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August 1994

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American Horticulturist

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August 1994

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AUGUST'S COVER

Photographed by Rob Simpson

The red-shouldered hawk, one of the commonest hawks in the Southeast, breeds in moist, lowland woods and bogs, often close to cultivated fields. It hunts from a low perch, from which it drops to catch snakes, frogs, and rodents. Richard Devine, head gardener on a private north Florida estate, was inspired by the hawks and other birds that live in its acres of natural woods to landscape his own home as a haven for birds. His story begins on page 18.

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COMMENTARY

By the sounds you hear in your garden, or wafting into your home, you know the summer of 1994 is in its full glory: leaf, insect, bird, and even frog noises resound from this season's verdant growth. Even the bitter scars of our 17-snow winter here in the Washington, D.C., area seem to fade under the luxuriance of foliage, flowers, and seed heads. Few plants have yet to reflect the changes that the environment is already using to prepare them—even in the most tropical parts of our country—for the coming winter.

These seasonal changes are often factored out of our awareness by careful but shortsighted plant selection and design in public and private gardens, theme parks, and even in malls. Everything must look like a Ross Hunter production where Sandra Dee is 23 years old forever—everything must be in place, perfect, and never changing. Seasonal changes provide a vehicle to incorporate a much wider palette of species, and forms beyond the typical three-tiered design—upright tree forms, shorter flaring masses of shrubs, tied together with ground cover and lawn.

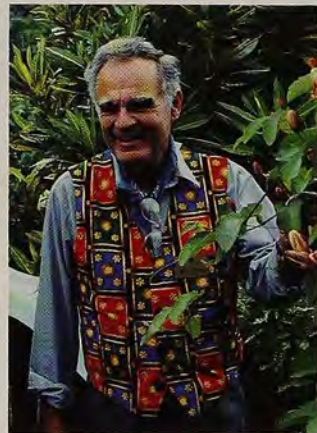
Designs based on nature allow for a much wider range of forms—not only upright but weeping and columnar, and foliage that is a mix of evergreen and deciduous or that changes color. Imagine reclothing a barren urban site with multiple layers of plants, in exposures ranging from full sun to deep shade.

When you add water for the enjoyment of songbirds, you have all the elements of what is coming to be recognized as the New American Garden. A prototype, the New American Friendship Garden, designed by Wolfgang Oehme and James van Sweden for the National Council of State Garden Clubs, is on display at the U.S. National Arboretum in Washington, D.C. Native plants and selected species from around the world flourish with birds and insects in an environmentally responsible garden.

In this issue, read how the head gardener at a north Florida estate used the surrounding natural forest as a guide for replanting his own garden to attract birds. Another gardener tells how a 10-year-old neighbor persuaded her to take a close and appreciative look at that garden terminator, the praying mantis. Most of us are familiar with wintergreen and anise hyssop; two other articles will expand your awareness of their relatives.

Through this magazine as well as our awards program (you'll hear about this year's winners in the next news edition), AHS always stresses that individual gardeners can make a significant difference in the lives of many others. Read also about Betsy Borre, the driving force behind a new public garden in Grand Rapids, Michigan, who emphasized throughout her 12-year effort the importance of education and accessibility for all.

Each of us can do our share in our own communities, creating gardens to define and sustain the environment and havens that welcome all people and earth's other creatures as well. As you enjoy the sounds and sights of the summer of 1994, I encourage you to respond to the call. Together we can make ours a nation of gardeners. *H. Marc Cathey, AHS President*





MEMBERS' FORUM

Midwest Bougainvillea

Regarding the letter from A. H. in Columbus, Ohio, in your February "Gardeners' Information Service," bougainvillea could be grown that far north—if one is willing to make some concessions.

We lived in Mexico, where I fell in love with this glorious vine. Later we lived many years in Bermuda. Now that we are back in the Midwest, we still have one of our favorite vines. No, we cannot have a 15-footer that sprawls over the eaves, but we can enjoy it many other ways.

A south window is essential (preferably a tall south window), as are some large plant containers and sharp pruners. When one is certain that there will be no more killing spring frost, the bougainvilleas go outside in sun or half sun. They are watered when they begin to show that they need it. They should not be kept wet, ever. I let ours be watered by our own rainfall unless as last year, we have a constant deluge. They can be allowed to dry out—up to a couple of months with no water—and will slowly come back. In Mexico they will go for nine months with no rain. We train them into small trees. They can be trained to a trellis in their pots, but such a strong vine tends to grow up and topple the trellis. They can also be pruned hard to form a globe, a column, or a sprawling bush.

In the winter, a light fertilizer in its weekly watering is helpful. This plant thrives on neglect and rough treatment, however. Should it be left outside in the autumn and be caught by a hard frost, bring it into a cool room. It may look dead, but prune the roots and the top, root it in ordinary soil (a little sandy), and within a month it will have revived. It is not too particular about indoor temperatures, but thrives at 65 degrees.

A. H. should check into the many colors available.

Betsy Mullins
St. Louis, Missouri

Still Muddling

In your June "Gardeners' Information Service," you confused catnip, *Nepeta cataria*,

with catmint, *N. × faassenii*. *N. cataria* grows to three feet and has leaves up to two inches long and white (sometimes pinkish) flowers. *N. × faassenii* can reach 18 inches with blue-violet flowers and narrow leaves one and a half inches long. This is a natural hybrid of *N. mussinii* and *N. nepetella*. *N. mussinii* is a low-growing, spreading plant with blue flowers that self-seeds readily.

Mary Ober
Fairfax Station, Virginia

You're right. Our description of catnip did sound more like N. × faassenii than N. cataria. Elisabeth Sheldon's article "The Catmint Muddle" in our August 1993 issue makes it easy to tell one Nepeta from another.

Big Leaves and Large Flowers

It's frustrating as a horticultural photographer to see your beautiful magazine blemished occasionally by misidentified photos. The latest culprit is the so-called "southern magnolia" on page 19 of the April issue. Our native deciduous magnolias, like this one, are beautiful plants in their own right, but they look very different from the southern magnolia described in Richard Bir's excellent article. Based on the portions of the plant visible in the photo, your tree is probably *Magnolia macrophylla*.

That glitch aside, I really like the theme you put together for the April issue.

Guy Sternberg
Petersburg, Illinois

Just to make sure we get it right this time, we sought a positive identification from



Dorothy J. Callaway, whose 260-page book, The World of Magnolias, was published recently by Timber Press. Callaway says the photograph definitely shows M. macrophylla, the bigleaf magnolia. Its leaves are the largest in the genus, sometimes reaching three feet in length. In spite of the southern magnolia's botanical name of M. grandiflora, meaning large-flowered, the bigleaf has it beat in that category as well, with flowers up to 18 inches across.

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OFFSHOOTS



Up North, In Search of a Whirligig

By Margery Guest

Once thought whirligigs were in the same class as those wooden figurines of bent-over people with big butts. But then I saw several in a friend's garden, twirling gracefully among the digitalis and achillea. A whirligig would make the ideal gift for my father's 80th birthday, I decided. What else can you get a guy who's 80?

My friend said only that he'd gotten his "up north" somewhere from an old man who let them go for 12 dollars apiece. I was leaving the next day to visit my daughter and I would be traveling about three hours north. Up north is a big place, but I was sure I could find a whirligig.

On the way I saw no whirligigs, only antique shops. Okay, I'd find an *old* whirligig. I went into several shops, but I found only one whirligig, a soldier whose arms moved up and down. I didn't like him very much. I looked at the price tag: \$7,500. Now I didn't like him at all.

"Do you especially need an antique

whirligig?" the sales clerk asked. "No," I answered, hoping she wouldn't ask my price range. "Well," she said, "I've seen some a few times up north. Drive straight through and you'll see them on the right side of the road. Made by some old guy."

I bought a pound of Michigan sweet cherries from a roadside stand, plunked them on my lap, and drove. And drove. By the time I hit Pellston, I knew something was wrong. A few more miles and I'd be aboard Shepler's Ferry headed for Mackinac Island.

Apparently, the nearer one gets to the Mackinac Bridge, the more extreme the need becomes for antiques. In fact, this need seems to surpass all others—for gas, food, or lodging. In Pellston, I pulled over to ask at one more antique shop.

A woman with curly hair, about 60, was waiting on a customer while another woman rummaged through boxes. I waited. Finally, the customer left with two stacks of old *Gourmet* magazines.

"I'm trying to find a man who sells whirligigs."



"A real old guy? About 90? Those *are* whirligigs John makes, aren't they, Pat?"

"Yeah, sure. They twirl around in the wind. John Angevine. Is it Ange-VINE or Ange-LINE, Martha?"

"Ange-VINE, isn't it?"

I broke in. "Do you know where I can find him?"

"You must have seen his stuff on the way up here. He displays it down by Martin's Market."

"Where is that?"

She looked at me as though I were stupid. "Right back where you came from."

I looked at my watch. I was supposed to pick up my daughter after her shift and the morning was ticking away.

"Do you have a phone number for this man?" I asked.

"Sure. In the book."

"Did you see those buttons Marian brought in the other day?" Pat asked Martha. This distracted Martha and she set down the phone book she'd picked up.

"May I look it up?" I asked.

"Sure. John Ange-VINE or Ange-LINE. See, there it is," Martha said, pointing. She was pointing to *Richard* Angevine.

"Wait—that's not it," she said. "Well, now that's the strangest thing—Pat, didn't you think John's last name was Angevine?"

I broke in again—"Maybe I could call the market for his number?"

"Sure. Pat, what's the number of the market?" They argued about the correct number of the market while Martha searched the counter. "Where'd I put that phone?" she mused. "I've got one of those portables. I can never find it." At this, she and Pat laughed uproariously.

After a brief phone call, Martha turned to me: "Nobody there knows. Strange. I know John has a phone. He lives with his wife, you know, just the two of them . . ." (I was hardly listening. I was working on coming to terms with the fact that I'd just gone on a two-hour wild goose chase and, although I had scored on some sweet cherries, I was not going home with a whirligig.) ". . . so at the end of the season, I bought out his inventory. They needed the money and—"

I did a double take. "What?" I asked.

"He had a bunch left and I knew he couldn't sell 'em, so I just bought 'em all."

"You mean—" I said,—"you've got his whirligigs? Here?"

"Well, no, not here," she said. "Down the street—at my other place—where I store stuff."

I couldn't speak. So Pat did: "Go get 'em for her, Martha. I'll watch the store." There had been no more customers since the one who'd bought the magazines.

"Oh, no," she said, waving her hand. "They could be anywhere in there."

"Please," I said, stifling the urge to strangle her. "Couldn't we try? I'll go with you."

"Go on," Pat said.

Martha headed to a back room and returned with a key ring that would do the head janitor of the city of Detroit proud.

"It's one of these," she said.

About a block down the street, she stopped dead. "This isn't the right key ring," she announced. We turned back and found a new key ring as full as the last one. I looked at my watch. It could easily take an hour just to try the keys.

Martha tried a few, without success, and kept looking back at me. Not sheepishly; more like *I told you so*.

Then suddenly, the door opened—to a place so packed with chairs, clothes, farm implements, baby stuff, and lamps, it looked as though every unsold item from every rummage sale ever held in Michigan was stored there. My heart sank.

"By the way," she said, "I'm going to want to make a little profit on these—"

I could hear the hysteria in my laughter. "Sure," I said, "if we find them."

"Oh, we'll find them," she said. Where was this sudden confidence coming from? "I paid 14 dollars apiece," she went on. "I'll need something for my trouble."

And then a miracle happened.

"Here they are."

She handed me two large boxes. I held them obediently while she locked the place back up. "I hope to get in here some day," she said sincerely, "and clean up a bit."

On the way back, money was the sole topic of conversation. I was worried. Never had a customer been more vulnerable.

Back at the shop, Martha fell into helping Pat with something and I was left to unpack the whirligigs. They were in good condition, well-made, adorable. A woman washing clothes, a lumberjack chopping wood, an old man sawing timber.

I boldly offered Martha 20 dollars apiece for four and she took it. Out of complete happiness, I turned to her before leaving. "I want to thank you for going to all—" but she and Pat were already haggling over an oil lamp.

I took my whirligigs and left.

The old man sawing timber was perfect for Dad. In his younger days, he'd briefly worked in the lumber business—up north. I've set up an identical one in my garden. As I write this, I can see the propeller turning and the old man sawing back and forth tirelessly in the wind.

Margery Guest is a free-lance writer living in Grand Rapids, Michigan.

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A3

GARDENERS' INFORMATION SERVICE

Q: *We bought a new house and the garden is overgrown and weedy. What should we do first?* G. E., Elmira, New York

A: Get your soil tested so that you know its pH (acidity) and nutrient profile. While you're waiting for the results, start removing anything you know is a weed. (If you're unsure, a fairly safe bet is that anything growing in several areas throughout the property should be removed.) Attack the weeds again weekly. Use any seedless weeds to start a compost pile. As beds are cleared, add organic matter to the soil and apply a mulch to open beds to keep weeds from returning.

Prune back any overgrown trees and shrubs that are blocking walkways or hanging over your house. Remove any dead or diseased-looking branches or dead plants.

By this time you should have identified the plants on your property and can make some decisions about removing undesirable smaller trees or shrubs. This will give you a feeling of openness, which is important if your outdoor space is small.

Note the orientation of your yard and how much sun each area gets each day. It's best to keep records on this for a full year, so you know how much exposure your yard receives through the changing seasons. With that information, and the results of your soil test, you can begin to select new plants and work on a master garden plan to be installed bit by bit over several years. The soil test will also guide you in addressing any unusual nutrient deficiencies.

Q: *How can we design a long, narrow back yard so it doesn't seem like a bowling alley?*

M. B., Chicago, Illinois

A: Stay away from straight paths or beds. Build curving, meandering pathways down the center of the space, and break up the space with garden beds that curve out

into the yard at intervals.

Use shrubs and small trees to break up the area, planting them not straight across from each other but along diagonal lines, so that the eye goes from left to right and not up and down.

You could construct two or more garden "rooms" by partitioning one area for a patio garden and another for a children's play garden or vegetable garden. The sections could be separated by raised beds, living hedges, or a vine-covered fence.

Q: *I would like to try some indoor topiary projects. What are some of the best plants that would also be easy for a beginner to use?* L. I., Washington, D.C.

A: Patricia Riley Hammer, owner of Samia Rose Topiary in San Diego, California, and former senior gardener at Longwood Gardens, recommends such evergreen vines as hoyas, creeping fig (*Ficus pumila*), and ivies. The latter come in a variety of foliage shapes, sizes, and colors, including variegated. Evergreen herbs like rosemary are also excellent for topiaries.

While most people think of low spreading plants for topiaries, upright growing succulents, *Cryptanthus*, and fibrous-rooted begonias also work well. Whatever you buy should be able to grow in tight spaces and form masses of foliage. The plants should also be well-rooted but very young, says Hammer.

For special projects, she suggests, you may want to select specific plants that recall some quality or character of your topiary shape. For example, in making a lion topiary, she once used the long, straplike leaves of *Liriope* to suggest its mane.

For more information or for supplies:

The New Topiary: Imaginative Techniques from Longwood Gardens by Patricia Riley Hammer, Garden Art Press Ltd., Northam, East Sussex, England, 1991.

Cliff Finch's Zoo, 16923 North Friant Road, P.O. Box 54, Friant, CA 93626, (209) 822-2315. Free catalog of topiary supplies.

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Q: *What should I add to soil to lower its pH?* D. T., Davis, California

A: You don't say what your current pH is or why you want to make your soil more acidic, but we can give you some general guidelines. To lower the pH of 100 square feet of soil from 7.0 to 6.0, incorporate two pounds of ground sulfur or five pounds of aluminum sulfate. The best time to do this is in the fall, but if this is not possible, work the amendments into the soil in early spring, as far ahead of planting in the area as possible. Mixing peat moss with the soil will also lower soil pH, but more slowly and at greater expense.

—Maureen Heffernan
Education Coordinator



USE YOUR GIS

Using the Gardeners' Information Service is just one of the many benefits of membership in the American Horticultural Society. GIS can help find an elusive plant, suggest plants for special needs, diagnose a problem and find a cure, and track down other information sources.

AHS members can call GIS toll free, (800) 777-7931. Hours are 11 a.m. to 3 p.m. Eastern Time, Monday through Friday, except holidays.



NATIVES AT RISK



ALFRED SCHOTZ

Virginia Spirea

Spireas are old-fashioned garden plants. Most of the 100 or so species in the genus fall into one of two very different groups. The spring bloomers are fairly large shrubs with clusters of white flowers; the summer bloomers have flat pink or red flower clusters and may be low and compact or grow as tall as six feet.

The most popular garden spireas are native to Asia. Few garden manuals or wildflower books mention the Virginia spirea, a little-known family member that has been listed as threatened by the U.S. Fish and Wildlife Service since 1990.

Like its spring-blooming relatives, *Spiraea virginiana* can grow fairly large—reaching from two to 10 feet tall—and it produces clouds of fuzzy, creamy white flowers. But it breaks with tradition by blooming in June and July. Its inflorescence can be between four and eight inches wide.

G. R. Vasey collected the first specimens of this native spirea in the mountains of North Carolina in 1878, but the plant wasn't officially described until 1890 when C. F. Millsbaugh collected plants along the Monongahela River in West Virginia.



Today there are 24 populations of Virginia spirea growing along 23 stream systems in Georgia, Kentucky, North Carolina, Tennessee, Virginia, and West Virginia. Six other reported sites, including the northernmost in Fayette County, Pennsylvania, cannot now be located. Only three of the known populations of Virginia spirea are considered abundant, with at least 50 clumps. Thirteen locations have less than 10 clumps each.

