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December 1992

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American Horticulturist

Volume 71, Number 12

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DECEMBER'S COVER

Photographed by Michael S. Thompson

Like most other members of its genus, *Tillandsia cyanea* is a tropical epiphyte. It lives in the forest canopies of Ecuador, drawing its sustenance from air, rainwater, and whatever organic matter happens to come its way. Mounting interest in growing tillandsias has sparked a dispute over their conservation status. In June, international trade restrictions went into effect for some species. Beginning on page 30, Margaret Sloan covers the evolution, culture, and concern about the future of these fascinating "air plants."

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COMMENTARY

Among the many stars that gathered for our 1992 Annual Meeting last October, one shining light was the recipient of the individual Award for Urban Beautification, Dr. Nina Bassuk of Cornell University.

The Society's focus encompasses all aspects of horticultural education. We have talked a great deal about the horticultural education of children, and one reason for this emphasis is because so many of our children are growing up in urban landscapes empty of trees and other vegetation. The Society is also committed to encouraging civic involvement in horticulture, and this includes raising awareness of the need for greener cities and educating the public as to the most effective ways to bring this about.

In her lecture at the meeting, Dr. Bassuk emphasized that urban horticulture programs need money as well as expertise—that when budgets are cut, so too are trees. She described a fascinating study that found the air temperature of a New York City street was 107 degrees with 12 percent humidity, while Central Park, three blocks away, was 86 degrees with 40 percent humidity. Such extreme conditions require us to choose tough plants and to give their roots adequate space to survive.

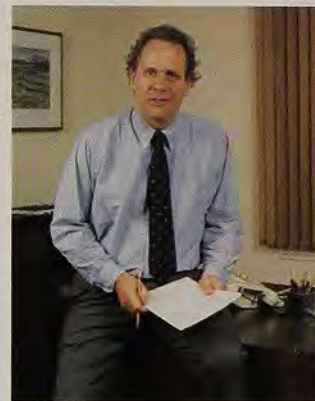
However, Dr. Bassuk observed that quality in ornamental horticulture is subjective, with plants being selected for their perceived attractiveness, as opposed to agriculture, with its more objective criteria such as yield and fruit size. Therefore, it is a great challenge to inform the public of the need for selecting trees on the basis of their predictable responses to their environment. When city planners lack knowledge about proper selection, planting, and care of trees, all the money spent on urban rebuilding is throwing good money after bad. If a sidewalk or street is not given the moderating influence of a group of trees, it is not worthy of habitation. Such research as Dr. Bassuk has carried out is precious fruit; we need to make sure the seeds of her knowledge are scattered across the nation.

By making this year's award winners the central focus of our Annual Meeting, we allowed members to get to know all of them, and to appreciate their remarkable accomplishments more fully. We hope you will come to our next Annual Meeting, scheduled for October 1993 at Disney World in Orlando, Florida. Besides the opportunity to get a behind-the-scenes look at Disney's extensive horticultural activities, we'll enjoy visits to key gardens and greenhouses in the area.

The AHS staff is exploring new areas of horticultural education for all ages. An AHS-sponsored symposium for elementary-level educators, "Children, Plants, and Gardens: Educational Opportunities," will take place August 12-14, 1993, in Washington, D.C. On April 3 and 4, our River Farm headquarters will be the site of EcoFest, an environmental demonstration fair that we hope will become an annual event.

Watch your News Edition for more information on these and other activities scheduled for the New Year. Happy Holidays to all!

George C. Ball Jr., AHS President





BOOK REVIEWS



The Exuberant Garden and the Controlling Hand

William H. Frederick. Little, Brown, Boston, 1992. 342 pages, 8½" × 11". Color photographs and illustrations. Publisher's price, hardcover: \$50. AHS member price: \$45.

In the debate over art versus nature, William H. Frederick comes down squarely on the side of art. For Frederick, a landscape architect, garden design is an art form, which by definition involves a civilizing influence of humankind over nature. In fact, he thinks that gardens are probably the most important art form in twentieth-century America, because they keep us in touch with the natural world.

The Exuberant Garden and the Controlling Hand quite eloquently makes his case for what he believes to be the best sort of garden for our times. In his gardens, plants may have their way only within a carefully defined structure. When the plants are allowed to break free of the garden's framework, it is all very consciously done, with what he calls "studied abandon."

Frederick has developed his careful style over fifty years of gardening in his native Delaware. He believes his gardens truly reflect the American character. One might

be tempted to argue that Americans are a more undisciplined and self-indulgent lot than these gardens would indicate, but whether or not one agrees with Frederick's approach, there is much of interest in his handsome and informative book.

Each of five types of gardens is addressed in its own chapter: entrance gardens, gardens meant to be viewed from inside the house, gardens to live in, swimming pool gardens, and gardens for strolling. Each chapter opens with an explanation of the characteristics of that type of garden, followed by two or three examples drawn from his practice, as well as his own extensive gardens. For each example we are given a plan and a list of plants used in the garden. Lovely color photographs of garden views and details illustrate the text. Cross-references in the appendices relevant to each garden direct the reader to additional information on suitable plants.

Following the case studies, Frederick explores design elements particularly germane to that type of garden, such as fragrance, texture, and ground covers to unite different parts of a garden. (He defines a ground cover, by the way, as any plant that works well in mass plantings; ground covers can be evergreen or deciduous, herbaceous or woody, ground-hugging or tall.) Throughout the book, Frederick points out plant combinations he finds especially effective.

The book concludes with detailed charts on hundreds of plants and their uses in the garden. I happen to like charts that provide lots of information at a glance, and these are outstanding in their utility. The first appendix provides cultural and descriptive information on over 600 plants, then summarizes their design qualities. Other appendices list plants for particular environments, seasonal interest, and special attributes such as fragrance, attractiveness to birds and butterflies, foliage color, and bark texture.

This is not a book for casual gardeners and the romantically inclined may feel uncomfortable with Frederick's disciplined, labor-intensive

Continued on page 41

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OFFSHOOTS



Black Orchids

By Katherine Grace Endicott

If I had read Dick Tracy during those formative years when the central interest of the Sunday morning newspaper was the comic strips, my life would have turned out differently. But Sunday mornings found me sprawled on the living room carpet, comic section spread out before me, as I followed the adventures of that ace reporter Brenda Starr. Hypothetically, dazzling Brenda covered assignments for her metropolitan newspaper, *The Flash*, but her major preoccupation appeared to be doomed love affairs. Brenda's great love, the mysterious Basil St. John, sported a black patch over one eye and always seemed to be off in the depths of distant jungles from which he sent her perfect black orchids.

Thanks to Brenda, my preteen heart coveted one-eyed lovers and black orchids. In fact, black orchids epitomized romance until my teenage dating years when I coveted any orchid. In the days before limousine escorts, the type of flowers contained

in a prom night corsage box were more important than arriving at the dance in a Cadillac versus a Chevrolet. That modest gold-colored florist box clutched in a young man's hands held the key to a girl's social standing that night. There was a flower caste system. Carnations, usually pale pink and bound with frilly white nylon lace, were pinned rather low on the dress where they might be hidden from sight while dancing. Rose buds entwined with white satin, on the other hand, were worn high on the shoulder to be seen by all.

But best were orchids.

A velvety lavender cattleya with a ruffled labellum and the fragrance of a florist's stale refrigerated air all but brought on a swoon. A clever florist might hide a small wristband beneath the elegant bloom. The orchid would then perch on the lucky recipient's wrist to be waved arrogantly before admiring friends and envious foes. A cattleya could make a girl feel as exotic as a jungle princess sporting a small parrot.

During my formative years in the arid climate of southern California, it never occurred to me that mere mortals actually grew orchids. So it came as a surprise, as I



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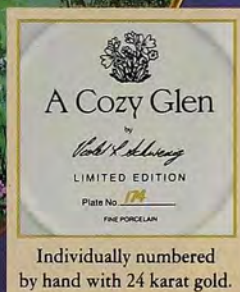


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set up my first household in coastal California, to see cymbidiums blooming beneath the protective branches of a neighbor's oak tree. Orchids as landscaping plants? What would Brenda Starr think? What was good old Basil doing in those steamy jungles if not collecting orchids? Orchids, after all, represent the unobtainable, the exotic.

Once I realized that cymbidiums grew as easily as camellias in California's temperate climate, I steadfastly refused to consider them as orchids. Perhaps because of my reluctance to give them full orchid status, cymbidiums behaved in a contrary and unaccountable manner in my own garden. Other plants died in a forthright fashion so I could toss them in the compost heap and get on with growing plants of a more agreeable disposition. But my cymbidiums persisted with an infuriating obstinacy. They wouldn't bloom, mind you, but neither would they die.

