plant Physiology at Delaware State University for more than 15 years.

Green Byways

Sharon Lappin Lumsden. Limetree Publications, Champaign, Illinois, 1993. 317 pages. 6" × 9". Black-and-white maps. Publisher's price, softcover: $19.95. AHS price: $17.95.

Most "greenthumbs" enjoy visiting gardens, whether in home territory or traveling. To help those playing tourist in the Great Lakes states (here defined as Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin), Sharon Lappin Lumsden has come out with a book covering some 265 gardens.

Its greatest strength is that it describes not only larger, well-known estates, parks, and botanical gardens, but also relatively undiscovered gems (except perhaps among people living in the area). For instance, if you happen to be near Momence, Illinois, in late spring, it might

be fun to visit the Van Drunnen Farm when its chives turn 100 acres violet with their flowers. While there, one can also tour the chives freeze-drying factory on the grounds.

Lumsden visited about two-thirds of these gardens personally. She clearly visited the chives factory, since she observes: "The scent of chives is not gentle inside the factory, and after a visit there, you may not need onions on your lunchtime burger."

Occasionally there is an "FYI" blurb giving readers additional information, suggesting an interesting side trip or relating regional history. For instance, there is one that tells about the landscape architect Jens Jensen (1860-1951), an adherent of Frank Lloyd Wright's "prairie school" who emphasized a naturalistic style and the use of native plants. Occasionally in the Midwest one can still run across some of his work, although as Lumsden notes, much of it has disappeared.

From now on, when I roam the Great Lakes states, I intend to carry my copy of *Green Byways* with me. —*June L. Hicks*

June L. Hicks is a free-lance garden writer living in Dearborn, Michigan.

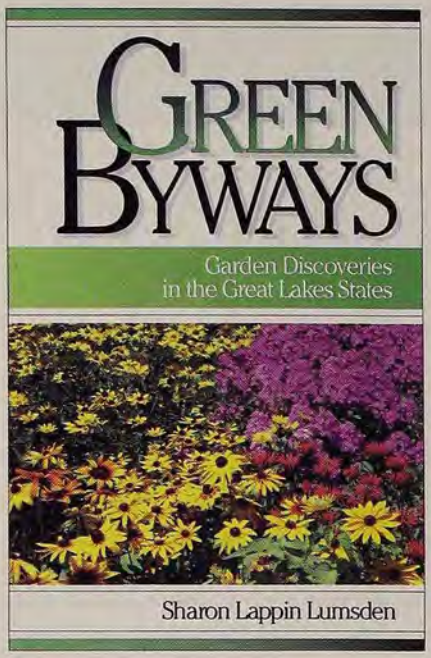
The Water Gardener

Anthony Archer-Wills. Foreward by John Brookes. Barron's Educational Series, Inc., Hauppage, New York, 1993. 192 pages. 10" × 10". Color photographs, color and black-and-white drawings. Publisher's price, hardcover: $45. AHS member price: $40.50.

As a rabid, unapologetic American-gardening chauvinist, I normally bend over backward not to "Buy British." But that was before I was faced with the prospect of bending over in another direction—to help my 11-year-old son dig a wildlife pond to emulate one in our children's gardens here at River Farm.

A number of new water gardening books have come out in recent months, but none that I've seen so far (another is due out any minute from Lilypons owner Charles Thomas and Washington, D.C., writer Jacqueline Heriteau) can touch this one in terms of thoroughness. It is subtitled "A Complete Guide to Designing, Contructing, and Planting Water Features," and for once, the publisher isn't exaggerating.

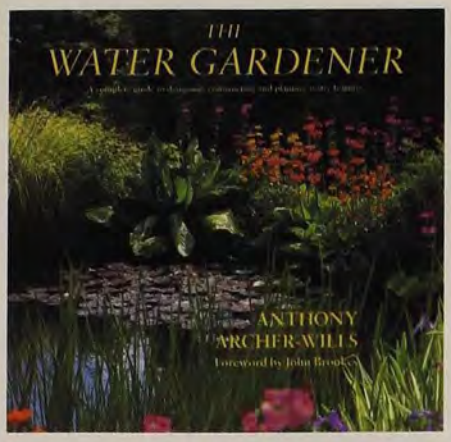
Most water gardening books succeed in the inspiring photograph category, but when Archer-Wills shows you a photo of an octagonal pond, he also tells you how to measure and mark an octagonal shape. He brings up considerations that probably should be obvious but may not be—especially to a sixth grader!—like the need to figure out where to put all the dirt you excavate and how you're going to move it, or the consequences of situating your pond on a slope. An appendix on maintenance and repairs tells what you will need to do season by season, and how often you can expect to patch or replace things like liners and pumps. (Thus offering a last-minute chance to talk yourself out of said project.)