One of the reasons for Virginia spirea's threatened status is its habitat requirements—this is one very fussy plant. It grows in a constantly changing environment along the scoured banks or edges of meandering streams. The spirea needs disturbance to colonize and thrive, but too much scouring or flooding can eliminate populations altogether. The scouring must be strong enough to keep the canopy open but still leave some small woody species.

S. virginiana doesn't compete well with other plants either. When it tangles with kudzu, poison ivy, Japanese knotweed, Japanese honeysuckle, ninebark, silky dogwood, hazel alder, and multiflora rose, it is often the loser.

The Virginia spirea's own reproductive system is also playing a role in its demise. The shrub produces a multitude of flowers and is visited by a variety of common insects, but it rarely produces seeds. And while most *Spiraea* seeds germinate readily, hundreds of seeds from this species collected from a Virginia site yielded only five seedlings. Plants spread clonally, but field observations haven't recorded any seedlings—most of the plant populations are very old with well-established root systems. Researchers believe that each of the 24 Virginia spirea populations represents a different genotype.

Federal, state, and private agencies are protecting many of the Virginia spirea's habitats, and researchers continue to study this complex native in hopes that understanding its behavior will help increase its numbers. —Mary Beth Wiesner
Managing Editor



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NATURAL CONNECTIONS



PRISCILLA CONNELL: PHOTONATS

The Loudmouth of the Woods

By Branley Allan Branson

If you live on the eastern half of the continent, you may be right on top of a creature you'll have only a few opportunities to meet: the 17-year locust.

Despite its common name, this bug isn't really a locust—it's a cicada. Locusts, the menace of biblical fame, are grasshoppers. Grasshoppers aren't closely related to cicadas, as you can see from their mouthparts. Grasshoppers' mouths are designed for chewing, while cicadas have long, jointed mouthparts for piercing plant tissues and sucking the juice out of them. The wings are also different and so are the life cycles.

It's the life cycle that makes the 17-year locust—or periodical cicada, as scientists usually call it—such an unusual insect. Periodical cicadas make up the genus *Magicicada*, which occurs only in North America and is variously analyzed as containing from three to

six species. The species have different ranges and different habitat preferences: some occur in lowland areas, while others prefer upland sites. In the North, periodical cicadas really do live up to their reputation: their life span is generally 17 years. Farther

south, they average about 13 years. Either way, *Magicicada* is by far the most long-lived of American insects. (It's true that some spiders live longer, but spiders are arachnids, not insects.)

Nearly all of that time is spent underground: periodical cicadas emerge only for the last few weeks of their lives. Different populations, or "broods," emerge in different years. In general, only one brood is present in any particular area, but neighboring broods may overlap in range if they emerge at least four years apart. Some broods cover vast areas of the country; others occupy less than 100 square miles. Fourteen 17-year broods and five 13-year broods are known to exist today.

If you ever witness the emergence of a brood, you'll probably never forget it. Enormous numbers of cicadas crawl out of the ground and for the next few weeks they dominate the landscape. Day and night, the males put up a buzzing din so loud it can sound like an army of chainsaws. The earth may be covered with shed skins—I was studying an emergence several years ago along the Tennessee-Georgia border and found shed skins in layers up to three inches thick. Later you may notice damage from feeding and egg laying, in the form of broken branches and twigs. Injured growth often succumbs to secondary fungal infections. This damage can be a serious problem for orchardists and it's something of a nuisance for homeowners, but it's of little ecological significance.

Magicicada eggs hatch a few days after they're laid in the bark of branches and twigs. Then the tiny white larvae drop to the ground, where they burrow along tree roots. They dig with a specially modified pair of back legs and with their beaklike mouthparts they suck sap from the roots. As they grow, molting every few years, they enlarge their burrows, digging to depths of over two feet. After their



fourth molt, when they're 10 to 12 years old, they become pupae. Unlike other insect pupae, cicada pupae continue to feed. Eventually, shortly before their emergence, they work their way back up to the surface.

At the surface, the pupae rest just beneath the litter. Sometimes they construct little nipplelike "chimneys" as exits from their tunnels. Then, as if summoned by some sorcerer, hundreds of thousands of them emerge during the course of a few nights in late May or early June. The scale of these emergences would do justice to a horror movie: it's estimated that there may be up to 10,000 cicadas in the soil beneath a single tree.

Once out of the soil, they climb into the trees. Some go no farther than a few inches up a trunk; others climb three or four yards. Then they clamp their spiny front legs onto the bark and stop. After several hours, the backs of the pupae split open and ever so slowly, the adult cicadas emerge. They seem almost reluctant to leave their shells, which may remain attached to the trees.

The new adults are soft and entirely white, except for their red eyes and a pair of black patches just behind the head. They can't fly yet, since their wings are merely tiny, crenulated pads. They're conspicuous and helpless, so they're vulnerable. Insect-eating birds gorge themselves during an emergence, as do other predators. I've even seen raccoons eating them.

But the adult body hardens quickly, while the wings unfold and spread over the back. The result is a striking insect, up to an inch and a quarter long. Its body is black or dark green with orange or red stripes and blotches. Its round head bears a pair of big orange or red compound eyes with three simple eyes in between them. Its transparent wings are supported by a network of orange and black veins.

By their first dawn, the cicadas are fully

formed, sexually mature adults ready to procreate the species. The mating ritual begins with a raucous serenade offered by the males. In their abdomens, the males have a sound organ made up of a set of ribbed tympanums connected to powerful muscles that cause them to vibrate. The result is a weird buzzing cacophony that can drown out virtually every other sound. Attracted by the nuptial racket, the females seek out their mates.

Soon after mating, the female begins to lay her eggs. She will probably choose a deciduous hardwood for this purpose. Oaks seem to be a favorite; conifers are usually avoided entirely. Once she has picked a site, she makes a series of incisions in a small branch or twig with her strong, pointed ovipositor and deposits a clutch of eggs in each slit. Then she moves to another twig and repeats the operation. Eventually, she will lay 600 to 800 eggs. To sustain herself, she will pierce the tree with her mouthparts to suck its sap. Unlike some other insects with extended larval stages, both male and female cicadas feed during their adult stage. But even so, theirs is only a brief fling in the world. They live just a month to six weeks.

Why should the periodical cicadas have developed their extraordinary longevity? After all, of the over 130 cicada species native to North America, none outside of *Magicicada* is known to live longer than two years; many live only one. Perhaps natural selection has been pushing them in that direction to reduce competition from other cicadas. Certainly, it would be very difficult for any predator to adjust to such an erratic menu. Whatever the reason, periodical cicadas remain a natural paradox: so rarely seen but overwhelming when they appear.

Branley Allan Branson is a biology professor at Eastern Kentucky University.



PRISCILLA CONNELL - PHOTONATS

Clear wings with orange and black veins help identify of the periodical cicada.

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PLANTING THE FUTURE

Minnesota Celebrates Its Children

By *Julie Kruse*

Nestled into the back yard of Minnesota Governor Arne Carlson is an enchanting garden with a special purpose—to attract and honor the state's children. The garden begins just outside the solarium of the Governor's Residence, a three-story brick mansion on St. Paul's historic Summit Avenue. A flagstone path circles a lily pond surrounded by ferns and wildflowers. The 300-foot path then leads guests along the edge of the grounds, through lush hosta and a rainbow of spring flowering bulbs, and past a lone redbud, four large American elms, two carved teak benches, and a bronze sculpture of a young boy riding a bicycle. The 40 varieties of perennials and wildflowers in the garden are clearly labeled with scientific and common names, making the tour educational as well as recreational.

Minnesota's First Lady Susan Carlson modeled the project after the White House Children's Garden, created by Lady Bird Johnson during her husband's last year in office. Susan Carlson envisioned a beautiful, serene place to reflect on the history of the grounds.

After two years of planning and fund raising, enough private donations were received to finally begin work on the garden. As horticulturist for the Governor's Residence, I worked closely with landscape architect Kevin Norby on the design and installation of the garden. Susan, Kevin, and I selected the plants specifically to interest the children who visit the garden.

The Governor's Residence Children's Garden was planted in the spring of 1993 and has been visited by more than a thousand children. They are delighted to find pincushion flowers, orange sneezeweed, butterfly weed, hen-and-chickens, and balloon flow-



COURTESY OF JULIE KRUSE

Jessica Carlson, 10, admires lilies in the children's garden.

ers—plants with amusing names, bright colors, and odd shapes. They also cluster around the lily pond to watch the goldfish and koi. Often the high point of a visit is searching among the greenery for the topiary monkey christened "Co Co" by the Carlsons' 10-year-old daughter Jessica.

The garden symbolizes the state's commitment to children and recognizes the children who have lived at the Governor's Residence. Built by Horace Hills Irvine in 1911, it was donated to the state in 1965 and has since

been home to six governors and first families. Along the flagstone path are large stones with plaques bearing the names of the children and their families.

At its July 1993 dedication Susan Carlson said the garden "will remind future governors of the commitment the state has to improving the lives of our children."

Julie Kruse is the horticulturist for the Minnesota Governor's Residence in St. Paul.



THE URBAN GARDENER



PETER LOEWER

The Moss Garden

By Peter Loewer

Back in 1907, Nina L. Marshall wrote the following tribute to mosses in her delightful book entitled *Mosses and Lichens*: “The blackened embers of the picnic fire are hidden with golden cord-mosses and the roadsides in the woods and the slopes to the lake are carpeted with sturdy hairy-caps. The crumbling roofs of deserted cottages and the unused well-sweep and old oaken bucket are decorated with soft tufts of green.”

I hesitate to mention this particular approach to gardening because so many Americans, when confronted with moss growing either in their garden or, heaven forbid, in the lawn, immediately call the county extension agent and attempt to kill it. They should not, but instead sit down and take it as an excuse not to mow the lawn.

There is a beautiful moss garden next door. It was created over many years by the late Doan Ogden, a brilliant landscape architect who, with his wife Rosemary, brought moss plugs from the nearby woods and slowly turned a 30- by 50-foot area that consisted of sparse grass and some large white oaks into a garden of contemplation that in-

spires visitors at all times of the year. The only maintenance needed is removing fallen leaves so that the moss does not go dormant from the lack of light.

But it's not necessary for moss gardens to be big; they can also be a world in miniature. Small rocks become mountains, and the mosses change from tiny plants to thickets of impenetrable green. The yellow blossoms of a tiny star grass (*Hypoxis hirsuta*) assume the proportions of the Liberty Bell.

Friends in the mountains of North Carolina created such a garden by collecting rocks from nearby walking tours and the mosses from an area eventually to be cleared for a pond and small botanical garden. There are a number of small hostas and small-flowered plants such as pinks (*Dianthus* spp.) and bluets (*Hedyotis purpurea*), but by far most of the plants in the garden are mosses.

Most mosses need shade because they have poorly developed water distribution systems and the hot sun can dry them out before water reaches thirsty cells. Haircap moss (*Polytrichum commune*) will grow in open fields, but in that environment the grass provides some protection and helps to collect and channel the morning dew to the mosses below. When mosses become dry, they fold up their leaves, which markedly changes their appearance. But once the plants have water again, the cells quickly swell and the mosses revert to their normal size.

Mosses reproduce by releasing spores from little containers called peristomes.



Looking at different peristomes—each genus has a design all its own—is like looking at a Paul Klee etching of Turkish minarets. These fanciful capsules are edged with teeth that vary from four to 64, always being in multiples of four. When the weather is damp, the teeth are closed tightly together; when it is dry, they open up and the spores are shaken to the winds like salt cast from a saltcellar.

Mosses can easily exist on bare rock. By

threading their rhizoids, or tiny roots, into microscopic pores in the rock's surface, they can remove elements for nutrition and eventually create soil. Even airborne dust is trapped by the leaves of the mosses and eventually combines with pieces of old and dehydrated plants to form dirt.

The following are mosses common to most temperate woods and not in any danger of extinction:

Andrea petrophila, the stone-loving andrea, was named in honor of the German naturalist and apothecary, G. R. Andreae. The species name is from *petra*, or rock. This plant grows best on granite or slate in shady, damp places. It is among the first colonizers to settle on these inhospitable surfaces.

Bartramia pomiformis, or apple moss, gets its species name, *pomum* (apple) and *forma* (form), from the plant's tiny spore cases, which look like little apples. The genus was named in honor of John Bartram, the great botanist from Pennsylvania. There are 13 known species of *Bartramia* in North America, most of which are found growing in rock clefts.

Dicranum longifolium, the fork moss, gets its generic name from the Greek word for flesh-hook or fork, referring to the unusual formation of the teeth on its spore case. The species name refers to the very long leaves. This moss is among 65 species of *Dicranum* in North America; at the turn of the century, six were found within the limits of New York City. Fork moss, however, grows only in high-altitude rocky regions and is sometimes found at the bases of trees.

Hypnum triquetrum, the triangular wood-reveller, makes an excellent plant for a moss garden. The common name is the English translation for the Greek generic name, and *triquetrum* refers to the shape of the stems. This particular moss will grow with luxuriant delight only on wood.

Hypnum crista-castrensis, the ostrich-plume feather moss, is so called because the plants are plumelike. The Greek term *hypnum* suggests that these mosses were once believed to be helpful in promoting



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sleep; the species name refers to the shape of the branches. The spore capsules are large, curved, and held horizontally. This bright yellow-green moss is common in mountainous regions and grows on soil or rotten wood.

H. splendens, the arched feather moss, is a beautiful combination of gold and green leaves on reddish stems. This splendid plant is common on rocks in the deep woods and on nearby fallen stumps or rotten logs. Miss Marshall wrote of them: "Glittering with yellow, red and green,/ As o'er the moss, with playful glide,/ The sunbeams dance from side to side."

Leucobryum longifolium, the pincushion moss, looks so much like a pincushion that little imagination was needed to come up with the name. The generic name is Greek for "white moss," which refers to the unusual pallid green color. Plants look pale because the cells containing chlorophyll are surrounded by larger transparent cells that carry water and protect them from heat.

Polytrichum commune, the haircap moss, gets its name from *poly*, "many," and *trichum*, "hair." Pliny called this plant golden maiden-hair because of the golden gloss the leaves exhibit when dry. The fringed edge on the sporecaps is said to resemble a lady's tresses—hence the common name. Haircap moss has been used in lieu of expensive feathers to stuff pillows. It was the first plant to be recognized by early botanists as not having true flowers.

Thuidium delicatulum, the tiny cedar moss, was named for its close resemblance to a miniature cedar tree. (*Thuidium* is an ancient name for a resinous-bearing evergreen.) This moss was well known to Linnaeus, the great Swedish botanist who devised the binomial system for naming plants. He called it *delicatulum* because of its dainty appearance. Tiny cedar moss enjoys damp shady places and runs over stones, earth, and rotten logs.

Moss gardens are not for everyone. They require a delight in the small, in fact, a complete shunning of bravura—not to mention a shady spot beneath some tall trees. But for those gardeners inclined to create a world in miniature, the moss garden is the answer.

Peter Loewer is an editorial advisor and frequent contributor to American Horticulturist. This article was adapted with permission from his most recent book, The New Small Garden (Stackpole, 1994), available from the American Horticultural Society's Horticultural Book Service for \$17.95, softcover, plus \$2.50 for shipping and handling.

BOOK REVIEWS

Creating a Garden for the Senses

Jeff Cox. Abbeville Press, New York, 1993. 192 pages. 9¼" × 9¼". Color photographs. Publisher's price: hardcover, \$35. AHS member price: \$31.50.

Anyone who has ever stooped to drink in the spicy-sweet scent of a clove pink or bent over to stroke the silky leaves of lamb's-ears knows that there is far more to a garden than meets the eye. Gardens appeal to all our senses if we let them, and this book aims to open us up to the richness of the garden's sensory appeal.

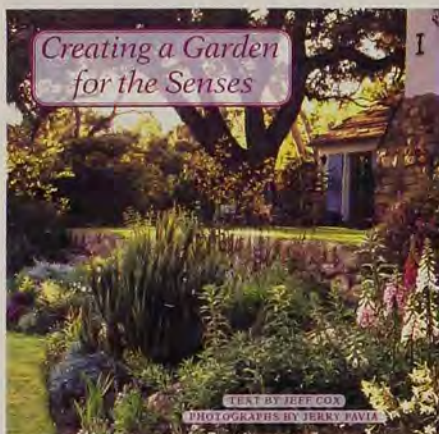
"A garden is a picture people can move through," declares author Jeff Cox. "How much more enjoyable is the garden experience when the visitor is always being surprised by the way the garden anticipates and fulfills the subconscious desires of the senses!" Cox's message is that a much richer experience awaits those who learn to appreciate subtleties of color, form, scent, and texture, and who are open to exploring sound and flavor.

The evocative images that accompany the text are the work of Jerry Pavia, one of our foremost garden photographers. His photos shimmer with light and feeling, and capture eloquently the sensual qualities of plants.

The book devotes a section to each sense, beginning with sight. Cox's analysis of color covers not only pigments but perceptions. We learn, for instance, why flower colors seem to change with the weather and the time of day. We're introduced to traditional color theory, which sees design in terms of complementary or contrasting colors, shades of a single color, or a mixed palette. We learn about other ways to work with color too, like linking colors to musical notes, or using color to express



particular moods. Not everyone will want to choose a mood for the garden based on a favorite film, as Cox suggests, but we can all profit from his advice to take note of color combinations that appeal to us wherever we find them. Cox also stresses the



importance of foliage color, and explains how to compose with other visual qualities, like form and line.