Not that it's easy to gauge a cymbidium's health. Cymbidiums are deceptive. A nice lush green cymbidium indicates too much shade—it probably won't bloom. The ideal is what gardening manuals describe as a "golden" green. Frankly, I'd call it a "pasty" or "sickly" green. If your lawn were that color, you'd fertilize it. I devoted altogether too much effort to those cymbidiums, and they sulked as bloomless and as decorative as a large weed.

Finally I said "the heck with them." From then on the cymbidiums were on their own. I watered them with the rest of the plants and I fertilized them with whatever I used on the roses.

So it followed, inevitably, that one fine March morning I turned the corner, intent on spraying the roses, and discovered the cymbidiums budding profusely. I forgave them for all the trouble they gave me, and perhaps because of the trouble, I adored them as if they were Basil St. John's black beauties. Once they bloom, orchids characteristically possess an almost hypnotic power to hold their keepers captive.

Our mania for orchids began accidentally in 1818 when one William Cattley, an import merchant and amateur horticulturist, found a few bulbous stems used as packing material in a shipping of tropical plants. Being a curious sort of fellow, he nurtured them in his greenhouse in England. They grew. To the delight of future prom queens, the unknown bulbous stems developed gorgeous ruffled lavender flowers that were named *Cattleya labiata* var. *autumnalis*.

Shortly after Cattley's discovery, the ecologically ruthless search for orchid varieties began. Since an orchid's price at

auction depended upon its rarity, orchid gatherers sometimes removed all the orchid plants from a particular habitat. One professional orchid hunter estimated that approximately 10,000 trees were chopped down to provide 4,000 marketable orchids.

Today collecting and importing orchids are practically forbidden by the Convention on International Trade in Endangered Species (CITES). This effort to save wild species may be irrelevant, however, since the destruction of tropical rain forests by the timber industry is currently estimated at 168,000 acres a day. As the trees are sent to the mill some 200 billion orchids and other plants are also killed.

Even though the Orchidaceae is the largest flower family known, with approximately 25,000 species, a truly black orchid has never been discovered in the wild. Certain dark maroon Asian lady's-slipper orchids—*paphiopedilums*—have paraded as black orchids. The blooms of these lady's-slipper orchids always seem to me to be looking for something to eat. When staring at them closely, I have the definite impression that I am peering down something's angry throat. Despite my longing for black orchids, I have never been able to bring myself to grow them.

In fact, there are a number of orchids I find disagreeable to look at for very long. For example, the odontoglossum hybrids, the oncidiums, and the brassias all give me the willies. They are sometimes described as bizarre. Orchid catalogs tend to use playful adjectives like freckled or tiger-striped to describe the markings on their petals. Who are they kidding? These patterns are found on beetles, spiders, and snakes. I find them primeval. Each of them has a botanical come-hither look. Feckless insects are invited by these patterns to slither down their throats, thereby pollinating still another animal-like orchid.

Even though I have been able to limit myself to growing only a few varieties of orchids, I reflect on how my life was changed by reading a comic strip. Like my former heroine, Brenda Starr, I work for a major metropolitan newspaper, in my case covering, as you might suppose, gardening. As for the elusive black orchid, a wholesale orchid grower told me recently that within the last couple years a black orchid had been hybridized—the *Paphiopedilum maudiae coloratum*. I finally saw one at an orchid show. It seemed to be a hovering black moth amid the more colorful butterflies. Somehow, it was not as I imagined.

Katherine Grace Endicott is a garden columnist for the San Francisco Chronicle.

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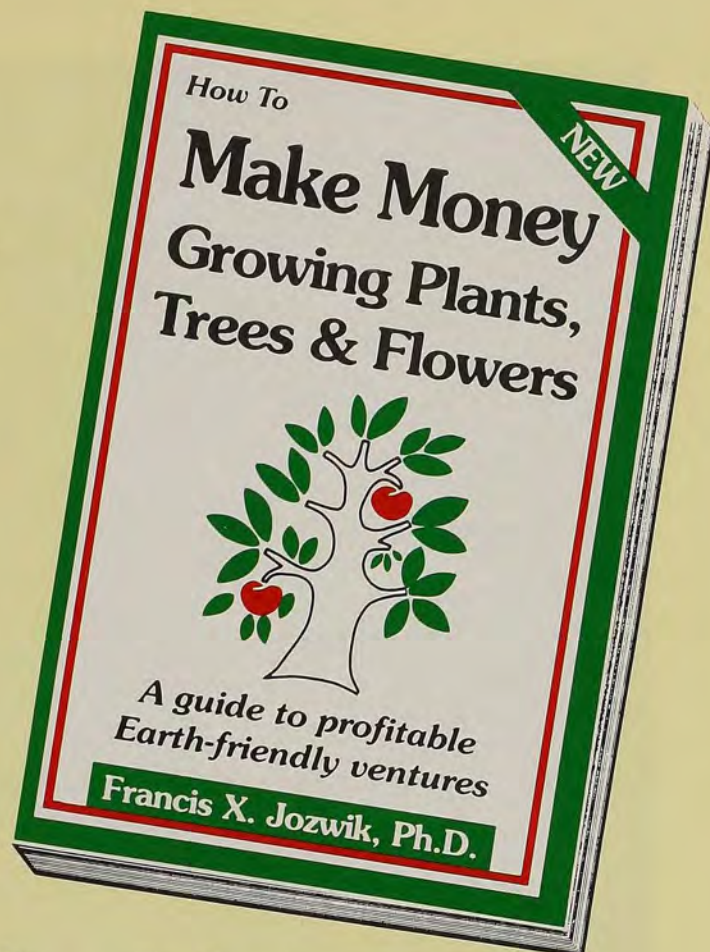
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Terms like “handsome foliage,” “colorful flowers,” and “exceptionally easy care” are among those used to promote members of the *Heuchera* genus, a group of perennials native throughout North America. While all of these are accurate, perhaps the most apt is the phrase “what you see is not necessarily what you get.” For the *Heuchera* is a changeling, rivaling the rhododendron in the mutability found among its species.

The gardening public became acutely aware of this situation following the introduction and runaway popularity of ‘Palace Purple’. This plant was discovered about fifteen years ago on the grounds of Kew Gardens among a batch of seedlings germinated from a packet labeled *H. americana*. Because *H. americana* was among the first of our native plants sent to England—sometime between 1630 and 1651—its seed had been ordered as part of a restoration project involving the Queen’s Garden behind Kew Palace.

Kew horticulturists, convinced that the striking plant with dark

Heuchera: Let the B

*These perennials
are well worth
having, if you don’t
mind surprises.*

purple, maple-shaped leaves could not possibly be related to its green, round-leaved companions, dubbed it *H. micrantha* var. *diversifolia* ‘Palace Purple’. In 1982, its fifteen-by-fifteen-inch, tidy mound of colorful foliage and midsummer display of small, blushing white flowers on wiry stems earned it an Award of Merit from England’s Royal Horticultural Society.

Plantsman Allen Bush, proprietor of Holbrook Farm and Nursery in Fletcher, North Carolina, took note of this honor and asked for seed. In 1986, he introduced ‘Palace Purple’ to the American gardening public and the plant went on to become one of the most popular introductions ever. In 1991 the Perennial Plant Association selected it as Plant of the Year.

Just as ‘Palace Purple’ was hitting incredible heights of popularity, however, a strong backlash set in. Many gardeners were discovering to their bitter disappointment that their seed-propagated descendants of ‘Palace Purple’ plants had reddish bronze foliage at best, while others saw green leaves on their plants.

And among those seeing green were gardeners with extensive horticultural backgrounds. They proclaimed that ‘Palace Purple’ plants were none other than variants of *H. villosa*. *H. villosa* is so like

BY PATRICIA A. TAYLOR



Buyer Be Aware

Heuchera varies from plant to plant and season to season. The coppery spring foliage of this 'Palace Purple' glows warmly when backlit by the sun. Compare it to the fall color of the 'Palace Purple' on the next page.



H. micrantha that horticulturists point to features like pollen color to distinguish the difference.

Horticulturists are intrigued by such muddles. After all, this is an interest group that saw the entire genus *Chrysanthemum* decimated overnight. (See "Where Have All the Chrysanthemum's Gone?" *American Horticulturist*, August 1991.)

While some devoted their energies to debating the classification of 'Palace Purple', others decided to examine more closely sister variants of its proposed new species, *H. villosa*. They discovered in these Dixie natives plants that could handle humid heat better than most other members of the *Heuchera* genus. They also saw some with rich ruby tones on their maplelike leaves. Eleanor Sauer, former proprietor of Rocknoll Nurseries in Hills-

boro, Ohio, chose one with purple-red leaves of a richness that rivals 'Palace Purple' and called it 'Royal Red'.

