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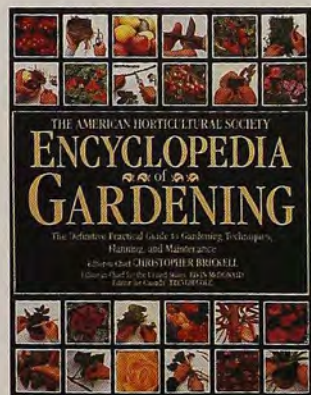
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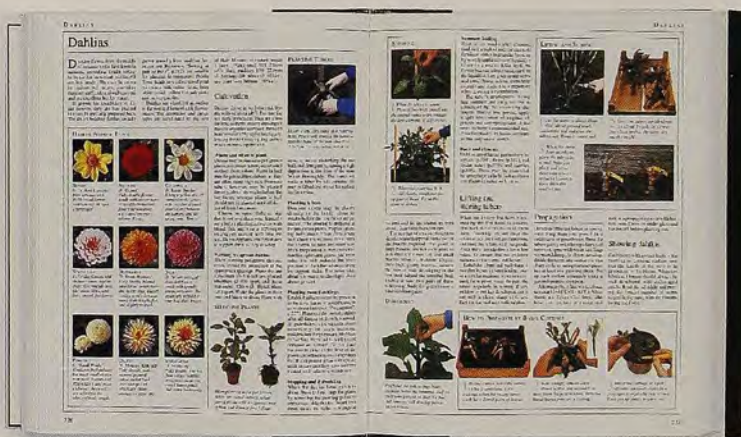
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American Horticulturist

Volume 72, Number 12

December 1993

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DECEMBER'S COVER

*Photographed by David M. Stone:
PHOTO/NATS*

Gardeners who've seen the cranberry, *Vaccinium macrocarpon*, being grown commercially in flooded bogs may assume that it requires similar conditions to grow well. But this native, mat-forming evergreen will thrive in any moist acid soil. In fall, its mahogany leaves add color to a landscape, and its berries, if not eaten by animals, will persist until late December. The cranberry is just one of many native ground covers that Paul E. Cappiello and Ken McPheeters recommend for the home landscape in an article beginning on page 14.

American Horticultural Society

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

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COMMENTARY

It's wonderful to be back at the American Horticultural Society, although I never actually left. My last term on your Board of Directors expired a year ago, but I have remained involved in many ways. It is a great honor to return as your new President.

I first remember AHS as a source of the beautiful but simple block prints of flowers I studied in art classes as a youth. My teacher, Miss Claire, showed us how simple the designs must be, the opportunities to use line and mass, and the great variety of forms available. I wanted to create both detailed water colors and dramatic block prints like the ones she showed us. Then I learned that the block print artist was B. Y. Morrison and the publication in which they appeared was from the American Horticultural Society. My only other sources of information were the magazine *Flower Grower* and the Saturday radio show on CBS with the Old Dirt Dauber. To have subjects to paint I had to learn to grow them. I was interested in form (columbine), uses (foxglove for digitalis), history (tulip), and food ('Big Boy' tomatoes).

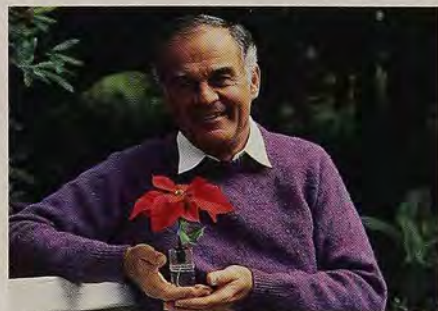
Art, growing, learning, and communicating what I discovered became a part of my daily routine as a teenager and still propels me after all these years.

I follow U.S. Department of Agriculture horticulturists B. Y. Morrison, Henry Skinner, John Creech, Fred Meyer, Neil Stuart, and Skip March, who have served as AHS President in volunteer roles. The position that I assume is now a staff position, intended to give more stability to both day-to-day operations and the realization of the Society's long-term goals.

For the past two years, I have served the USDA as national chair of florist and nursery crops review, shaping long-term goals for the nation's "green industries." These providers of plants and related services are the most rapidly developing segment of American agriculture, representing 11 percent of the crop value and ranking sixth in all commodities, with only corn and soybeans being more valued. By the year 2000, the green industries will represent 20 percent of the crop value and should be the number one crop segment of the U.S. economy.

AHS should direct its programs, publications, symposia, and member services to inform these professionals as well as amateur and consumer groups. I call on all members of AHS and their organizations to help ensure that the beauty, health, and fun we now enjoy can be experienced by the millions of other consumers who want to be successful and environmentally responsible gardeners. Write me about what we can do together!

I still look at every plant as a subject to paint, to use in an arrangement, or to introduce into a garden. Now I know their botanical and common names, their culture, their pests and diseases, and facts about the many contributors to their research, growing, and marketing. As President of AHS, I will be working to ensure that everyone in America knows the full benefit of having plants in their lives and environment. I'm back where I started—at AHS.



H. Marc Cathey, AHS President



LETTERS

Thanks for Their Memories

I thoroughly enjoyed Kathleen Fisher's article "The Incidental Ornamental" (October) on the history of New Guinea impatiens. As a former employee of PanAmerican Seed, I learned bits and pieces in conversations with impatiens breeder Claude Hope and others, but always wondered about the entire plant-hunting expedition. You have put my mind to rest. Thanks to *American Horticulturist* for taking the time to research and write such an intriguing article about the events.

As the article says, it was not a "wimpy tale" but one of dedicated scientists who deserve a place in history. This bit of horticulture's past is now preserved forever. I have recommended the article and magazine to my colleagues for accurate information and reading pleasure.

I look forward to more articles that capture recent horticultural events and preserve history. *Nona Wolfram-Koivula*
Downers Grove, Illinois

More Book Dealers

Keith Crotz's article on starting a garden book collection (August) was both interesting and timely. It would be unreasonable to expect him to know all the book dealers. He did miss two fine second-hand botanical bookstores: The Captain's Bookshelf, 31 Page Avenue, Asheville, NC 28801, (704) 254-6631, and Garden Works, owned and operated by Robin Wilkerson, 31 Old Winter Street, Lincoln, MA 01773, (617) 259-1110. *Peter Loewer*
Asheville, North Carolina

Compost Bill Supporter

Many gardeners compost. Members of the American Horticultural Society should know about the Executive Composting Act, HR 2292, sponsored by Congressman George Hochbrueckner. What the bill does is simply *ask*, not require, the president and governors to start composting in their back yards. With this good example, many other citizens would be encouraged to do the same.

Please put out a call to action, asking AHS members to contact their representatives and urge them to cosponsor this legislation. It would be wonderful if President Clinton could sign the bill at AHS's River Farm, site of the National Home Composting Park. *H. Clark Gregory*
Atlanta, Georgia

AHS is nonpolitical and doesn't take official positions on legislation. We do try to keep members informed so they can make their own decisions on issues. A short article on this bill appeared on page 24 of the September News Edition. Hochbrueckner, a Democrat from New York, introduced the bill in May.

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Members of the following institutions are participants in AHS's Affiliate Membership Program, a networking opportunity available to most botanical gardens, plant societies, and horticultural groups.

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Tennessee Native Plant Society
Knoxville, Tennessee

Tustin Garden Club
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OFFSHOOTS



A Fabulous Garden Tour!

By Peter Loewer

Come along with all of us at Kaleidoscope Tours, Inc. on this once-in-a-lifetime trip as we discover how our European counterparts live, work, and play. Forget your problems with weeds, slugs, and powdery mildew and join other friendly folks who also love to till the soil and surround their property with beauty, beauty, beauty! Here's your chance to bring home idea after idea, not only to transform your own garden but to have a memory chock-full of great suggestions for your neighbors and all those fun members of your local garden club—who didn't have the chance to attend this whirlwind garden tour.

Day 1: Your nonstop adventure begins! The group of happy gardeners will assemble at the airport in Kansas City for our nonstop flight to Amsterdam. After checking in we will board the KLM Royal Dutch Airline jumbo jetliner and settle back for a delicious dinner served by our friendly flight attendants. Next we'll enjoy an in-

flight movie (we're showing "The Life of Van Gogh" followed by a slide show of various garden shots, including a number of iris species sent to us by previous Kaleidoscope travelers) and have a chance to introduce ourselves and relax, ready to enjoy the fun-filled days ahead.

Day 2: A day to remember! As the sun rises to meet us through the windows of our airliner, we continue to wend our way to the Netherlands on the final leg of our flight. Right after breakfast, we'll land at Holland's Schiphol Airport, where we'll collect our baggage and, after meeting our tour guide (who speaks excellent English), board a bus for the trip to our hotel, located 125 miles away at Velp, a charming town close to the onion fields of Eerbeek. After checking into the hotel, we will board a glass-topped bus for a lively tour of the fields, stopping for a late-afternoon snack at the brand new McDonald's close to the hotel, built as part of a cultural exchange. While at Eerbeek we will visit the Mayor's garden, a most delightful plot with the world's largest collection of petunia hybrids in all shades of purple and yellow. Dinner will be at the Hans Brinker

Room of the hotel, dress optional.

Day 3: Today will be fabulous! At 6:30 a.m. we will board a bus for Amsterdam to visit a diamond factory and watch Dutch craftsmen cut and polish sparkling gems. Then we will visit the Rijksmuseum where, after viewing the paintings, we will lunch in the museum snack bar (a great time saver) and drive to the quaint city of Weesp for a view of the cactus gardens of Hans Putter, the wooden shoe king. There we will see over 600 species of cactus planted in 600 different wooden shoes. After a stop at the Annual Cheese Fair in the town of Loon op Zand, we will visit the largest indoor covered market in the Netherlands devoted entirely to household appliances, then head back to the hotel for dinner and a night out at the local night club to hear the hit rock band, the Vaporizers.

Day 4: What a picnic! At 7 a.m. it's off to Aalsmeer to visit the world's largest flower auction where we'll see over thirty-eight acres of freshly cut flowers under one gigantic roof. We will thrill to the sounds of commerce and the hectic goings on around us as bidders vie for bunches of valuable flowers and we witness several million flowers change hands before our eyes in less than six hours. You will be delighted by the afternoon visit (lunch will be served on the tour bus) to the quaint village of Volendam on the Zeider Zee where everyone will wear wooden shoes to tour the streets and visit the swamp renovation district near the town's state-of-the-art landfill project. For dinner we plan to stop at the largest truck stop in Holland to experience a true Dutch fast-food restaurant, planning to be back at the hotel before midnight.

Day 5: The wonders of Germany! At 6 a.m. we board the bus for the happy jaunt to Germany where we will travel through the Ruhr Valley, marveling at the factories that are bound to give reunited Germany eminence in the new scheme of things. At one of the quaint villages we will stop for what is sure to be a first-hand look at the Rhine River. A fantastic photo opportunity awaits all as we visit the owner of a small chemical factory who has a garden made entirely of antique coat hangers in the shapes of dinosaurs (including a pregnant *Tyrannosaurus rex* and three pterodactyls) and planted with an unusual variety of members of the vast cabbage family. Passing a number of historic castles, we will pause for wine outside the famous Lorelei Rock and stop at the Knuspern Family Rosinpfalz, the world's largest collection of petrified fruits (we will marvel at a portrait of Elvis Presley done entirely in multi-colored raisins). Our hotel that night will be

Hans and Fritz's Palace of Perfection located just outside Upper-Gravenbroche, a small town some forty miles from Nohm.

Day 6: A gaga time! This morning we will travel to the famous city of Heidelberg where we will take time to visit the oldest college in Germany and see the fantastic gardens of the world-famous Huffelberg Castle. We will marvel at the thick walls of the castle and the incredible forest of trunks—much of the landscape is being cleared for what will be one of the largest convention centers in Europe—plus the Mayor's Tomato Garden, a spectacular acre featuring over 150 different types of the love apple. Soon we will be driving along a back mountain road, passing spick-and-span villages divided by deep spruce woods in neatly packed rows, in a world straight out of the Brothers Grimm. Our ever-present tour guide will answer all your questions before our visit with a typical German family who actually lives in the Black Forest, operating a small hotel next door to the world's largest manufacturer of concrete gnomes and small garden sculptures in the guise of celebrities of today. The trio of Willie Nelson, Minnie Pearl, and Garth Brooks is said to be absolutely lifelike and the Gertrude Jekyll boot (planted with dwarf crape myrtles) makes a fitting centerpiece for any garden.

Day 7: Never to be forgotten! It's on to Spain. After taking a nonscheduled flight from Merzigtraum we'll visit the fabulous Hotel Sordide with its world-famous maze modeled after the face of legendary and famous General Francisco Franco. Here we will laugh and frolic amid the largest collection of ivy topiaries in Europe, all modeled after famous heroes of the Spanish labor movement. That night at the hotel the international conclave of the Zipper Entrepreneurs of Europe and Portugal (ZEEP) will be crowning Miss Zipper from a host of contestants flown in from around the world. After an orgy of drinking, dancing, and carousing amid the colored lights of the convention, we will board a plane for our flight back home and the memories of a lifetime.

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Peter Loewer is a frequent contributor to American Horticulturist. His most recent book is The Evening Garden. A version of this article appeared in Quill & Trowel, newsletter of the Garden Writers Association of America.

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BOOK REVIEWS

Gentle Conquest

James L. Reveal. *Starwood Publishing, Washington, D.C., 1992. 160 pages. 8" x 10½". Color and black-and-white illustrations. Publisher's price: hardcover, \$39.95. AHS member price: \$35.95.*

A single book seldom touches upon all of the reasons that compelled one to become a horticulturist. But James L. Reveal's *Gentle Conquest*, subtitled "The Botanical Discovery of North America With Illustrations From the Library of Congress," helped me relive decades of study in only 157 pages of text and illustrations.

What took me years to acquire is presented in nine chapters. Each chapter describes the exploits of a different group of plant collectors. A common element in so many of their stories is the importance of private funding, as they struggled to return live specimens to their benefactors. Reveal describes their successes and failures, and we hear about the illnesses and problems of spirit that complicated their work.

It's exciting to watch European conceptions of the plant kingdom change in the face of the New World discoveries. For instance, our flora served as the basis for fundamental revisions in the science of taxonomy, such as the definition of what constitutes a species. We also rediscover our many flowering evergreen trees in all their eye-dazzling variety—and relive the excitement of their introduction into Europe, whose own flora boasts only six such trees. Reveal covers nearly five centuries of botanical exploration, beginning in the West Indies and concluding in the distant reaches of the Far West.

Each chapter's illustrations show us discoveries we have come to take for granted. The brilliance of the colors, the beauty of the compositions, and the great diversity of plant form, site, and climate are captured on every page. The illustrations give ample testimony to the importance of the botanical collection in the Library of Congress, and the publisher deserves credit for bringing these pictures before a broader public.