The section on smell explores fragrance in different parts of plants—flowers, foliage, roots, and bark. Cox also describes some of the best plants for fragrance. I found myself wishing for a closer correlation of text and photos here, and more detail. I wanted to see one of the jasmines described so lovingly in the text; I wanted a list of fragrant rose varieties. Still, I was sufficiently inspired to go out into my own garden, put my nose to the ground, and search for subtle scents I hadn't noticed before.

Touch is the sense we use least in the garden, says Cox. All plants have texture in a visual sense, whether they're feathery and delicate, or sleek and sculptural. But some leaves and flowers just beg to be touched. They can be soft and silky, hairy or fuzzy, smooth and waxy, puckered and quilted, thick and leathery, sharp and prickly. We are reminded, too, of the textures underfoot when we walk barefoot through the garden. Visitors will be encouraged to use their sense

of touch if they find an assortment of interesting textures within reach of a path, dangling overhead, or next to a patio.

Sound is a constant presence in the garden as well. Consider wind blowing through pines, or ornamental grasses

whispering and rustling in a passing breeze. The songs of birds, the buzzing of insects, and the trickling of water can contribute to the music of the garden as well. For those willing to pursue the natural through the artificial, a pool liner and a recirculating pump can be used to bring a waterfall into the garden.

Taste, of course, is the realm of the vegetable gardener. Cox attempts to extend the possibilities of the vegetable patch by suggesting that some ornamentals have a place in the plot, and by dwelling on the ornamental virtues of edible plants. He also offers guidelines on designing with edible plants.

Finally, we are urged to use our sixth sense—the intuition that can guide us through life if we let it. There is a place for intuition, too, in choosing and caring for plants.

The book suffers from a few editorial glitches. Some of Pavia's photos are cropped in a way that removes plants mentioned in the captions, and the text and photos are not always closely enough related for my taste. But even so, *Creating a Garden for the Senses* can help us add new dimensions to our gardening: if we let our senses guide us, each of us can create our own version of Paradise. —Anne Halpin

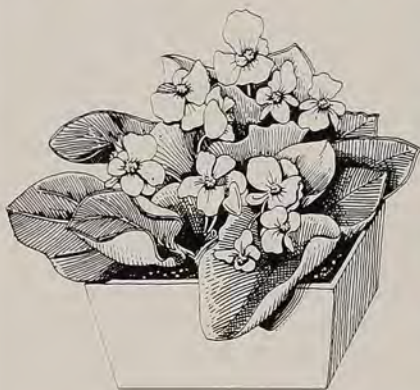
Anne Halpin, an editor and professional gardener, is the author of *Great Gardens From Everyday Plants* and several other books.

The Lawn: A History of an American Obsession

Virginia Scott Jenkins. Smithsonian Institution Press, Washington, D.C., 1994. 246 pages. 6" × 9". Black-and-white photographs and drawings. Publisher's price: softcover, \$14.95. AHS member price: \$13.85.

Virginia Scott Jenkins's "History of an American Obsession" may prove as significant a work as *Silent Spring*, Rachel Carson's seminal study of the environmental effects of pesticides. Carson cured

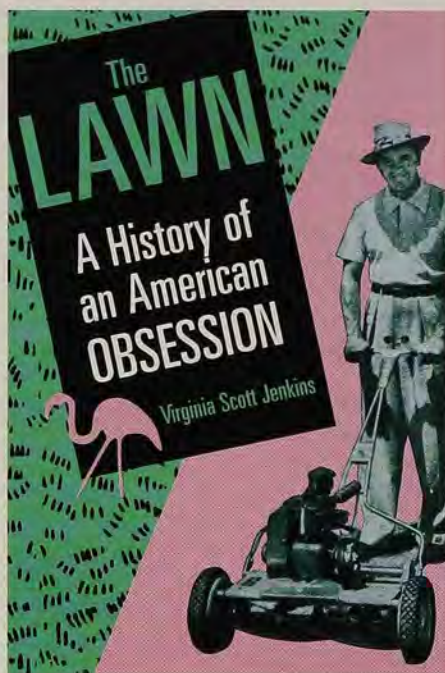
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Americans of a naive enthusiasm for pesticides; Jenkins is out to change our attitudes toward the unnatural world of the lawn. Her long-overdue history is an exhaustive—and shocking—study of the intricate web of influences that created this cultural juggernaut.

The Lawn challenges us to understand where we went wrong. What led us from the pastoral ideals of our colonial gentry to an obsession that now appears to tolerate almost any degree of environmental degradation and financial outlay?

Today, over 45 million lawns cover 30 million acres of the American landscape. Lawn maintenance in 1988 cost 5.3 billion dollars, excluding the costs of the 60,000 lawn mower injuries treated annually in emergency rooms. According to Environmental Protection Agency estimates, over 70 million pounds of chemicals are dumped onto lawns every year, and prodigious quantities of water are diverted to keep the grass green. Here in the Washington, D.C., area, for instance, about 10,000 gallons of water are expended on every 1,000 square feet of grass. On a national level, lawn irrigation is one of the reasons our aquifers and rivers are suffering.

How did it happen? The players in America's unique lawn drama are many and varied. First, we find Washington and Jefferson attempting to establish an English bucolic vision on American soil—with Mount Vernon serving as a paradigm for the emerging nation.

At the beginning of this century, the "City Beautiful Movement" encouraged wealthier homeowners to develop showcase properties for the aesthetic enlighten-

ment of their social inferiors: the lawn became "democratized" by being absorbed into middle-class values.

Contemporary expositions and gardening contests furthered the role of the lawn as a central element in the landscape. The U.S. Department of Agriculture (USDA) began preaching the virtues of turf monoculture, setting a standard nearly impossible to attain—until the chemical revolution of more recent decades.

Another promoter of the lawn ideology was the U.S. Golf Association (USGA). As early as 1917, the USGA had begun to collaborate with the USDA. By 1950, the USGA had spent hundreds of thousands of dollars on its own grass research. The result was an intimate linkage of golfing and lawns, as American males sought to bring a bit of the fairway home. Golf courses and lawns grew in popularity together. About 1,000 golf courses were built in 1964 and 1965 alone, and during the early 1960s, half a million lawns were being developed annually. By 1975, America boasted 11,000 golf courses with 14 million golfers on them.

A lawn care industry rapidly grew up around consumer demand. Hand mowers, then power mowers were presented as the means of realizing the new ideal. Mowing was soon supplemented with a more sinister method: chemical warfare. By the 1920s, arsenate of lead and organic and inorganic mercuries were part of the lawn care arsenal. In the post-war era, DDT was touted as the "atomic bomb of the insect world." Chlordane and 2,4-D joined the cadre later on.

Through its ads in magazines, trade cards (a kind of 19th century flyer), direct mail catalogs, and the electronic media, the lawn care industry seduced Americans to the call of the not-so-wild. The message was that a house was not a home without a velvety front lawn and that "good lawns make for good neighbors." Lawn care was also presented in martial terms: we were "battling pests" and declaring "war on weeds." (It's interesting to note that much of the key research on turf management was conducted in Arlington, Virginia, on a site now occupied by the Pentagon.)

With *The Lawn*, Jenkins brings us to a turning point in the history of our landscape. Can the multi-billion dollar lawn care industry be reconciled with growing pressures for water conservation, air pollution control, and environmentally sound pest management? What will the costs be if we continue to pave our nation with turf? Already, many Americans are replacing parts of their lawns with trees, mulch islands, xeriscape designs, and sweeping perennial borders. This may be the

future—or just a passing trend. Perhaps the real battle for—or against—the American lawn has just begun. —Joseph Keyser

Former AHS program director Joseph Keyser wages war on grass as an environmental specialist for Montgomery County, Maryland.

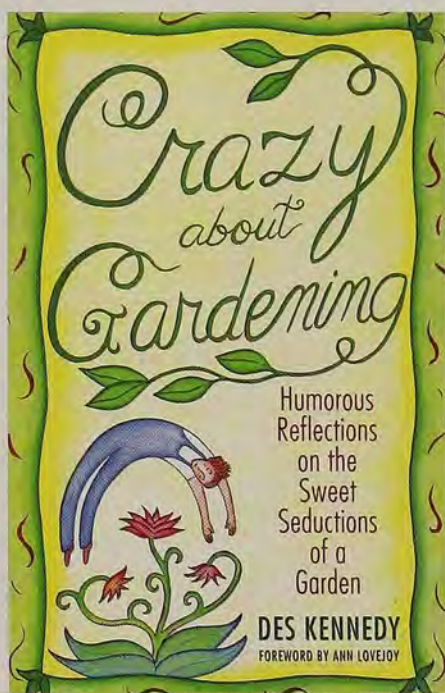
Crazy About Gardening.

Des Kennedy. *Alaska Northwest Books, Seattle, Washington, 1994. 282 pages. 5 1/4" x 8 1/4" Publisher's price: softcover, \$14.95. AHS member price: \$13.85.*

During summer's dog days, even those of us who don't log any literal beach time adopt a beach mentality. In reading matter, like our wardrobe and dinner menus, nothing heavy will do. I would never before have considered packing a gardening book along to the shore, but that was before I discovered Des Kennedy.

Now Fred McGourty and Peter Loewer are pretty funny guys, but they're always so determined to teach me something, cramming their books full of information on the best hosta cultivars or how to properly care for an angraecoid. An experienced gardener might safely reach the end of *Crazy About Gardening* without picking up a shred of useful information. What readers will find instead are the sort of observations that make us shake our heads in recognition of other gardeners and ourselves. Sometimes the shaking extends to the full body hee-haws that, if you read in bed like I do, verge on awakening a sleeping spouse.

But what is Kennedy funny about? you



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might well ask. Let's take the first chapter, "Gardeners." Herein he takes on gardening as an addiction, gardening with a spouse, garden snobs, overly generous neighbors, and garden tours. He suggests that gardeners who specialize in a certain kind of plant come to resemble it, the way pet owners are said to look like their pets. "Alpine gardeners gradually shrinking into wizened little characters with brilliant smiles and tiny, glittering eyes. Iris fanciers who, even while wearing the most sensible of outfits, seems to be walking in elegant procession down the central aisle of Westminster Abbey. Do all gladiolus growers wear Hawaiian shirts and drink too much?" This is not a convergence I have noticed but I'll be on the alert, in case this season's fascination with vines may be making me less squat.

This is not to imply that Kennedy shies away from weighty topics. In "Time," he analyzes the circular nature of gardening time, as opposed to the linear nature of the work week (like a sweep-hand watch versus a digital model) and the way that mortality stalks the garden. "And there it is in stark black and white: it is our own death that we see in the leaf-strewn soil. This isn't Harlequin, it's Bergman. The grim reaper stands at your doorway holding his scythe (which looks remarkably like the one you loaned to someone last year and never got back)."

Kennedy and his wife are back-to-the-landers right out of the '70s, which sets up situations destined for sit-com scenarios, such as compost toilets and a bicycle-powered water pump. Not surprisingly, he's attuned to environmental concerns and trots out many well-worn statistics on topics like landfills and water use. But about the time his lectures are getting stale he opens a window. "One of the perks of becoming a water-wise gardener yourself is that it allows you to flounce around town with a tremendously inflated sense of moral superiority," he observes. But to the reformed, whether smoker or water-profligate gardener, temptation is

always at hand. "Just one" herbaceous peony leads to an insatiable ligularia, and then it's lust for a *Gunnera chilensis*, "consuming water by the tanker load. With self-discipline fled, self-respect soon follows, and in no time at all, the water-wise garden is undone."

Now and then, the reader may be baffled by an un-American spelling or turn of phrase from this British Columbian, such as "hose pipe" for garden hose. But if you don't begin to feel that Kennedy is someone you've known for years, you'll at least suspect that he's been peering over the fence during your most intimate moments in the flower bed. —Kathleen Fisher

Kathleen Fisher is editor of American Horticulturist.

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Avian Gardener

He applied all his professional skills to his home landscape. Then he realized: it was sterile.

B Y R I C H A R D D E V I N E

One of my earliest encounters with birds was a memorable, though not so pleasant, experience as a boy of 10 or so. I was wandering the woods near my home when I noticed a nest high in an oak tree. Anxious to see what

was in it, I started to climb. About halfway up I felt a sharp pain on the top of my head. Before I was sure of the cause, the furious mother blue jay struck me again. I half jumped, half fell back to the base of the tree where I sat rubbing my head, watching the angry bird fly back to its nest.

Growing up on Long Island, I witnessed those woods slowly disappear as development progressed, and it became increasingly difficult to watch birds in their natural surroundings.

"Progress" has become synonymous with the destruction of native habitats, such as that of the scrub jay where I now live in Florida. The scrub jay is endemic to the scrub habitats of the Lake Wales Ridge, a strip of high, well-drained sandy soil that runs down the center of the Florida peninsula. Unfortunately, this land is highly prized by humans, both for homes and citrus groves. Only 10 percent of the scrub remains, and the scrub jay has been brought nearly to the brink of extinction. Likewise, the loss of North American forests to development is thought to be the reason for the three percent decline in songbirds since the 1970s.

One way to protect our ecosystems is to incorporate them into our developments, from 50-acre subdivisions to quarter-acre lots, leaving natural corridors



RICHARD DEVINE

Opposite: Pileated woodpeckers are shy birds that seek the privacy of deep woods. Above: Birds appreciate a water source, like this basin the author formed from leftover concrete. He and his wife planted around this fallen turkey oak to create an enriched habitat for woodpeckers and chickadees.



DOING THE BAT STROKE?

Among the winged creatures attracted to Richard Devine's yard are bats, which skim along the surface of his swimming pool. The experience isn't an unusual one, according to Heidi Hughes, education director of the Rockville, Maryland-based American Bat Conservation Society. "I got a frantic call from the Rockville Swim Club last year saying that an orange bat was attacking everyone in the pool. They said, 'We're sure it's rabid and we got everyone out.'"

Hughes said that most bat species, including the red bat that had frightened the swimmers, get their drinking water "on the fly," and a lap-length pool is ideal. "It's really a wonder that more of them don't drown, and sometimes the baby bats, who are just learning to fly, do." They are not harmed by chlorine, which most of us consume in municipal drinking water, she noted.

Baby bats in particular are unlikely to be frightened away by the presence of humans, Hughes went on, and in fact have reason to be drawn to a populated pool. "The carbon dioxide we're exhaling draws mosquitos and gnats and the bats go after the bugs."

So the bat disrupting your pool party could be thirsty or hungry or both. But one thing you can be absolutely sure of is that it isn't rabid. "When bats are sick," emphasized Hughes, "they can't fly."

—Kathleen Fisher, Editor

not only for birds but for other forms of wildlife. Of critical importance to neotropical songbirds is almost unbroken forest between their breeding grounds in North America and their wintering grounds, primarily in Central America.

Two ways to provide such habitat are to clear no more space than we must when developing, and to replace as much of the denuded landscape as possible with native trees, shrubs, and forbs. I've been involved in both. As head gardener of an estate in north central Florida, I work with wooded natural areas; at home, I've begun to restore vegetation lost to development.

The estate where I work is a 5,000-acre thoroughbred horse farm nestled in what remains of the vast upland forests that covered the southeastern coastal plain. It's a transition zone of moisture-retentive sandy-loamy soils, where northern deciduous hardwoods and subtropical evergreens compete for dominance. Here canopy trees such as pignut hickories, white ashes, and shumard's red oaks vie for headroom with southern magnolias, cabbage palms, and magnificent 200-year-old live oaks. The understory is filled with dogwoods, redbuds, hornbeams, and ironwoods, while coontie (*Zamia* spp.), bluestem palmetto, and partridgeberry fill ground-level spaces. From a horticultural point of view, the area is unique, offering the opportunity to grow temperate and subtropical plants side by side.

Surrounding the farm is a crazy quilt of habitats—freshwater ponds, hydric hammocks, pine flatwoods, scrub and sandhill communities, with abrupt changes from xeric to hydric conditions. Pine flatwoods

are probably the most common terrestrial ecosystem in Florida, surrounding and merging with all other ecosystems. It's flat, well-drained terrain, composed largely of longleaf and slash pine over an understory layer of saw palmetto, gallberry (*Ilex glabra*), dwarf huckleberry, and tarflower (*Befaria racemosa*).

Hydric hammocks—a type of wet temperate forest—are for me the most interesting. In our area, they contain a rich mix of evergreen and deciduous trees and shrubs over a ground cover of temperate and tropic ferns. Hammocks can be found in moist bottomlands between higher and drier sandhill and scrub communities. These latter two ecosystems have similar soils. But sandhill areas are characterized by deciduous oaks, longleaf pines, and grasses in an open woodland, while scrub habitats are dominated by a dense mix of evergreen oaks over mostly bare sand.

The forest on the farm is fragmented, but much remains intact around rolling pastures grazed by cattle and race horses. Little touched except for a few winding paths, its old-growth character is evident in the regular appearance of pileated woodpeckers, shy birds that prefer the cover of deep woods. During wet summers, storm runoff creates small streams that wind through the hammocks past American hollies, sweetbay magnolias, and loblolly bays, disappearing underground in places and emerging again before spilling into isolated ponds formed from age-old sinkholes.

While exploring one of these ponds, I came across the endangered ladies'-tresses orchid, *Spiranthes praecox*, with its tiny



RICHARD DEVINE

white flowers spiraling up a stem eight to 12 inches long. On another trek, I found a clearing filled with lush swamp fern (*Blechnum serrulatum*) and Jack-in-the-pulpit (*Arisaema triphyllum*).