The book's cut-away schematics of pond construction are useful, although when your goal is a naturalistic pond for frogs, it can be a bit daunting to see suggestions for concrete footings, water supply pipes, and optional storm drains. Nevertheless, it doesn't hurt to know all your options, including ones you can safely ignore.

There are separate chapters on "Special Features"—bridges, lighting, swimming pools, spas; building fountains, streams, and waterfalls; and on creating an environment that will be hospitable to animal life. Archer-Wills notes the downside of the latter, such as predators ("Ack! A blue heron's making off with our 50-dollar koi!") and ichthyic ailments.

One concern when buying British books is whether the plants they mention can be purchased in the United States. Archer-Wills has 50 pages of plants, divided into trees and shrubs, bog and marsh plants, green foliage plants, emergent plants, and floating-leaved plants. Most are widely available; a large percentage are American natives. (Among the waterside plants there are a few exceptions, but for now I have elected to live without the Tasmanian waratah.) Among his aquatic plants, almost half did not appear to be available



from any of four major U.S. mail-order sellers of aquatic plants; however, his appendix lists seven additional North American sources.

In the front of his book, Archer-Wills warns against collecting wild plants, but he could have gone further, since a number of those he recommends are endangered in several states and are rarely propagated by commercial sources. He cautions that some others, such as purple loosestrife, are invasive, but he did fail to note one: Eurasian water milfoil (*Myriophyllum spicatum*), which has become a menace in Minnesota waters.

All in all, this book gets high marks from our pond-building crew for being at once beautifully inspirational and almost painfully practical. —*Kathleen Fisher*

Kathleen Fisher is editor of American Horticulturist.

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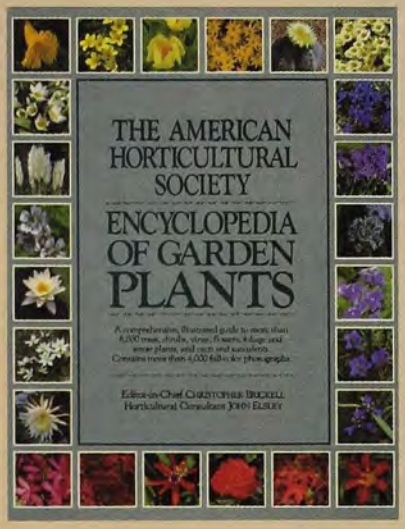

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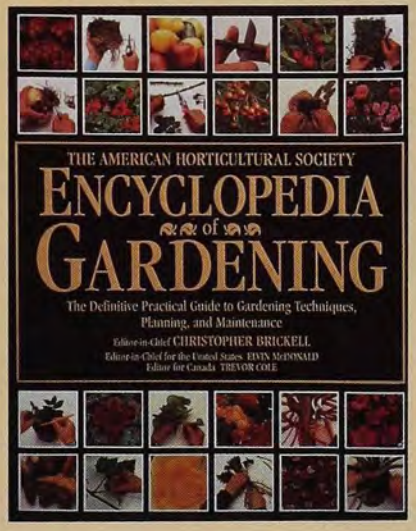

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U.S.A.

Affiliated Clubs

There are more than eighty affiliated organizations located throughout the United States, Canada and other countries. For more information on organizing an affiliate club, or on the location of a club near you, write to:

Affiliate Committee
c/o Mary Jo Gussett
11807 Dover
Houston, TX 77031

CLASSIFIEDS

Classified Ad Rates: $1 per word; minimum $20 per insertion. 10 percent discount for three consecutive ads using the same copy, provided each insertion meets the $20 minimum after discount. Copy and prepayment must be received on the 20th day of the month three months prior to publication date. Send orders to: AHS Advertising Department, 2300 South Ninth Street, Suite 501, Arlington, VA 22204-2320 or call (703) 892-0733.