In fact, keen gardeners experimenting with both 'Palace Purple' and *H. villosa* cultivars often found more purple color in the foliage of the latter than in the former. However, in most cases (one can never really be definitive about this genus), 'Palace Purple' flowered earlier and was cold hardy to U.S. Department of Agriculture Zone 4 rather than Zone 5 or 6.

Most of these adventuresome gardeners were seeking handsome foliage plants for their shade gardens. Both 'Palace Purple' and *H. villosa* meet this goal. Both withstand slug and insect attacks and ignore droughts. They are choosy only about drainage, as is any *Heuchera*.

And then a sun-lover appeared among

the plants designated *H. villosa*. This one bears the additional tag line of var. *purpurea*. The purple that fades from others in bright light deepens in this variety. I tucked mine at the foot of a butterfly weed (*Asclepias tuberosa*) and surrounded it with *Coreopsis rosea* in a sunny raised bed. The orange, pink, and purple color combination was fabulous.

After three years, however, this plant faded away while all my other *Heuchera villosa* plants kept getting more vigorous. This, in my experience, is not uncommon among *Heuchera*, particularly those favoring sun. The plants grow woody with age and, if not divided, eventually die.

Whatever the true identity of 'Palace Purple'—some still contend that it is an offspring of *H. micrantha*—it should not have surprised anyone that a seed-grown

member of this genus proved to be a quick-change artist. *H. americana*—the species among which ‘Palace Purple’ was first found growing at Kew—also seems to have a kaleidoscopic personality. As more attention focused on other members of the *Heuchera* genus, it was relatively easy for nurseries to introduce cultivars of the tough native *H. americana*—and once again Allen Bush was in the vanguard.

Dale Hendricks, a friend of Bush’s from Landisburg, Pennsylvania, came to North Carolina for a wildflower conference and while there, collected seed from an *H. americana* with beautiful silver-mottled leaves. Bush grew the seeds and released the plant as *H. americana* ‘Dale’s Strain’.

The name acknowledges, as does Bush’s catalog, the variability among these plants. “Strain” is more accurate for most Ameri-

DRANG OVER ‘GOLDSTURM’

Heuchera ‘Palace Purple’ is not the only extremely popular perennial cultivar that is widely seed-propagated. Steven Still, executive director of the Perennial Plant Association, notes that *Rudbeckia fulgida* var. *sullivantii* ‘Goldsturm’ is frequently offered as seed-grown stock. ‘Goldsturm’ is supposed to attain two feet in height, with a nice clumping habit and flowers three to four inches across; seed grown plants could show variation in any of these factors, particularly height. Some sources will acknowledge seed-derived offerings by calling them “Goldsturm Strain.”

In regard to ‘Palace Purple’, Still said that while it’s true that many are seed-grown, most nurseries growing it from seed will rogue out green- or bronzy-colored plants.

Nevertheless, consumers should be aware of the possible variation in ‘Goldsturm’ and many *Heuchera* cultivars. They may want to query their source on the methods used in propagation and selection.

—Kathleen Fisher, Editor



PATRICIA A. TAYLOR

Far left: Bressingham Hybrids are an English twist to an American native. Top: A new cultivar, ‘Pewter Veil’, will be propagated by tissue culture. Center: Many growers of ‘Palace Purple’ will find that it bears no resemblance to this concord-grape-colored plant. Left: Heuchera was crossed with another genus, Tiarella, to produce × Heucherella ‘Bridget Bloom’.

can-grown *Heuchera*, growers agree, than the word “cultivar,” which gardeners assume to mean a vegetatively propagated clone that will be predictable in appearance and behavior.

The foliage on my ‘Dale’s Strain’, instead of green mottled with silver, would be better described as silver mottled with green. But as the foliage ages, particularly with the onslaught of cold weather, it assumes a purplish cast. Over the past three, relatively mild winters here in Princeton, New Jersey, the leaves have remained evergreen.

During a summer 1992 tour of mail-order nurseries in Ohio, Tennessee, and North Carolina, I saw extensive foliage variation on plants with this name. Although all were without question handsome plants, some had grayish casts and others were mottled with dark maroon.

The appearance of red tones on *H. americana* plants is not unusual. In 1984, Richard Lighty of Mount Cuba Center for the Study of Piedmont Flora in Greenville, Delaware, selected a plant from among mixed *H. americana* plantings on the basis of foliage that he describes as “gemstone quality garnet in spring and a dusky, industrial quality garnet in winter.” The summer foliage of ‘Garnet’ is soft green, but it retains a lime green edge as it begins to redden in autumn. It is hardy to at least 15 degrees below zero, tolerant of pests and hot, dry, urban sites.

“We don’t market it as a specimen perennial, but as a ground cover,” Lighty says. Its *H. americana* heritage means that its rhizomes spread along the surface of the ground, and its center does not die out as those of other *Heuchera* species do. Thus

it will have a long life without division. Lighty says the only variation he has observed in vegetatively-propagated ‘Garnet’ is a color difference in shade versus sun; it thrives in both. But unless a cultivar is patented, he observes, once it is released into the trade there is no control over how it is propagated.

Meanwhile, down in North Carolina, Nancy Goodwin, owner of Montrose Nursery, had found a plant whose foliage seemed to offer the dark purple of ‘Palace Purple’ combined with the silver mottling of ‘Dale’s Strain’. She had placed the two side by side, and the resulting seedlings showed that bees had been busy pollinating back and forth.

She named the result ‘Montrose Ruby’. “The best feature of this plant is that it does not lose its dark foliage color even in mid-

summer," says Goodwin.

I ordered three of these plants and found, not surprisingly, that they were quite variable. While all had mottled foliage, two had leaves resembling those of *H. villosa* and one those of *H. americana*. The former tended to turn green with age, while new leaves were purple. The foliage on the latter, however, is gorgeous. As I write these words on a humid August day, it continues to boast rich purple foliage with a shine reminiscent of the taffeta dresses I wore as a young girl too many years ago.

I have found that they do fine in bright shade with just three hours of full, high summer sun as well as in rather dark shade receiving just several hours of dappled sun.

Those with brighter gardens than mine may want to experiment with two sun-loving species, *H. sanguinea* and *H. cylindrica*. Both have a wider hardiness range than *H. villosa* or *H. americana*, being able to withstand the cold of Zone 3 and, except for areas with high humidity, the heat of a Zone 10.

H. cylindrica has large clumps of foliage, and greenish white flowers, but, since it is a *Heuchera*, it is as variable as all get-out. I ordered three plants this past summer and was astounded to see coral pink flowers on

the sturdy stems arising from one clump. I called my source and learned that they were having a similar experience with a few of their field plants.

These *H. cylindricas* were all seed-grown with seed purchased from Jelitto, a German firm with an international reputation for high quality. I have since discovered that Alan Bloom refers to these pink-flowered *H. cylindrica* plants by the cultivar name of 'Hyperion'.

Rod Richards, an English breeder, has crossed 'Palace Purple' with *H. cylindrica* 'Greenfinch' to produce 'Pewter Moon', which will be available from Jackson & Perkins for the 1993 season. Allen Bush is also experimenting with the combination in the hope of obtaining both the small, glossy leaves of *H. cylindrica* and the silver mottling on 'Greenfinch'.

Among Heims's *H. sanguinea* introductions for 1993 are 'Cherry Splash', an aptly named plant with cherry red flowers in spring and white and gold splashes on its foliage, and 'Frosty', which features heavily silvered foliage and bright red flowers.

Coral-bells are relative newcomers to the garden scene, having come into prominence about 1884, almost 250 years after *H. americana* was discovered by Europeans. Breeders immediately began to develop new varieties. *H. sanguinea* var. *alba* was introduced about 1896 and *H. sanguinea* var. *splendens* in 1898.

Although they do well in partial shade, coral-bells are at their best in sunny settings. It is, therefore, somewhat surprising that their colorful flowers did not quickly catch favor with the American gardening public, which at the turn of the century had

SOURCES

B & B Laboratories, 1600 D Dunbar Road, Mount Vernon, WA 98273. (A wholesale source for Heims introductions. Ask a retail nursery to contact them.)

Bluestone Perennials, 7211 Middle Ridge Road, Madison, OH 44057, (216) 428-7535. Catalog free.

Crownsville Nursery, P.O. Box 797, Crownsville, MD 21032, (410) 923-2212. Catalog \$2.

Fir Grove Perennials, 19917 N.E. 68th Street, Vancouver, WA 98682, (206) 944-8384. Catalog \$2, refundable. (Carries some Heims introductions.)

Holbrook Farm & Nursery, 115 Lance Road, P.O. Box 368, Fletcher, NC 28732-0368, (704) 891-7790. Catalog free.

Klehm Nursery, Route 5, Box 197, Penny Road, South Barrington, IL 60010-9389, (217) 373-8401. Catalog \$4, refundable.

Montrose Nursery, P.O. Box 957, Hillsborough, NC 27278, (919) 732-7787. Catalog \$2.