My home, by contrast, is in a residential development not far from the Gulf of Mexico, on land that once formed a sandhill habitat. It is flat, sandy, somewhat xeric terrain, with a canopy of slash and longleaf pines towering above an understory of mixed evergreen and deciduous oaks. Natural sandhill ground cover consists mostly of wiregrass (*Aristida stricta*), but with the suppression of fires, this has thinned and oaks have taken over.

Our half-acre was entirely cleared by the builder, so little of the native vegetation remained when my wife and I moved in 15 years ago. To make matters worse, my idea of landscaping at that time conformed to



the traditional principles of neat clipped hedges, exotic plants, and lots of grass.

Then I realized that not only was I discouraging birds and other animals from returning—the opposite of my intent—but I was creating a lot of unnecessary work for myself. The gardens may have looked attractive, but they were sterile.

When I was hired more than 17 years ago to develop and maintain the grounds of the estate, I was allowed a great deal of freedom. The owners provided only broad direction, seeking above all to preserve as much of the natural surroundings as possible. The details were left to me. They encouraged experimentation and were understanding and remarkably tolerant of the many mistakes I made along the way.

Searching for a solution to my personal landscape dilemma, I began to note the examples before me every day—the natu-

The grounds of the estate where the author works, above, merge gradually from managed beds to natural woods. The red-winged blackbird, top right, is a year-round Florida resident, while the cedar waxwing, bottom right, is a “snowbird” that winters there and flies north in spring. Understory plants in the north Florida woods range from temperate trees like dogwood and redbud to subtropicals like coontie, middle right.



VALORIE HODGSON, PHOTO/NATS



ANITA SABARESE



ROB SIMPSON

FRIENDLY NATIVES

Richard Devine is luckier than most of us in having a 5,000-acre "garden." Most of the estate on which he works has been left natural. Here is a short list of the American native plants occurring on or introduced to the property.

Botanical Name	Common Name	Native Range
Herbaceous Ornamentals		
<i>Blechnum serrulatum</i>	Swamp fern	Continent-wide
<i>Coreopsis gladiata</i>	Glades coreopsis	Deep South
<i>Crinum americanum</i>	Crinum lily	Gulf states
<i>Liatris chapmanii</i>	Blazing-star	Florida
<i>Muhlenbergia capillaris</i>	Muhly grass	Southeast, South-Central
<i>Penstemon multiflorus</i>	Beard-tongue	Georgia, Florida
<i>Phlox divaricata</i>	Woodland phlox	East of the Mississippi
<i>Ruellia caroliniensis</i>	Wild petunia	Mid-Atlantic, Southeast
<i>Salvia coccinea</i>	Tropical sage	Southeast, Texas
<i>Solidago odora</i> var. <i>chapmanii</i>	Goldenrod	Georgia, Florida
<i>Spartina bakeri</i>	Sand cordgrass	South Carolina to Florida
<i>Spigelia marilandica</i>	Indian pink	Southeast, Gulf states
<i>Stokesia laevis</i>	Stoke's aster	Southeast
<i>Woodwardia areolata</i>	Netted chain fern	East Coast, Gulf states
<i>Yucca filamentosa</i>	Beargrass	Southeast, Gulf states
Shrubs		
<i>Befaria racemosa</i>	Tarflower	Georgia, Florida
<i>Calycanthus floridus</i>	Sweet shrub	Southeast
<i>Ceanothus americanus</i>	New Jersey tea	East, Midwest
<i>Hibiscus coccineus</i>	Scarlet hibiscus	Georgia, Florida
<i>Ilex vomitoria</i>	Yaupon holly	Mid-Atlantic, Southeast
<i>Itea virginica</i>	Virginia willow	Mid-Atlantic, Southeast
<i>Leucothoe axillaris</i>	Doghobble	Mid-Atlantic, Southeast
<i>Myrica cerifera</i>	Wax myrtle	Coastal—Maryland to Texas
<i>Rhododendron austrinum</i>	Flame azalea	Georgia to Mississippi
<i>Vaccinium darrowi</i>	Blueberry	Deep South
<i>Viburnum obovatum</i>	Walter's viburnum	Deep South
Trees		
<i>Celtis laevigata</i>	Hackberry	Southeast
<i>Cercis canadensis</i>	Redbud	Mid-Atlantic, Southeast, Texas
<i>Chionanthus virginica</i>	Fringe tree	Mid-Atlantic, Southeast, Texas
<i>Cyrilla racemiflora</i>	Titi	Southeast
<i>Magnolia grandiflora</i>	Southern magnolia	Southeast, Texas
<i>Serenoa repens</i>	Saw palmetto	Deep South, Gulf states
<i>Styrax americanus</i>	Storax	Southeast

ral beauty and simplicity of the farm's wild areas—and those observations gradually transformed my view of the function of landscaping. I realized it wasn't enough just to fill a site with beautiful plants arranged in some artistic pattern.

Literature searches uncovered sources for further ideas. I found support in books like *Bold Romantic Gardens* by Wolfgang Oehme, James van Sweden, and Susan Rademacher Frey, *The Natural Garden* and *The Natural Shade Garden* by Ken



CHARLES STEINMETZ/PHOTONATS

Druse, and *Gardening With Native Wild Flowers* by Samuel B. Jones and Leonard E. Foote. I joined the Nature Conservancy, the American Forestry Association, and the National Wildflower Research Center. My library swelled as I bought reference manuals on native plants of my region.

Thus redirected and a bit more knowledgeable, I was ready to take the first step in attracting birds back to my yard—identifying birds that appear naturally in the area. Some, like cardinals, bluebirds, nuthatches, and red-winged blackbirds, are Florida residents, moving very little in the course of a year. Others, such as white-throated sparrows and blue grosbeaks, are migratory, just refueling here on their long journeys north and south. Goldfinches, cedar waxwings, purple finches, and other "snowbirds" winter here and return north in spring, while others that spend the winter in Central and South America take up residence here in the summer.

The next step—providing the right plants to accommodate the birds—was a bit more complex. I knew I had to begin with an inventory of the existing vegetation, but I was still unfamiliar with many of the native plants. I was helped with that through membership in the Florida Native Plant Society and their annual field trips. One such trip last spring was to one of the last remaining scrub habitats in south central Florida. There I learned from researchers at the Archbold Biological Station in Lake Placid about the scrub jay's depen-

USEFUL IMMIGRANTS

There is currently a great deal of handwringing over the notion that the enthusiasm for natives has gone too far. But all evidence indicates that the purists among American gardeners are few in number. As Richard Devine says on page 24, he will frequently choose an exotic for an intensively managed bed if it meets aesthetic requirements and performs well under existing conditions. In Florida, that can include subtropicals—"house plants" for the rest of us. Here are a few of the exotics he incorporates with natives and their countries of origin.

Botanical Name	Common Name	Origin
Herbaceous Ornamentals		
<i>Agapanthus africanus</i>	Lily-of-the-Nile	South Africa
<i>Asparagus sprengeri</i>	Asparagus fern	South Africa
<i>Begonia coccinea</i>	Angel-wing begonia	Brazil
<i>Clivia miniata</i>	Kaffir lily	South Africa
<i>Cortaderia selloana</i>	Pampas grass	Argentina
<i>Crocasmia 'Lucifer'</i>	Montbretia	South Africa
<i>Cuphea hyssopifolia</i>	Mexican heather	Mexico
<i>Dietes bicolor, D. vegeta</i>	African iris	South Africa
<i>Eucharis amazonica</i>	Amazon lily	Colombia
<i>Hedera helix</i>	English ivy	Eurasia
<i>Hosta plantaginea</i>	Hosta	China, Japan
<i>Liriope muscari</i>	Monkey grass	China, Japan
<i>Maranta leuconeura</i>	Prayer plant	Brazil
<i>Miscanthus sinensis</i>	Zebra grass	East Asia
<i>Ophiopogon japonicus</i>	Mondo grass	Japan
<i>Pachysandra terminalis</i>	Japanese spurge	Japan
<i>Pennisetum setaceum</i>	Fountain grass	Africa
<i>Phaius tankervilleae</i>	Nun's orchid	Himalayas
<i>Plumbago capensis</i>	Plumbago	South Africa
<i>Salvia leucantha 'Emerald'</i>	Mexican bush salvia	Mexico
<i>Spathiphyllum</i> spp.	Spathe flower	South America

Trees and Shrubs

<i>Abelia grandiflora</i>	Glossy abelia	China
<i>Camellia sasanqua</i>	Japanese camellia	Japan
<i>Hydrangea macrophylla</i>	French hydrangea	Japan
<i>Magnolia soulangeana</i>	Saucer magnolia	China
<i>Pittosporum tobira</i>	Japanese pittosporum	China, Japan
<i>Raphiolepis indica</i>	Indian hawthorne	South China



The scrub jay, native to central Florida, has been brought nearly to extinction by development.

dence on fire. Fires started by lightning, it appears, prevent vegetative succession, which allows the birds to move about and rear their young but still find protection from predators.

As I developed a sense of the plant communities that existed here for thousands of years, I began to see what I needed to do to preserve habitat on the farm. And the attention I paid to preserving and enhancing the farm grounds helped me start transforming my home landscape.

About nine years ago, when I was still a traditional landscaper, my wife and I planted some Leyland cypresses (*Cupressocyparis leylandii*) along our back border for privacy. By now most are 12 to 15 feet high and six to eight feet wide. Though not native, they have proven to be an asset, since birds, especially cardinals and blue jays, love to hide among the branches. The rest of the border was filled with exotic shrubs such as Formosa azaleas, pyracantha, ligustrum, and junipers.

I could have ripped out all the exotics and replaced them with native plants, but that would have been costly and time-consuming. I wasn't trying to restore the original conditions, which would have been impossible anyway. Since we still had a lot of lawn, I decided that most of it could be replaced with enough natives to make birds

feel at home. Fortunately, my yard still had some native trees left. Scattered about were an American elm, a few dogwoods, a red-bud, a couple of slash pines (*Pinus elliotii*), a *Magnolia grandiflora*, and a laurel oak (*Quercus hemisphaerica*).

I had more freedom to use exotics at the farm because they formed a relatively minor part of the overall plant palette. The landscaping grades from informal but highly structured to completely natural. A lawn, which winds and flows for several hundred feet in connecting the main buildings, surrounds a number of planting beds and is itself surrounded by semi-natural woodlands filled with more than a thousand Formosa azaleas. Farther out, the

ATTRACTING HUMMERS

Two years ago I planted a bed of tropical sage (*Salvia coccinea*) outside my office, and many mornings as I arrive I'm greeted by one or more hummingbirds searching each flower for nectar.

While it's true that hummers prefer large solitary flowers with long floral tubes and are especially drawn to highly visible reds and oranges, they're also attracted to flowers that

break one or both of these rules. Every once in a while we see them flying from flower to flower in the rose garden. They even get into the greenhouses and fly up and down the aisles, searching for good nectar sources among the hanging baskets of impatiens, begonias, and bougainvilleas.

Seeing how hummers were attracted to *Salvia* at the farm, last year I scattered both tropical and autumn sage (*S. greggii*) throughout my more xeric sections, which are beginning to receive visits from ruby throats.

Other good hummingbird plants for us have been buckeye (*Aesculus* spp.), columbine (*Aquilegia* spp.), honeysuckle (*Lonicera* spp.), penstemon, and lobelia.

Lonicera sempervirens can be found growing wild along fence rows and roadsides. We planted a few to cover a dying tree stump near the edge of our property and they bloom almost year round if the weather is warm.

Penstemon multiflorus is an abundant native with erect stems and 15 to 25 white to light pink flowers in late spring or early summer. They're easy to germinate, so I've collected seed during field trips and propagated thousands, giving some to a teacher for his native plant nursery at school, others to a nearby state wildlife park, and setting the rest out both at the farm and at home. They're great for dry areas.

Lobelia cardinalis is the quintessential hummingbird plant, with 70 or 80 bright red flowers on stems to three feet high. Be sure to buy plants grown locally. A few years ago I bought seeds from out-of-state, and while they germinated, the plants never grew well or flowered. I've since purchased plants propagated from local sources and had much better luck.

—Richard Devine



A ruby-throated hummingbird sips from a fire pink (*Silene virginica*).

woodland becomes completely natural.

The more intensively managed beds are filled with what functions best. I first look for natives to fill the slot, but if I can't find the right one I use exotics that satisfy the aesthetic requirements while performing well under the same conditions. (See sidebar, page 23.) Less intensively managed areas contain more native plants, and the proportion increases until only natives are allowed in the outlying areas.

This gradual transition, along with the continuous canopy of live oaks and the irregular shape of the lawn, gives the whole property a natural look. Birds are ever present. In addition to the pileated woodpeckers, red shouldered hawks and great horned owls make regular appearances. In less inhabited parts of the farm, we see nesting bald eagles.

Although the farm and my home have

different natural plant communities, many of the same plants, such as slash pines, can be grown in each. Upland trees such as American elm (*Ulmus americana*), winged elm (*Ulmus alata*), ironwood (*Carpinus caroliniana*), and hackberry (*Celtis laevigata*)—which self sows with such determination at the farm we've even found it growing in an asphalt driveway—do well once established in sandhill areas. American beautyberry (*Callicarpa americana*), which springs up all over the farm's woodlands, is a prime source of winter food for mockingbirds, cardinals, wood thrushes, and robins. It's just as much at home on my xeric sandhill ground. So in many cases, I'm able to enrich my home grounds with plants started from seeds and cuttings and unwelcome volunteers from the farm.

My library research and my bird-watching at the farm convinced me I could supply food for birds at home almost year round with a variety of trees, shrubs, and flowers. Here is where natives really shine: our birds have evolved with them and know their cycles. I do set out some supplemental feeders, but I don't want the birds to rely on them since I know I'll sometimes forget to fill them, especially in bad weather.

When I look for food plants, I try to find candidates that will be useful in more than one season. Tulip trees (*Liriodendron tulipifera*), though not a prime food source for birds, do supply nectar to hummingbirds in the spring, and evening grosbeaks eat the seeds that develop later in the fall. The red cedar not only attracts warblers and finches, but adds some green to our usually drab winter garden.

Another attractive evergreen, a ground cover, is wild coffee (*Psychotria nervosa*). It can grow to four feet in a garden, but I haven't seen it over two feet in the woods. It has shiny dark green leaves with impressed veins, a profusion of tiny white flowers in spring and summer, and a myriad of bright red berries that begin coloring in October; cardinals and blue jays love them. I've been rooting cuttings at home to use under trees and shrubs.

Pines and oaks are important food sources for birds. Most of our longleaf pines, once dominant from southern New Jersey along the coast to east Texas, have been harvested for timber. But there are still extensive stands of slash pines almost to the southern tip of Florida. Abundant at the farm are live oak (*Quercus virginiana*), water oak (*Q. nigra*), and laurel oak. At home the dominant oaks are turkey (*Q.*



ROB SIMPSON



ROB AND MELISSA SIMPSON



JESSIE M. HARRIS



RICHARD DEVINE

laevis), bluejack (*Q. incana*), and sand live oak (*Q. geminata*).

Wildflowers allowed to go to seed are also good sources of fall and winter food for ground feeders like doves, quail, buntings, finches, and juncos. In a problem area at the farm once used as a vegetable garden and later as a lawn, we began some plantings of wildflowers a couple of years ago. They've worked out so well we've expanded the area into a roughly kidney-shaped meadow garden of almost 700 square feet. The garden begins to look a little unruly by November, when the last black-eyed Susan (*Rudbeckia fulgida*) has faded, but we try to leave the spent flower heads on as long as possible so the birds can pick through them for seeds. Before we cut everything down, I collect any leftover seeds to propagate. At home I plant these wildflower seedlings mostly as fillers be-

Birds like the brown thrasher, top, and the Carolina wren, left, like the protection of dense undergrowth where they can forage through leaf litter. In the undisturbed woods of his employer's estate the author has found rare plants like the endangered ladies'-tresses orchid, above. Wrens have built nests on the bookshelves in his office, right.

tween shrubs, where they add seasonal color and increase the fall food supply.

Cardinals love sunflower seeds, so we leave the plants scattered in the perennial garden when they've finished blooming. Indian blanket (*Gaillardia pulchella*), another good seed source, can look a little ratty when it dies back in fall, so we mix it with perennials like goldenrod (*Solidago nemoralis* and *S. odora* var. *chapmanii*), silk grass (*Pityopsis graminifolia*), or spiderwort (*Tradescantia ohioensis*) that will hide it when it hits the unkempt stage.

An appreciation of this messy look, like that for fine wine, is an acquired taste, and my wife is less tolerant of it than I am. We compromise by limiting it to outlying areas that I clean up in early winter.

Birds don't like prim and proper yards. The more plants, the better. When native trees and shrubs are planted thickly to-



RICHARD DEVINE

This pond, formerly used to exercise race horses, is now home to swans, ducks, and geese.

gether they draw insects, which in turn bring birds that eat them—often cavity-dwellers like woodpeckers, flickers, and martins. Carolina wrens and brown thrashers like dense undergrowth with lots of leaf litter for foraging.

At the farm we've noticed that many birds prefer to hunt for food under the large expanses of saw palmettos (*Serenoa repens*). The palms offer year-round protection from the elements and predators, allowing the birds to search for food among the fallen pine needles that form a natural mulch. These dense plantings also provide shelter and nesting spots.

Plants should be mixed to create a rich variety of canopy, understory, and ground cover. On the back of my property, I've been experimenting with some passion vines (*Passiflora incarnata*), allowing them to grow as they please on the Leyland cypresses. As a larval food for Gulf fritillaries, they not only encourage those butterflies to take up residence, but attract insect-feeding birds as well. The beautiful four-inch blue flowers are a bonus.