Reveal's history deserves a sequel, and it



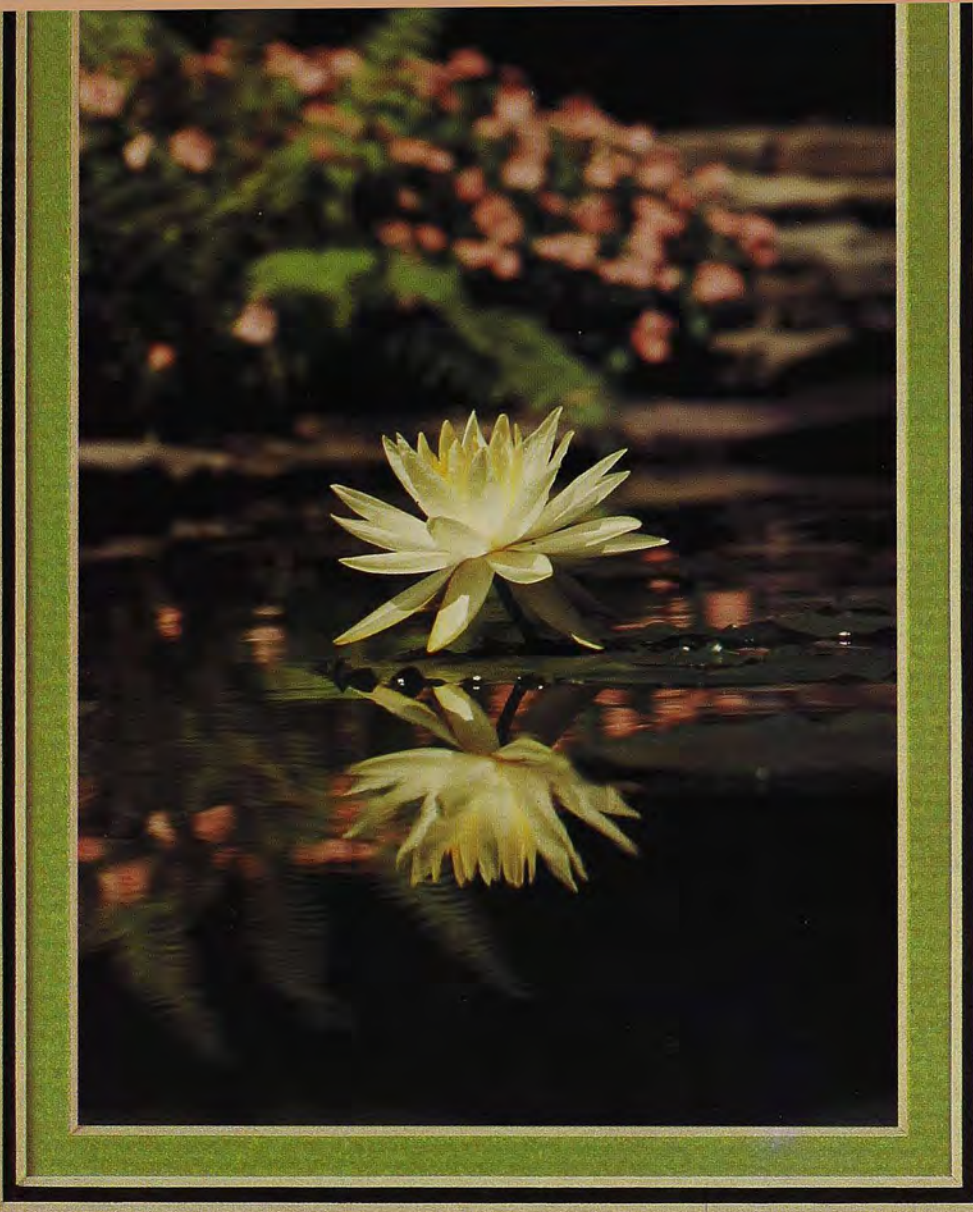
is about to get one. All those centuries of exploration will soon culminate in a full *Flora of North America*, which is being produced at the Missouri Botanical Garden. Perhaps there is some way that this project too could make use of the botanical art of the Library of Congress. *Gentle Conquest* shows how incredible such a combination might be. —H. Marc Cathey

H. Marc Cathey is President of the American Horticultural Society.

Passalong Plants

Steve Bender and Felder Rushing. *University of North Carolina Press, Chapel Hill, North Carolina, 1993. 221 pages. 8" x 9". Color photographs. Publisher's price, hardcover: \$29.95; softcover: \$16.95. AHS member price, hardcover: \$25.50; softcover: \$15.25.*

In *Passalong Plants*, Steve Bender and Felder Rushing have achieved the perfect marriage of two noble traditions: southern storytelling and a gardener's love for sharing plants. Their one- to two-page studies of a variety of unrelated plants glide comfortably from one species to another, like an idyllic raft trip down the Mississippi.



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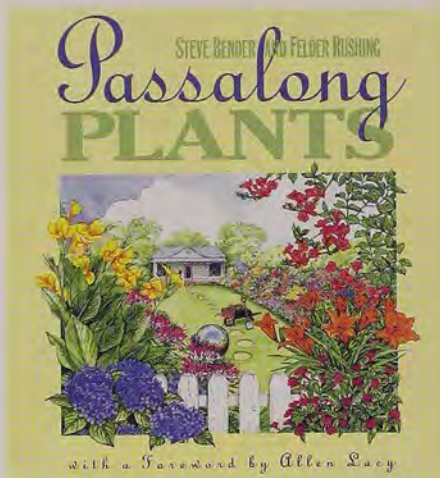
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The book is perfect for night-stand reading: a collection of short stories to make you smile, chuckle, or reminisce about the first time a friend coaxed you into touching a touch-me-not (*Impatiens balsamina*).

The language and tone of *Passalong Plants* is the best part of the reading. Rushing's fans will recognize his unwaveringly personal style—it's as if he were greeting us from his front porch, saying, "Here, pop open a beer and let me tell you about this orange montbretia." Bender's equally friendly prose is a walk through his old neighborhood: we peek over fences and take stock of everyday gardening wisdom.

The "passalong" nature of these plants strikes a chord in any of us who've nurtured and loved a now rampant vine given to us as a rooted clipping by a mother, grandmother, or childhood friend. Passalong plants grow from the garden of the heart and their value is in their history or nostalgic charm—not necessarily in their quality as cultivars.

Bender and Rushing are candid about their selections. While some choices are exquisite, perhaps even standards of beauty in the southern garden, others are clearly not the most impressive of botanical discoveries or the latest and greatest. But all of them are real performers, with an *élan* to match the tales that have grown up around them.

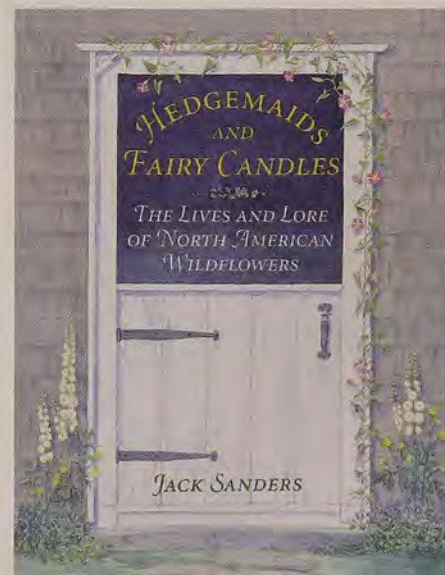
Sample a few of the chapter headings to get a taste of the book's sensibilities: "Weirdisms, Oddities, and Conversation Pieces," "Well, I Think It's Pretty," and "Gaudy or Tacky?" We're not dealing here with top-secret experiments on germplasm or international corporate schemes to patent a black marigold. What interests the authors are plants that are fun to grow, to sniff, to wrestle under control, and to "passalong" to friends and children. And after all, isn't that one of the reasons most of us got into gardening in the first place?

But for all the down-home warmth and wit of *Passalong Plants*, the book is far more than anecdotes and chummy conversation. It contains a strong measure of horticultural insight—an undercurrent that subtly explores the gardening impulse and urges us to expand traditional horizons by taking a few quirky chances.

A final chapter by Rushing, "Organizing Your Own Plant Swap," offers some basic guidelines to keep gardeners' enthusiasm jumping—like that notorious leaping frog—even after they've finished the book. The plant swap is the garden catalog for friends and neighbors. This is how you can get that yellow or blue walking iris you've had your eye on, in exchange for your chaste tree weeds (or, uh, seedlings). Forget whether a species is regionally appropriate, and get a seedling of that yellow-berried nandina growing down the street by the town hall.

I find that my copy of *Passalong Plants* has already become a "passalong book"—its tales of southern plants are rumored to be doing nicely up in Zone 5. In keeping with the custom of southern passalongs, I won't thank the authors for this colorful cutting from garden life. —Joseph M. Keyser

Joseph M. Keyser directs composting programs for Maryland Environmental Services.



Hedgemaids and Fairy Candles

Jack Sanders. Ragged Mountain Press, Camden, Maine, 1993. 232 pages. 7½" × 9½". Color and black-and-white illustrations. Publisher's price: hardcover, \$21.95. AHS member price: \$19.75.

Lifelong Connecticut resident Jack Sanders has been studying wildflowers for twenty years. And his experiences as a veteran

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Camellia

Azalea

newspaper reporter and editor and as Northeast regional editor of the Canadian Wildflower Society's *Wildflower* magazine have provided him with a rich background for writing *Hedgemaids* and *Fairy Candles*.

Despite the subtitle, "The Lives and Lore of North American Wildflowers," Sanders admits that most of the plants in the book are found east of the Rockies. Arranged in three seasonal sections, each of the eighty-two chapters offers a vivid description of a particular wildflower's appearance, habitat, pollination, history of use, and folklore. Sanders also offers gardening advice for growing (or discouraging) these plants.

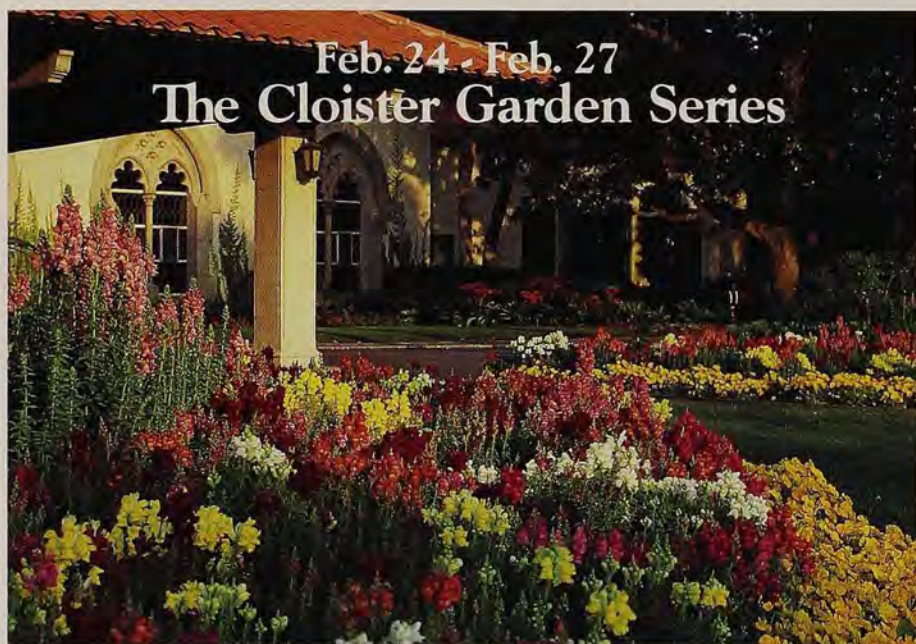
Whenever I open a new wildflower book the first thing I do is check the index for my favorite plants, and I was happy to discover fringed gentian, hepatica, and violets among these pages. At first I was disappointed that Sanders devoted so much space to weedy plants like heal-all, hawkweed, and chicory. I never gave chicory a second glance until I read Sanders's description of bright yellow goldfinches "fluttering among chicory's sky blue flowers." That image was enhanced when I learned that the flowers produce a yellow dye, while the leaves yield a blue dye. Now I scan roadside stands of chicory in hopes of seeing a flock of goldfinches.

Of course, part of the fun of reading a new book is discovering new plants. I'd never seen black cohosh (*Cimicifuga racemosa*)—the "fairy candles" of the book's title—until I visited the Blue Ridge Mountains this summer. I was enchanted with the tall fuzzy spires of white flowers and delighted to find a chapter devoted to them in Sanders's book. "The woodlands, where flowers show their splendor in the spring, are almost void of blossoms by midsummer," he writes. "So it's often surprising, even to someone familiar with wildflowers, to run across black cohosh brightly blooming in the dimly lit deciduous woods of July and August."

The plant biographies are lively and informative and Sanders's words can weave magic. His description of the color of common speedwell, *Veronica officinalis*, evokes a splendid image: The flower is "blue with a hint of red, a shade described by the Chinese with a word meaning 'the sky after rain.'"

The book is illustrated with black-and-white line drawings by Dawn Peterson. The beautiful end papers—covered with delicate water colors—are a special touch. This book should be in the library of every wildflower lover. —Mary Beth Wiesner

Mary Beth Wiesner is managing editor of *American Horticulturist*.



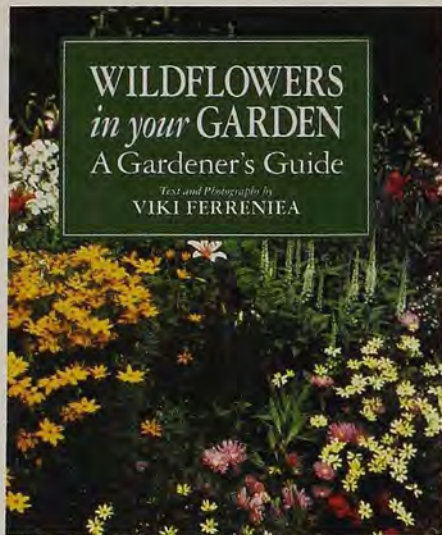
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Wildflowers in Your Garden

Written and photographed by Viki Ferrenia. Illustrations by Carol Bolt. Random House, New York, 1993. 217 pages. 8 1/4" x 10 1/4". Color photographs and color and black-and-white illustrations. Publisher's price: hardcover, \$35. AHS member price: \$29.90.

Books about wildflower gardening fill the shelves of bookstores, and gardeners with an interest in the subject probably already have several of these volumes in their collections. I haven't found any new book on the how-tos of native plant gardening that has topped my two favorites—Ken Druse's *The Natural Shade Garden* and *Landscaping With Wildflowers* by Jim Wilson. But while Viki Ferrenia's *Wildflowers in Your Garden* hasn't replaced either of these on my shelf, it has joined their ranks.