The Primrose Path, R.D. 2, Box 110, Scottsdale, PA 15683 (412) 887-6756. Catalog \$2.

Others are concentrating their efforts on *H. sanguinea*, the bright-flowered species commonly known as coral-bells. One of these is Dan Heims of Terra-Nova Nursery in Portland, Oregon, who at the 1992 annual meeting of the Perennial Plant Association described fifteen new cultivars that he is breeding. He has drawn not only upon the genes of *H. sanguinea*, for its colorful blooms, but also *H. micrantha* for ruffling and *H. americana* for durability. Some of his new plants are hybrids, which cannot be grown from seed. All of his introductions, he says, are being propagated by tissue culture. In addition to ruffled foliage, he has produced some with cup-shaped leaves and others with green picotee edges around white centers, metallic sheens similar to those on rex begonias, and chocolate stipples.

a rage for splashy beds in open areas.

The English, as they have with so many other American natives, took to coral-bells immediately. Their popularity in that country was further heightened by the breeding work of the Bloom family, noted British nurserymen.

Bloom introductions are sold today either as Bressingham Hybrids (which means the plants are seed-grown) or as named cultivars, which are propagated vegetatively. Flower colors for the seed-grown plants range from white to gorgeous red. Only two of the more expensive-to-produce Bloom cultivars are widely available in this country: Both 'Pretty Polly' and 'Freedom' have lovely pink flowers.

About six years ago, I ordered plants identified as *H. sanguinea* species and could tell no difference between them and



COURTESY OF DAN HEIMS

Left: 'Fairy Cups', a cultivar with concave leaves, has not yet been released into the nursery trade. Right: 'Firefly' will set a sunny garden ablaze.

unidentified coral-bells growing in my gardens. The latter are divisions from plants that had been in my neighbor's borders when she bought her house in 1952.

Whether hybrids or species, my coral-bells are great plants. They are covered with pinkish white flowers for at least six weeks every summer and have foliage mottled with maroon in spring and gray in summer. As my beds and border have become increasingly shadier over the years, these stalwarts have continued to do well. I have tried two cultivars: 'Chatterbox' and 'Patricia Louise'. Neither is as sturdy or as long-blooming as my old standbys, although, to be fair, both have larger, more colorful flowers.

My gardens are fast becoming too shady to incorporate many of the *H. sanguinea* cultivars. But my friend Joyce Anderson,

genera are not usually closely enough related to interbreed. Thus, bigeneric hybrids—plants descended from two separate genera—are rarities. The beautiful crosses between *Tiarella* and *Heuchera*, designated \times *Heucherella*, are the most famous and readily available.

It appears that the first such cross was produced in 1912. But it was not until 1950—when Alan Bloom crossed *Heuchera* \times *brizoides* with *Tiarella cordifolia* var. *collina* and named the result 'Bridget Bloom'—that the gardening public noticed these plants.

The slightly mottled foliage resembles that of *Tiarella* and the white or shell pink flowers are more open, upright versions of those on *Heuchera*. Landscape designers are increasingly incorporating large groupings of \times *Heucherella* into shaded proper-

The commercial fact of life is that growing *Heuchera* (as well as many other plants) from seed is less labor-intensive and has a higher success rate than vegetative production. Given the economics of the perennial plant business—one that is relatively easy to enter and fiercely competitive—many less-than-meticulous nurseries will grow cultivars from seed. While gardeners will find they have handsome plants, these will often differ significantly from printed descriptions and published photographs.

However, *H. sanguinea* cultivars are something of an exception. Because there is such a wide market for coral-bells, many of them are vegetatively produced. The economics of scale allow nurserymen to sell them at affordable prices. Perhaps their example will set a precedent for cul-



PATRICIA A. TAYLOR

who has a hot sunny border by her home in Hopewell, New Jersey, has filled it with blazing clumps of 'Firefly'. Its red flowers are particularly spectacular when backed with the purple-blue spires of *Salvia nemorosa* 'East Friesland'. Continued cutting of the flower stalks leads to a two-month bloom period. Contrary to some catalog claims, however, the flowers on 'Firefly' are not fragrant.

To add to the *Heuchera* confusion, most coral-bells cultivars claim not only *H. sanguinea* as a parent but also a hybrid of uncertain background named *H.* \times *brizoides*. American nurseries, none too fussy in their use of nomenclature, use the terms *H. sanguinea* and *H.* \times *brizoides* indiscriminately.

The *Heuchera* mutability is even able to leap generic boundaries. Plants in different

ties. Since these plants are sterile, they can only be propagated vegetatively.

For gardeners who demand predictable plants, perhaps it is unfortunate that this is not true of *Heuchera*. Its mutability makes it ideal for creating and promoting new forms but extremely tricky to propagate. Allen Bush compared it to another Perennial Plant Association award winner, *Coreopsis verticillata* 'Moonbeam', which can be vegetatively propagated throughout a long season with a success rate near 100 percent. "*Heuchera* stem cuttings have to be taken in February or March before it shoots or in late autumn, with great precision under very sterile conditions. You often lose 50 to 70 percent." The 'Palace Purple' plants that Bush sells are from first generation seed of vegetatively propagated stock.

tivars of other *Heuchera* species.

Readers feeling saturated with *Heuchera* at this point should be warned. Many other excellent species, cultivars, hybrids, and bigeneric crosses are on the market or in the works. There is a great deal of horticultural excitement about this genus, not only because of its low-maintenance requirements, drought tolerance, and wide regional adaptability but also because of its good looks. Keen gardeners should find it difficult to complain about this wealth of plants, unpredictable though some of them may be at present, because *Heuchera* will leave their beds and borders immeasurably enriched.

Patricia A. Taylor is the author of Easy Care Shade Flowers, to be published in February by Simon and Schuster.

The back yard lot next to my parents' aging house doesn't look like much these days. Maybe to a casual observer the plot looks all right—it's nothing spectacular, but the grass seems green enough, with just a bit of weediness.

I can remember a time, though, when that routine patch of green was a whole lot more significant than it appears today. It was about fifty years ago. It was wartime, and it was a time of everyday sacrifice and national belt-tightening. Looking back now, it seemed to be a time when the whole country almost moved as one.

Fifty years ago, if you were a man between the ages of 18 and 38, you probably served in the armed forces. If you were a woman, you may have joined the Women's Auxiliary Corps, but chances are your struggle was in stretching the rations coupons to buy enough food, shoes, and other commodities for your family.

If you happened to be an avid gardener, as my father was, you were suddenly joined by millions of other civilians who boldly stepped into gardening with a fervor and dedication that the gardening world has not seen since. It was a concept simply called "The Victory Garden." Every man, woman, and child was encouraged to garden. Food was going to "win the war and write the peace," according to one popular slogan of that time.

We didn't realize it then (no one really did), but by tilling our little back yard garden we became part of a grand gardening scheme—not that the "Victory Garden" was an idea unique to my generation or World War II. During World War I, my grandparents had gardened for victory, too, only then it was called a "War Garden." These war gardens were part of a very ambitious program—perhaps too ambitious—with overzealous

gardeners pulling up flowers and tearing up parklands and golf courses to make room for more vegetables. Grass was considered unpatriotic, so front lawns planted with potatoes became a common sight. Even children were coaxed or conscripted into the ranks of the "United States Garden Army." What resulted from all that gardening frenzy was in too many cases not only a lot of food, but also a lot of wasted

which called for a vegetable garden or fruit garden in every home, and community and school gardens in every city and suburb.

While the conference and program could only advise, the intent was very serious. Within a matter of months, the entire country began to operate on a wartime basis. Whole industries were converted to war uses. Sewing machine factories, for example, now made rifle and pistol parts, and farm equipment manufacturers began rolling out tanks.

Our own blue-collar city of Buffalo was a perfect example. Where local factories once concentrated on heavy-duty machinery, warplanes now assumed top priority. The strategic importance of these factories and their goods became quite evident to me even as a child when frightening nighttime "black-outs" started occurring on a regular basis.

Food production presented special strategic problems. War meant a sharp reduction in imports such as chocolate, tea, bananas, rice, sugar, fats, and oils. There were not only fewer farm implements but fewer farm workers trying to meet the needs of a growing army.

Even when that period saw bumper crops, food processing and distribution were difficult. The tin used for commercial canning was a scarce commodity. Recycling helped to ease the shortage somewhat—we all stomped on tin cans and dutifully turned them in—but with every inch of space in the

national freight transport system devoted to supplying the boys and men in uniform, getting food to the corner grocery was not always easy.

Victory Gardens were viewed as a relatively simple way to alleviate these problems. Having a nation full of back yard gardens could release more foodstuffs for use by troops abroad, relieve some of the pressure on the transportation system, and

VEGETABLES FOR VICTORY



*Return with us to a time
when carrots and cabbage
could win a war.
Or so at least it seemed.*

B Y J E A N N E P A L A M U S O

food, wasted seed, and wasted effort.