Not all birds are particular about their nesting requirements. I've watched Carolina wrens build nests on the bookshelves in my office or in hanging baskets on the back porch. But cavity nesters, such as woodpeckers, nuthatches, screech owls, and bluebirds, need fence posts or dead or dying trees. Bluebird populations in the eastern United States have declined nearly 90 percent over the past 50 years, in part because so much of our forests have been supplanted by "yards," whose owners zealously clear them of dead trees.

When a March 1993 storm blew down a turkey oak in our yard, we realized after much consternation about how to get rid of it that it would make a perfect addition to our wild garden. We cut it into a few large but picturesque sections, maneuvered them to a spot near the edge of the property, and planted around them. Now we have an enriched habitat for chickadees and red-headed woodpeckers.

Water is also an important part of a bird habitat. It offers a refreshing break for migrants and locals alike. Orioles like to nest near water, and running water is especially attractive to eastern phoebes and great crested flycatchers.

On the farm, in addition to the wet-season streams, are numerous hammocks and ponds. Some of the ponds are deep in the woods and filled with vegetation, while others are out in the open. Near the green-

house is one of the latter, a former exercise pond for race horses, some 500 feet across and 10 to 12 feet deep. I plan to surround it with fresh water plants to give more cover to the ducks, geese, and swans that now call it home.

You don't need anything this immense. Blue jays appreciate a shallow basin I made out of leftover concrete and placed near the fallen tree in my yard. Just turning on sprinklers always draws birds.

Though it wasn't our intent, our swimming pool attracts another winged creature: for the past six or seven summers, about five bats have been visiting the pool around dusk, swooping down and skimming its surface, presumably picking up a much-needed drink or searching for insects (see sidebar, page 20).

Wingless creatures are also attracted to these enhanced habitats. A pocket gopher has disfigured sections of the farm's lawn with a myriad of little mounds. The piles are easily knocked down and spread out, however, so it's only a minor inconvenience. There's been a slight increase in the number of snakes sighted, but most are harmless and help keep the rodent population in check.

Thus I've gone from installing tidy beds of Asian perennials to creating passion flower bowers and welcoming snakes. But can all of these native plants and dead trees really make a difference? Will they save a threatened species, or merely encourage more adaptable opportunists to drop by?

As individuals, we can do little to save the dwindling population of songbirds as long as our woodlands continue to shrink in size. Many songbirds are inhabitants of the deep forests, and need large unbroken expanses to protect them from predators that search wood margins. To ensure their survival, we need large preserves linked by greenways, shelterbelts, and wildlife corridors.

But the back yards of individual homeowners can give safe haven to migratory birds and other wildlife and have the effect of widening such corridors. If each of us practices responsible stewardship and removes no more of the tree cover than is absolutely necessary, or adds back some of the native flora that have been lost, we can collectively help slow the slide of songbirds and other creatures into extinction. Our reward will be enjoying their sight and sounds far into the future.

Richard Devine is a former orchid grower who lives in Crystal River, Florida.

A Great Notion in Grand Rapids

*Her city would have a conservatory, Betsy Borre vowed.
“That’s all there is to it.”*

BY MARGERY GUEST

Early next year, the Frederik Meijer Gardens in Grand Rapids, Michigan, which features the state’s largest conservatory, will open to the public. The campaign to fund it, surpassing its goal of \$13.6 million, has been called the most successful ever in the region. It began 12 years ago when one determined woman, a self-proclaimed garden club drop-out, dropped back in and galvanized the discouraged members of the West Michigan Horticultural Society.

Betsy Borre (pronounced BOR-ee) is a former teacher of children with mental disabilities, a lawyer’s wife, and the mother of three grown children. In the 1970s, she worked unsuccessfully to elect a Democratic candidate to the U.S. Senate and then as a coordinator on the 1980 Carter-Mondale election campaign. Working for Democrats in conservative Republican Grand Rapids may have tempered her mettle, but most important, it gave her an up-close look at fund-raising. She was fascinated by the process, and paid close attention to the campaigns’ paid consultants.

Borre says while she’s never had a spectacular garden, she’s always had plants, even if only some containers on a shelf. “I never studied botany, nothing like that,” she says. She credits her grandmother for instilling in her a special feeling for gardens. Mamie, as all the grandchildren called her, created a prize-winning garden in her yard in downtown Grand Rapids, complete with a pond and waterfall. During World War II, Borre’s physician father and photojournalist mother took her two



NICK TIMMER

Betsy Borre has planted the area around her private patio with Michigan natives.

younger brothers to live in Florida for six months, while the six-year-old girl was left with Mamie. When they returned, they continued to live with Mamie for nearly eight years.

During that time, Borre helped her grandmother tend her garden, starting with small responsibilities. “She always gave me pansies to plant. It’s a smart choice for a child because they’re very easy and you pick them and they come back. She bought them, but the understanding was

that I would care for them.”

This fundamental belief in the importance of caring for things was always at the heart of Borre’s vision for a Grand Rapids garden. From the beginning, she envisioned a public garden in Grand Rapids as a place where all children and adults could learn—especially those with disabilities. “The garden would be for everybody. That was always my agenda. Always. If that part hadn’t worked out, I wouldn’t have been so involved in this.”

TREES, SEASONS INSPIRE DESIGN

The focal point of the Frederik Meijer Gardens will be a 65-foot-high, 15,000 square-foot glass conservatory whose structural support is provided by concrete “trees.” Both Bob Olson, the architect, and David Nederveld, the landscape architect, had a strong desire to find an arresting, yet natural means of inviting the public from the parking lot into the building. They first conceived of an arbor, envisioning at the same time a high ceiling and a fairly grand space. Nederveld says something “just snapped.”

At first there was some doubt whether or not the tree forms could be used to support the building, but the structural engineer on the project rose to the challenge, working it all out with computer-aided design and juggling elements of some of the profiles, forms, and branch relationships until he could make it function. The public has already found the tree forms to be an exciting element of the garden. “The day they poured the first tree,” Nederveld says, “there was a big crowd watching.”

The four-foot-thick limestone walls of the main building are another unique architectural element. At the time of the summer solstice, the sun rises in alignment with one, and on the day of the winter solstice, it sets along that same wall, within fractions of a degree, according to Olson.

These elements are not only dramatic, say he and Nederveld, but provide additional opportunities for education. When visitors ask why these massive walls were placed at such seemingly odd angles or inquire about the tree forms supporting the main building, the answers lead naturally to a discussion of science and horticulture. Says Nederveld: “You can move very easily from a question about the solstice walls right into teaching about how the sun affects plant growth.”

The garden’s purpose, according to the West Michigan Horticultural Society, is to “provide a better understanding of Michigan’s natural environments and to encourage gardening and horticulture through instruction, demonstration, and display.”

The conservatory will be a subtropical garden under glass and will include a waterfall, pathways among ponds, and a wall of orchids, non-native ferns, and palms.

While visitors can learn about non-native habitats inside, the grounds will educate them about four distinct Michigan environments: ponds, woodlands, prairie, and marsh. Plans call for the development of some wooded trails, viewing bridges, and a number of natural, formal, and specialty gardens.

A sculpture garden will feature a collection of more than 40 bronze pieces by several artists, including Marshall Fredericks, an internationally known sculptor whose bronze work “Spirit of Detroit,” in front of the City-County Building, is one of the city’s most impressive art works. Many of the sculptures were designed exclusively for the garden. The sculptures were collected by local retailer Frederik Meijer, the garden’s major benefactor. Meijer recently retained the services of James van Sweden, a Grand Rapids native and partner in the Washington, D.C., landscape architecture firm Oehme and van Sweden, to design plans for incorporating the sculpture collection into the landscape.

A 100-year plan for the garden calls for two more major conservatories totalling 20,000 square feet, conventional greenhouses off the gallery for such specialty growing as bonsai and orchids, and a greenhouse classroom.

The garden has hired an executive director, J. Mark Jeter, a Texas native and previous conservatory curator for AmeriFlora ’92 in Columbus, Ohio.

—Margery Guest



The main structures of the Meijer Gardens curve to fit the site.

Bob Olson of Cox, Medendorp and Olson, the architect on the project, echoes that sentiment: “The philosophies established early on in terms of educational and handicapped issues were right on the table and Betsy believes in them very strongly.” Olson refers to Borre’s dogged insistence that the garden be barrier-free and affordable for people with low incomes. “Betsy wants inclusiveness. She wants it open and accessible to everyone. And she wanted that before it became popular to want it.” He notes that many supposedly public gardens around the country are not barrier-free and have steep admission fees.

Borre’s involvement in the garden began with a newspaper. One evening in 1981 this self-described “news junkie,” who remembers listening to Walter Winchell nightly with Mamie, picked up the local paper to read that Fort Wayne, Indiana (a city similar in size to Grand Rapids at slightly fewer than 200,000 residents), had constructed three glass conservatories in its downtown area. “That instant I said to myself, ‘If Fort Wayne can have that, we can have that. That’s all there is to it.’”

In that same paper, she saw another article inviting people to attend a slide show hosted by the West Michigan Horticultural Society. The group was attempting to raise money to build a conservatory in West Michigan. It was a freezing night in February, and Borre had written off garden clubs many years earlier. “I couldn’t take the rules,” she confides. But she dropped her paper and went. After the program, she paid her two dollars to join and offered to help the group raise money.

She laughs. “I quickly rose in the extremely small ranks. What we had was a group of about nine very dedicated gardeners who knew what they were doing in a garden, but didn’t know a whole lot about raising money for a project of this size.” Borre didn’t realize it, but at the same time that she was enthusiastically signing up with the West Michigan Horticultural Society, the group itself was at a point of great discouragement. Someone proposed that they take the small sum already raised, create a scholarship, and abandon any further attempts to interest the town in a conservatory.

“It looked like it was all over. Here we were at this table, lined up in two rows. Mostly men, but there was this one older woman. Her name is Ruth Esler and she’s very tiny, but she fought off that whole line of men across the table. She said,

Further information about the Frederik Meijer Gardens may be obtained from the West Michigan Horticultural Society, (616) 957-1580.



The focal point of the Grand Rapids conservatory will be concrete “trees,” shaped from steel rods covered with plywood. Eventually, 14 of them will support the area leading from a vestibule to the glass conservatory.



“You may want to give this idea up, but this can get done. I know it and I don’t want to give it up.” After the meeting, Borre offered Esler her support. “Betsy, we’re gonna do this,” Esler said. One of the men overheard them and offered to help. The three agreed to meet again and form a task force. As they walked out together, they argued about who should be president, a job none of them wanted. Borre lost.

“I’m not a president type, really,” she maintains. “But this situation needed real management—it needed goals and objectives and allocation of resources to get a job done.”

Borre began to think about who might be interested in helping. She didn’t seek out gardeners. From her past political experience, she knew she should talk to business people, CPAs, activists, lawyers—high-profile people with experience in making things happen. And her instincts told her this project should not be seen as a pretty place for garden club types to hang out, but rather as an important addition to public life in the city.

Among the people she talked to were Bob Olson, who had helped remodel the gray Victorian that serves as the Borre home and her husband Glen’s law office, and David Nederveld, who had been their landscape architect.

One year later, with Borre still president, the task force had those two and 24 other people on board. Most of them enjoyed gardening, but were not active in horticulture in any organized way. The West Michigan Horticultural Society membership had jumped to 50 members. They had a small amount of contributed money, a site selection committee, and a small grant for a slide show to introduce the project to an unknowing public.

Members of the site selection committee visited the Fort Wayne garden and took public garden side-trips during family vacations or business travel. The task force chose a downtown location—John Ball Park, the 140-acre home of the Grand Rapids zoo—as a possible conservatory site. The zoo director, who had just accepted a new position in Pittsburgh, loved the idea and they began to move forward. But his successor didn’t feel the same way, and plans stopped dead.

Finding a new site was a tall order considering the scope of the project. But Nederveld—Borre calls him “the mind and soul of this project”—continually reassured her that if the group could obtain a

new and valid free site, they'd have a legitimate project that could succeed.

After looking at 21 potential sites, beginning in 1983, everyone had the same favorite—120 acres of vacant land owned by the United Auto Workers (UAW). Although there was some commercial development around it, this acreage was untouched and encompassed four distinct natural habitats: prairie, woodlands, marsh, and a perched pond—one above the water table. But when the horticultural group called, the UAW informed them the land had just been sold to Meijer, Inc., a locally owned grocery and department store chain and one of Michigan's largest retailers.

It was early 1989 when the county suddenly offered 53 acres about eight miles from downtown. The task force eagerly accepted and dedicated the land.

Now began a concentrated push to present the project to the people. Borre and the others offered to appear at any club meeting that needed a speaker—garden clubs, libraries, Kiwanis, Rotary, the Chamber of Commerce. They stressed the benefits of a botanic garden to the community. Above all, it would be a place of learning. They tried to excite the public about the renaissance going on in conservatories—new ones were going up in San Antonio, Milwaukee, Fort Wayne, and Des Moines. Grand Rapids should have one too.

The next move was to conduct a professional feasibility study to determine whether the Grand Rapids donor community—individuals and companies with resources to donate large sums of money and a history of doing so—would actually contribute to such an enterprise. The \$8,500 study revealed that the donor community knew absolutely nothing about botanic gardens, conservatories, or the West Michigan Horticultural Society. In spite of the fact that the society now had over 300 members, \$45,000 in raised funds, and a grant from Michigan's Department of Natural Resources to begin architectural planning for the garden, it was clear that no capital fund drive could be started until they had a "lead donor"—someone with great resources and a high profile in the city—someone who would get behind the project with money, credibility, and stature. Who could it be?

Frederik Meijer was on the short list. The retired chief executive officer and son of the founder of Meijer, Inc. (pronounced MY-er), he was a frequent donor to public causes but had not been approached. It



NICK TIMMER

Borre and landscape architect David Nederveld talk details at the site of a 120-seat cafe.

A terrace for outdoor dining is also planned.

was decided that Borre should try to meet with him and pitch the garden story.

In October 1990 she called Meijer, Inc.'s vice president for community relations and was given the okay to make a presentation. They would meet in Meijer's office. In spite of being "extremely nervous that day," Borre got up the courage to ask Meijer to be the lead donor. "I asked for a capital gift and an equal size gift to an endowment. Then I asked him to be honorary chair to the capital campaign that would ensue. He agreed to everything."

During the meeting, Meijer mentioned he'd been collecting large pieces of sculpture, including some by Marshall Fredericks, a Michigan-based, internationally known sculptor, and André Harvey, a local sculptor known for creating large sculptures appealing to children. Meijer was

storing the sculptures in a pole barn on company property, hoping to someday find an appropriate site for them. Meijer envisioned a setting where children would be encouraged to touch them, even climb on them. That was in sync with Borre's own philosophy, and she quickly realized the sculptures could work well with the botanic garden. But Meijer didn't like the county land as a site for his sculptures. He would still make good on everything he'd agreed to, but he wouldn't put his sculptures there. For Borre, this translated to: he'd give his money but his heart would be elsewhere—still looking for a home for his sculptures. She needed to have Meijer's whole heart in the garden campaign, and she accepted his offer with the promise that the sculptures would be incorporated and the group would find a new site.

Borre isn't sure who finally realized that the originally favored site—the old UAW land—was now owned by Meijer, their lead donor. She peers over her glasses, and asks in a whisper, "Do you believe in fate?"

Meijer had tried a few years earlier to put one of his stores on the old UAW property but neighbors, concerned about heavy traffic and noise, halted his plans. Now he was considering selling the land, but he made Borre an offer: he'd donate 70 of the 120 acres to the garden. Everyone at the horticultural society was thrilled. A concerted public relations effort to make the neighbors part of the planning process brought them around as well.

But now the county's already dedicated land had to be refused. "What happened



then was very difficult for me,” Borre says. “It just went against my nature. It was like we were a couple at the altar and said, ‘We don’t.’ We had to write to every one of the county commissioners and tell them we couldn’t accept the land—we were changing our minds. Here’s this brand new, huge project that people are just beginning to understand and we appeared to be vacillating. We tried to do it nicely, but there was no nice way to do it, and the project took a dip it never quite recovered from.” By ending its partnership with county government, the group effectively cut itself off from public funding.

But while county officials may have been chagrined, the Grand Rapids Township was thrilled to host a 13-million-dollar public garden and in early 1992 quickly gave the plan the go-ahead. The task force began an earnest person-to-person solicitation of community members, offering \$1,000 founding memberships and \$500 charter memberships. “Not to buy bricks and mortar,” says Borre, “but to get us to the bricks and mortar.” They raised some \$30,000 this way, and the money-raising pump was primed.

Now that the garden is under construction, with the main building and the conservatory almost completed, Borre considers her work on the garden finished. She’s already mentally moved on. She and her husband plan an early October trip to Australia, and when she returns, she’ll begin working on a new goal: she wants to investigate earning a master’s degree in horticultural therapy, with the hope of

The main building of the Frederik Meijer Gardens, as seen from wetlands to the north. Fate seemed to lend a hand in obtaining the site.

someday using that skill with prisoners.

“The reason I love the idea of horticultural therapy is that it makes so much sense. In prisons, hardened criminals learn how to be care-takers and produce something beautiful. In hospitals, critically ill children learn to care for another living thing instead of always being taken care of. It’s just so hopeful.”