THE AVANT GARDENER

FOR THE GARDENER WHO WANTS MORE FROM GARDENING! Subscribe to THE AVANT GARDENER, the liveliest, most useful of all gardening publications. Every month this unique news service brings you the newest, most practical information on new plants, products, techniques, with sources, feature articles, special issues, 26th year. Awarded Garden Club of America and Massachusetts Horticultural Society medals. Curious? Sample copy $1. Serious? $12 full year (reg. $18). THE AVANT GARDENER, Box 489M, New York, NY 10028.

AZALEAS

SELECT! DON'T SETTLE!—growing over 1,800 varieties of northern acclimated azaleas and rhododendrons. Catalog and Color Cue Card subscription: $3. CARLSON'S GARDENS, Box 305-AHC394, South Salem, NY 10590. (914) 763-5958.

BOOKS

GARDENING TRIVIA. Great rainy day activity for gardening enthusiasts. 167 pages of horticultural quizzes. $4.95 postpaid. BRUCES, 30548 St. Andrews Blvd., Sorrento, FL 32776.

HORTICA—All-Color Cyclopedia of Garden/Flora, with Hardiness Zones, also INDOOR PLANTS, 8,100 photos, by Dr. A. B. Graf, $238. TROPICA 4 (1992), 7,000 Color photos of plants and trees for warm environments, $165. EXOTIC HOUSE PLANTS, 1,200 photos, 150 in color, with keys to care, $8.95. Circulars gladly sent. Shipping additional. ROEHRS CO., Box 125, East Rutherford, NJ 07073. (201) 939-0090.

BULBS

TULIP COLOR BLENDS—First quality bulbs at the best prices. Free catalog, SCHIPPER & COMPANY, Box 7584a, Greenwich, CT 06836. (800) 877-8637. "Our Roots are Bulbs."

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DUTCH BULBS for fall planting, 12cm Tulips, DN1 Daffodils, Hyacinths and Miscellaneous. Catalog Free. Paula Parker DBA, Mary Mattison Van Schaik, IMPORTED DUTCH BULBS, P.O. Box 32AH, Cavendish, VT 05142. (802) 226-7653.

CACTI AND SUCCULENTS

SEMPERVIVUMS! Hardy succulent rosettes. Twelve variety collection, $15 check. Descriptive list, $1 deductible. STRONG'S ALPINE SUCCULENTS (C), P.O. Box 2264, Flagstaff, AZ 86003-2264.

CARNIVOROUS PLANTS

CARNIVOROUS (Insectivorous) PLANTS, seeds, supplies, and books. Color brochure free. PETER PAULS NURSERIES, Canandaigua, NY 14424.

DAHLIAS

EXHIBITION, GARDEN, WORLDWIDE SELECTION. 32-page color catalog, over 100 photographs, $2. CONNELL'S, Dept. AH, 10216 40th Ave. E., Tacoma, WA 98446.

EMPLOYMENT

"SIMPLE," THE ROVING GARDENING ARTIST specializing in horticultural art, garden illusion, facade, topiary, trompe l'oeil, espalier, trellis work, personalized teaching and training. Box 69AH, Honey Brook, PA 19344.

PROFESSIONAL CARETAKER AVAILABLE. Expert property care. Horticultural expertise. Upkeep and improvement skills. Estate, farm or ranch position sought in Rural West or Rocky Mountain States. L.S., P.O. Box 761, Ojai, CA 93024.

We at the American Horticultural Society are often asked to refer individuals to significant horticultural positions around the country. We are not in a position to offer full placement services to candidates or employers. However, as a service to our members—jobseekers and employers alike—we are 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. AHS's participation in this activity is only to serve as a connecting point for members of the Society. Inquiries and informational materials should be sent to HORTICULTURAL EMPLOYMENT—AMERICAN HORTICULTURAL SOCIETY, Dept. 494, 7931 East Boulevard Dr., Alexandria, VA 22308-1300.

GROUND COVERS

QUALITY GROUNDCOVERS AND PERENNIALS. Aegopodium, European Ginger, Ivies, Lamiums, Hardy Cactus, Plumbago, Sweet Woodruff, Sedums, Vincas. Over 100 varieties. GILSON GARDENS, INC., Dept H, P.O. Box 277, Perry, OH 44081. Fax (216) 259-2378.

HARDY HEATHERS for all-year garden color! Descriptive mail-order list for S.A.S.E. Fast service! HEATHS & HEATHERS, P.O. Box 850, Elma, WA 98541.