Victory Gardens were no less patriotic but were far more organized and better planned. The idea of gardening for victory was formally introduced at a National Defense Gardening Conference initiated by Secretary of Agriculture Claude Wickard in Washington just two weeks after Pearl Harbor. The conference established the "National Victory Garden Program,"

CTOR

VICTORY

Backyard Gardens

SIMPLE RULES FOR GROWING YOUR OWN VEGETABLES



help ensure a steady source of vitamins for a war-weary population.

When the government began to mobilize this "Land Army," no one was left out. Families, whole communities, schools, and employers were urged to participate—and almost everyone did, at least initially. Across the country, cities such as Milwaukee, Cleveland, Boston, Indianapolis, San Francisco, and Omaha established community gardens.

Buffalo, although a relatively small city, wholeheartedly joined the movement. A Victory Garden Committee, under the guidance of the Buffalo War Council, systematically parceled out over 700 community gardens.

One local manufacturer, Bethlehem Steel, tilled company land adjacent to the plant on the shores of Lake Erie, and made it available to any employee willing to work the garden on a regular basis. Such cooperation between employers and employees was quite common, with some local and national companies even giving out cash awards to the most successful gardeners.

School children joined the gardening movement under the direction of the Office of Education. Older students participated in the High School Victory Corps, while younger children formed "Junior Victory Gardens."

Propaganda posters and slogans played a big part in encouraging participation. Making a commitment to "till the soil for victory" was after all a new concept to millions of people, particularly city dwellers. Colorful, persuasive posters were very instrumental in convincing Americans to "dig and delve for victory and vitamins" and to plant gardens of "Vegetables for Vitality for Victory."

Emotionally charged slogans somehow always seemed to imply that nonparticipation was unpatriotic.

In an age before television, these visual

images had quite an impact. You tended to find their very serious messages in very serious places—city hall, almost every office building or factory, libraries, and schools—but the government was also not above using Mickey Mouse or Daffy Duck to promote the cause in countless wartime cartoons.

The press also routinely issued the call for patriotic gardeners. It was virtually im-

Garden program. The War Gardens of World War I most often failed because so many amateurs participated with so little solid gardening knowledge. During World War II, however, the government made sure that gardeners were well-advised. Besides a steady stream of pamphlets and articles from the Department of Agriculture, gardeners could call on agricultural colleges and cooperative extension agents for assistance.

To their credit, government agencies stayed away from dull and wordy gardening advice and presented some pretty simple and understandable information. For our own garden, for example, my father had sent for the booklet "Victory Backyard Gardens," which was a compilation of governmental advisories. Our family studied it religiously and tried to follow the recommendations on garden size, planting schedules, and choice of seeds.

New gardeners, though, seemed to prefer the "show me" rather than the "tell me" approach, and so a lot of local organizations held gardening workshops. Our community was quite typical in having some local schools, churches, and banks host these meetings.

As the war progressed, however, the government tried to save gas by discouraging unnecessary travel. While some activities, like church attendance or doctor visits, were exempt from this ban, gardening meetings were not.

As a result, experienced gardeners like my father became very popular with friends and neighbors who sought advice and hands-on learning.

While garden size and crops varied somewhat, a typical family plot in our community measured about thirty by forty feet. Our own back yard garden matched the average very nicely with dimensions of twenty-seven by thirty-five feet. This size was quite economical with total expendi-



possible to pick up a copy of *Garden Magazine*, *Woman's Home Companion*, *House and Garden*, or any other popular magazine of the day without seeing an article extolling the virtues of Victory Gardening. Many newspaper garden columns, incidentally, got their start with a Victory Garden format.

Information, in fact, became a key factor in the promotion and success of the Victory

M E M B E R S R E M E M B E R

In our June magazine, we asked members of the American Horticultural Society to share their own recollections, or those of family members, of Victory Gardens. Their responses evoked a time of hard work and sacrifice, as well as simple pleasures and—dare we say it?—family values. Thanks to all who wrote.

LIGHTENING THE LOAD IN NEW HAMPSHIRE

In 1942, when our country was just pulling out of the horror of the recession years, my mother, a widow, was raising me, a 13-year-old, and working as a spinner and doffer in a cotton mill in southern New Hampshire. When the mill offered its employees land by the river to use as Victory Gardens, she seized the opportunity.

The lots were 100-feet square, and my mom and I began working the soil in April and planting in late May and early June, since New Hampshire is famous for its June frosts. Neither my mom nor I knew anything about gardening, but oh, how we learned! I spent hours in the local library gleaning information, and read as many magazines as possible on how to grow the perfect tomato.

We worked in our garden, hoeing and weeding, from 4 to 7 p.m. daily, carrying water from the river in two-gallon cans for watering as necessary, and always amazed at the miracle of nature, which we had always taken for granted.

We had our Victory Garden throughout the war years and we raised enough vegetables annually to feed ourselves, can for the winter, and supply fresh vegetables to our friends and neighbors. I can still recall our carrying large baskets full of cucumbers, tomatoes, corn, and squash for over a mile, giving the veggies away to people as we walked to lighten our burden.

The Victory Garden was my introduction to gardening, the very first time I touched the soil, and I have not let go since.

— Joye D. Kent, Haverhill, New Hampshire

A CONTEST WINNER IN ALABAMA

My first Victory Garden yielded some goodies for our table and won me a prize in a radio station contest. My husband had just been transferred to Montgomery, Alabama's, Maxwell Field during the spring of 1944 as D-Day was approaching. Land and housing were in acutely short supply.



Without the radio station's promotion of Victory Gardens and the help of the Cooperative Extension Service I probably would not have managed to produce and can my first batch of soybeans. Our benevolent landlord, a Mr. Peacock, found a man with a plow and a mule to do the first tilling in the empty lot next door. Coping with the broiling sun and dry weather was not as much of a problem as learning how to cultivate the soil and plants.

My Victory Garden was about twenty-five feet by sixty feet and was next to our landlord's house. I could see my "farm" from the window of our apartment over Mr. Peacock's garage. In addition to the soybeans and tomatoes, pole beans and eggplants did well for me. By the end of the summer of 1944 I'd ➤

tures amounting to about \$1.30 for seeds and \$1.50 for fertilizer. More importantly, in an era of chronic overtime at the factory, a smallish garden could be well-tended in less than eight hours per week.

When it came to choosing what to grow, many gardeners tried to follow the goal, set by the National Advisory Committee, of maintaining a long-season vegetable garden. For the early part of the season, the committee advised planting frost-resistant beets, carrots, kohlrabi, leaf lettuce, onions, radishes, peas, spinach, and turnips. Later crops included the more tender tomatoes, beans, Swiss chard, cucumbers, and squash.

While our family was duly patriotic during that long stretch of conflict, the commitment to duty had to be tempered with a smattering of practicality. As a foreman in a defense plant, my father had to put in long hours, which meant that the gardening chores often fell to my already busy mother, my five older sisters, and myself.

I must confess here and now that gardening had little appeal for six very traditional young girls. It was much more fun to talk about the latest Clark Gable movie or listen to the swinging music of Tommy Dorsey.

Knowing that our garden would receive limited attention, my father kept its plan fairly simple. We planted carrots, beets, onions, cucumbers, beans, cabbages, tomatoes, and those unfailing radishes, not only because we all liked them but also because it was a workable scheme.

Community plots and school gardens in our area and across the country were generally much larger than any of the family plots, which meant that the gardeners could grow more vegetables and greater varieties. These cooperative gardens were heavily promoted in the Victory Garden program, but they did require some special planning.

Since any kind of transportation, except by foot, was discouraged because of gas rationing, a community garden had to be easily accessible and as close to as many families as possible. Some plots were so large that hand-digging became impractical, and machinery had to be brought in.

Larger gardens depended quite heavily on cooperation and strong leadership, and most cities had a Victory Garden Commit-

tee and debris from a vacant lot. Then the city or Victory Garden Committee would issue a permit to the group, stating that the land had to be used only for raising vegetables or fruits, and that the resulting harvests could not be sold. If the garden fell into neglect or was abandoned, the group lost its claim to that particular plot.

In Buffalo, I can recall seeing community gardens in some unusual locations. The

largest city hospital, for example, donated land for tilling, as did the Buffalo Zoo. As a child, I disliked seeing the magnificent lawn that normally greeted me at the zoo suddenly turned into a tomato-staked plot of mud!

All Victory Gardeners and their dependents had to deal with some minor inconveniences. Because of the metal shortage, for example, new garden tools were not readily available, so that the old rake, hoe, and spade were carefully guarded and maintained. My sisters and I always meticulously, if not ungrudgingly, followed my father's instructions to wipe the rake and hoe clean and to rub them both with an oily rag each time we finished using them.