She hesitates slightly. “It’s the same kind of thing that happened to me when I was six and probably saved me—I was left behind for a while and separated for no apparent reason. I know how that feels. That’s the reason this is calling me so much.” Although Borre seems quite content to move on and watch the garden grow from a distance, Olson and Nederveld aren’t quite so comfortable.

“We’re a little frustrated that Betsy is

moving out of the picture,” says Olson. “We don’t want her in the back row. She should be given more credit—but she’s not seeking credit; she’s very modest.”

“And it wouldn’t even be underway without her, that’s for sure,” adds Nederveld. “The garden is becoming a very glamorous project, you know? There are new people just coming aboard at the present time who need to be educated as to what the original vision was. Even professionals. We would tell them, ‘This is barrier-free’ and they’d come back with a design that wasn’t at all barrier-free and when we’d object, they’d be incredulous. ‘You don’t mean *everywhere*, do you?’ they’d ask, and we’d say, ‘Yes, we mean everywhere.’”

Many of us have dreams. How was this one woman able to keep hers alive for 12 long years with all the hard work and discouragement a project like this encounters? Her two friends and fellow visionaries offer their thoughts. Says Olson: “Betsy is a very bright person. She’s just very, very smart. And she works at developing consensus rather than directing people to simply follow what she says. She’s not ego-driven. She says, ‘Let’s approach this as a group and the group will decide the best way to do things.’”

Nederveld adds that Borre also has sound judgment. “She knows when to talk to someone, when not to talk to someone, when to push, when not to push. She won Fred Meijer over in that meeting. And I think she had the insight to understand that for the garden to be successful, it would have to share the space with the sculptures, and that it would work.”

Borre seems unconcerned about whether or not she is forgotten, but is looking forward with delight to the garden’s opening to the public. Is the soon-to-open real garden at all like the one she first envisioned? “Exactly,” she says, nodding her head. “In the sense of it, the design of it, everything.”

It’s been a demanding 12-year journey, sometimes terrific fun, sometimes very difficult, but she doesn’t regret a moment of it. “You know,” she says, “looking back—it took a lot longer than I ever thought it would. And I played a much bigger role than I ever intended to.” Then she breaks into a broad smile. “But if there’s one thing I have confidence in, it’s that this is gonna be one heck of a garden. It really is.”

Margery Guest is a free-lance writer living in Grand Rapids.

For those who don't demand dinner-plate proportions in their flowers, an entire clan of suitable candidates awaits consideration in the *Agastache* tribe. In writing the New York Botanical Garden's *Encyclopedia of Horticulture*, Thomas Everett saw agastaches as most suited for use "in an informal semiwild state." But they're so easy to grow and they bloom for so long—throughout the summer and often until frost—that they deserve a more important place in the garden hierarchy.

Agastaches are robust perennials in the mint family (Labiatae or Lamiaceae), often aromatic, with triangular or oval leaves. Their branch tips taper into flowering spikes composed of tiered whorls of bracts bearing many small flowers. The Greek words "agan" and "stachys" translate as "many ears of wheat," a reference to the dense character of these floral clusters. They're unique among the mint family for flowering at their tips, since most of their relatives flower from axillary buds.

Except for a sole Asian representative, the 22 species of *Agastache* are exclusive to North America. Taxonomists have split the genus into two divisions, based on whether their stamens are crossed or parallel.

Of the eight species with parallel stamens (subdivision *Agastache*), four grow stiffly upright. One of these is the Asian species; the other three are found east of the Rocky Mountains. The remaining four have thinner stems that tend to flop over, but short basal internodes—the spaces between their leaves—make the plants look bushy. These grow naturally from our Northwest into British Columbia.

Of the 14 crossed-stamened agastaches (subdivision *Brittonastrum*), 11 are primarily erect, and all members of the subdivision are native to the Southwest.

Most of the agastaches are ornamental enough to grace our gardens, but few are available in the nursery trade. The most well-known is the sweetly scented anise hyssop (*A. foeniculum*), which originated as a prairie plant before migrating eastward. A member of the parallel-stamened subdivision, anise hyssop forms an erect candelabra up to three feet tall. The undersides of its three-inch-long oval leaves are covered in a white felt of near-microscopic hairs, and the four-inch tapering flower spike, composed of tightly packed whorls of pale violet calyces, produces a succession of tiny blue flowers throughout the summer. There is also a

After July- *Agastache*

*For the late summer blahs,
try these fragrant mint relatives.*

B Y J A C K H E N N I N G

white-flowered variety, 'Alabaster' (sometimes called 'Alba'), which has paler green foliage.

The amenable anise hyssop needs little more than a sunny, well-aerated site. In USDA Zone 6, it will occasionally die out during a cold winter, but will leave a prodigious legacy of seedlings in its wake. It doesn't seem to perform well as far south as Zone 9 because of its preference for cooler evenings. Cool spring temperatures give its new foliage a purple tint, an ephemeral trait that makes a good contrast with yellow-flowered spring bulbs. Once the pale lavender flowers appear, they call out for silver and white companions in a pastel garden scene.

Anise hyssop has long been valued for its aroma. In *The Complete Book of Herbs, Spices, and Condiments*, Carol Ann Rinzler explains that the scent is a mingling of two chemicals—anisaldehyde imparts a vanilla sweetness and pulegone gives it the bite of camphor. The combination is fen-

nel-like but unique, and so pervasive that it will flavor honey produced from bees feeding off the flowers. In fact, anise hyssop reached a zenith of popularity as a honey-flavoring plant just before the turn of the century. "It produces honey in the greatest abundance," H.A. Terry wrote in the *Beekeeper's Journal* of March 1872, "which possesses in a slight degree the same fragrance of the plant, which renders it exceedingly pleasant to the taste."

Native Americans used anise hyssop to combat sundry ills. According to ethnobotanist Daniel E. Moerman, the Cheyenne brewed a tea from the leaves to use as an analgesic, a cough and cold remedy, and to fortify a weakened heart. Dried leaves were crushed into a powder for rubbing on a fevered body or to induce perspiring in a sweat lodge. The Chippewa dressed burns with a poultice of the leaves.

Modern American herbalists don't have much to say about anise hyssop, but Eastern pharmacopoeias frequently men-



JOANNE PAVIA

The fennel-like flavor imparted to honey by anise hyssop made it a favorite of beekeepers at the turn of the century.

HARVESTING AGASTACHE

In addition to their medicinal uses, agastaches can be used like mints in tea and as food flavoring. The flowers are usually a lighter flavor of whatever the leaf scent happens to be. All agastaches—not only anise hyssop—have a licorice flavor, mixed with that of mint, lemon, or another fruit. The most pungent tea is made from fresh leaves or flowers, since drying tends to reduce the intensity of the flavoring. Leaves should be harvested early in the day during a sunny, rain-free spell, since those conditions create the highest concentration of oils. Both leaves and flowers make interesting additions to the mixed greens of a mesclun salad or garnishes for fruit desserts.

—Jack Henning

tion its Asian relative, *A. rugosa*. It seems to have similar remedial attributes, since it is brewed into a soothing tea for coughs, colds, and lung ailments. Qingcai Zhang and Hung-yen Hsu, in a supplement to their 1990 book *AIDS and Chinese Medicine*, report its use with other herbs to make *Zhi Xie I*, a treatment for diarrhea and fever caused by AIDS.

The leaves of *A. rugosa* are slightly larger than those of anise hyssop, and it is probably a bit more tender, but it also has pale purple flowers with parallel stamens, carried on four- to six-inch spikes. The similarities suggest the classic pattern of close resemblance between East Asian and eastern North American plants. In the 1980s, however, chemical analysis found a closer alliance between *A. rugosa* and a western North American plant, *A. urticifolia*. James Vogelmann of the University of Indiana, who conducted the analysis, theorized that this rarer alliance could have been the result of a common ancestral link during a warm period in America 14 to 19 million years ago. This plant migrated across an ancient land bridge to Siberia, Vogelmann suggested, and became regionally extinct during subsequent cooling.

A. urticifolia, the horsemint hyssop, is widespread in moist sites throughout the Northwest. It's easy to see the origin of its specific name, meaning stinging leaved, but the short hairs that cover its nettle-shaped leaves are painless to touch. Horsemint hyssop can vary in height from three to six feet tall and the spikes that bear its rosy purple flowers, from two to six inches. It's hardy from Zones 7 through 9.

This agastache has a strong mint flavor, and while most animals prefer blander fare, both wild and domestic fauna like to graze on it. Birds are especially fond of its seeds, along with those of the anise hyssop. The Paiute and Shoshone made medicinal use of its leaves, and occasionally ate its seeds out of hand or ground into a flour.

The crossed-stamened agastaches are less well-known, but include some of the



TOVAH MARTIN

Agastache pallidiflora is a native of the Southwest, once used for a cough medicine and snuff.

showiest members of the genus. They also tend to bloom later, into fall. It's not surprising that they're hard to find in nurseries, since they're notoriously hard to propagate. Many have small leaves typical of the arid Southwest, but only two endure truly desert conditions. Most occur in open pine and oak woods. They're adapted to intense sun and summers of infrequent rain, and they demand dry winters as well.

This heat and low humidity promote an intense concentration of volatile oils in southwest agastaches. Their scents range from the balsam-calamint odor of *A. mexicana* to the licorice redolence of *A. cana*. Their flowers are larger and more tube-shaped than their eastern cousins, suggesting pollination by hummingbirds rather than bees.

A. mexicana, hardy only in Zones 9 and 10, is worth growing as an annual elsewhere. It is composed of a few erect, unbranched stems two to three feet long with triangular leaves two and a half inches long

and half an inch wide. The flower spike, which ranges in color from pale rosy pink to near crimson, is usually about four inches long but can reach one foot in a favorable site. The original range of *A. mexicana* is said to be central Mexico, but it's hard to pin down since the native Mexicans planted it throughout the country. There's also reportedly a white form, treasured for its rarity.

According to Karen Ford's *Las Yervas de la Gente*, a 1975 report for the University of Michigan, *A. mexicana* leaves were brewed for cold remedies, and another southwest native, *A. pallidiflora*, was used for a cough medicine and a decongestant snuff. According to Moerman, the Navaho used the pulverized root of that species to treat skin ailments and as a disinfectant.

A. pallidiflora is handsome for its erect, narrow habit, but isn't as exciting as its large-flowered brethren. Its pink to purple flower spike is similar to that of *A. urticifolia* except for having parallel stamens, and botanists have suggested that it's an evolutionary link between the two subdivisions. But its leaves are quite different—small, hairy, triangular, and held close to the stems.

A. cana of New Mexico and western Texas is more willowy and more hardy, up to Zone 7. It has wiry, branched stems up to four feet tall, clothed in hoary leaves less than half the size of the Mexican agastache. Its bright magenta flowers appear late in the season on a loose inflorescence up to a foot long. There seems to be no written explanation for the origin of its common name, mosquito agastache, but Texas folklore holds that it's an insect repellent. That's not surprising, since both anisaldehyde and pulegone are insecticides.

Tenderness isn't necessarily the rule among southwestern agastaches. Since some are at home in the mountains, a careful selection of variants can give certain species a Zone 6 or even 5 hardiness, as long as they stay dry in winter. Thus the orange rose *A. rupestris* and the shocking pink *A. pallida* var. *pallida* enter the picture, most notably as parents in a race of floriferous hybrids developed by Richard Dufresne, a labiate-obsessed gardener in North Carolina. (See "The Sage of Salvia," *American Horticulturist*, October 1992.) Known for their ease of propagation from cuttings, two Dufresne introductions, 'Tutti-Frutti' and 'Firebird', reliably overwinter in Zone 6 as long as their soil is amended for sharp drainage and they are

shielded from excess winter moisture by a snow blanket or overhanging roof line.

Aptly named for the light fruity tang of its triangular leaves, 'Tutti-Frutti' resulted from a hand-pollinated cross between a strongly lemon-scented form of *A. mexicana*, 'Toronjil Morado', and the hardier *A. pallida* var. *pallida*. 'Tutti-Frutti' begins blooming in midsummer and seems to gather steam moving into autumn, its 18-inch spikes of dusky rose-flushed calyces studded with raspberry pink flowers. With sparse, stiff branches like *A. mexicana*, 'Tutti-Frutti' grows to three feet its first season and approaches five feet by its second year.

'Firebird' is a bushy plant up to three feet tall with blossoms of coppery orange backed by rose-tinted calyces, the old flowers bleeding to magenta with age. It occurred as a natural cross, getting its size and shape from the Mexican *A. coccinea* and its hardiness and coloration from *A. rupestris* of Arizona and New Mexico. With purple-flushed new foliage, 'Firebird' straddles the fence between many different colors, making it invaluable as a "blending" plant. At Stonecrop Gardens in Cold Spring, New York, horticulturist Rita Kingsley takes advantage of its chameleonic qualities to knit together a border of sunset hues including achillea, daylilies, nasturtiums, roses, and peach-toned dahlias.

Other Dufresne hybrids are suited for Zone 7, most notably 'Apricot Sunrise'. A natural cross between orange *A. coccinea* and the golden-flowered *A. aurantiaca* from Mexico and the southwest U.S. mountains, 'Apricot Sunrise' produces a clear buttery orange flower with none of the rosy overlay of 'Firebird'. It forms a three- to four-foot, open and willowy plant suggestive of *A. cana*. The burnished orange flowers and gray green leaves are especially striking against deep purples and blues.

Although longevity isn't part of their reputation, many of the agastaches can last for 10 years or more in the garden if they're kept in a sunny, well-aerated, humus-laden soil of low fertility. Excess nitrogen tends to promote tall, thin plants that will need staking, and overfed plants may succumb to root rot in damp winters. The southwestern agastaches like a bit of lime in their soil, and their colors may bleach out in climates with high humidity and warm nights.

Most of the southwestern agastaches are



PHOTOS BY JESSIE M. HARRIS



Above: Buttery orange 'Apricot Sunrise' was developed by North Carolina mint breeder Richard Dufresne. Left: The leaves of *Agastache cana*, a willowy species from New Mexico and western Texas, are said to repel mosquitos.

available in the trade only as seeds because of the difficulties in propagating them vegetatively. While the northwestern agastaches are said to germinate erratically, the appearance of their southwestern relatives in widely varied habitats indicates their readiness to sprout.

Agastaches can be treated as half-hardy, long-blooming annuals north of their hardiness range. Where they are hardy, their upright narrow shape makes them ideal for filling gaps left by early bloomers. Add to this that they require no deadheading, and it's clear that the agastache tribe should be welcomed into the garden of anyone who appreciates a combination of low-maintenance and striking colors.

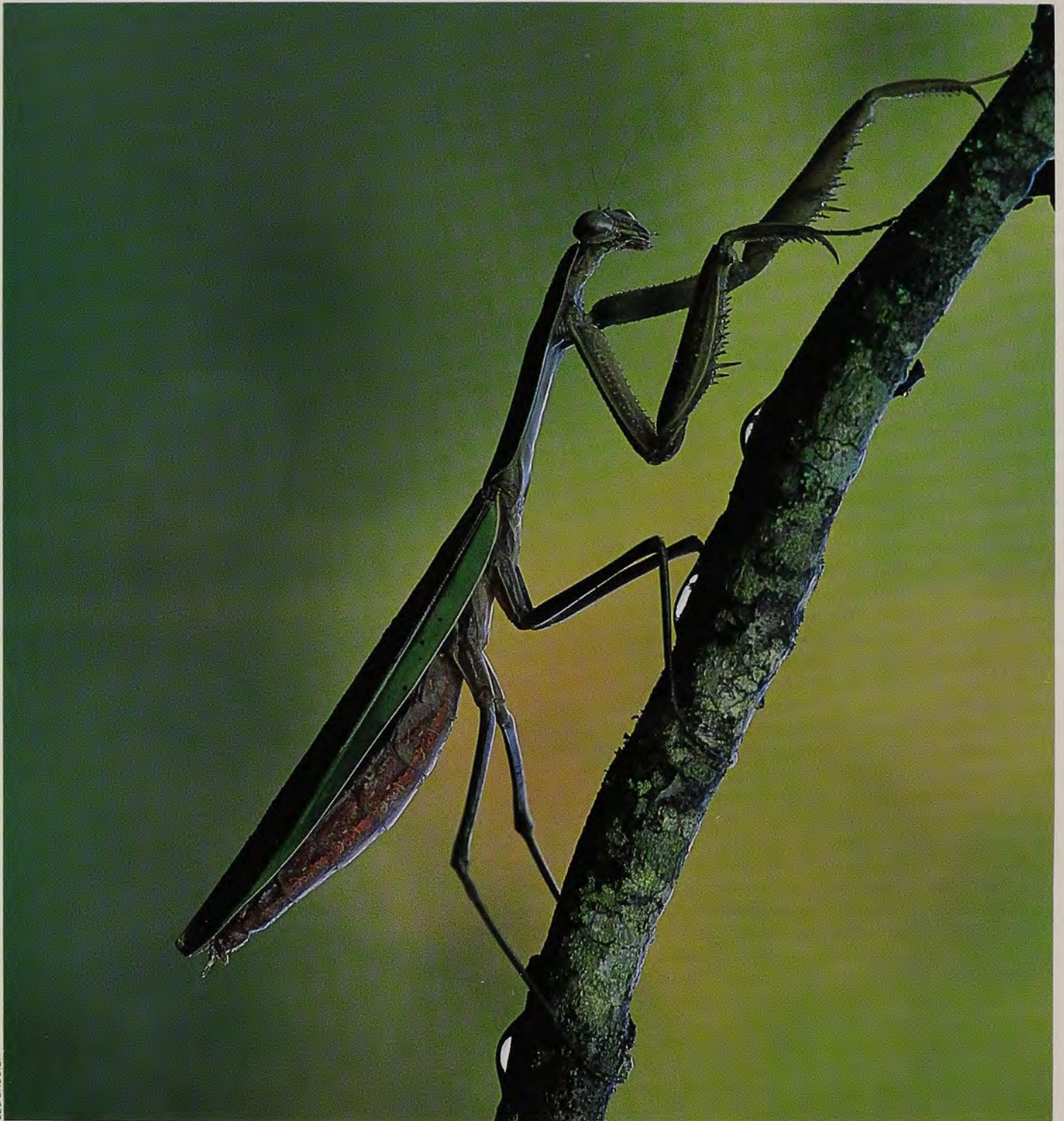
Jack Henning works for a landscape design company in New York City.