Wildflowers in Your Garden compares most closely to the Wilson book in its basic approach—both are practical guides to creating a variety of wildflower gardens. But Wilson's book is for purists, who want only wildflowers in their gardens. Ferrenia's landscape plans use wildflowers with other garden favorites to create natural area gardens, rather like what Druse advocates.

The book opens with ten landscape plans. Almost every work in this genre includes a plan for a meadow and a woodland garden: predictably, Ferrenia has both. But she also includes plans for water-side, rock, and bog gardens, shady and sunny borders, a fern garden, and a wildflower container garden. Along with a detailed discussion of the possibilities of each, there are landscape plans with plant keys as well as photographs of gardens.

The second, and probably the strongest, section is a set of plant lists. Here *Wild-*

flowers in Your Garden sets itself apart from other wildflower gardening books. Ferrenia arranges the lists in three categories—stalwarts, intermediates, and specialty plants. Each section is further divided into plants for shade and plants for sun. Entries include detailed information on culture and habitat and a color photo.

The stalwarts, which include foamflower and fringe tree, "are readily available and easy to handle and transplant." Intermediates "generally demand more attention to their particular needs for site, habitat, or culture." Some of the intermediates are easy to grow but may be hard to establish or propagate. Others may be difficult to find. Included here are fringed polygala and dewdrop. Specialty plants, which make up the shortest list, "are hard to come by, slow and difficult to propagate, and generally challenging to grow and get established." This is where you'll find plants like purple fringed orchid.

The last section contains in-depth chapters on planning, planting, and maintaining wildflower gardens. Ferrenia, who created the North American wildflower garden at Longwood Gardens in Pennsylvania and served as director of horticulture at the New England Wild Flower Society, provides everything a gardener needs to know to embark on a wildflower gardening adventure.

—M. B. W.

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Undercover Natives

It's time our own ground covers came in from the wild. Here's a debriefing.

BY PAUL E. CAPPIELLO AND KEN McPHEETERS

Ground covers are the workhorses of the landscape. They can smother and outcompete weeds, conserve soil moisture, and paint backdrops that turn mere plant collections into landscapes. But too many gardeners choose an old gray mare, like Japanese pachysandra, or an untameable stallion, like periwinkle. American gardeners have learned that many native plants are a sure bet in terms of both beauty and health; natives flourish in local weather and soil and have natural defenses against insects and diseases that inhabit the same area. Native ground covers tend to put on the same kind of unflagging performance, and there are both woody and nonwoody species for just about every garden.

One of North America's best woody ground covers is bunchberry (*Cornus canadensis*), also called dwarf cornel. It's fairly widespread throughout our Northeast, growing as far north as USDA Zone 2, but also appears in mountainous areas of our South and even in New Mexico and California.

If you can imagine our native flowering dogwood (*C. florida*) growing along the ground, you have a pretty clear image of bunchberry. From late May to late June, and sometimes sporadically through the summer, it has four to six white bracts surrounding small greenish flowers. In late summer, it produces terminal clusters of up to ten red drupes, or stone fruits, each about a quarter-inch in diameter. *C. canadensis* is sometimes called pudding berry; Laplanders made a pudding or dainty from fruits of a relative, *C. suecica*. Humans find the raw fruit almost tasteless, but they're favorites of white-tailed deer, grouse, and other forest dwellers. If animals don't find them, bunchberries may put on a display through winter's first snows.

Like flowering dogwood, they also put on a fall foliage show. On some plants the leaves remain green with only a mottling of red, but the best turn a clear dark crimson.

Many a frustrated gardener has thrown in the trowel after repeated attempts to establish bunchberry in a garden, and it's true that this wonderful native is a bit on the touchy side. But the trick to growing *C. canadensis* is not some ancient guarded secret of the Penobscott Indians. Give it the same conditions that make it thrive in the wild: adequate moisture, well-drained acid soil, a relatively cool root zone, and generally, a light, filtered shade. It performs best when well-mulched and irrigated during summer droughts. Bunchberry's only common ailment is a leaf spot that shows up on drought-, heat-, or otherwise-stressed plants.

Bunchberry is easy to propagate from seed, but seedlings grow slowly and may take three to five years to flower. It's easier to divide the plants in spring, following the old adage, "dig 'em a spade deep." Needing to be moved with a substantial root-and-soil



MICHAEL S. THOMPSON



JEAN T. BUERMEYER PHOTO/NATS



Left: Bunchberry, one of our best ground covers, looks like a carpet of dogwood in late spring. Above: Bunchberry's red fruits appear in summer and will last until the first snow if white-tailed deer and other wildlife don't eat them first.

Yellowroot isn't very flashy, but it spreads aggressively and will grow almost anywhere. This woody creeper will reach over two feet tall.



ROB SIMPSON

mass probably indicates that bunchberry roots benefit from a specific soil-fungus interaction.

An impressive evergreen ground cover that flourishes under much different conditions is bearberry (*Arctostaphylos uva-ursi*). Its succulent, inch-long, glossy dark green leaves and its dense branching make it look almost artificial.

A. uva-ursi is also called bear's grape, barren myrtle, and kinnikinick. Native Americans made a "tobacco" from its leaves and bark. Most members of this genus are the manzanitas of our West and South, reliable only to Zone 6 or 7. Bearberry is the hardy soul of the bunch, toughing it out into Zone 2. It will grow as far south as Virginia, and is also found in parts of northern California.

The urn shape of the quarter-inch, white to light pink flowers reveals their membership in the Ericaceae, or heath family. They appear in clusters at the end of branches from April through June. The three-eighths-inch fruits turn brilliant scarlet in August and, while popular with animals, can remain on the plant through most of the winter.

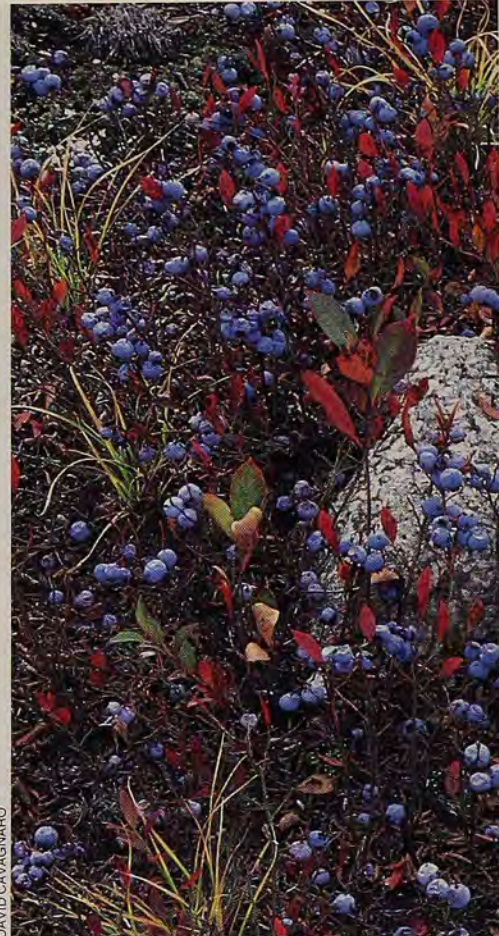
Bearberry is most often found on sandy coastal soils, exposed dunes, slopes, and rocky ledges. It can also be found in partially shaded, woody sites, but rarely in full shade. In Maine, it grows on the rocky shoreline, exposed to harsh winter winds and salt spray.

So it's not surprising that easy culture is another of its attributes. Given a well-drained, preferably sandy soil, and at least partial sun, bearberry will thrive for many years. Its dense growth requires little pruning, and its preference for low soil fertility means there's little need to feed it.

There are quite a few cultivars available. Those that have been especially vigorous here are 'Vancouver Jade', a release from the University of British Columbia Botanical Garden, and 'Massachusetts'. Both are pink-flowered.

American gardeners have finally noticed that blueberries grow on native plants that happen to be beautiful. There are several species of low-growing blueberries native to the Northeast, but the most common is the deciduous *Vaccinium angustifolium*, a dynamic plant with something going for it all year long.

Ultimately two feet high, it produces quarter-inch, typical heath-type flowers during May and June in shades of pink and white. The blue-black fruits—covered by a gray white waxy bloom on many clones—are exceptionally juicy and sweet. Some



DAVID CAVAGNARO

gastronomes swear that wild blueberries make the best muffins and pancakes this side of anywhere.

But fall may be its most spectacular season. In northeast Maine, wild blueberry barrens may stretch out for hundreds of acres in a patchwork of spreading colonies, each displaying its own mixture of red, purple, orange, and every combination in between. When the foliage drops, the show continues with red, yellow, and green stems, which can create stunning patterns against a blanket of snow.

Culture is simple. *V. angustifolium* does best in sandy soil with a pH between 4.5 and 5.5 in full sun. But it will tolerate a pH up to 6.5, and filtered shade as well, if the gardener can tolerate more open growth.

While the blueberry is relatively pest free, some clones seem very susceptible to powdery mildew, especially late in the season. Unfortunately, lowbush blueberry cultivars have never been thoroughly evaluated for disease susceptibility, growth characteristics, and ornamental value, although we're currently doing so here in Maine.

An evergreen closely related to the blueberry is the cranberry, *V. macrocarpon*. It's also a mat former, growing only six to ten inches tall but spreading to three or four feet. The tiny, single, pinkish flowers aren't overly showy, but mahogany fall leaves add a nice touch to the autumn landscape. In the wild, the three-eighths-inch red fruits



DAVID CAVIGNARO

Left: Wild blueberry boasts pink and white flowers in spring and blue-black fruits in summer, but its red and orange fall foliage may be its most spectacular attribute. Above: Bearberry's urn-shaped light pink flowers brand it as a member of the heath family.

are devoured by animals within a few weeks, but they can last until late December in a garden.

V. macrocarpon is native from Newfoundland to Saskatchewan, south to Minnesota and North Carolina and is usually found in low-lying areas, bogs, and on the edges of swamps. When cranberries are grown commercially, the bogs are flooded during the harvest to make the floating berries easier to collect. But gardeners don't need to go to such extremes. The cranberry needs only a moist, well-drained soil with a pH of 4.0 to 6.0. It's pest-free and needs no fertilizing, although it may not be appropriate for large expanses of ground because it's so slow to spread.

Another well-behaved ground cover for limited spaces is the evergreen *Paxistima canbyi*. This native, which grows slowly to twelve inches, never fails to amaze gardeners when they see it for the first time. But it's rarely seen in gardens, perhaps because of its unappealing midwestern name of rat stripper. Nurseries that do offer it understandably use another appellation, cliff-green. Its flowers and fruit are sparse and inconspicuous, but its foliage is dense and striking. The inch-long leaves are thick, glossy, and serrated and borne along rather stiff, erect stems. It fits nicely into a planting of rhododendrons or other acid lovers, where if kept reasonably moist it should require little or no care.

On the other end of the growth spectrum is the yellowroot, *Xanthoriza simplicissima*. This rhizomatous woody creeper will grow over two feet tall and will spread as far as allowed.

It's not a raving beauty. The ho-hum little brown-to-purple flowers appear before the leaves in terminal racemes, and the fruit is inconspicuous. The compound leaves remain light to medium green throughout the season, although it does offer golden yellow fall foliage long after other leaves have dropped.

Yellowroot's major attribute is its aggressive spread and ability to grow almost anywhere. It likes moist soil, but is as effective in hot, dry, compacted soil as in "perfect" conditions. Few pests bother it. It will grow in full sun or light shade, and soil that is acid or slightly alkaline. Native to most of eastern North America, it will grow as far north as Zone 3 and as far south as Florida. Needless to say, it's easy to propagate.

A nonwoody ground cover that can be almost as aggressive is the Canada anemone, *Anemone canadensis*. Its leaves are mostly basal and compound, similar to more familiar *Anemone* species like windflower and pasqueflower. Growing to two feet tall, in April or May it produces showy buttercuplike white flowers with yellow centers, up to two inches across and held on stalks just above the foliage.

Its native range stretches from Quebec to

British Columbia and south to Maryland, Missouri, and New Mexico. Its origins in temperate woodlands give it a liking for rich, moist, slightly acid soil and light shade. Given those conditions, its spread can become authoritative, making it a perfect choice for shaded areas. But as another common name, meadow anemone, indicates, it will also tolerate full sun and spread quickly to fill a field. This plant is almost foolproof. Propagation—if ever needed—is by division of the creeping rootstock from May to September.

Perennial growers may be more familiar with the glossy-leaved European wild ginger (*Asarum europaeum*) than with our native *A. canadense*, Canadian wild ginger or snakeroot. Growing from six to ten inches high, like other gingers it has three- to six-inch heart-shaped leaves. Borne on long petioles, they're made less shiny than those of their European cousin by the short hairs that cover the whole plant.

Finding ginger flowers can be a challenging rite of spring. The one-inch, purplish brown, urn-shaped flowers appear in April or May, but because they're hidden by foliage near ground level, some searching on hands and knees is in order. The flowers' position creates perfect access for crawling insects. The slug, usually the gardener's foe, makes itself useful in the ginger's case by serving as a pollinator.

Canadian wild ginger rhizomes are



MICHAEL S. THOMPSON

strongly scented and can be dried and used as a substitute for the unrelated spice ginger—a member of the genus *Zingiber*—which grows in the tropics.

Asarum canadense is native to woodlands from New Brunswick south to North Carolina and Missouri. It requires shade, abundant moisture, and slightly acid soil high in organic matter. If spaced a foot apart, plants will cover a sizable area in a few years. They make a subtle, dependable ground cover under deciduous azaleas and add texture to the woodland garden. Propagation is by seeds or division of the creeping rootstock in spring before new growth begins.

While the Canadian ginger's leaves disappear in winter, two other native gingers are evergreen. British Columbia wild ginger (*A. caudatum*) is hardy to Zone 4 and has flower lobes that extend into long tails. *A. shuttleworthii* is native from Virginia to Georgia and has attractive, glossy, mottled foliage. It too can survive in Zone 4, but not surprisingly, it's more heat tolerant than *A. caudatum*.

Another good choice for southerners is

Chrysogonum virginianum, commonly called green-and-gold or golden-star. Native from Pennsylvania to Florida and Louisiana, it's evergreen or semi-evergreen in the South, but suffers in snowless winters in Zones 4 and 5.

Both common names were inspired by the star-shaped flowers, which are bright yellow with brown stamens and about an inch wide. They appear for weeks in spring and summer and rebloom later in the season. The plants are four to ten inches high and about a foot wide. The branching stems sport fuzzy, oval, serrated leaves that can be one to three-and-a-half inches long.

Green-and-gold is at home in average soil with average moisture and finds a half day of sun ideal. It will self-sow but isn't invasive. A light pea gravel mulch will encourage seedlings, which can be easily transplanted, or mature plants can be divided in fall or late winter every other year. Cheery and informal, green-and-gold is ideal for the edge of a woodland.