Most gardeners used nicotine sulphate to deal with insects, and while it was plentiful during the war, fertilizer was another matter. Because most chemical nitrogen was earmarked for explosives, chemical fertilizers became scarce and their distribution was regulated by the government. Eventually a special grade of fertilizer

was produced especially for Victory Gardens and clearly marked "Victory Garden Fertilizer—For Food Production Only." (The government prohibited the use of chemical fertilizers on lawns or parks.)

A problem not unique to Victory Gardens was the matter of overproduction. Bountiful harvests occurred quite often, and gardeners were advised to give away or can extra produce. Canning, too, was



tee that helped to meet this need. In many cases the venture was truly cooperative, with the parks department, the fire department (which often took up the task of watering the gardens with fire hoses), extension agents, garden clubs, and local nurseries all participating.

Selecting a site for a community garden was relatively easy. Usually a group of neighbors got together and cleared weeds

Continued from page 19

won a soil testing kit by writing the best letter about "Why I Have a Victory Garden" in the local radio station's contest.

The thrill of planting and nurturing my own garden produce has not lessened one bit from 1944 to 1992. With the Cooperative Extension Service's help, I've been making gardens ever since. I've never managed, though, to grow as good a crop of soybeans in Pennsylvania as I did in Alabama in 1944. Secretly I felt that the radio station, Cooperative Extension, and I won the war. —Hannah Polster Matthews, Pittsburgh, Pennsylvania

A TEXAN IN CALIFORNIA

My wife and I lived in North Hollywood, California, from 1942 to 1945, when I raised a very productive Victory Garden. Being from the San Antonio, Texas, area, I found the climate and soil very different, but trial and error really paid off.

I planted my first Victory Garden in February, which proved too early for black-eyed peas, which got rust and promptly died. In following years I planted them in May and June along with green beans, tomatoes, and lima beans, and they turned out just fine, except when some of the tomatoes got wilt. The early planting was fine for zucchini, squash, carrots, radishes, onions, corn, lettuce, cabbage, and cucumbers.



Before I worked up my soil in my twenty-by-fifty-foot garden I borrowed a trailer and hauled a load of chicken manure and applied it first. I then worked it up with a spade, hoe, and rake. It was drudgery doing all that spading and cultivating manually, compared to my present setup with a rototiller and speedy hoe, but it was delightful to pick such a bountiful harvest to eat and supply all my neighbors. I planted thornless boysenberries along my chainlink fence and they produced unbelievable crops. —Herman J. Hoffman, Panhandle, Texas

PAILS AND PRESERVES IN MASSACHUSETTS

My Victory Garden during World War II was my introduction to gardening, and I've had a garden ever since. The Victory Garden in Marblehead, Massachusetts, was on Humphrey Street on land that a Ralph Sevinor owned and let the town use for Victory Gardens. The town plowed the land and anybody that wanted to have a garden was allotted a plot. It took a lot of hard work to make the land fit for planting. I think a hydrant was opened so we could carry pails to water our gardens.

My daughters, who were about 8 and 13 at the time, remember how I divided my garden into rows with string tied to sticks at each end. First there was a row of radishes, then onions, carrots and beets (didn't do too well), tomato and pepper plants, lettuce (not too successful), but wonderful pole beans, string beans, and wax beans, cucumbers, Swiss chard (successful but we didn't care for it much), and one of my daughters remembers mounds of plants with yellow blossoms—squash? pumpkins?

We went down to the garden every night to weed and water and my husband, who was busy building radar equipment for the war effort, would help in his spare time. ➤

not hassle-free. Rubber seals for canning jars were not of the best quality, and housewives learned how to seek out the best ones and to hoard scarce metal lids and bands.

My mother must have been an expert at finding the best—at least when it came to jars—because today I still use the very same jars for my canning. Today my canning is quite simple, mostly grape jelly and chili sauce, but back then the canning process took on monumental proportions. Our fruit cellar resembled a kaleidoscope of colors, with jars of deep burgundy beets, luscious red tomatoes, sunny orange carrots, and bright green beans. On a dreary winter day in that world of long ago, it was a real delight to gaze at the glowing, captured colors of summer and pick out the designated vegetables of the day.

Through rose-colored glasses is the way children see most experiences. Looking back now with an adult's scrutiny, there were other problems with Victory Gardens besides overproduction and scarce supplies. Vandals struck at community gardens from time to time, and interest sometimes waned. That garden at the Buffalo Zoo, for example, touted as the model community garden, became so neglected that even before the war was over it was converted back to a lawn.

Many gardeners had more ambition than knowledge, and stories of gardening mishaps commonly made the rounds. A family friend, Bud Brennan, recalls that as a true Irishman, he planted potatoes for his very first garden. After Bud had spent many grueling hours tilling and planting, co-workers asked him whether he had planted the potatoes with the eyes up or down. Well, the novice gardener had not paid much attention to how he had oriented his crop, but Bud's friends convinced him that he'd better go check. And this he did by digging up every single

potato and replanting it in the correct position! After that, Bud says his family considered their garden a victory if anything came up at all.

Unfortunately, other first-time gardeners could not be quite as light-hearted about their less-than-successful garden experiences, and they became very disenchanted with the whole thing. Nonparticipating neighbors, too, fre-

mated that nearly half of all food grown for fresh consumption in the country had come from Victory Gardens—a total of 8 million tons of produce! At a time when vast amounts of food had to be set aside to feed an American military force of 14 million men and women, plus help feed the rest of the Allies, the contributions of Victory Gardeners proved to be invaluable indeed.

This overall success, however, did not translate into a continuation of Victory Gardens after the war was over, and these gardens quickly became an anachronism. Immediately after the war, local Victory Garden committees hurriedly disbanded, transferring any residual efforts to city or county agencies.

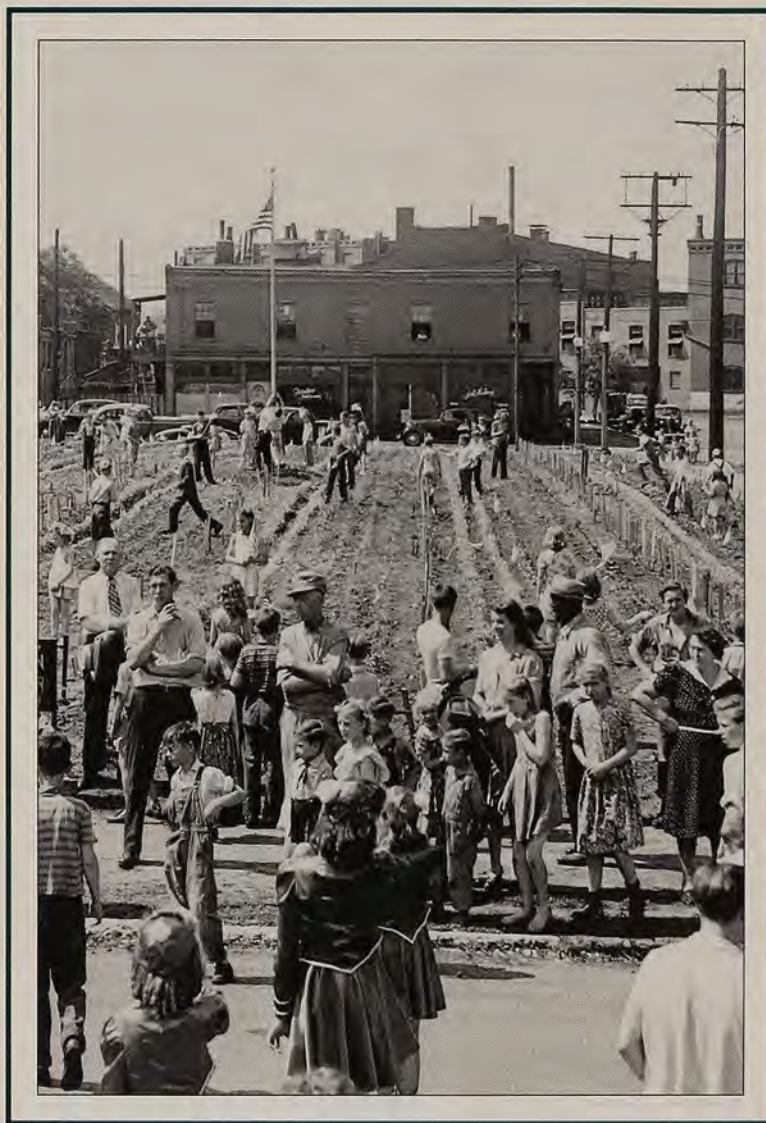
Buffalo continued leasing community plots, but interest quickly dropped off, probably just in time to accommodate the land-grabbing that was so much a part of postwar growth.