NEW ENGLAND GROWN HEATHER PLANTS. Discover this unique family of hardy evergreens! Heathers have fascinating foliage colors, blooming times and flowers. Quality plants available year round. Shipped UPS. Send $1 for our color catalog to: ROCK SPRAY NURSERY, P.O. Box 693, Truro, MA 02666. (508) 349-6769.

HELP WANTED

COLORADO-BASED, full service tree company needs staff Horticulturist with min. 3 yrs. exp. & B.A. Send résumé, salary req. to Box AH, Harrison Publishing Services, 2300 9th St. S, #501, Arlington, VA 22204.

HERBS

EXTENSIVE COLLECTION—Perennials—sedums—scented geraniums—display gardens—living room gift shop—catalog $2—wholesale list SASE. WRENWOOD, Rt. 4 Box 361, Dept. AH, Berkeley Springs, WV 25411. (304) 258-3071.

PERENNIALS

Offering Northern grown, top quality plants
Unique selection for sun and shade rock gardens and ground covers
Astilbe-McEwen Siberian Iris-Daylilies
Descriptive catalog $1.50
Fieldstone Gardens,Inc.
620 Quaker Lane, Dept.A
Vassalboro, Maine 04989
207-923-3836

GARDENING QUESTIONS?

Call the American Horticultural Society 's Gardeners' Information Service

Your daylilies are drooping and there are spots on the leaves of your roses. A mysterious weed—or is it a wildflower?—just appeared in the perennial bed. You covet your neighbor's scarlet tulips, but where can you buy the bulbs? GIS can help. Call toll-free (800) 777-7931 between 11 a.m. and 3 p.m. EST.

European Garden Tours in 1994

The Gardens of Italy: explore the finest gardens of the Italian Lake district and Tuscany and enjoy 2-3 night stays in Venice, Florence and Rome.

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4208 N. Freeway Blvd., Ste. 121, Sacramento, CA 95834
(800) 505-2505 or (916) 922-7927

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THE AMERICAN HORTICULTURAL SOCIETY ANNOUNCES

THE GREAT GARDENERS OF AMERICA LECTURE SERIES

AT THE EPCOT INTERNATIONAL FLOWER AND GARDEN FESTIVAL
WALT DISNEY WORLD RESORT, LAKE BUENA VISTA, FLORIDA, APRIL 29 TO JUNE 5

FRIDAY, APRIL 29 AND SATURDAY, APRIL 30

Dr. H. Marc Cathey, President of the American Horticultural Society, former director of the U.S. National Arboretum in Washington, D.C., and USDA research horticulturist.

FRIDAY, MAY 6 AND SATURDAY, MAY 7

Roger Swain, noted garden author, co-host of PBS's "The Victory Garden" and science editor of *Horticulture* magazine; his latest book is *Groundwork: A Gardener's Ecology.*

FRIDAY, MAY 13 AND SATURDAY, MAY 14

Dr. Mark J. Plotkin, ethnobotanist, noted rain forest researcher, vice president of plant conservation at Conservation International, and author of *Tales of a Shaman's Apprentice: An Ethnobotanist Searches for New Medicines in the Amazon Rain Forest.*

FRIDAY, MAY 20 AND SATURDAY, MAY 21

Suzanne Frutig Bales, garden author and photographer, American Horticultural Society Board Member, author of *Gifts From Your Garden* and four books in the Burpee American Garden Series—*Bulbs, Perennials, Annuals,* and *Vegetables.*

FRIDAY, MAY 27 AND SATURDAY, MAY 28

Rayford Reddell, one of America's foremost rosarians, author of the best-selling book *Growing Good Roses,* columnist for the *San Francisco Chronicle;* his articles have appeared in *American Horticulturist, Horticulture,* and *The American Rose.*

FRIDAY, JUNE 3 AND SATURDAY, JUNE 4

Tom MacCubbin, Orange County urban horticulturist with the University of Florida, author of a series of popular regional gardening books, garden editor for the *Orlando Sentinel,* and host of "Better Lawns and Gardens."