If you need a real shade lover, consider wandflower, *Galax urceolata*. This herba-

ceous perennial evergreen is native from Virginia to Georgia but is hardy to Zone 3. From its clump of scaly rhizomes, clusters of leaves arise to form mounds six to twelve inches tall. The five-inch leaves are nearly round with scalloped margins. Glossy and leathery, the leaves are often used to provide foliage for flower arrangements, where they're likely to outlast the flowers. Their own tiny white flowers are crowded along wandlike stalks up to thirty inches tall in May or June. In fall, the leaves will be bronzed by frost.

In addition to shade, it likes moisture and acid soil. Planted under rhododendrons, azaleas, or other heath relatives, it will spread at a moderate rate by underground rhizomes. It can be divided in spring or early fall.

Foamflower, *Tiarella cordifolia*, is another woodland native requiring similar conditions. Native from Nova Scotia to Georgia and Alabama, it's hardy to Zone 3, but is evergreen only in the South. Its downy, maplelike leaves rise in mounded tufts six to twelve inches tall. The small white spring flowers, borne in dense racemes on slender eight-inch stems, may continue for a month. It derives its name from the Greek word *tiara*, referring to its crown-shaped fruit.

Foamflowers will spread without assistance by underground stems, but gardeners who want to hurry the process should plant them twelve to eighteen inches apart. Shade should not be too dense or growth will be slow and uneven. In spring, clumps can be divided or seeds can be sown in a protected area.

A similar native—so similar that the two genera have been interbred—is alumroot or coralbells. These durable members of the *Heuchera* genus grow naturally on cliffs, hills, and mountainsides, especially in the West.

There are some seventy species, known for their dense, spreading mounds of rounded leaves that are usually lobed, and sometimes toothed, mottled, or hairy. Their wispy flower stalks delicately embellish mixed plantings.

Hybrid heucheras are common in the nursery trade. But several of the native species and their cultivars deserve to be included in native plant gardens or mixed perennial beds.

The eastern species *H. americana* is a real trouper in hot summers if given partial shade. Two to three feet high and eighteen inches wide, it has heart-shaped evergreen

leaves with hairy undersides. Young foliage is marbled with purple. Deep purple veins are a hallmark of the 'Sunset' cultivar.

Alpine enthusiasts appreciate the densely tufted habit of *H. bracteata*, just six inches high and wide, which hails from the Rocky Mountains. It has kidney-shaped, lobed, and toothed leaves.

The Northwest is home to *H. cylindrica*, which grows to two feet high and a foot wide. Its deeply lobed, dark green leaves are two to three inches across and the early summer flowers are creamy green. 'Greenfinch' grows slightly higher and has greenish white flowers, while 'Green Ivory' has white flowers with a green throat.

H. villosa is a southeastern native that grows two to three feet tall with panicles of creamy white flowers in late summer. It deserves to be grown by more gardeners for its long-lasting bloom and vigor during hot summers.

The densest, most attractive alumroots grow in filtered sunlight. In colder areas, they should be mulched after the soil freezes to prevent heaving. Flowering time can be extended by removing their flower stalks, which add a graceful note to mixed flower bouquets.

The species can be propagated from seed or division, which should be done every three to four years to stimulate flowering. To help alumroots cover the ground quickly, they should be planted a foot to eighteen inches apart.

If you feel that you absolutely must have pachysandra, you can choose a refined native instead of the mass-produced, predictable, and ubiquitous Japanese species, *Pachysandra terminalis*. Alleghany spurge, *P. procumbens*, is native to rich woods from Kentucky and West Virginia to Florida and Louisiana. It performs admirably to Zone 4, although it is deciduous in the North.

The plants spread slowly to form two- to four-foot clumps six to twelve inches high. Spoon-shaped leaves, mottled with gray and three to five inches long, appear whorled at the end of erect stems. Five-inch spikes of creamy white or pink flowers arise from late March until May. They're fragrant, but sometimes hidden by leaf litter.

This plant's favorite site is a shaded bed; foliage will yellow under too much sun. Plants should be eight inches apart in slightly acid to neutral, humus-rich soil, and get plenty of water until they're established. Clumps can be divided in spring, or cuttings taken in spring and rooted in a moist and shaded mixture of sand and soil.

For a delicate, fernlike effect, there is *Vancouveria hexandra*, also called American barrenwort or Vancouver fern. One of three species of North American *Vancouveria*, it hails from the Pacific Northwest and is hardy to Zone 5. Each leaf on this twelve- to eighteen-inch plant is divided into three glossy leaflets that are slightly oval and an inch-and-a-half long.

Another common name is inside-out flower. In early summer, leafless flower stems put out panicles of ten to twenty half-inch white flowers. The white sepals—there are no petals—curl back, showing off long yellow stamens.

Rootstocks of American barrenwort are thick and creeping. It is an admirable colonizer under large shrubs or trees or in shady perennial borders. It grows best in woodland conditions of cool, rich soil and shade, but will even tolerate dry shade. Rootstocks can be divided in spring or fall.

In seeking out these plants for your garden, remember that collecting from the wild disturbs the natural environment. In some areas, it's illegal. None of the plants mentioned is endangered, but all are easily propagated and available from commercial sources. Nursery-propagated plants are apt to be healthier and better suited to garden conditions than wild plants.

These are some of our showiest and most adaptable native ground covers, but there are many woody and herbaceous perennials that slip nicely into a garden of natives, or integrate well with exotics to show the best features of both. Native ground covers are a natural choice for your American garden.

Dr. Paul E. Cappiello is an assistant professor of landscape horticulture at the University of Maine. Dr. Ken McPheeters is a horticulture specialist at the University of Illinois.

SOURCES

Each of these sources has a large selection of the ground covers in this article.

Carroll Gardens, 444 East Main Street, P.O. Box 310, Westminster, MD 21157, (301) 848-5422. Catalog \$2.

Forestfarm, 990 Tetherow Road, Williams, OR 97544, (503) 846-6963. Catalog \$3.

Roslyn Nursery, 211 Burrs Lane, Dix Hills, NY 11746, (516) 643-9347. Catalog \$2.

Russell Graham, 4030 Eagle Crest Road N.W., Salem, OR 97304, (503) 362-1135. Catalog \$3.

Opposite: Shade-loving foamflower is a woodland native with maplelike leaves and small white spring flowers. This is a cultivar, 'Oakleaf'. Below: Green-and-gold or golden-star gets its common name from the star-shaped yellow flowers. Bottom: The flowers of Canadian wild ginger, like those of other gingers, are hard to find since they are hidden under foliage.



PAMELA HARPER



JOHN A. LYNCH PHOTO/NATS

Is Peat P.C.?

In Europe, there's a clear case for bog conservation. In North America the issue remains murky.

B Y C H R I S B R I G H T

Should the peat in your garden have stayed in a bog? That's a question Europeans have been asking for several years, in response to controversy over the health of Europe's peat bogs. Now some American gardeners have begun to worry about our own use of peat.

Many of Europe's peat bogs are in undeniably bad shape. In the Republic of Ireland, where peat has been mined for centuries, mostly for fuel, about three-quarters of the bogs have been drained. Finland has drained about 45 percent of its bogs. In Denmark, only about 2 percent of the bogs remain in their natural state and in Germany, the figure is a tiny fraction of 1 percent. In the Netherlands, which once had nearly 445,000 acres of bog, there is now no virgin bog left at all.

The controversy is most intense in Britain, where conservationists argue that peat producers are despoiling valuable wildlife habitat. For example, they blame the peat industry for the disappearance of the longleafed sundew from Thorne Moore, a bog near the Humber estuary on England's east coast. Critics also say the industry is wrecking an irreplaceable historical resource. Peat preserves just about everything that ends up in it—including people. Several years ago, an ancient cadaver was discovered in an English bog. The man, nicknamed "Pete Marsh," was preserved only above the waist: his lower half was apparently bagged and sold with the surrounding peat. The industry counters that most British peat comes from bogs that were stripped long ago of vegetation, and that only peat producers have the resources to restore the bogs.

Friends of the Earth (FOE) is an environmental group that has been particularly vocal on the peat issue in Britain. FOE spokesman Robin Maynard puts the anti-peat case this way: "When growers buy peat they are buying areas of wildlife habitats, unique records of value to scientists and bags of carbon which oxidize to carbon dioxide fueling the greenhouse effect." Could the same be said of American gardeners?

Peat is the layer of dead mosses, sedges, and reeds that accumulates in certain types of wetlands. The United States has vast peat deposits. According to Raymond Cantrell, peat commodities specialist at the U.S. Bureau of Mines, about 150 million acres of the country

A sphagnum bog encroaches on spruce forest in Ontario.



DAVID CAVAGNARO



are covered in peat—an area more than twice the size of Arizona. In terms of peat reserves, that puts us in third place, after the countries of the former Soviet Union and Canada. Over 80 percent of our peatland is in Alaska, but most American peat is mined in Michigan and Florida. Last year, those two states accounted for some 64 percent of the 660,000 tons of peat the country produced.

But if you check the last bag of peat you bought, you'll probably find that it came from Canada. There are several reasons for this. Cantrell says most American peat doesn't make it to a national retail market—it's usually consumed in the regions that produce it. And over 80 percent of U.S. production is either "hemic" peat, which is the remains of reeds and sedges, or "humus" peat, which is so decomposed it's impossible to identify its origins. These peats usually wind up as soil amendments at nurseries, landscaping services, and other businesses.

But for home gardeners, peat *par excellence* is slightly decomposed moss of the genus *Sphagnum*. Sphagnum, primarily a northern plant, is the champagne of soil amendments: it holds up to twenty times its weight in water. It aerates and loosens clay soil and binds sandy soil. It attracts and holds nutrients. And like champagne, it's really a foreign product: only 5 percent of U.S. peat production is sphagnum.

Overall, Cantrell says, about half of the peat Americans used last year was domes-

tic. And virtually all of the imported half—over 99 percent of it—was Canadian sphagnum. "About five years ago," says Cantrell, "the split was 38 percent Canadian and the rest domestic. But the U.S. is losing some production and the Canadians are filling in the gap." Are the Canadians selling us a renewable resource or are big chunks of that country being transplanted under our petunias?

Wet, treeless, and buggy, Canada's sphagnum bogs aren't a charismatic ecosystem. One unhappy adventurer cursed them as "smearred across Canada like leprosy . . . a rotting mushland of blackflies and mosquitos." But to a botanist, a bog is a subtle and dynamic plant community with a rich complement of beautiful plants, like leatherleaf, bog rosemary, Labrador tea, ferns, and orchids.

And to an ecologist, a bog is one of the strangest places on the planet, because two things happen there that rarely occur anywhere else. In a bog, most dead plant material simply accumulates, in the form of peat, rather than rotting away, as it tends to do in other ecosystems. This makes the bog a tremendous energy sink: it's estimated that peat stores up to 70 percent of the solar energy the bog captures by photosynthesis. The bog's other bizarre property is that it soaks up water like a sort of infinite sponge. Instead of balancing inflow and outflow, the growing sphagnum is always drinking a little more water than it releases. Theoretically,

The bog-loving Virginia chain fern, below, is rare in New Brunswick, a major peat producing province in Canada. Many European bogs, like the Irish bog at right, have been mined for generations. Critics say the practice has badly degraded wetland floras.



LEFT: DAVID M. STONE; PHOTO/NATS; RIGHT: REG PERRY

water will accumulate indefinitely in a bog, because the sphagnum itself will accumulate indefinitely.

This is what scientists call a positive feedback mechanism—a self-stimulating cycle of cause and effect. It begins when a floating mat of sphagnum forms on a lake. As the sphagnum grows, the older moss dies and sinks to the bottom. After centuries of growth, the lake is nothing but sphagnum, from surface to bottom, but the moss continues to multiply. Absorbing the seepage and rain that once fed the lake, it forms a dome above the lake cavity. Eventually the dome may reach a kind of critical mass and begin to grow outward, over what used to be dry land, as well as upward. This process, called paludification, occurs when nearby drainages start to clog and pockets of moisture appear in the neighboring terrain. Soon sphagnum is growing there too.

As the bog grows, the vegetation changes radically. What was once a lake surrounded by boreal forest becomes a bulging expanse of shrubs, occasional pools, and islets of dead or dying trees. Trees and other forest plants can't usually survive an encroaching bog. It's too wet—by weight, the dome may be up to 98 percent water, which means it contains fewer solids than milk. It's also too acid and too poor in nutrients. The only nutrients available at the bog's surface are those brought in by dust and precipitation, because the dome is too thick to allow leaching from the mineral-rich soil below the peat. Bog vegetation is therefore a distinctive and highly adapted community.

You can see the results of the process best from above. "From the air, the dome will be featherlike in shape, with the sphagnum branching out in ridges, and conifers growing in between," says Tom Malterer, peat program director for the University of Minnesota's Natural Resources Research Institute (NRRI) in Duluth. At any one spot, Malterer says, peat is accumulating very slowly. It takes about a century to lay down two inches of it.

The store of peat looks much different from a global perspective. According to Cantrell, a total of 1.1 billion acres, or nearly 4½ percent of the planet's landmass, are clothed in peat. Some 13 percent of the Earth's entire carbon supply is locked up in peat, which means the bogs play a major role in determining the amount of carbon in the atmosphere. And Malterer says peat is growing much faster

than it's being mined. "The rate at which sphagnum is accumulating has accelerated greatly in the last century," he says. "No one knows why. It might be acid rain, or climate change, or maybe the peatlands have reached a stage where they're promoting their own growth." This mystery is of great interest to scientists studying climate change. The NRRI is looking at the effects that global warming may have on peatlands. Some scientists think there may be a connection between paludification and the beginning of a new ice age.

Weighed against such inexorable expansion, what harm is there in using an occasional bag of sphagnum? That's the view of Canadian producers, who published a report last year to allay any American concerns about the environmental effects of Canadian peat mining. Entitled *Canadian Peat Harvesting and the Environment*, the report was written by David Keys, a geologist with Maritime Groundwater, a wetlands consulting firm in Fredericton, New Brunswick. It was paid for by the Canadian Sphagnum Peat Moss Association, the main peat producers' trade group in Canada, and the Department of Natural Resources and Energy of New Brunswick, a major peat-producing province.

Keys says peat is accumulating in Canada at the rate of 50 million metric tons a year, while only 700,000 to 800,000 metric tons are removed annually. The industry is working only 0.02 percent of Canada's peatlands, which are so vast they account for 12 percent of the entire country. "It is very evident," Keys writes, "that Canadian peat moss harvesting is not contributing to a decline in peatland functions or values on a national or global scale. There is room for further growth of the industry in a cooperative, consultative manner with regulators and environmental interests to ensure a balance between the needs of the environment and sustainable development."