While it's true that some of the original Victory Gardens are still being worked as community gardens today, there are fewer of these each year. What was once a gardened vacant lot became a high-rise, and what was once a community garden on the outskirts of town became a bustling suburban mall.

With so many changes and so many visible traces of that era long gone, time has a way of forgetting, and not many people today remember meatless Tuesdays, eggless cakes, and gardens that assumed such serious roles. It wasn't

a time when you might garden just for pleasure or to fight off everyday tensions. It was a time when you very much believed that your garden was the first line of defense against a common enemy and that your vegetables would help secure a victory that would most assuredly bring about a better world.

Jeanne Palamuso has been garden columnist for the Buffalo News for sixteen years.



quently complained that the gardens brought rats and too many squirrels.

Victory Gardeners were a dedicated group, though, and considering the scope of the program and the minimal experience of the participants, Victory Gardens were remarkably successful. By the end of the war, American gardeners had farmed more than 20 million Victory Gardens. During one year alone, 1943, the government esti-

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I still have a large blue kettle with a lid and a rack inside to hold the jars that I used for preserving. I was afraid of botulism but I must have done a good job because we didn't get it. My youngest daughter remembers that her little fingers were just the right size for poking the beans down into the jars.

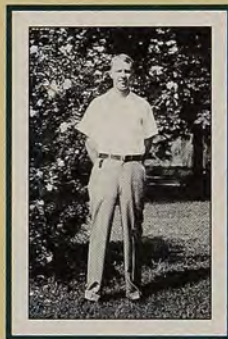
I canned string beans, corn relish, stewed tomatoes, ketchup, chili sauce, pickled green tomatoes, beets, and all kinds of pickles. If there was going to be a food shortage, at least we had jars and jars of condiments, vegetables, stewed peach halves, and applesauce.

Now I have a garden of fruit trees, dogwoods, old roses, herbs, scented geraniums, foxgloves, lady's mantle, and bed straw, inspired by the garden in the Cloisters in New York City.

—Esther Heins, Marblehead, Massachusetts

A HORSESHOE PIT IN VIRGINIA

My father grew up on a farm and like many others of his generation, moved into the city—in his case Richmond, Virginia—as a young man. He continued to love growing things and when the call came from President Roosevelt to plant Victory Gardens, he responded with great enthusiasm. We shared a city lot with four other families and his garden was about fifty feet by eighty-five feet. The first year he engaged a farmer with a horse and plow to break up the earth; in subsequent years we saved gas rations to have a tractor come for the plowing and discing.



He grew tomatoes, cucumbers, snap beans, "butterbeans," green peppers, corn, beets, squash, onions, black-eyed peas, cabbage, carrots, English peas, lettuces, and potatoes. He had great success except for watermelons, which disappeared as the neighborhood boys discovered them.

There was a small space left for a pit where the men relaxed by pitching horseshoes. My father felt that the president would approve.

My brother and I were children, but our part in the effort was to water, and we carried many buckets in the hot Virginia climate.

Our most successful crop was tomatoes, and there was great competition to grow the largest and the earliest. How well I remember the taste of those just-picked tomatoes.

My brother inherited rural property and today cultivates a large vegetable garden of his own. A heavily wooded suburban lot has limited me to shade-loving perennials and shrubs. We both use nontoxic pesticides and natural fertilizer as much as possible, just as our father did.

—Anne Jackson Morledge, Williamsburg, Virginia

FIGHTING FOR MANURE IN PENNSYLVANIA

When I was about five years old, my father asked me to help work in the garden. He told me that he had to help his parents in the garden when he was my age. He grew up in Philadelphia, and during World War II, everyone had a Victory Garden. They grew tomatoes and peppers in a small yard in front of the house. The yard was about twenty-five square feet and before the war, had been covered with ivy. It wasn't easy to grow vegetables in poor soil, and fertilizer was a very valuable commodity. ➤

Continued from page 23

At that time, street vendors used to peddle their wares from horse-drawn wagons. Every morning, they would go up and down the streets trying to sell their goods. Everyone would stand with their shovels, waiting for them. People who were ordinarily good friends would fight each other for the privilege of shoveling up the horse manure.

My father later moved to suburban New Jersey where he planted tomatoes and peppers every year. Horse manure was still the fertilizer of choice, but he didn't have to fight for it. He would drive out to the country early every spring and come back with the bed of his pickup full of manure. He never planted anything except bell peppers and 'Big Boy' tomatoes, but was always thrilled by the fact that they grew to be large when given enough space and fertilizer.

Today I live in rural North Carolina and my garden is about 2,500 square feet. I grow a wide variety of fruits and vegetables including bell peppers and 'Big Boy' tomatoes. Horse manure is still the fertilizer of choice. The garden is presided over by a scarecrow. I named him Clem, after my father.

—Debra Hughes, Bolivia, North Carolina

A SWEDISH HERITAGE IN ILLINOIS

My parents were Swedish immigrants to the city of Chicago and we made our home within the city limits on the far south side of the city. Fortunately, our home bordered the edge of development and we had open prairie land behind the house on which we had a huge garden. My parents were both raised on farms in Sweden and the "working the land" heritage was deep in their bones. Dad was an avid fisherman, and after cleaning his catch, he would grind up the fish heads and waste and dig this material into the rose beds. He had some of the best climbers and shrub roses on the south side.

He also had what my sisters and I termed "the garbage pile" next to the garden. It was our job, after the dishes were done, to take the peelings, egg shells, coffee grounds, etc., out to this pile. We were always embarrassed and hoped that none of the neighbors would see what our parents made us do each night.

Dad's gardening practices, which I found old-fashioned and somewhat embarrassing at the time, I know now as good organic gardening practices that I have fully adopted through the years as my own way of doing things.

Among the vegetables growing in our Victory Garden, where my dad flew a little American flag from one of the tall posts that anchored wire fencing for the tomatoes, were parsnips and rutabagas. Rutabagas are an integral part of the Swedish menu. Boiled with potatoes, they are mashed into a golden fluffy side dish called rutmose, served with melted butter. Served with homemade courve (Swedish sausage), it made a wonderful though plain midweek meal.

I have fond childhood memories relating to gardening. Most of the food in our home was either grown, baked, or caught, and much of the clothing, furniture, and decorative items were handmade. We always seemed to be busy as children and felt that we had a part in making the family work. As a grandparent, I am passing on this gardening heritage to our two grandchildren. Each has two rows in our large organic vegetable garden. We have restored a remnant Wisconsin prairie on the land around it. One of the most important skills to pass on to the next generation is that of self-sufficiency, and gardening is one of the great teachers of that ethic.

—Nancy Orwar Newcomb, Lake Geneva, Wisconsin

Beating Our Missiles Into Manure Forks

Victory Gardens are being introduced to our former Cold War enemies as a means to a lasting peace.

BY ERIC RAIMY

Americans who cultivated Victory Gardens during World War II, in their own backyards and in collective gardens on vacant city lots, helped feed a hungry people in wartime. Now some Americans are attempting to revive this approach in the land of a World War II ally turned Cold War enemy, whose

experiences with collective action have been much grimmer. That land is the new Russian republic, where uncertain food supplies are casting a shadow over the future of democracy.

This spring, residents of St. Petersburg (formerly Leningrad) will be invited to plant two large community gardens in the midst of high-rise apartment buildings. The plans, seeds, and technical assistance for this demonstration project, which is intended to generate widespread enthusi-

asm for city gardening, are being provided by the San Francisco-based Center for Citizen Initiatives (CCI).

For three years, the center's strong-willed founder and president, Sharon Tennison, has doggedly pursued a vision. She wants to persuade Russians to curb malnutrition and help stabilize the political situation by growing vegetables inside their cities.

At first glance, the task might not seem that formidable. Millions of Russian city dwellers are accomplished gardeners. By



Alexander Gourilov, CCI's director of agricultural initiatives in St. Petersburg, with a local citizen's tomato crop.

COURTESY OF DAN DIPPERY



Top: A Russian veteran of World War II. While their American allies were creating Victory Gardens, Leningrad residents were dying from hunger; nearly 200,000 perished in January and February 1942. Left: Martin Price of ECHO outside a mud hut used for potato storage. Above: Sharon Tennison, CCI president and founder.

some estimates they already produce more than 40 percent of the country's vegetables. They preserve much of this crop, usually by pickling, for winter consumption when food is scarcest.

But Russian gardeners are reluctant to grow vegetables in the city. Instead, they prefer to cultivate country plots hours away from their apartments. Their country plots are called "dachas," but these are not the luxurious country villas Americans associate with that Russian word. Many are simply small plots of land adorned with a ramshackle toolshed or improvised greenhouse. But no matter how distant or hum-

ble, Russian gardeners love their dachas.