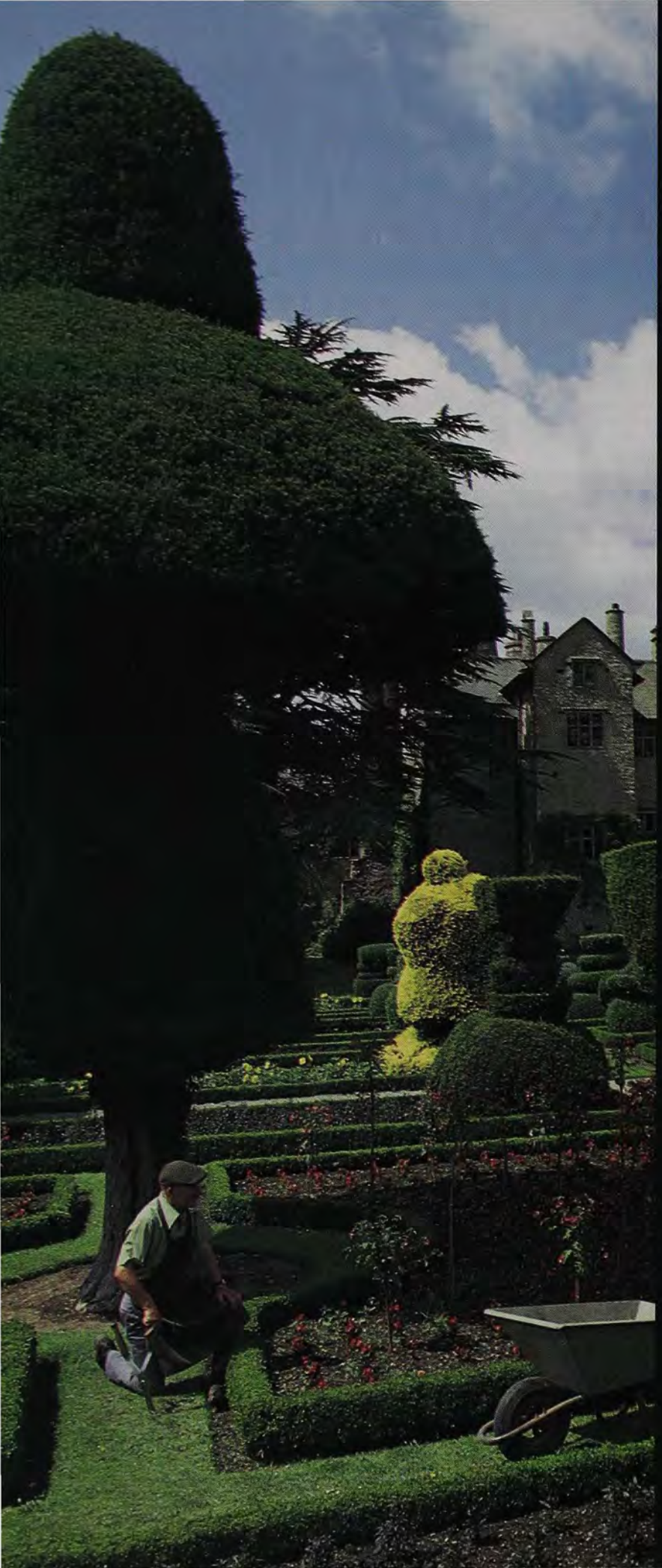
American Horticultural Society members have a special invitation to attend the first-ever Epcot International Flower and Garden Festival at the Walt Disney World Resort. Presented by *Better Homes and Gardens,* this five-week celebration of gardens and gardening begins April 29 and continues through June 5.

The entire Disney horticulture staff is going all out to ensure that the award-winning gardens of Epcot Center will be at their very best for this inaugural event. Special displays—from the newest bedding plants and exotic orchids to historic roses and outstanding bonsai—will have special appeal to garden enthusiasts. A wide variety of special programs are also planned. In addition to the nationally known experts participating in the Great Gardeners of America Lecture Series, Disney horticulturists will be on hand to share their gardening know-how. Guided tours of the gardens and backstage growing areas will provide even more opportunities for guests to get "inside" information and tips for their home gardens.

Admission to the festival is included in Epcot Center admission. Information and details regarding advance reservations for accommodations and special tours can be obtained by phoning Walt Disney World Information at (407) 824-4321.