But some scientists say the view from within the bogs is less clear. In 1991, for example, the little province of Prince Edward Island (PEI), off Canada's east coast, approved a proposal to mine the Miscouche Bog, one of the largest bogs on the island. "The Miscouche was about the best assemblage of bog flora that we had," says Ian MacQuarrie, a botanist and professor at the University of PEI. In the early 1970s, MacQuarrie was on a scientific panel that recommended the Miscouche for listing as an area of international ecological significance with the United Na-



Many of North America's most spectacular native orchids, like these white fringed orchids (*Habenaria blephariglottis*), are bog plants.

PEAT SUBSTITUTES

Controversy over the effects of peat mining has inspired a search for substitute growing media that are above environmental suspicion. But it's unlikely that any medium will emerge as an all-purpose substitute for sphagnum peat moss. Chemical properties always vary somewhat from medium to medium, and some substitutes have their own liabilities, like high cost or possible contamination, which may limit their usefulness. But for particular applications, researchers are finding some unusual materials that could replace peat. Here are a few of the more promising candidates:

A fiberglass-like material spun from blast furnace slag may prove useful as a commercial growing medium. Despite its unglamorous origins, this by-product of the steel industry has a high pH and good water and nutrient retention. It might be suitable for mass producing begonias, impatiens, chrysanthemums, and poinsettias.

Various agricultural wastes may make versatile media and some are already on the market. A Texas company is selling composted cotton burrs, the by-product of cotton ginning. In Louisiana, another firm is marketing rice hulls. Auburn University in Alabama is testing broiler litter—chicken droppings and bedding material. While they differ from each other in various ways, such products share a higher nutrient value than peat. Peat's nutrient-holding capacity is high, but it contains little nutrition itself. Agricultural by-products are being used in landscaping projects and in container media.

A by-product of tropical agriculture that interests European researchers is coconut husks, or coir. Once composted and milled, the coir's water and nutrient retention is said to be 30 percent greater than peat. Coir may have a future as a container medium component.

Wool makes good mulch, say British scientists, who hope to develop other applications for their wool mulch matting. The scientists envision plant pots made entirely from wool, and hope to use it as a container amendment as well. Proponents claim wool decomposes readily, improves water retention, and contains some nutrients. Brown, rather than white, is the color of choice for horticultural wool.

For the home garden, compost is attracting increasing attention as a peat substitute. Compost is generally richer than peat but it tends to decompose more rapidly, which means it won't give the soil as much "body." Compost is also usually cheaper than peat. You can make it at home for free, or you may be able to get it for little or nothing from a municipal composting program.

The bogs themselves may yield a peat substitute, in the form of living sphagnum, or "top moss." Tom Malterer, of the University of Minnesota's Natural Resources Research Institute, says that a crop of live sphagnum could be pulled from a bog every five to seven years without damaging the bog's ecology. Top moss is not quite as good at holding nutrients as sphagnum peat but is otherwise similar to it. Malterer says top moss harvesting is already "a cottage industry" in Wisconsin. The material is sold as a medium for hanging baskets. For broader applications, top moss could be mixed with ordinary peat. Malterer thinks top moss could eventually replace a quarter of the sphagnum peat market. —Chris Bright

tions International Biological Program. Among the plants at Miscouche were the bog birch (*Betula pumila*), "which is quite a pretty little thing and rare on PEI," says MacQuarrie. "There were also pitcher plants, which aren't rare but a lot of bogs here don't have them, and orchids. I thought the Miscouche would have made a good interpretive site."

When a sphagnum bog is mined, a network of drainage canals is cut through it and the vegetation is stripped off. The surface is harrowed, and when the top inch or two has dried a bit, a tractor-drawn vacu-

uming machine sucks it up. The vacuuming is repeated as often as the drying rate allows. Before the process began at the Miscouche, a local conservation group, the Island Nature Trust (INT), rescued some of the rare and unusual plants. Diane Griffin, a botanist and the INT's executive director, says that in addition to the bog birch, specimens of round-leaved sundew (*Drosera rotundifolia*), pitcher plant (*Sarracenia purpurea*), bake apple (*Rubus chamaemorus*), and the orchid *Calopogon pulchellus* were transplanted to other sites in the province. The rescue, which took

three days in July 1991, got national media coverage. Another part of the mining agreement required the province to turn over three smaller bogs to the INT for permanent protection.

Some saw the arrangement as a compromise that worked for both sides. "If anything," says Keys, "it probably spurred provincial authorities to move ahead faster with protection: the protection of other sites was part of the deal." But Griffin disagrees. "To have lost an area of such importance is most unfortunate," she says. "And rescuing some individual plants doesn't make up for the loss. It's like putting a Band-Aid on a machine gun bullet hole shot through your chest." The plants themselves have had a mixed reaction to their resettlement. Griffin says the pitcher plants, sundew, and bake apple will probably pull through. The orchids survived last year but "orchids can look fine for a few years and then give up." As for the bog birch, "I haven't checked it recently but I didn't really expect it to survive."

Keys argues that the mining of the Miscouche benefited the province economically and did no serious harm to the environment. "There was nothing growing there that couldn't be found somewhere else," he says. "I think it's a question of balancing development with conservation." MacQuarrie doesn't think that argument works on PEI, which has only a tiny share of the country's peat bogs. "Most Canadian peat is more accessible than ours—you don't have to take a ferry to get to it," he says. "So it's rather a pity to destroy an important natural area for some short-term jobs. We have a history here of starting up little enterprises, funded by the government, and then seeing them go broke when the government says it's had enough. And I would be very surprised if this wasn't one of them."

Elsewhere in the Canadian maritime provinces, other bog battles are being fought. "We went through quite a battle a couple of years ago to save the Bull Pasture Bog," says Hal Hinds, a botanist at the University of New Brunswick. Bull Pasture, just outside of Fredericton, is used by the university to study bog ecology. The province approved a plan to mine it, says Hinds, but eventually the proposal was dropped in the face of local opposition. Bull Pasture has a large assemblage of orchids, including the genera *Calopogon*, *Calypso*, *Platanthera*, and *Pogonia*. It also has *Splachnum*, which Hinds defines as "a

painted moss that grows on moose dung.”

In Nova Scotia, plans to mine peat for fuel at the Barrington Bog, near the southern tip of the province, were halted by the discovery of the thread-leaved sundew (*Drosera filiformis*), says Alex Wilson, curator of botany at the Nova Scotia Museum. While the thread-leaved sundew is not rare in the United States, only four populations are known in Nova Scotia, and Barrington is home to the largest. Wilson thinks the Barrington decision is nearly unique. “There are very few cases in North America where a major industrial operation was blocked because of the existence of some little-known plant.”

But Hinds argues that saving a few unusual bogs doesn't really address the problem. “The large bogs are the ones the industry is most interested in,” he says, “and many of these are environmentally interesting areas that have their flora and fauna intact.” Some of that flora is rare, according to Hinds, who wrote a book on New Brunswick's rare plants. Bog plants rare in New Brunswick include the Virginia chain fern (*Woodwardia virginica*), the sedge *Carex lepidocarpa*, and the Virginia screwstem (*Bartonia virginica*), a semiparasitic plant that attacks ericaceous shrubs like blueberries.

Hinds, who advises the New Brunswick government on mining proposals, says the pressure to develop the bogs is intense. “Peat is a multi-million dollar industry in New Brunswick,” he says. “We have serious unemployment, with the east coast fisheries falling apart, and many of these bogs are along the coast.” Keys, who helped design New Brunswick's peatland management plan, concedes that peatland development in the province exceeds the national rate of 0.02 percent. But the portion in production, he says, “is still less than 10 percent.”

The industry also maintains that mined bogs can be restored to ecological health. The Canadian Sphagnum Peat Moss Association has developed a reclamation policy, which it recommends to member companies. And provincial authorities sometimes require a restoration plan before a bog can be mined. But as Keys' paper admits, “Reclamation requirements for peatland developments in Canada have not been clearly defined.” One reason for this is that peat mining is a very slow process. “It takes about a decade to take a meter of peat off,” Keys says. “There are bogs in New Brunswick that have been in production for 40 or 50 years.” Nationally, fewer than 4,000 acres of peatland have been exhausted.

Bog birch, below, and bake apple, bottom, were two species rescued from a Prince Edward Island bog.



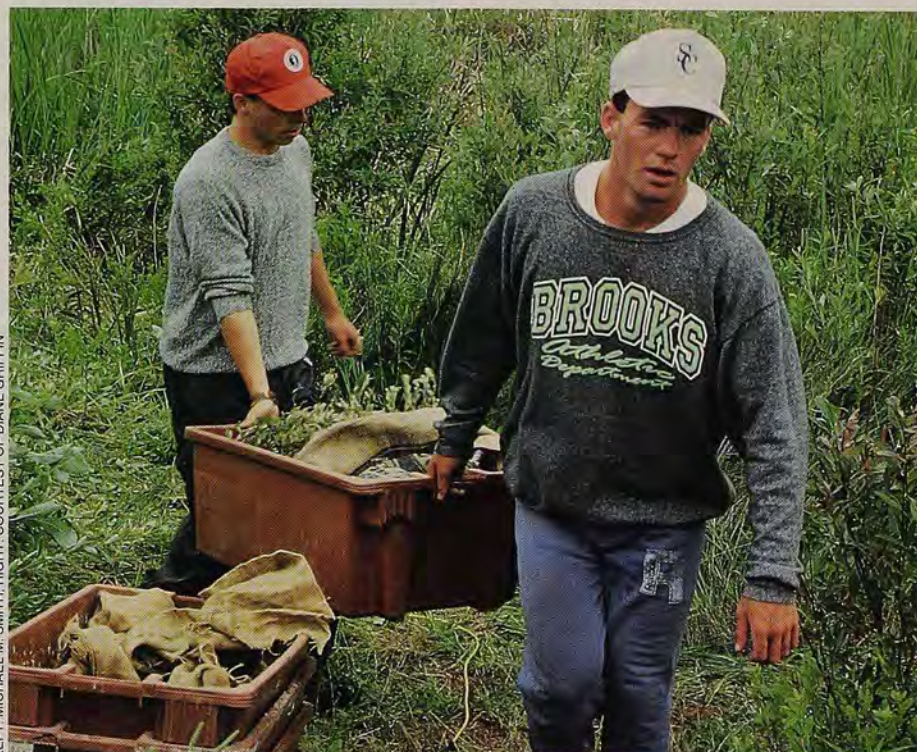
JOANNE PAVIA



DON JOHNSTON: PHOTO / NATS



Bogs aren't just for plants: they're also home to many small animals, like the garter snake above. At right, volunteers remove rare plants from a Prince Edward Island bog scheduled for mining.



LEFT: MICHAEL M. SMITH; RIGHT: COURTESY OF DIANE GRIFFIN

Because of this, most of the reclamation work thus far has really been a form of research. Typically, restoration begins by plugging drainage ditches to restore the water table. Lime and fertilizer may be added and transplants introduced, or the area may be left to revegetate on its own. Researchers are looking into the possibility of turning depleted bogs into forests, as has been done in parts of Europe, or into marshes for waterfowl. But usually the goal is to encourage the return of the original flora.

Can a mined-out bog become a bog again? Griffin admits the possibility but says, "you and I aren't going to be here to see it. We're not talking about grading a roadside and seeding clover. Bogs take thousands of years to develop." Keys responds that "the objective is to restore the function, not to restore the peat level. With the proper conditions you can get a representative sample of bog flora out there in five to ten years." Some botanists aren't so sure. "Bog flora is very complex," says MacQuarrie, "and it strikes me as very primitive biology to think that you could remove the insides of the bog and return the flora to its original state in a short period of time."

Restoration may not work miracles but it clearly has some healing power. Norman Famous, a plant taxonomist and consultant on peatland restoration, says that

many species will meet Keys' schedule if they are coaxed back onto the bog with additional nutrients. "But getting live sphagnum back in takes longer"—a good ten years if the area is level, which would allow more nutrients to reach it. "On crowned bogs with low nutrient peat," he says, "it can take decades." Famous thinks a better strategy is what he calls "sequential" restoration. "Just about every large bog operation has some areas that have been exhausted," and restoration should start on those areas as soon as the mining stops. The first steps should be to reestablish the water table and to cover the exhausted areas with the living sphagnum layer stripped from the next areas to be mined. Famous recently collaborated on two New Brunswick restoration plans that incorporated these recommendations.

But restoration has its limits. One way to describe what restorers do, says Malterer, "is that they turn the clock back about a thousand years and start the succession over again." A restored bog, he says, "would very much resemble what you've just mined, but it won't be the same." So restoration is not a matter for man alone. We can patch a mined-out bog with water and plants, but it will take a millenium to make it whole.

Chris Bright is assistant editor of American Horticulturist.

Their Own Private Idaho

“A garden?” the rangers asked. “Up there? You’re kidding.”

In our dreary middle years, my husband, Stew, and I chucked our hectic careers and left life as we knew it in smog-enshrouded southern California. In Idaho, we wandered into a world where life is still simple, where quietness counts, where the days are unhazy and the nights starry bright. In a cabin far removed from humankind, we chipped out our niche and developed a subsistence lifestyle tied to hunting, fishing, foraging, and gardening.

Few roads penetrate the 20,000-square-mile vastness known as the central Idaho

BY MARY JO CHURCHWELL

Rockies, yet vacationers come from afar to hike and ski its famous ranges: the Sawtooths, the White Clouds, the Pioneers, the Boulders, and the Bighorn Crags. The peaks that ring our cabin belong to a range that shares its name with the river it gives birth to—a river that once ran red with salmon.

The strand of asphalt that winds along the Salmon River connects the town of Challis to several other small settlements

that hunker down below peaks in the 12,000-foot class. As could be expected, extreme differences in elevation create diverse climates and vegetation types. While mountaintops receive over fifty inches of precipitation annually, mile-high Challis—the driest reporting station in Idaho—averages a scant seven and a half inches. Temperatures at the highest elevations drop to 50 degrees below zero in winter but soar to 100-plus in summer along the Salmon. Down by the riverside, cottonwoods meander through a gray sea of sage, while conifers cover subalpine heights and



MARY JO CHURCHWELL

The author's Rocky Mountain hideaway as seen from her vegetable garden.

aspens stand along the creeks. Above the timberline, bits of tundra cling to crannies below high walls of rock carved by glaciers.

At 7,000 feet, the climate on Sawmill Creek ranges somewhere between these extremes. My growing season is a mere month in length—in the best of years. Not that we weren't forewarned. The statistics came from the Challis National Forest, along with these discouraging words from staff members at the district ranger's office: "A garden? Up there? You're kidding. Lettuce, if you're lucky."

Stew and I confronted the demands of a short growing season and other challenges that would confound even well-seasoned sodbusters, like winters with weeks of arctic cold, like snowstorms in July followed by August drought. Here, lettuce-loving deer roam in gangs and nocturnally raiding rodents clear-cut entire plots. My advantages . . . I'm thinking . . . I'm thinking.