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Mantis

Metamorphosis



LES SAUCIER

How a stick-shaped cannibal won over an avowed entomophobe.

B Y M A G G I E P E R R Y

Before I tell my story, I think it's important that you know I'm an "animal person" as well as a gardener. I love animals almost as much as I love the feel of rich garden soil under my fingernails or the sight of neat, straight rows of bean plants in midsummer. I see a kind of parallel between a well-tended garden and an affectionate pet: both seem to thrive on attention.

But I had never regarded insects as animals. I knew, of course, that there were "beneficial" bugs—creatures to whom I was supposed to be grateful, as fellow gardeners would tell me. But I could never really get over the bad ones. Bugs, for me, were the things that preyed on my defenseless seedlings—that wreaked havoc on blooms and produce alike. And besides, I thought, most insects are ugly. No: as far as I was concerned, bugs were definitely not animals.

So perhaps you will understand my reaction when, on a sunny afternoon last fall, a young neighbor came running up to show me something cupped in his hands. "Look what I found in your garden!" he exclaimed.

When he opened his hand to reveal his prize, I wanted to scream and run for the insecticide.

There was an alien-looking monster a couple of inches long. A live stick with eyes—a praying mantis! Not wanting to disappoint this 10-year-old entomologist, I stifled my shock and took a closer look. Curiosity soon got the better of contempt and I found myself wondering about this strange creature. Questions about its behavior and function formed in my head and I determined to find out all I could about my visitor.

In the meantime, I wasn't about to return it to the garden. Where there was one bug, I knew there would almost certainly be others, but I just couldn't bring myself to set it free. I resolved to quarantine the invader. With my daughter's help, I set up a 20-gallon aquarium in the spare bed-

room—well away from both humans and "real" animals.

Since the mantis was found in my backyard garden, I had some clue as to what type of habitat it would require. I began by putting two inches of soil in the bottom of the tank. Then I added a small tree branch and some plants. I used weeds: I wasn't about to sacrifice so much as a pansy to the enemy. A rock with crevices and a small bowl of water completed the decor. I covered the tank with a plate of glass, leaving an opening large enough to admit fresh air but too small to permit escape.

I stood back and admired my handiwork. Yes, I thought, it looks like a nice enough cage, but what about food? I had no idea what this living twig might regard as a meal. Did it eat leaves, flowers, or other bugs? Its diet wasn't the only mystery. Does it bite people? I wondered. Are those enormous front claws used to pinch or grasp? Where and how long does it live?

The situation demanded research. I was off to the library, where I discovered that the mantis is no monster. Despite its fearsome mien, the mantis posed no threat to either my azaleas or my family.

Mantises or mantids, as entomologists usually call them, are related to grasshoppers, crickets, and cockroaches. (The similarities have to do with fine points of insect anatomy, not behavior.) But the exact relationships are not very clear. Mantids are sometimes grouped with all these related bugs in the order Orthoptera. Sometimes they're classed with roaches alone, in the order Dictyoptera, or they may be given their own order, Mantodea. Whatever the classification, the total number of mantid species is thought to be about 1,800 worldwide. Mantids are native to Africa, Europe, Asia, and the Americas.

North America has 11 resident mantids. But our most common mantis, *Mantis religiosa*, is not native. It arrived as a stow-away in a shipment of nursery stock from southern Europe in 1899. Some of our other mantids are immigrants too. The Chinese mantis, *Tenodera aridifolia*, was

intentionally introduced in the 1890s. So was the narrow-winged mantis (*T. angustipennis*), a south Asian species imported in 1933. My visitor was probably a *Mantis religiosa*.

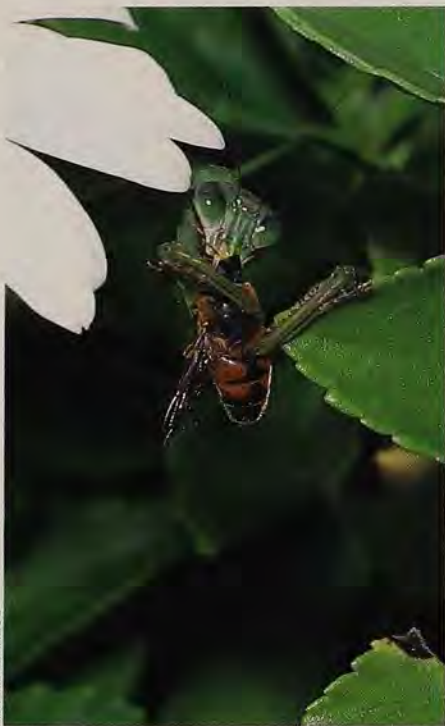
All mantids have the same basic anatomy: a long, rather substantial abdomen, slender thorax, and a triangular head atop a very flexible neck. Unlike any other insect, a mantis can look over its "shoulder," which allows it to make good use of its well-developed eyes. It walks with its two lower pairs of legs; the upper pair is modified into a set of heavy-duty pincers, used for hunting and repelling attackers. Its mouthparts are small but very strong, allowing it to pierce the tough exoskeletons of its prey.

But there's a great deal of variation on the basic theme. Mantids range in length from a fraction of an inch to a formidable half foot. They come in a full palette of colors, from muted browns and greens to pink, yellow, or vibrant green-and-white patterns. Some species fly, while others are earth-bound. In some, only the males fly.

Our common name for the mantis recalls its characteristic posture, which resembles a human at prayer, hands together and head bowed. But the only thing a mantis is praying for is its next meal. Mantids are voracious and indiscriminate carnivores. They will eat any insect they can catch, including other mantids, and some species will attack frogs, lizards, and small birds as well.

Mantids are accomplished stalkers. Their form and color make them look more vegetable than animal, and some species enhance that effect by swaying gently, to look like leaves stirring in a breeze. Some can lighten or darken themselves, like chameleons, to suit the prevailing light. Many lurk near flowers to ambush pollinating insects. One African species is actually adapted to look like a flower, to attract its

Opposite: A walking twig with an attitude. Mantids are among our most formidable insect predators.



Mantids often stake out flowers to trap pollinators.

would-be pollinators to a sudden demise.

I fed my mantis spiders, moths, and small grasshoppers. She abstained from the crickets I offered, even though crickets are supposed to be a favorite food. She seemed to prefer the moths to anything else; it usually took her about five minutes to eat one. Once she appeared mildly interested in a honey bee but evidently she wasn't hungry—or perhaps she was unfamiliar with this snack. No doubt, my garden offered a far more extensive menu.

When a mantis senses movement, it will twitch its slim, delicate antennae and turn its head like a cat whose curiosity has been piqued. Usually slow and graceful in its movements, the mantis is lightening quick to react to nearby prey. It snaps up its victim, then positions it parallel to its own thorax. Next, the mantis inflicts an immobilizing bite in the area corresponding to the back of the neck. Dinner itself is a more leisurely affair, typically beginning with the victim's head, then the thorax, then the abdomen. Often the legs and wings are discarded.

After dinner, the mantis takes a bath. First it runs its forelegs through its mandibles, like a cat licking its paws. Then it passes its forelegs over its head and antennae to brush off any remaining morsels. Lastly, it brings its hind legs up, one at a time, grasping each in a pincer and running nearly the entire length of the leg through its mandibles. A fastidious creature, the mantis seems to enjoy bathing almost as much as eating.

The mantis sleeps at night, hanging upside down like a bat. Gripping a twig with its back legs, the mantis hangs parallel to it with its pincers folded up. I imagine this must be a comfortable position, easing the burden of its enormous forelegs and providing some protection from inclement weather.

A day after her arrival, I found my houseguest swaying back and forth as if she were seasick, secreting a cocoa-brown foam onto her branch. The sudsy mass was an ootheca, or egg case: before her capture, my mantis must have mated, and she was now preparing to lay her eggs. Female mantids may mate with as many as six males. In some species the females eat their mates during or after copulation—a form of romance that recalls the infamous black widow spider. After the ootheca is deposited, usually on bark or soil, the mantis expels her eggs into the lather. The foam then hardens to protect its contents.

The ootheca is said to repel birds but it may attract other diners. I noticed that my mantis's egg case was getting plenty of attention from two pill bugs, or wood lice, that must have come into the tank with the soil. They had eaten about half of the 50 or 60 eggs in the case before I realized what they were up to. I moved what was left of the case into a separate jar. My mantis's eggs were pale beige, roughly a quarter of an inch long, and about as thick as a pencil lead. I'm sorry to report that none of them hatched.

A successful clutch produces miniature versions of the parents. Newly hatched mantids need no maternal care and they start life with a voracious appetite. They'll eat anything that's small enough and comes within reach, including their own siblings. Before they reach adulthood, mantids go through several molts, growing larger each time they shed their skins. Flying species develop wings only after the final molt.

The mantis may look like a miniature monster but it is, as organic growers say, a "beneficial"—a good bug. You can even buy mantis egg cases from suppliers of organic pest controls. Unfortunately, hosting a mantis is no guarantee against invading hordes of aphids making a banquet of your roses, or grasshoppers holding end-of-summer picnics among your vegetables. So far, systematic attempts to use mantids for pest control have yielded indifferent results. The problem may be that as the mantis population grows, the effect on the pests is limited by cannibalism and predation on other beneficials. But recently, researchers in China have reported encouraging results from mantis releases carefully timed to match exploding pest populations. The Chinese also feed the young mantids a special diet to discourage cannibalism. So maybe mantids will one day have a place on the farm.

I'm convinced they already have a place in the garden. That's why, three weeks after I had imprisoned her, I restored my mantis to the freedom of a pink spirea. I knew she hadn't much longer to live, since it was already late autumn and mantids don't overwinter. But I also knew my garden would be the poorer without her. Today, when I look among the flowers for her relatives, I look at the flowers differently too. My mantis taught me to see a kind of wilderness in the shrubbery.

Maggie Perry is a free-lance writer in Loveland, Colorado.

Refreshing Gaultherias

Wintergreen and its kin are a nostrum for the fall garden.

BY DANIEL HINKLEY

Under the sullen, late autumn skies of the Pacific Northwest, amid a surplus of foliar green, gardeners relish any bright colors that shine beyond the first frost. In that season, the gardens at my Washington nursery are re-

splendent with a variety of fruits that relieve the green gloom. We grow many trees, shrubs, and perennials for this effect, but one group of plants stands out, both for brilliant fruit and for handsome evergreen foliage. In my view, many species of *Gaultheria*, as well as those of the related genus *Pernettya*, are among the aristocrats of the fruiting plants.

Both of these genera belong to Ericaceae,

a large family that includes heaths, heathers, blueberries, and rhododendrons. Gaultherias have the urn-shaped, white or light pink flowers so common in Ericaceae, but the blooms tend to be hidden by the foliage. The berries, however, are very colorful and vary greatly from one species to

The fruits of the common wintergreen adorn eastern woodlands in the fall.



ARTHUR P. DOME

another. Actually, gaultherias don't have true berries, because the seeds aren't imbedded directly in the flesh of the fruit. Instead, the flesh surrounds a seed capsule. The capsule is explosive: you can make a ripe fruit spit its seeds if you pierce the capsule with a needle.

The genus name commemorates Jean François Gaultier, an 18th-century French physician who botanized in Quebec. It's appropriate that a botanizer of the New World should preside over these plants. Even though *Gaultheria* includes over 200 shrubs and ground covers from all over the world, two of its North American species are probably the most widely grown.

I grew up in northern Michigan, where I got to know both of these—*G. procumbens* and *G. shallon*. I could find the former growing wild in the woods, and if you live on the eastern half of the continent, you can probably do the same. *G. procumbens* is the original source of oil of wintergreen, which has since been distilled from several other *Gaultheria* species. A topnotch ornamental shrublet, it's a common understory plant throughout eastern Canada and the northeastern and mid-western states, occurring occasionally as far south as Georgia. Spreading by underground stems, it produces dense tufts of glossy, oval leaves on five-inch stems. White flowers blushed with pink appear in early spring, followed by plump scarlet fruit, ripening in autumn.

The fruits are edible; they're sweet and laced with the flavor of wintergreen. Grouse and turkey relish them, as do white-tailed deer, which also browse the foliage. Native Americans smoked the leaves and valued the fruit as a tonic for the stomach. European settlers added the plant to their pharmacopoeia as well. They brewed wintergreen teas and distilled the aromatic oil from the foliage. By the 19th century, oil of wintergreen had become a common patent medicine ingredient. Modern analysis has found the chemical basis for wintergreen's reputation: a high concentration of methyl salicylate, a compound closely related to aspirin. So even though there are recipes for wintergreen pies, jellies, ice cream—even beer—wild foods connoisseurs should watch their dosage.

I remember *G. shallon* not from the Michigan woods, but from the florist's refrigerator. As a boy, I worked after school at a flower shop, where I had to open and store away shipments of flowers and greens. One of the greens we received every



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week was called lemonleaf. Twenty years later, gardening in the Pacific Northwest amid dense stands of *G. shallon*, I realized I had found the lemonleaf's native habitat. In the forest communities of western Washington and Oregon, the cottage industry of cutting "greens" is still very much alive.

G. shallon, or salal, occurs along the West Coast from California to Alaska. It prefers moist forests, where it creates impenetrable thickets of five-foot stems bearing glossy, oval leaves up to five inches long. Its pinkish white bells appear in spring and are followed by large clusters of blue-black fruit. Native peoples used the leaves for lining cooking pits and as a medicinal. The berries were eaten both fresh and dried. *The History of the Lewis and Clark Expedition* describes an ailing Meriwether Lewis being offered "a kind of

syrup, pleasant to the taste" made from salal berries—apparently the local equivalent of chicken soup.

I'm fond of salal. It can be an effective, weed-smothering ground cover in many situations. But as a garden subject, it's a bit on the boisterous side. It snakes about subversively, sending up shoots where they aren't welcome, and tends to swamp its more diminutive neighbors. A better choice for the garden might be the dwarf variety of salal discovered in central Washington, in the Cascade Range's Snoqualmie Pass. It was found about a decade ago by Steve Doonan and Phil Pearson, the owners of Grand Ridge Nursery of Issaquah, Washington. I've had *G. shallon* 'Snoqualmie Pass' growing in my peat bed for six years and it has only recently begun to spread. It forms a neat, dense mound of foliage to 15



Salal, far left, is native to the West Coast. It's a showy but unruly garden subject. Moxie-plum, above, occurs in Canada and our northern states. It's more subtle than salal—and harder to grow. A less demanding white-fruited species is *Gaultheria itoana*, left, a native of Taiwan.

inches, and bears flowers and fruit similar to those of the species.

The other three gaultherias native to North America are rare in cultivation. *G. humifusa*, alpine wintergreen, grows to about four inches. It's native to the western mountain states, where it prefers wet sub-alpine forests. *G. ovatifolia* may grow to eight inches. It has much the same native range as alpine wintergreen but prefers somewhat drier conditions. *G. hispidula*, creeping snowberry or moxie-plum, grows in coniferous forests and sphagnum bogs all across Canada and occasionally in the northern states. It's a low, trailing, semi-herbaceous shrub. All three species have a reputation for exactitude in their growing requirements.

Outside North America, *Gaultheria* has an enormous distribution, from the Andean region of South America to East Asia, the Himalayas, and Australia. The genus usually favors a cool, moist, subalpine climate, like that of the Pacific Northwest. I've taken advantage of that fact to grow many of the most interesting foreign species. Here are some of my favorites:

G. miqueliana, from Japan, has heavily veined leaves blushed with purple. White fruits appear in late summer or early fall.

This is a slow-growing, distinctive ground cover, usually well under a foot. It does have a peculiar growth pattern, which I have observed in more than one locality: its older stems tend to die for no apparent reason, but new stems sprout in the scars left by the dead branches.

An equally appealing ground cover is *G. cunneata*, from western China. It has small, glossy, pointed leaves and grows to about eight inches. Crops of popcorn-shaped white fruit blushed with pink appear in fall and remain through December.

G. itoana, from Taiwan, bears tiny needlelike foliage on five-inch stems. Snaking about the front of our peat bed, this species forms handsome greenish bronze mats studded with white fruit in autumn.

G. veitchiana, from western China, produces an 18-inch mound of bright green foliage. Its leaves are fairly large—to four inches—and in late summer it bears a pleasing crop of dark blue fruit.

G. tetramera, from western China and Tibet, is similar to Veitch's gaultheria in foliage and size. Its fruit is the color of lavender Venetian glass. In the nursery trade, this species is often muddled with *G. hookeri*, a much larger Himalayan species with white fruit.



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A high-altitude groundhugger, *Gaultheria nummularioides*, above, hails from the Himalayas. At right, the urn-shaped flowers of *G. veitchiana*, from China, invite close inspection. Their form is typical of the genus and the heath family in general. The five-foot South American *Pernettya mucronata*, far right, commands attention from a distance.