PRONUNCIATIONS

Acacia ah-KAY-shuh
Acer rubrum AY-ser ROO-brum
Aesculus parviflora ES-kyew-lus par-vih-FLOR-uh
Allium sativum AL-ee-um sah-TY-vum
Amaranthus pumilus am-ah-RAN-thus PYEW-mih-lus
Amelanchier grandiflora am-eh-LANG-kyer gran-dih-FLOR-uh
A. stolonifera A. stoh-lon-NIF-er-uh
Aristida stricta ah-riss-TEE-duh STRICK-tuh
Aster sericeus ASS-ter seh-RISS-ee-us
Baileya multiradiata BAY-lee-uh mul-tee-ray-dee-AY-tuh
Belamcanda chinensis bel-am-KAN-duh chy-NEN-siss
Beloperone californica bel-oh-per-OH-nee kal-ih-FORN-ih-kuh
Betula nigra BET-yew-luh NY-gruh
Bouteloua gracilis boo-teh-LOO-uh GRASS-ih-liss
Calliandra californica kal-ee-AN-druh kal-ih-FORN-ih-kuh
C. eriophylla C. air-ee-oh-FIL-uh
Carnegiea gigantea kar-NAY-gee-uh jy-gan-TEE-uh
Carpinus betulus kar-PIE-nus BET-yew-lus
Celosia cristata seh-LOW-zee-uh kris-TAY-tuh
Cephalanthus occidentalis sef-ah-LAN-thus ahk-sih-den-TAL-iss
Cercidium ser-SID-ee-um
Chilopsis ky-LOP-siss
Clethra alnifolia KLETH-ruh al-nih-FOE-lee-uh
Cornus amomum KOR-nus ah-MOH-mum
Corylus avellana KOR-ih-lus ah-vel-LAN-uh
Dalea greggii DAY-lee-uh GREG-ee-eye
Danthonia spicata dan-THONE-ee-uh spy-KAY-tuh
Digitalis ferruginea dih-jih-TAL-iss fair-oo-JIN-ee-uh
D. lanata D. lan-AY-tuh
Encelia farinosa en-SEE-lee-uh fair-ih-NO-suh
Eragrostis spectabilis air-ah-GROS-tiss spek-TAB-ih-liss
Eriogonum crocatum air-ee-OG-oh-num kroh-KAY-tum
Fothergilla gardenii fah-ther-GIL-uh gar-DEN-ee-eye
F. major F. MAY-jer
Fouquieria splendens foo-kee-AIR-ee-uh SPLEN-denz
Gallardia gah-LAR-dee-uh
Gentiana andrewsii jen-she-AN-uh an-DREW-zee-eye
Hamamelis virginiana ham-ah-ME-liss vir-jin-ee-AN-uh
Heuchera sanguinea HYEW-ker-uh sang-GWIN-ee-uh
Ilex decidua EYE-leks deh-SID-yew-uh
I. verticillata I. ver-tih-sih-LAY-tuh
Iris pseudacorus EYE-riss soo-DAK-or-us
I. pumila I. PYEW-mih-luh
Jeffersonia diphylla jef-er-SOWN-ee-uh die-FIL-luh
Juncus tenuis JUNG-kus TEN-yew-iss
Justicia californica jus-TISH-yuh kal-ih-FORN-ih-kuh
Lavandula angustifolia lah-VAN-dyew-luh ang-gus-tih-FOE-lee-uh
Leucaena retusa loo-KAY-nuh re-TOO-suh
Leucophyllum frutescens loo-koh-FIL-um froo-TES-enz
Lindera benzoin lin-DAIR-uh BEN-zoh-in
Liquidamber styraciflua lik-wid-AM-ber sty-rass-ih-FLEW-uh
Liriodendron tulipifera leer-ee-oh-DEN-dron too-lih-PIH-fer-uh
Lobelia cardinalis low-BEEL-yuh kar-dih-NAL-iss
Lychnis chalcedonica LICK-niss chal-seh-DON-ih-kuh
Lythrum salicaria LITH-rum sal-ih-KAIR-ee-uh
Magnolia grandiflora mag-NOH-lee-uh gran-dih-FLOR-uh
M. virginiana var. *australis* M. vir-jin-ee-AN-uh var. aw-STRAY-liss
Malus coronaria MAL-us kor-oh-NAIR-ee-uh
M. ioensis M. eye-oh-EN-siss
Mirabilis jalapa mih-RAB-ih-liss jah-LAP-ah
M. longiflora M. lon-jih-FLOR-uh
Myriophyllum spicatum mir-ee-oh-FIL-um spy-KAY-tum
Perovskia atriplicifolia peh-ROF-skee-uh at-rih-plih-kih-FOE-lee-uh
Phragmites communis frag-MY-teez kom-YEW-niss
Pieris floribunda PY-er-iss flor-ih-BUN-duh
Polygonum aubertii pol-IG-oh-num aw-BERT-ee-eye
P. glaucum P. GLAW-kum
Primula media PRIM-yew-luh ME-dee-uh
Prosopis pro-SO-piss
Rhamnus caroliniana RAM-nus kair-oh-lin-ee-AN-uh
Rhododendron arborescens roh-doh-DEN-dron ar-boh-RES-enz
R. atlanticum R. at-LAN-tih-kum
R. periclymenoides R. pair-ih-kly-meh-NOY-deez
Rosa rugosa ROH-zuh roo-GO-suh
Salvia lyrata SAL-vee-uh ly-RAY-tuh
Schizachyrium scoparium skits-ah-KEER-ee-um skoh-PAR-ee-um
Solidago canadensis sol-ih-DAY-go kan-ah-DEN-siss
Sphaeralcea ambigua sfeer-AL-see-uh am-BIG-yoo-uh
Spigelia floridana spy-JEE-lee-uh flor-ih-DAN-uh
S. gentianoides S. jen-shen-OY-deez
S. loganoides S. low-gan-OY-deez
S. marilandica S. mair-ih-LAN-dih-kuh
Sporobolus heterolepsis spor-OB-oh-lus heh-ter-oh-LEP-siss
Tamarix parviflora TAM-ar-iks par-vih-FLOR-uh
T. pentandra T. pen-TAN-druh
T. tetrandra T. teh-TRAN-druh
Taxodium distichum taks-OH-dee-um DIS-tih-kum
Ulmus glabra UHL-mus GLAB-ruh
Vaccinium corymbosum vak-SIN-ee-um koh-rim-BOH-sum
V. crassifolium V. krass-ih-FOE-lee-um
Viburnum cassinoides vy-BER-num kass-ih-NOY-deez
Viola tricolor VY-oh-luh try-KUL-ler