For one thing, from where I stand, I can look up from my labors and be knocked breathless by the epic scenery. Van Horn Peak punctuates a skyline spiky with pines and snowcapped until June. To compete with the grandeur of summits, hillsides flaunt their flowers: showy daisies, mountain bluebells, sticky geraniums, Indian paintbrush, sego lilies, lodgepole lupines, and canary yellow arrowleaf balsamroot. We feel no need for cultivated ornamentals when the meadows around us are spangled with buttercups, monkey flowers, and Rocky Mountain irises, and the air is perfumed with wild roses, lilies-of-the-valley, and phlox.

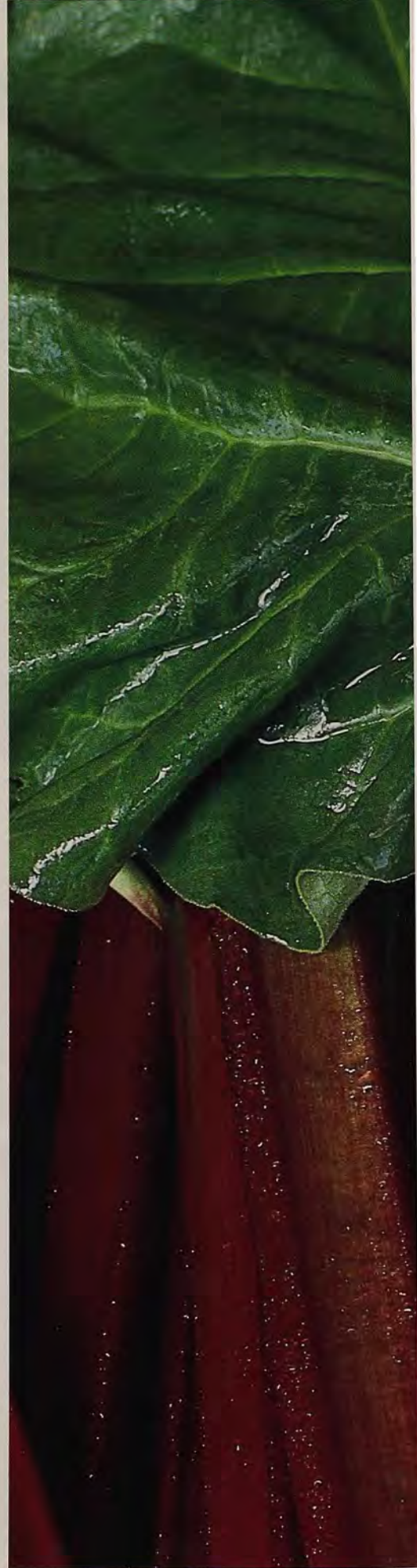
The geologic collision and upheaval that created these mountains were accompanied by volcanic activity that enriched the soil. Unfortunately, our garden site had been thoroughly, thoughtlessly bulldozed clean of topsoil when the land was leveled, then driven over repeatedly during the cabin-building years. The compacted clay had the consistency and fertility of concrete and wouldn't grow a turnip, even with extensive reconditioning. The soil had to be replaced before we could plant.

With sticks, string, and much discussion, we marked off most of the southern side of the yard into a long, narrow rectangle. With picks, shovels, and much grunting, we hacked the clay a foot deep, filled the wheelbarrow, and patched potholes in the driveway. We drove the pickup the hundred yards up and down the driveway dozens of times until the crater was filled to the brim with rich creekside topsoil squirming with earthworms. We raked the soil smooth, then subdivided the rectangle into plots, each three feet across, several yards long, and separated by walkways wide enough to work in. We read that raised beds grow more in less space, so we hauled dirt until plots were six inches above ground level.

In this back-to-the-land adventure, we collaborate on many such projects, but in our daily duties there is a suspect division of labor. Stew has assigned us separate roles to suit our skills, meaning he gets to be construction foreman, master mechanic, and fearless hunter, while I am ditch digger, go-fer, and camp tender. I also



PHOTOS BY MARY JO CHURCHWELL





Far left: While the world outside is still snowbound, greenhouse seedlings get a jump on spring. Left: Protected from garden marauders by its toxic leaves, rhubarb is harvested in abundance. Above: Mary Jo Churchwell's mountain-grown elephant garlic far surpasses the store-bought version.



LEFT: MARY JO CHURCHWELL; RIGHT: JERRY PAVIA



get to be the gardener because I managed to keep a dozen potted begonias alive in Los Angeles for five years, although they never bloomed.

My season begins with the coming of seed catalogs by snowmobile, when wild flowers are fantasies and garden plots thigh-high in the snow. Curled up near the wood-burning stove, I sigh as I thumb past pages of corn, squash, apples, and plums, and order what I have learned will grow here without miracles, without the fuss and expense of row covers and black plastic mulch. Some challenges are best met by bowing to authority.

I bow low but don't buckle. From companies catering to high-altitude growers come varieties bred for short seasons. My own rows of potatoes and peas supply better seeds still. Victories and defeats fill the pages of my journals, as do sketches of plots with crops that thrive on adversity: root vegetables, cabbages, spinach, kale, mustard greens, and yes, lettuce.

Wondering if sunflowers would survive, I planted a dozen and was surprised to see their golden rays tower above the potato plants. Then autumn froze their flower heads and undeveloped seeds. The Jerusalem artichokes likewise thrived but produced tubers too stunted to make digging worthwhile. The five-year-old, winter-tough fruit bushes might bear plums, cherries, and elderberries if deer didn't deflower the branches and

prune them to the stems. Deer so discouraged the raspberries, strawberries, and asparagus that they came back less and less every year, then finally, not at all.

"Plant pickets." This is the sound that Stew makes. My objection is strictly aesthetic. A sky-scraping fence might make deer better neighbors, but it would scar our mountainous vista.

"Try firecrackers," said the local game cop, handing us a bunch. The booming M-80s and screaming rockets violated the mountain hush for a week but didn't faze the deer. When homemade hot pepper solutions and commercial repellents also failed, Stew and I dragged pillows and sleeping bags out to the berry bushes and watched stars fall while deer crept undetected into the lettuce beds. When sunrise disclosed the destruction, Stew had to remind me about the California man who took a pipe wrench and beat a deer that had acquired a taste for his pampered posies. The man was arrested, found guilty of animal cruelty, and sentenced to a year in jail.

Stew and I never wanted the wildlife to suffer from our intrusion, so the neighborly solution was to double-up on lettuce. From former asparagus and berry beds, I now harvest the rhubarb that only we seem to savor. Coyotes and foxes, garter snakes and hawks also help out with pest control, preying on garden-ravaging wood rats, porcupines, and voles.

As I grow grayer with age, my taste for venison is dulled when I watch mother does teaching their spotted fawns how to nibble beet tops. I find I am fonder of snowshoe hares than the peas they chew up. Though I have no raspberries, seed-stealing chipmunks share their supply of wild currants with me, so it all works out in the end.

Aphids, flea beetles, grasshoppers, and pretty but unwelcome white butterflies come out of the wilderness and into my oasis of exotic greenery. But predatory wasps, lacewings, lady beetles, wrens, robins, and shrews are never far behind. The white butterflies of course will become cabbage worms, a few of which will be unavoidably tossed in salads served to summer guests. "Spit 'em out!" Stew again—a man of few words. Turnips, too, host the worms and by late August, lettuce leaves have their centers chewed away. Yet insect pests have never completely wrecked a crop (or a guest for that matter).

My ethics disallow all poisons, so I smother weedlings with blankets of spoiled hay hauled home from the county dump. The earthworms kidnapped from the creek turn this trash into food the plants can use. (I don't use synthetic fertilizers either.) And with the hay came spores of shaggy-maned mushrooms that fruit for a sautéed side dish that Stew serves over rice.

Mulch retains moisture, but in this land of little rain, never enough to forgo irriga-



State' tomatoes developed specifically for the northern Rockies by the University of Idaho. In mid-April, I seed the remaining flats with the cabbages, beets, storage onions, culinary herbs, and leaf lettuce that will go into plots the first warm week in June. Until July, sunsets turn the spa into a refrigerator, so flats spend nights in a spare bedroom. This is back-busting work when the shuttle includes over twenty jumbo-sized pots teetering with tomato and pepper plants towering over their stakes. The effort must be worth it. Why else would I do it every year?

"Why do any of it?" friends in Challis want to know as they ply us with their surplus corn, squash, apples, and plums. How do I explain to these USDA Zone 3 gardeners, who should know better than to ask?

I garden for health and self-sufficiency, to fill the root cellar with carrots (somewhat slim) and beets that would be bigger if the tops were allowed to grow unchewed. Most years, we store fifty pounds each of onions, turnips, beets, and parsnips, and up to a hundred pounds of potatoes (some notched by tiny teeth). Pantry shelves hold jars of grated, homegrown horseradish, rhubarb syrup, rhubarb sauce, rhubarb jam, and plastic bags stuffed with snow peas, cabbage leaves, and kale that rehydrate in soups all winter long. For taste, there is lemon balm, dill seed, sage, and garlic better than store-bought. Stew supplements our garden harvest with lake trout, deer, elk, and bear meat, and I collect pounds of mushrooms, berries, and greens along Sawmill Creek. We buy in bulk and only staples such as beans, flour, oats, sugar, and salt. Our grocery bill runs under \$400 a year.

Even if it weren't absolutely necessary, I would garden because it gets me outdoors, away from my housework, when the air is soft and fragrant with April. If I didn't have rows to hoe, I might miss the migratory birds winging their way back to breed in my canyon, or the male mountain bluebird that perches on the pitchfork stuck in a bale of hay, or the calliope hummingbird that zips through hillsides scarlet with gilia.

I garden this mountainous terrain in spite of a few challenges. Beyond a doubt, I reap rewards that few gardeners will ever know.

Formerly a bank officer in Palm Springs, California, Mary Jo Churchwell now lives and writes in Sawmill Creek, Idaho, where, she says, "it's an adventure just going the mile for the mail."

Far left: A least chipmunk savors the wild currants that Churchwell also gathers. Left: In the Idaho Rockies nature provides ornamentals like this sticky geranium. Below: Time out from the rugged mile-high life for an impromptu coffee klatch. Bottom: Another Idaho eye-catcher, Indian paintbrush.



PHOTOS BY MARY JO CHURCHWELL



tion. To bring water from the creek to the house and garden, Stew built a hydraulic ram pump with pipe and fittings from the hardware store. This centuries-old invention uses gravity and simple hydraulics to lift a small amount of water higher than its source—about thirty feet up the hillside in our case. Stew says someday soon he will build a 700-gallon cement holding tank into the hillside above the house to provide enough water pressure for a sprinkling system. For now, I supply each plant with a personal shower and am thankful I don't have to tote buckets from the creek.

The creek is small and won't float a fish. Sometimes it only trickles between the willows, into the diversion dam and then into the ram pump, which thuds rhythmically as it pushes water through a pipe to 55-gallon plastic storage barrels in the greenhouse adjoining the kitchen. Another pump delivers water from the barrels to the kitchen sink, where I fill a watering can for the greenhouse plants: hot peppers, tomatoes, watercress, and the nasturtiums that jazz up our salads with their bright red petals.

Around the first of March, when outdoor temperatures seldom climb above freezing, the sun-drenched greenhouse bakes at more than 80 degrees. Here I sow flats of jalapenos, serranos, and rellenos that will go into the spicy Mexican food that Stew acquired a craving for in California. Now's also the time to start the 'Gem



*In a mountain cloud forest in Tamaulipas, John Fairey collects seeds of *Quercus canbyi*, one of fifteen evergreen Mexican oaks sold by Yucca Do Nursery.*



Treasures of the Sierra Madre

*Texas plantsmen discover a gold mine
of flora on the brink in Mexico.*

B Y E R I N H Y N E S

Twenty-three years ago, owning a nursery was about the farthest thing from John Fairey's plans. He wasn't even a gardener. "I was raised on a large garden in South Carolina," he says. "That was a chore." He simply wanted to live somewhere between Houston, where he could take in ballet, opera, and the symphony, and College Station, forty miles away, where he teaches first year architecture students at Texas A & M University.

When a real estate agent showed him a seven-acre piece of property just west of Houston, he wasn't interested in the rolling, grassy ranch with its fence maze, eroded soil, and swampy spots. But the agent persuaded him to return for a second look. When he saw the spring-fed stream that cut through the property and the mature trees that drew moisture from it, he was transported back to a day in his youth when he was wandering along a similar stream and looked up in wonder at a *Stewartia malacodendron* in full bloom. The dormant seed

Below: Seed propagation at Yucca Do spills out of a permanent structure into plastic-covered hoop houses. Bottom: Ruellia brittoniana, a Mexican native, can be invasive. But 'Katie', selected by Texas nurserywoman Katie Ferguson, is well-behaved and blooms from summer to fall. Opposite: Tecoma alata can't tolerate cold but thrives in drought and is a hummingbird magnet.



in him sprouted. The professor became a gardener. In honor of the abundant woodpeckers—downy, pileated, and many other species—he named his new property Peckerwood Gardens and started planting a variety of trees and shrubs to screen the house from the road.

Driving into Peckerwood Gardens today, it's hard to imagine how it must have looked when Fairey first saw it. The driveway, hidden beneath a verdant arch of maples, oaks, and Cherokee roses, leads to an Eden. Fairey and his partner Carl Schoenfeld—both trained as artists—have created a horticultural oasis of light and shadow so balanced, so soothing, that it slows your pulse, quickens your senses, and reminds you that the concerns consuming you most days are not really important in the Grand Scheme of Things. It's both a very personal space and a test site for some 3,000 species and cultivars of natives and their Asian and Mexican counterparts.

What Fairey is doing in his six-acre landscape is art. But the business he and Schoenfeld have established on the remaining acre represents a philosophy. Yucca Do Nursery is not only making little-known Mexican plants available to American gardeners, but is possibly saving some of them from extinction.

The genesis of both the current garden and the nursery enterprise was a tornado, which in 1983 ravaged ten years of Fairey's landscaping. "The tornado hit while I was out of town," Fairey says. "When I came back, it had taken down or damaged more

than fifty mature trees, including thirty-eight pines. I looked at the garden for two or three days and realized it wasn't going to correct itself."

Fairey hired two university students to cut and clear damaged limbs. Schoenfeld, a philosophy major, ended up staying on. "Carl says he learned more here in one month of working than he did in four years of school," Fairey says.

Many of the young trees Fairey had planted were flexible enough to withstand the tornado. But removing the dead or mangled canopy trees—a project that took five years—exposed the once-protected understory to the Texas sun. Fairey and Schoenfeld had to rethink Peckerwood Gardens. By opening up the woodland, the storm opened up landscape possibilities as well: more light for a greater variety of plants, wider spaces to create paths and exterior rooms.

Fairey's thirteen years of gardening in the Houston area's humid and hellishly hot climate had taught him that natives were more often than not the best choice. At that time few were offered in the nursery trade, and Fairey and Schoenfeld thought they could improve that situation. In 1987 they launched Yucca Do Nursery to propagate plants for the garden and for sale.