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G. nummularioides, a low-growing shrub from the Himalayas, is impressive mainly for its foliage. The variety *minor*, a ground-hugging dwarf form, is especially distinctive. With its dark green, rounded leaves along prostrate reddish stems, *minor* forms tidy rosettes bejeweled with shiny black fruit. I consider it one of the finest plants in the genus.

G. sinensis boasts perhaps the largest fruit in the genus. These marbles of brilliant cerulean blue make a delightful, humorous contrast with the plant's diminutive habit: it reaches only one foot.

These species are generally at their best in Zones 6 and 7, but many will survive a Zone 5 winter under a thick layer of mulch. You might cover them with fallen leaves and pine boughs. Of course, heavy snow cover makes an excellent mulch.

Like *Gaultheria*, the closely related genus *Pernettya* is named for an 18th-century botanizer, Antoine Joseph Pernetty. He accompanied the famous French explorer Louis Antoine de Bougainville on a trip to the Falkland Islands and South America and produced a chronicle of the expedition. *Pernettya* consists of some 25 species native to Mexico, South America, New Zealand, and Tasmania. Some au-

thorities now lump *Pernettya* into *Gaultheria*, since they consider the differences between the two groups too slight to justify separate genera. But there are some obvious distinctions. *Pernettya*, for instance, produces true berries: the seeds are imbedded in the enlarged tissue of the ovary. More important from a horticultural viewpoint is the prevalence of dioecism in *Pernettya*. *Gaultherias* are self-fertile but in *Pernettya*, the sexes usually occur on different plants. That's not always true—some clones produce flowers with both sexes—but in general, if you're growing pernettias for the fruit, you'll need both male and female plants.

In the garden, the most commonly encountered pernettia is *P. mucronata*. Native to the southern tip of South America and Chile, this species is hardy through Zone 7. *P. mucronata* deserves its popularity. It has probably produced more cultivars than any other member of the genus, and the species is a beautiful plant in its own right. Its upright, densely branching stems may reach five feet but can readily be pruned to a more modest stature. The new growth is cherry red and bears a dense complement of dark green needlelike leaves. In late spring, the foliage is packed



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with bright white flowers and at the end of autumn, succulent fruit ripens to shades of red, pink, or white, depending on the clone. The fruits are edible but bland; I find their appearance more refreshing than their taste. Luckily for the gardener, *P. mucronata* is not entirely dioecious. But as with many species that are only partly self-fertile, you'll get more fruit if you plant several different clones.

Excellent for this purpose is the dwarf variety, *P. mucronata* 'Thymifolia'. It forms a mound of very fine dark green foliage only eight inches high. Since it's male, it produces no fruits of its own, but any fruit-bearing clones will benefit greatly from its presence.

A first-rate fruiting clone of *P. mucronata* is a plant known at our nursery simply as "the large fruited form." It came from seed we obtained about seven years ago from the University of British Columbia. We've never given the plant a formal name, but it definitely lives up to our matter-of-fact label: it bears stunning, rich pink to rose red fruits. Plants offered under the name 'Compacta' are also excellent choices for fruit. This term isn't a formal name either—it's a looser category that includes several similar forms. 'Compacta' plants

generally reach about two feet and produce pink berries.

In the 1920s, breeders at the Royal Horticultural Society's gardens in Wisley, England, succeeded in crossing *Gaultheria* and *Pernettya*. They interbred our native salal with *P. mucronata* to produce the bigeneric hybrid called \times *Gaulthettya wisleyensis*. (An alternative name for this artificial genus is *Gaulnettya*.) *Gaulthettya wisleyensis* is usually sold as the selection 'Wisley Pearl', a tidy little plant only 15 inches high. Its leaves look like miniature salal leaves, and it produces multitudes of ivory-white flowers followed by bacchanal clusters of blue-black fruit. Like salal, this hybrid spreads vigorously by underground runners to form sizable colonies.

Both genera and their hybrid demand similar growing conditions. They will tolerate light shade, but here in the Pacific Northwest they seem to do best in full sun. If you do plant in full sun, you'll have to make sure they don't dry out in the summer. And of course farther south, full sun could be too much of a good thing. Before planting, the soil should be amended with a generous amount of peat moss, fine bark, sawdust, or compost. In spring, my gaultherias respond nicely to a top dressing of

well-composted manure. I give the foliage a quick once over with a push broom to settle the manure in place. Pruning, except to keep the larger plants under control, is unnecessary.

All these plants make ideal companions for dwarf conifers, heaths and heathers, vacciniums, leucothoes, and smaller rhododendrons. But when fall arrives, don't be surprised if you find yourself giving the lower growers top billing.

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PRONUNCIATIONS

Abelia grandiflora uh-BEEL-yuh
gran-dih-FLOR-uh
Aesculus ES-kyew-lus
Agapanthus africanus ag-ah-PAN-thus
af-rih-KAN-us
Agastache aurantiaca ah-guh-STAH-she
ar-an-tee-AH-kuh
A. cana A. KAN-uh
A. coccinea A. kok-SIN-ee-uh
A. foeniculum A. fee-NICK-yew-lum
A. mexicana A. mex-ih-KAN-uh
A. pallida A. PAL-lih-duh
A. pallidiflora A. pal-lih-dih-FLOR-uh
A. rugosa A. roo-GO-suh
A. rupestris A. roo-PES-triss
A. urticifolia A. er-tih-sih-FOE-lee-uh
Andrea petrophila AN-dree-uh
peh-TROF-ih-luh
Aquilegia ah-kwi-LEE-juh
Arisaema triphyllum air-ih-SEE-muh
try-FIL-lum
Aristida stricta ah-riss-TEE-duh STRICK-tuh
Asparagus sprengeri as-PAIR-uh-gus
SPRENG-ger-eye
Bartramia pomiformis bar-TRAM-ee-uh
pahm-ih-FOR-miss
Befaria racemosa beh-FAR-ee-uh
ras-eh-MOH-suh
Begonia coccinea beh-GOHN-yuh
kok-SIN-ee-uh
Blechnum serrulatum BLEK-num
sair-yew-LAY-tum
Callicarpa americana kal-lih-KAR-puh
ah-mer-ih-KAN-uh
Calycanthus floridus kal-ee-KAN-thus
FLOR-ih-dus
Camellia sasanqua kuh-MEEL-yuh
sah-SAHNG-kwuh
Carpinus caroliniana kar-PIE-nus
kair-oh-lin-ee-AN-uh
Celtis laevigata SEL-tiss
lee-vih-GAY-tuh
Ceanothus americanus see-ah-NO-
thus uh-mer-ih-KAN-us
Cercis canadensis SER-siss
kan-uh-DEN-siss
Chionanthus virginicus
ky-oh-NAN-thus vir-JIN-ih-kus
Clivia miniata KLY-vee-uh min-ee-AY-tuh
Coreopsis gladiata koh-ree-OP-siss
glad-ee-AY-tuh
Cortaderia selloana kor-tah-DEER-ee-uh
sel-oh-AN-uh

Crinum americanum KRY-num
uh-mer-ih-KAN-um
Crocosmia kroh-KAHZ-mee-uh
Cryptanthus krip-TAN-thus
Cuphea hyssopifolia KYEW-fee-uh
hiss-sop-ih-FOE-lee-uh
× *Cupressocyparis leylandii*
koo-press-oh-SIP-ar-iss lay-LAND-ee-eye
Cyrilla racemiflora sigh-RIL-luh
ras-em-ih-FLOR-uh
Dianthus die-AN-thus
Dicranum longifolium die-KRAN-um
lon-jih-FOE-lee-um
Diets bicolor die-EE-teez by-KUL-er
D. vegeta D. VEJ-eh-tuh
Eucharis amazonica YEW-kah-riss
am-ah-ZAHN-ih-kuh
Ficus pumila FIE-kus PYEW-mih-luh
Gaillardia pulchella gay-LARD-ee-uh
pul-KEL-uh
Gaultheria cuneata gahl-THEER-ee-uh
koo-nee-AY-tuh
G. hispida G. hiss-PID-yew-luh
G. hookeri G. HOOK-er-eye
G. humifusa G. hyew-mih-FEW-suh
G. itoana G. ih-toh-AN-uh
G. miqueliana G. mih-kel-ee-AN-uh
G. nummularioides var. *minor* G.
num-uh-lar-ee-OY-deez var. MY-ner
G. ovatifolia G. oh-vat-ih-FOE-lee-uh
G. procumbens G. pro-KUM-benz
G. shallon G. SHAL-lon
G. sinensis G. sigh-NEN-siss
G. tetramera G. tet-ra-MAIR-uh
G. veitchiana G. veech-ee-AN-uh
Gaulthetia wisleyensis
gahl-THET-ee-uh wiz-lee-EN-siss
Gunnera chilensis GUN-er-uh chil-EN-siss
Hedera helix HED-er-uh HE-lik
Hedyotis purpurea hed-ee-OH-tiss
per-PER-ee-uh
Hibiscus coccineus
high-BISS-kus kok-SIN-ee-us
Hosta plantaginea
HAHS-tuh plan-tah-JIN-ee-uh
Hydrangea macrophylla high-
DRAN-juh mak-roh-FIL-uh
Hylocomium triquetrum
high-loh-KOH-mee-um try-KET-rum
Hypnum crista-castrensis HYPE-num
kris-tuh-kas-TREN-siss
H. splendens H. SPLEN-denz
Hypoxis hirsuta high-POK-siss her-SOO-tuh

Ilex glabra EYE-leks GLAB-ruh
I. vomitoria I. vom-ih-TOR-ee-uh
Itea virginica eye-TEE-uh vir-JIN-ih-kuh
Leucobryum longifolium loo-koh-BRY-um
lon-jih-FOE-lee-um
Liatris chapmanii lie-AY-triss
chap-MAN-ee-eye
Liriope muscari lih-RY-oh-pee mus-KAR-eye
Leucothoe axillaris loo-KOH-thoh-ee
ak-sih-LAIR-iss
Liriodendron tulipifera leer-ee-oh-DEN-dron
too-lih-PIH-fer-uh
Lobelia cardinalis low-BEEL-yuh
kar-dih-NAL-iss
Lonicera sempervirens lah-NISS-er-uh
sem-per-VY-renz
Magnolia grandiflora mag-NOLE-yuh
gran-dih-FLOR-uh
M. macrophylla M. mak-roh-FIL-luh
M. soulangiana M. soo-lan-jee-AN-uh
Maranta leuconeura muh-RAN-tuh
loo-koh-NER-uh
Miscanthus sinensis miz-KAN-thus
sigh-NEN-siss
Muhlenbergia capillaris mew-len-BER-jee-uh
kap-ih-LAIR-iss
Myrica cerifera mih-RY-kuh ser-IF-er-uh
Nepeta cataria NEP-eh-tuh cat-AH-ree-uh
N. × faassenii N. × fas-SEN-ee-eye
N. mussinii N. mus-SIN-ee-eye
N. nepetella N. nep-eh-TEL-uh
Ophiopogon japonicus off-ee-oh-POH-gon
jah-PON-ih-kus
Pachysandra terminalis pak-ih-SAN-druh
ter-mih-NAL-iss
Passiflora incarnata pass-ih-FLOR-uh
in-kar-NAY-tuh
Pennisetum setaceum pen-ih-SEE-tum
seh-TAY-see-um
Penstemon multiflorus PEN-steh-mon
mul-tih-FLOR-us
Pernettya mucronata per-NET-ee-uh
moo-kroh-NAY-tuh
Phaius tankervilleae FAY-us
tang-ker-VIL-lee-eye
Phlox divaricata FLOKS
dih-vair-ih-KAY-tuh
Pinus elliotii PIE-nus el-lee-OT-ee-eye
Pittosporum tobira pit-toh-SPOR-um
toh-BEER-uh
Pityopsis graminifolia pit-ee-OP-siss
grah-mih-nih-FOE-lee-uh
Plumbago auriculata plum-BAY-go



ar-ik-yew-LAY-tuh
Polytrichum commune pah-lee-TRIK-um
 kom-MEW-nee
Psychotria nervosa sigh-KOH-tree-uh
 ner-VOH-suh
Quercus geminata KWER-kus
 jem-ih-NAY-tuh
Q. hemisphaerica Q. hem-iss-FEER-ih-kuh
Q. incana Q. in-KAN-uh
Q. laevis Q. LEE-vis
Q. nigra Q. NY-gruh
Q. virginiana Q. vir-jin-ee-AN-uh
Raphiolepis indica raf-ee-oh-LEP-iss
 IN-dih-kuh
Rhododendron austrinum roh-doh-DEN-dron
 aw-STRY-num
Rosa multiflora ROH-zuh mul-tih-FLOR-uh
Rudbeckia fulgida rood-BEK-ee-uh
 FUL-jih-duh
Ruellia caroliniensis roo-EL-ee-uh
 kair-oh-lin-ee-EN-siss
Salvia coccinea SAL-vee-uh kok-SIN-ee-uh
S. gregii S. GREG-ee-eye
S. leucantha S. loo-KAN-thuh
Serenoa repens sair-eh-NO-uh REP-enz
Silene virginica sigh-LEE-nee vir-JIN-ih-kuh
Solidago odora var. *chapmanii* sol-ih-DAY-go
 oh-DOR-uh var. chap-MAN-ee-eye
S. nemoralis S. neh-mor-AL-iss
Spartina bakeri spar-TEE-nuh BAY-ker-eye
Spathiphyllum spath-ih-FIL-lum
Spigelia marilandica spy-JEE-lee-uh
 mair-ih-LAN-dih-kuh
Spiraea virginiana spy-REE-uh
 vir-jin-ee-AN-uh
Spiranthes praecox spy-RAN-theez
 PREE-koks
Stokesia laevis stoh-KEE-zee-uh LEE-vis
Styrax americanus STY-raks
 uh-mer-ih-KAN-us
Thuidium delicatulum thew-ID-ee-um
 del-ih-KAY-tuh-lum
Tradescantia ohioensis trad-es-KAN-tee-uh
 oh-high-EN-siss
Ulmus alata UHL-mus ah-LAY-tuh
U. americana U. uh-mer-ih-KAN-uh
Vaccinium darrowi vak-SIN-ee-um
 DAIR-row-eye
Viburnum obovatum vy-BER-num
 ahb-oh-VAY-tum
Woodwardia areolata wood-WARD-ee-uh
 ar-ee-oh-LAY-tuh
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ANNUAL MEETING
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This year the American Horticultural Society's Annual Meeting returns to the Washington, D.C., area with an exciting program that includes lectures by John Brookes, British landscape designer and author; Allan Armitage, horticulture professor at the University of Georgia; and John Alex Floyd, AHS Board Member and vice president and editor of *Southern Living* magazine. This year's garden tours will take us to Green Spring Valley outside Baltimore, Maryland. As always, the highlight is our Awards Dinner, honoring horticulture's brightest stars. Optional events include an evening Gala at our River Farm headquarters in Alexandria, Virginia.

For more information on the 1994 Annual Meeting call AHS toll-free at (800) 777-7931 between 8:30 a.m. and 5 p.m. Eastern Time, Monday through Friday. A complete Annual Meeting program will be mailed to members in June.





STUDY TOURS

TRAVEL/STUDY TRIPS FOR THE AHS GARDENER

SEPTEMBER 7-20, 1994 GARDENS OF SPAIN

Beginning with the great Muslim garden of the Moors in the 12th century, gardens in Spain reflect not only the influences of the Koran but also that of monarchs from France and Holland. Our trip begins in Seville and continues to the Costa Del Sol, Granada, and Madrid. We will visit the Muslim gardens and a wide variety of private gardens where owners strive to collect and grow an immense variety of trees, plants, and shrubs. From the Casa de Pilatos, home of the Duchess of Medinaceli in Seville to the Placio de Liria, home of the Duchess of Alba in Madrid, each private garden is different in style and content. Leading this program for AHS will be long-time AHS Board Member Julia Rappaport and her husband, Irving.

OCTOBER 8-15, 1994 GARDENS AND FALL COLORS ALONG THE HUDSON

An exploration voyage on board the *M/V Nantucket Clipper*, along the Hudson River from New York to Albany, this program fea-

tures an exceptional collection of private gardens including Far-A-Field, home of former AHS Board Member John H. Whitworth Jr., and Stonecrop, home of long-time AHS members Frank and Anne Cabot, along with Lisbourne Grange, home of AHS members Mr. and Mrs. William Moss. We will visit private gardens designed by landscape architects Fletcher Steele and Lynden Miller and the home garden of esteemed plantswoman Louise Beebe Wilder. The fall colors along the Palisades and in the Berkshires promise to be in full glory. Leading the program will be former AHS President Everett Miller and his wife, Cass. Guest lecturer for the voyage is Caroline Burgess, director of Stonecrop in Cold Spring, New York.

NOVEMBER 3-16, 1994 GARDENS OF HAWAII

A unique look at the splendor of a tropical paradise. Participants will visit the islands of Maui, Hawaii, Kauai, and Oahu. Garden destinations include the unique English-style gardens of Masaru and Shirley Yokouchi on Maui and the splendid gardens of AHS members Ed and Joyce Doty on Kauai. A relaxed sightseeing program will allow every opportunity to enjoy the marvelous settings of the hotels selected for this program. This is a splendid way to see Hawaii as you have always imagined it, with quiet picnics and even a helicopter exploration of the Na Dali Coast of Kauai. Leading this program for AHS will be its President, H. Marc Cathey, and his wife Mary along with Philip Parvin, researcher emeritus of the University of Hawaii.

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

Participants in our November trip to Hawaii will visit the gardens of Ed and Joyce Doty on Kauai.

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