STUDY TOURS

TRAVEL/STUDY TRIPS FOR THE AHS GARDENER

MAY 12-24, 1994
GARDENS OF SCOTLAND AND ENGLAND

Glorious gardens are featured in this itinerary as we travel from Oban in Scotland to London, England, via the Lake District, Chester, and Bath. From the distinguished garden of Arduaine on Loch Melfort to the splendid Bodnant Gardens in Wales, each garden promises a spectacular array of color and charm. In the Cotswolds, Barnsley House, home of author Rosemary Verey, is outstanding both in garden design and plantings. Guests wishing to extend their stay in London are invited to the first Members Day at the Royal Chelsea Flower Show and an evening of London Theatre. Noted horticulturist David Wilson, associated with previous AHS Travel/Study programs, will lead this tour.

JULY 13-21, 1994
GARDENS OF THE CANADIAN ROCKIES

A journey through what could be described as the most spectacular scenery in the world. The program includes visits in Calgary, Banff, Jasper, and Edmonton. With the assistance of the Calgary Horticultural Society, the program includes a number of exceptional private garden visits, including the Eagle Ridge home of Mr. and Mrs. Harley N. Hotchkiss. The day-to-day program includes a number of picnics, garden receptions, a glacial excursion, a lake voyage, and even a day raft trip on the Bow River. Leading this program for AHS will be Andrew Pierce and his wife, Gina. Andrew has long been associated with the Denver Botanic Garden and is a recognized expert in mountain flora.

JULY 29-AUGUST 11, 1994
GARDENS OF BAVARIA AND SWITZERLAND

Although Bavaria and Switzerland are neighbors, their approaches to gardening could not be more different. From the grand palace gardens of the Wittelsbach Kings to the botanical treasures found on Mainau Island in Lake Konstanz to the charming farmhouse gardens in the Emmental Valley, each day brings different gardens in different settings. The itinerary begins in Munich, travels into Bavaria, and then on to Lucerne and Geneva in Switzerland. The program includes a side excursion to Interlaken to make the cog railway trip to the Schynige Platte Alpine Botanical Garden, where the collection of native Swiss alpine plants is nearly complete. Leading this program for AHS will be Board Member André Viette and his wife Claire, who together have helped to lead a number of AHS Travel Study Programs.

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

AHS tour participants will visit the Topiary Garden at Levens Hall in Cumbria, England, during a trip to Scotland and England in May.

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