The search for interesting, heat-tolerant plants led Fairey and Schoenfeld to accompany Lynn Lowery, a now-retired Houston nurseryman, on one of his many botanical expeditions to northern Mexico to collect seeds and cuttings.

"The direction of the nursery became more focused after the first trip to Mexico," Schoenfeld says. They started propagating Mexican natives, many of which are adapted both to the heat of deserts and the cold of mountains.

After a few more trips with Lowery, Fairey and Schoenfeld began organizing their own collecting expeditions to the Sierra Madre Oriental in the Mexican states of Tamaulipas, Coahuila, and Nuevo León. All told, they've made nearly fifty trips, sometimes traveling alone, sometimes with botanists and horticulturists who want to learn about the little-studied region.

One horticulturist who joined an expedition was Brett Hall of the University of California Arboretum at Santa Cruz. "I've never seen any team as efficient and productive in their approach," says Hall, who is testing about 100 plants grown from seed Fairey and Schoenfeld have collected. "And what they're doing is remarkable



PHOTOS BY ELVIN McDONALD

and important. No one else is doing that type of work for that region.”

Horticulturist Martin Grantham concurs: “It’s a region that’s not well-documented botanically. People don’t know what’s there.” Grantham, who runs the Meso-American section of the University of California Botanical Garden at Berkeley, has also traveled with Fairey and Schoenfeld. After the botanical garden suffered a devastating freeze three years ago, Grantham wanted plants from mountainous northern Mexico, where cold weather common in the high altitudes naturally selects for hardiness.

The Yucca Do catalog shows the results of the expeditions. Of the 186 trees and shrubs now offered, Fairey and Schoenfeld have collected seventy-one in Mexico. Twenty-three of those, to the best of Fairey’s and Schoenfeld’s knowledge, are plants never offered for sale elsewhere. The catalog also includes fifty-six Mexican natives among its 141 perennials, sixteen of which are introductions, and thirty-six Mexican natives among its eighty-six woody lilies and palms. Yucca Do also sells vines, conifers, and bulbs—all heat tolerant—as well as cacti and succulents. The Fall 1993-Spring 1994 catalog includes 182 new offerings. “We don’t try to market things you can find in a regular catalog,” Fairey says, “unless we think it’s exceptionally fine.”

Some expeditions have yielded remarkable finds. Last summer, for example, they came across a wild population of *Echeveria runyonii*, a cultivated succulent perennial thought to have disappeared from the wild at the turn of the century. They spotted it on the north face of a granite mountain 200 miles southwest of where it was discovered in 1907 in Matamoros. Until they discovered a colony of Mexican witch hazel (*Hamamelis mexicana*) in Tamaulipas, the rare shrub was known to grow on only one site. And they’ve found a species of rain lily (*Zephyranthes* spp.) that two experts believe is new. Fairey describes it as one of the most beautiful rain lilies he has ever seen, with large clear pale pink petals that are drooping and slightly recurved, and more intensely colored on the edges. It has no species name as yet, but is being called ‘Labuffarosa’ for the mountain where they saw it.

Fairey and Schoenfeld are conscientious about making sure their discoveries benefit the horticultural community. In addition to the arboretum at Santa Cruz and the botanical garden at Berkeley, they regularly



make seed available to researchers at North Carolina State University, Harvard University’s Arnold Arboretum, Chollipo Arboretum in Korea, and others, who plant them in their research and public gardens and distribute seeds to collectors.

“The importance of what we’re doing is that we’re preserving and distributing this seed,” Fairey says. “A great deal is being destroyed in the wild.” The mountains they explore, once considered uninhabitable, are now being settled by farmers who’ve been relocated from the south. Their livestock graze on flowers, seedheads, and young tender seedlings.

Fairey estimates that only 5 percent of the plant populations he sees can regenerate. “Every year we see something that’s been lost—we’ll go back to collect the seed and it’s been devoured,” he says. “But the cows, goats, and horses don’t scare me nearly as much as United States technology and greed.” There are plans for a major timbering project in the Nuevo León area, he says, although a number of environmental groups are trying to halt it.

Fairey and Schoenfeld are careful not to contribute to the problem. They never collect whole plants—just seeds and cuttings. When Hall of the Santa Cruz arboretum traveled with them, he admired their conservative methods. “They don’t just go in and clean out all the seed of a rare population,” he says. “They make sure to leave a good amount behind.”

Fairey and Schoenfeld aren’t the first to explore the region, but are among the best-organized. “Many of these seeds had been collected here and there in the early 1900s, but had been lost,” Schoenfeld explains. “There wasn’t a constant and intense effort to collect and distribute them. And the collectors never kept records.”

The Yucca Do partners keep detailed records on where seeds and cuttings were collected, growing conditions, companion plants, soil type, and altitude. Says Fairey: “It’s important that we observe a plant’s microclimate closely. Just because a plant’s in a desert doesn’t mean it’s growing in dry, sandy conditions. It could be in a rock crevice that catches water and has good soil.”

OFFERINGS FROM THE YUCCA DO CATALOG

Most of Yucca Do's plant offerings are adapted to USDA hardiness Zones 7 to 10, although some are hardier farther north. Many of the plants have survived to 4 degrees at Peckerwood Gardens.

Because the plants are often new to cultivation—some are still unnamed—Fairey and Schoenfeld are interested in hearing from their customers about their observations of Yucca Do plants in different climates and soils.

Their catalog says their goal is providing "unusual and rare plants for the collector and discriminating gardener." In many cases, it describes the setting where the plant was found, including elevation, soil, and exposure, letting customers decide if the plant would be appropriate to a location in their own gardens.

Trees and Shrubs

Acer skutchii. A very rare and unusual sugar maple from the cloud forest, with bright pink new growth changing to red, and fall foliage usually yellow to orange.

Carpinus sp. Fairey and Schoenfeld are growing five other species of the Mexican hornbeam, but they feel one still unidentified species is the most beautiful, with its serrated leaves, pendulant habit, smooth twisting trunk, and bronzy pink new foliage.



ELVIN McDONALD

Salvia madrensis.

Clethra pringlei. When this rare, small evergreen tree blooms its long racemes of delicate white flowers fill the garden with the aroma of cinnamon. The serrated foliage changes from bronze to dark green.

Cornus florida subsp. *urbiniana*. Seeds for these Mexican dogwoods were collected from sixty-foot trees on a northern site at high altitude. The leaves have a bluish cast with pink petioles and the bracts of the large white blooms are held together in an open sphere.

Philadelphus coulteri 'Bull's Eye' (*P. maculatus*). The current catalog offers seventeen mock oranges. This one is exceptionally rare. Each one-inch bell-like white flower has fringed petals with a maroon pink eye and an incredible orange fragrance. The leaves are small and the form is delicate and pendant.

Quercus polymorpha. The current catalog lists twenty-three oaks. The leaves of the large-growing Monterey oak are thick

and smooth and vary from dark green to bluish green. Drought-tolerant, it is probably the most widely grown of the Mexican oaks in Texas.

Q. rhizophylla. Also drought-tolerant, the loquat oak is large and fast-growing, with leaves that are glossy, olive green, and heavily textured.

Styrax glabrescens var. *pilosus*. This rare, small tree was found three years ago and identified a year later from photographs and herbarium pressings. Its leaves are larger than those of the more common snowbell, *S. grandifolius*, and its flowers more numerous and two to three times larger.

Perennials

Callirhoe involucrata var. *tenuissima*. Fairey says that this dense, ground-hugging evergreen attracts more interest than any other introduction from Mexico. It has finely dissected dark green foliage veined blue-green, and delicate violet flowers shaped like wine cups that last most of the summer. In winter its leaves pull in to make a tight ball.

Eryngium umbelliferum. Among the many *Eryngium* species the team has found and cultivated, they consider the foliage of this one exceptional. Its delicate silver green leaves interweave to give a spiky, sculptural effect. Only six to eight inches tall and eight inches wide, it has blue-purple blooms and interesting seed spikes.

Monarda pringlei. This species was grown from a small quantity of seed collected on their first Mexican expedition in 1988. Its large scarlet flowers begin opening on sturdy fifteen-inch spikes in mid-April and continue through May. Unlike other monardas it stands up to Texas heat.

Salvia blepharophylla 'Sweet Numbers'. This year's catalog offers fifty-four salvias. The flowers of this one, found in the remote village of Dulces Nombres in the state of Tamaulipas, are large and brilliant red. With a magnifying glass, tiny hairs can be seen around the edges of each green leaf.

S. madrensis. This forsythia salvia, collected in Mexico by English plantsman Jamie Compton, has deep purple markings on its stems.

Woody "Lilies"

Nolina nelsonii. The catalog has nine representatives of this genus, evergreen yucca relatives with delicate, threadlike foliage. This species is fifteen feet tall with silver blue blades. Its three-to-four-foot bloom stalk produces thousands of tiny white flowers that change to green and then light brown.

Yucca rostrata. The catalog has nineteen yuccas. This one has soft, undulating blue foliage and is hardy to Zone 7.

Conifers

Juniperus flaccida. Collected at 6,000 feet, this juniper has gray green weeping foliage and is exceptionally drought tolerant.

Pinus maximartinezii. A blue-green piñon that produces especially large and tasty nuts indispensable for pesto. "The magnificent cones," says the catalog, "are also in demand." Dense and rounded, it matures at thirty to forty feet in the wild.

Write Yucca Do Nursery at P.O. Box 655, Waller, TX 77484. The catalog is \$3.

Indeed, the expeditions have shown that climates and microclimates aren't always straightforward. Once, for example, after collecting on a dry mesa at 6,000 feet, they climbed a road ten miles and 2,000 feet into the mountains and found a pine forest where they could look down on the desert they'd just left. They camped there that night, awakening the next morning to discover ice on their tents.

Another time, they noticed a cloud hanging over a mountain pass in the Jaumaue Desert. They headed for it and found a misty spot. From there they followed a trickle of water, eventually discovering the junction of two rivers that originated underground. "That's the sort of contrast we find out there in pure desert," Schoenfeld says.

These many microclimates, combined with the absence of an ice-age die-out of plant species in Mexico, accounts for its astonishing plant diversity, says Fairey. He notes that Mexico has some 400 oak species, compared to fifty-six in the United States.

The pair say that the mysterious and beautiful mountains of the Sierra Madre Oriental still fill them with wonder. That and the opportunity to distribute seeds of rare and endangered plants compensate for the difficulty and expense of their expeditions. The partners usually go in the spring to hunt for unusual plants in flower, then go back to collect seed when they think it will be ripe. If they're too early, they have to return a few weeks later. If they're too late or if cattle have eaten the seed, they have to wait another year.

Often, they travel on rocky, one-lane dirt roads, covering only thirty bouncy miles a day. Schoenfeld recalls one trip when their Isuzu Trooper slid off a muddy road and became stuck in a ditch. Fairey stayed behind to look for plants while Schoenfeld walked in the rain to the nearest village. For an hour its residents fed him and asked him questions, finally loaning him a burro to carry him back on a high, narrow trail, accompanied by a farmer and a team of oxen to pull out the Trooper. Fairey tells of saving a man whose truck was dangling over a 1,500-foot precipice, and moving the stalled car of a woman and child just before an avalanche buried the spot where they'd been stranded.

Fairey estimates that each trip costs well over \$1,000. Nursery sales help cover some of the expense. And Fairey and Schoenfeld have begun selling "seed shares" in their expeditions; for \$300, subscribers get seeds



PHOTOS BY ELVIN McDONALD

from at least five trips. They've also started a practice that some other specialty nurseries have copied: charging for educational tours of their gardens.

Fortunately, Yucca Do's mail-order business is growing; Schoenfeld estimates that orders nearly double every six months. Most of Yucca Do's customers are collectors and gardeners in Texas and California, botanical gardens, and Florida's Cooperative Extension Service, which is studying plants with low-water requirements.

This year, Schoenfeld took over most of the business responsibilities, as Fairey prepared to expand Peckerwood Gardens onto twenty-seven acres of adjacent pastureland. Short-term plans call for creating a berm to screen out noise from an increasingly busy highway. The long-term plans are described only as "a meadow for trees." But if Peckerwood could go in seven years from a tornado-ravaged woodland to being featured in Rosemary Verey's 1990 *The American Man's Garden*, the mind reels at what Fairey may eventually achieve in four times as much space.

Yucca Do still operates in the red, and of course Fairey looks forward to the day when that changes. But profit isn't his motive. "Yesterday," he said recently, "I spent an hour on the telephone with a man from the National Arboretum. He'd just found out about our work and was talking about beginning a germplasm bank. I want more people to be aware of these plants, but that takes a long time to materialize. That's why I donate seeds to botanical gardens. That's my little bit."

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



Top: Inside the Yucca Do propagation house. Fairey and partner Carl Schoenfeld collect only seeds or cuttings of the unusual plants they find. Above: Ipomoea fistulosa is a desert subshrub from northern Mexico. In any but the driest, sandiest soils it can become overly aggressive.

Crystal Bridges and Down-Home Domes

Conservatories of all shapes flourish in the Plains states.

ARTICLE AND PHOTOS BY ART ODE

The major cities of America all have their fantasy-land conservatories. The grand tradition goes back over a century to the Crystal Palace of London and the Victorian glasshouses of Kew Gardens, established at the zenith of both the British Empire and the Industrial Revolution to serve as repositories for the botanical wonders of Britain's tropical colonies.

Some of these grand glasshouses, like the New York Botanical Garden's Enid A. Haupt Conservatory, are marvelous restorations of turn-of-the-century extravaganzas. Some are twentieth-century architectural marvels: Mitchell Park Conservatory in Milwaukee, the new conservatory of the Brooklyn Botanic Garden, the Climatron of the Missouri Botanical Garden, or the Lucile Halsell Conservatory of the San Antonio Botanical Gardens.

Whimsical and impractical as they usually are, conservatories continue to be constructed or restored all across the United States. Some of these expensive projects grew primarily from the interest and philanthropy of a single person; some are the result of civic pride and ambition; a few are driven by education and science. But most arise out of a mix of these needs and emo-

tions. Inexplicable as it may sometimes seem, our culture continues to aspire to the European tradition of displaying exotic plants of the world and organizing seasonal flower shows for the delight and edification of the populace. Over the years, conservatories and botanical gardens have been as important to the cultural image of American cities as zoological gardens, symphony orchestras, libraries, museums, and of late, sports teams.

But what about the smaller cities and towns, the down-home places where big city folks would never expect to see an epiphytic orchid or a lavish holiday floral display?

Surprisingly, there are many glasshouses, often virtually unknown outside a small region, where the conservatory tradition flourishes, albeit sometimes on a scale commensurate with the smaller population. Some are romantic, some are nostalgic, some are a little silly. But they are all interesting and most are worth a turn off the interstate.

In the movie "Field of Dreams," when the ghost of Chicago Black Sox outfielder Shoeless Joe Jackson finds himself in a makeshift ball field built by the rural mystic played by Kevin Costner, he asks, "Is this heaven?" Costner answers: "No, it's Iowa." Indeed, that land of pastoral beauty



Des Moines Botanical Center Conservatory. Inset: The Bolz Conservatory at Olbrich Botanical Garden in Madison, Wisconsin.

is probably close to paradise, but you might not expect to find a first-class modern conservatory there.

Yet there is one, at the downtown Des Moines Botanical Center. Described by its architect as a "cristogon," it looks to the uninformed exactly like a geodesic dome. It's constructed of plastic and steel, 150 feet in diameter at its base and eighty feet tall. It houses a fine collection of tropical and subtropical plants, waterfalls and overlooks, and its seasonal flower shows are a regional attraction.

Collecting unusual species is a cornerstone of the accession policy at Des Moines. They have "practically every *Acalypha* and *Pseuderanthemum* in existence," according to Director Matt Rosen, extensive collections of unusual orchids, bromeliads, cacti and succulents, and one of the best bonsai collections in the Midwest. The conservatory exhibits reflect the world's ecological complexity through canopy, understory, ground cover, and epiphytic plantings.

This facility, operated by the Des Moines Department of Parks and Recreation, is complemented by outside gardens and a spectacular sculpture, "Spectral Liberation," by Christiane T. Martens. Made of steel and painted in rainbow colors, its perspective

changes almost magically when viewed from different vantage points.

Iowa has another, albeit less ambitious conservatory in Davenport's VanderVeer Park. This is an old city park, well cared for with outdoor displays of colorful annuals and perennial, herb, and rose gardens. The VanderVeer Conservatory is an old, rather undistinguished curved-eve glasshouse that was expanded and "modernized" in the 1950s. It exhibits economic plants such as coffee and cocoa, the usual philodendrons and aroids, palms, ferns, and gesneriads. There are many house plants of ancient lineage, which one suspects may have been donated by dowagers of the grand old houses surrounding the park before they were turned into multi-family homes. There is no grandeur here, but the atmosphere is pleasant and homey. It makes a relaxing stop during a hot afternoon drive down the interstate, particularly with a fast-food lunch to consume in the old-fashioned park and garden setting.

As Iowa is known for corn, Wisconsin is known for beer, cheese, and its north woods. But Wisconsin is really very cosmopolitan, particularly the southeast quadrant of the state, which is only an hour away from Chicago and about three hours

from our previous stop in Davenport.

A side trip to Madison's Olbrich Botanical Garden and Bolz Conservatory is likely to take big city horticultural sophisticates down a peg or two (although they probably won't admit it). The conservatory is not large, at a relatively compact 10,000 square feet and only fifty feet high, but it is the epitome of scientific and practical design, with automatic controls for temperature, humidity, fertilization, watering, and shading. And it houses an immaculately tended tropical collection, with the educational emphasis on economic plants and rain forest ecology.

The conservatory was built in 1991 for \$4.5 million, funded by a major gift from the local Bolz family, other public gifts, and \$1 million in city funds, according to Director Nancy Ragland. Beautifully joined to an existing educational complex of native stone, it evokes the prairie school of architecture. Its site, overlooking Lake Mendota and surrounded by elegant gardens and promenades, makes it an eye-popping horticultural experience.

Its educational programs emphasize the importance of tropical rain forests and the ecological interconnectedness of all regions of the world. Teaching children environ-



mental good citizenship is a major goal; they can take home cuttings of conservatory plants in recycled plastic containers.

At the opposite climatic end of mid-America from woodsy Wisconsin is Oklahoma, oil and cattle country, a windswept, even wild place with a few large metropolitan areas and wide open spaces in between.

Since the dust bowl days, Oklahoma City has been a boom-and-bust town, usually reflecting the cycles of its agriculture- and oil-dominated economy. It is a city with grand visions and just as often, grand defeats. When it was booming in the petroleum-driven 1970s and the federal spigot was still flowing with urban renewal money, it began a horticultural spectacular, the Myriad Gardens. A surreal place of sunken lakes and suspension bridges, Myriad Gardens is a sort of inverted Babylonian fantasy, all connected to the city center by underground tunnels and glass-enclosed atriums.

In the midst of this still-uncompleted wonderland stands the Crystal Bridge, an immense cylinder of steel trusses and acrylic panels 224-feet long and seventy feet in diameter, knocked over on its side like some classical temple ruin, spanning a concrete canyon. This singular structure was designed by William Conklin of Con-

klin Rossant Architects, who grew up in Hubell, Nebraska, population eighty, and who now has an office on Park Avenue in New York City.


You may search the world, but you will never, ever, see a conservatory remotely like this one. It is filled, like a bottle terrarium, with a fine collection of tropical, subtropical, and desert plants. The conservatory has three distinct climatic zones and boasts excellent displays of orchids, bromeliads, palms, and cacti, assembled by horticulturist Mike Bush.

While Myriad Gardens is still a building, the Crystal Bridge is a reality. They alone are worth a trip to Oklahoma City, where you can also check out the Cowboy Hall of Fame, with its outstanding collection of Frederic Remington sculptures and other western art.

I have become pretty adept at finding out-of-the-way conservatories, but I am sure there are many I have missed, particularly entities that perhaps don't really qualify as conservatories, but through dint of imagination and effort function as such.

I am thinking of places like the Bicklehaupt Arboretum in Clinton, Iowa, which has converted an indoor swimming pool into a place for tropical plants, and





*Myriad Gardens' Crystal Bridge
in Oklahoma City, Oklahoma.
Inset: Davenport, Iowa's,
VanderVeer Conservatory.*

Sallows Conservatory in Alliance, Nebraska, which was built painstakingly from old greenhouse parts, but happily holds seasonal flower shows for a grateful public in this town of 9,000 in the middle of nowhere, 100 miles east of Cheyenne, Wyoming. (If you somehow find yourself in proximity to Alliance, be sure to see not only the conservatory, but Carhenge, a thoroughly hilarious reproduction of England's Stonehenge, built from junked automobiles by some obviously beery local artisans. It's right out there on the prairie for all to enjoy; if it were in New York City, you'd pay \$20 for a peek.)

Conservatories have always been extravagant, impractical, and horticulturally challenging, to say the least. The average useful lifespan of these humidity-filled structures is about twenty years, at which time they will usually need either restoration or demolition. The New York Botanical Garden conservatory, for instance, was built in 1898, restored in the 1930s, the 1950s, again in 1976 at a cost exceeding \$10 million, and is presently undergoing yet another \$21 million restoration.

The very first conservatory, London's Crystal Palace, burned down a few years after it was built in the 1850s. This has

seemed to me patently ridiculous, since it was built of pretty fireproof materials—cast iron and glass. I have always envisioned it slowly melting, in horror-film splendor, like a giant sugar Easter egg on a hot stove top. Why in the world do we continue to build such frivolous structures?

Every society has its traditions and its symbols, without which it would be sorely impoverished. Ours sees its cities as places of adventure and culture, with streets of gold and temples of marble—places of wonder and science, where dreams come true. Never mind that they are far from that.

Our conservatories, great and small, are part of that tradition. In them we vicariously visit far-away places, engulf ourselves in the beauty of nature, learn about our natural world, get in out of the cold on a blustery day and emerge miraculously into spring. We see them as crystal palaces in the emerald cities of our dreams. Would that there were more crystal bridges to magically span the chasms that separate us from each other.

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

FOR MORE INFORMATION

☞ *Bicklehaupt Arboretum*, 340 South 14th Street, Clinton, IA 52732, (319) 242-4771. Open sun-up to sundown daily. Free admission.

☞ *Des Moines Botanical Center*, 909 East River Drive, Des Moines, IA 50316, (515) 283-4148. Open Monday through Thursday, 10 a.m. to 6 p.m., Friday 10 a.m. to 9 p.m., weekends and holidays 10 a.m. to 5 p.m. Closed Thanksgiving, Christmas, and New Year's Day. Small admission charge.

☞ *Myriad Gardens*, 100 Myriad Gardens, Oklahoma City, OK 73102, (405) 427-5461. Near I-35 on Reno. Open daily 9 a.m. to 6 p.m. Closed Christmas. Small admission charge.

☞ *Olbrich Botanical Gardens and Bolz Conservatory*, 3330 Atwood Avenue, Madison, WI 53704, (608) 246-4551. Open Monday through Saturday 10 a.m. to 4 p.m., Sunday 10 a.m. to 5 p.m. Closed Christmas. Free admission Wednesday, Saturday mornings. Small admission charge other days.

☞ *Sallows Conservatory*, P.O. Drawer D, City of Alliance, Alliance, NE 69301, (308) 762-7422. Eleventh Street and Nebraska.

☞ *VanderVeer Park Conservatory*, 215 West Central Park, Davenport, IA, 52803, (319) 326-7818. Open Tuesday through Sunday, 10 a.m. to 4 p.m. Open holidays. Small admission charge fall through spring.

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MIKE LOWE

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TED AND GWENDOLYN BRAND

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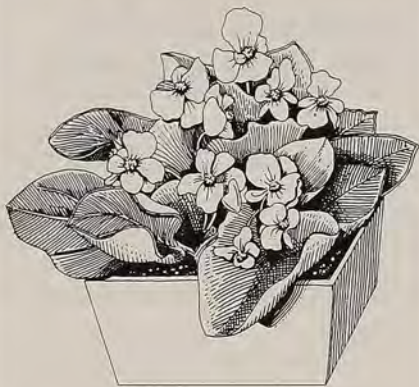
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 A. shut-uhl-WORTH-ee-eye
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 vir-JIN-ih-kuh
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 var. ten-yew-ISS-ih-muh
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Calypso kah-LIP-so
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 leh-pid-oh-KAR-puh
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 bleh-far-ih-GLOT-iss
Hamamelis mexicana ham-ah-ME-liss
 mex-ih-CAN-uh
Heuchera americana HYEWE-ker-uh
 ah-mer-ih-KAH-nuh
H. bracteata H. brak-tee-AY-tuh
H. cylindrica H. sih-LIN-drih-kuh
H. villosa H. vil-LOW-suh
Impatiens balsamina im-PAY-shenz
 ball-suh-MEEN-uh
Ipomoea fistulosa ih-poh-ME-uh
 fis-tyew-LOW-suh



JERRY PAVIA

American barrenwort or Vancouver fern is a native ground cover that grows well under large shrubs or trees in woodland conditions.

Juniperus flaccida joo-NIP-er-iss
 FLAK-sih-duh
Monarda pringlei moh-NAR-duh
 PRING-gee-eye
Nolina nelsonii no-LIE-nuh nel-SOWN-ee-eye
Pachysandra procumbens
 pak-ih-SAN-druh pro-KUM-benz
P. terminalis P. ter-mih-NAL-iss
Paxistima canbyi pak-SISS-tih-muh
 KAN-bee-eye
Philadelphus coulteri fil-ah-DEL-fus
 COOL-ter-eye
P. maculatus P. mak-yew-LAT-us
Pinus maximartineuxii PIE-nus
 mak-sih-mar-tin-EX-ee-eye
Platanthera plah-TAN-ther-uh
Pogonia poh-GO-nee-uh
Pseuderanthemum soo-der-AN-theh-mum
Quercus canbyi KWER-kus KAN-bee-eye
Q. polymorpha Q. pol-ee-MOR-fuh
Q. rhizophylla Q. riz-OFF-ih-luh
Rubus chamaemorus ROO-bus
 kam-eh-MOR-us
Ruellia brittoniana roo-EL-ee-uh
 brit-tone-nee-AN-uh
Salvia blepharophylla SAL-vee-uh
 blef-ah-roh-FIL-uh

S. madrensis S. mah-DREN-siss
Sarracenia purpurea sar-uh-SEE-nee-uh
 per-PER-ee-uh
Sphagnum SFAG-num
Splachnum SPLAK-num
Stewartia malacodendron
 stew-AR-tee-uh mal-ak-oh-DEN-dron
Styrax glabrescens var. *pilosus* STY-raks
 glab-RES-senz var. pih-LOW-sus
S. grandifolius S. gran-dih-FOE-lee-us
Tecoma alata teh-KOH-muh ah-LAY-tuh
Tiarella cordifolia tee-ah-REL-luh
 kor-dih-FOE-lee-uh
Vaccinium angustifolium vak-SIN-ee-um
 ang-gus-tih-FOE-lee-um
V. macrocarpon V. mak-roh-KAR-pon
Vancouveria hexandra van-koo-VEER-ee-uh
 hek-SAN-druh
Veronica officinalis ver-ON-ih-kuh
 oh-fiss-ih-NAL-iss
Woodwardia virginica wood-WARD-ee-uh
 vir-JIN-ih-kuh
Xanthoriza simplicissima zan-thoh-RIE-zuh
 sim-plih-SISS-ih-muh
Yucca rostrata YUK-uh ros-TRAY-tuh
Zephyranthes zef-ih-RAN-theez
Zingiber ZIN-jih-ber

STUDY TOURS

TRAVEL/STUDY TRIPS FOR THE AHS GARDENER

FEBRUARY 13-20, 1994 GARDENS OF THE WINDWARD ISLANDS OF THE CARIBBEAN

Join us for an exploration voyage on board the *MV Yorktown Clipper* from Antigua to Grenada. Ports of call include Guadeloupe, Martinique, St. Lucia, St. Vincent, and the Grenadines, where we'll have a barbecue lunch on a quiet beach. This program has many unique highlights including the private riverside gardens of Madame Christiane Berthelot on Guadeloupe and the oceanside gardens of Jonathan and Marne Palmer at Ratho Mill on St. Vincent. In St. Vincent we'll also visit the oldest botanical garden in the western hemisphere and see a breadfruit tree grown from the original plant carried to the island by Captain Bligh in 1793. Leading the program for AHS is new AHS President Dr. H. Marc Cathey, his wife, Mary, long-time AHS Board Member André Viette, and his wife, Claire.

MARCH 2-19, 1994 GARDENS OF MOROCCO

With an itinerary that includes the magical cities of Casablanca, Fez, Marrakech, Essaouira, and Taroudant, this trip might be best described as a passage back through time into the land of Berber and Sudanese cultures. The program includes visits to the magnificent gardens and palaces created by Moulay Ishmael. We'll stay at the exotic Palais Jamai in Fez and the world famous La Mamounia in Marrakech, where we'll also visit the Great Bazaar. March is an ideal time to visit Morocco since *Iris tingitana* and *Crotalaria saharae* promise to be in full bloom. Leading this program is AHS Board Member Katy Moss Warner, director of horticulture for Walt Disney World and a recognized expert on tropical horticulture.

MAY 12-24, 1994 GARDENS OF SCOTLAND AND ENGLAND

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

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

Grenada will be one of the ports of call during a February tour of the Windward Islands of the Caribbean.

PHOTO COURTESY OF ANDRÉ VIETTE