Warren Schultz, editor-in-chief of *National Gardening*, was one of nine American gardening experts that the center brought to Moscow and St. Petersburg in 1990. "We were supposedly there to help the Russians put in urban gardens," he recalls, "when they weren't interested in that at all."

Attempting to change long-entrenched garden traditions in a nation so different from our own is seen by some as an unrealistic goal. Nevertheless, says Schultz, "there is a great opportunity to transform some of the vacant land around apartment buildings into gardens, and one of the best

things we can do is show the Russians that it can work in a city, as has been proven in the United States. But it's not going to happen unless the people over there want it to happen."

Schultz gives the center credit for developing a strong organization and valuable contacts. Until the Soviet Union disintegrated, Tennison's organization was called the Center for U.S.-U.S.S.R Initiatives. Its staff and volunteers sought to defuse Cold War tensions by arranging thousands of citizen exchanges between the two countries. Today it has hundreds of friends spread across the former Soviet republics and the United States, and influential connections in both countries.

Tennison used those connections last winter to achieve what looked like a major breakthrough on the Victory Garden front. She arranged for Vladimir and Tamara Maximov, superstars of Russia's TV Neva, to make a fifteen-day tour of American cities, filming urban gardeners using the most advanced bio-intensive techniques. The resulting prime-time TV series would be seen by 280 million Russian viewers, showing them that city gardening is practical and desirable, and providing solid how-to tips.

But as the superstars began their American tour in the spring, accompanied by Tennison and Vladimir Shestakov, president of the Center for Citizen Initiatives-St. Petersburg, a different agenda emerged. The Maximovs were more interested in American celebrities than serious American gardeners. The series they had in mind was not "Secrets of City Compost" but, as one center staffer put it, "Gardening With the Rich and Famous," or more simply, "Vanna White Picks up a Carrot."

By the time Tennison and the Maximovs reached Rhode Island, "they were hardly talking to each other," says Graham Bell, an agricultural extension specialist whose wife, Kathleen Mallon, directs the University of Rhode Island's cooperative extension education center. That was in April. The next month, Mallon and Bell were scheduled to spend eight weeks producing a series of gardening programs at TV Neva headquarters in St. Petersburg. They were aghast at the breakdown in relations between Tennison and the Maximovs, fearing their Russian trip would be canceled, Bell says.

The couple's trip was saved when the center agreed to pay a portion of their travel expenses. But since then, Mallon has repeatedly questioned Tennison's urban

gardening dream in *Seedling*, a gardening newsletter she edits with help from Schultz and distributes to 40,000 Russian farmers and gardeners as part of Rodale's *Novii Farmer* (New Farmer).

One target of Mallon's criticism is a "seedlift" that the center views as a major accomplishment. At the end of May, a ship carrying 24,000 pounds of donated American seeds reached the port of St. Petersburg. If everything were to sprout, that would be enough seeds to grow 330 million carrots, 75 million heads of cabbage, and 15 million beets—to name just three of the many vegetables in the shipment. Gardeners stood in line for two days to collect the free seeds, along with planting guides printed in Russian.

Those who waited in line did so "more out of curiosity than need," Mallon wrote, because seeds have not been in short supply there. Nor do the Russians always appreciate our seed selections. They don't grow or eat beans, for example.

Dan Dippery, director of the center's agricultural initiative, responds that seeds are available in some locations, but scarce in others. More important, he says, is price, since the ruble's soaring inflation makes it hard for people on fixed incomes to afford seeds.

The seedlift's principal architects were

Tennison and Kent Whealy, the founder of Seed Savers Exchange in Decorah, Iowa. In 1990, Whealy received a \$275,000 "genius" award from the MacArthur Foundation for his efforts to ensure the survival of America's heritage vegetable seeds—traditional varieties that fell out of favor as big seed companies sold growers on the virtues of hybrids. Since receiving the award, Whealy has made several trips to the former Soviet republics to search for solutions to their food crisis.

Last winter, he met with leaders of the Moscow-based International Center for Minifarming, which helps poor families feed themselves by growing vegetables. The minifarming group publishes a newsletter that reaches 60,000 people and has connections with gardening organizations throughout the former Soviet republics, Whealy was told. When he suggested free seeds to alleviate hunger, leaders of the group jumped at the idea, saying they could distribute large quantities.

Access to seeds, Whealy believes, will also improve the political situation. "I think the level of hunger relates directly to the survival of the democratic reforms."

Whealy flew back to the United States and spent two weeks on the telephone,

asking seed companies for donations. He also received a call from Tennison, just back from her thirty-ninth trip to Russia, and worried about the possibility of widespread malnutrition there. Tennison and Whealy joined forces to put together the mammoth seed shipment, half of which went to the St. Petersburg area and half to the minifarming group in Moscow. Almost all of the seeds shipped were nonhybrid, so that gardeners would be able to harvest seeds to plant the following year.

Whealy is pleased to think that most of those seeds were probably planted in dacha gardens this summer, giving thousands of families more to eat this winter. He says his top priority was to get the seeds planted wherever they would produce food, although he calls the notion of promoting city gardens "certainly a good idea."

Mallon insists that such efforts to promote urban Victory Gardens are misguided. "It would appear to us," a recent *Seedling* article contends, "that continuing to try to force-feed the concept of community gardening to the Russian people is a waste of precious time and resources. It seems more reasonable to help people grow food where they want to—on their individual plots."



A typical Russian village garden with a greenhouse, raised beds, and a bathtub to collect rainwater.



Above: Plant vendors selling their wares in a St. Petersburg farmers' market. Left: Keith Kennedy of Cornell, one of nine American agricultural experts brought to Russia by CCI last August, receives flowers from a widowed pensioner who grows all her own food.



Information would be more useful to Russian gardeners than seeds, she suggests. Because they have limited access to chemical fertilizers and pest controls, tradition has taught them how to garden organically, using raised beds, interplanting, and manure, for example. But almost no one seems to compost or to control weeds with mulches.

To show how attached the Russians are to their dacha plots, a *Seedling* article described how a Russian mother of three, Olga Shestakova, would reach her country plot last summer. She would ride a train for three hours, then switch to a bus, and finally walk the last few miles, "lugging

plants, tools, fertilizer, and a rucksack full of clothes and enough food to carry her through the weekend." Like Shestakova, millions of city dwellers travel hours to reach their gardens, Mallon told her readers, "But to urban Russians, that effort is part of their culture."

The Russians are wedded to country gardening, she says, for three reasons. First, they yearn to leave overcrowded city apartments for country visits, no matter how arduous the trip. "They don't complain," she says. "To them it's like camping is for us." Second, they are convinced that soil pollution will poison any vegetables

grown in the cities, and they fear that urban theft and vandalism will leave little to harvest. Finally, urban gardens are often cooperative projects and, after enduring seventy years of Communism, the Russians have learned to be suspicious of any communal effort.

To clinch her case, Mallon says the Russian government "has stepped up the distribution of dacha plots. Essentially anyone who wants a garden can now have one."

Dippery says Mallon is right—up to a point. "People do want to get out of their apartments," he says, "but many of them must travel up to seven hours to reach their dachas and are able to visit their plots only a couple of times a year."

The government has distributed some new plots, he says, but has moved slowly: "There is a massive bottleneck in freeing up this land." As a result, two out of five city dwellers have no place to grow vegetables, and they are the people who need urban plots, Dippery says.

Both sides agree that city dwellers believe their soil has been poisoned. They disagree about how real that concern is and how it can be addressed. Last spring, Tension took a soil sample from a St. Petersburg district that residents believed to be heavily contaminated with lead. "Cornell University's extension service tested it and found insignificant amounts of lead," she says. While aluminum levels were high, Cornell scientists suggested that two soil amendments readily available in Russia—lime and manure—would render the soil safe for vegetables. Mallon counters that the lack of both vehicles and gasoline in the new republic makes it impossible to get manure from country to city in quantities sufficient to have an impact.

The center delivered four more soil samples to Cornell last summer. W. Keith Kennedy, professor emeritus of crop sciences, reports that in two of the samples, the levels of lead and chromium were "a little higher than we would like to see. But based on our experiences in New York City, we don't see this as any major problem. We would simply recommend that root crops, such as potatoes and carrots, be scrubbed well, or even better, peeled."

A more serious obstacle to city gardens is the poisoning of Russia's social climate. "I don't think community is a popular word," Dippery says. "What will it take to overcome the lack of trust? Maybe being hungry will have some bearing on it."

Tennison makes a similar argument: "People have gone two years without decent nutrition," she says, "and it's beginning to show, particularly with the children."

Whether the resistance to urban gardening is dissipating may become evident this spring, when St. Petersburg residents are invited to plant the two community gardens the center has on the drawing board.

"The mayor of the city's Moskovsky District has set aside up to ten acres for a tremendous demonstration project," says Dippery. The apartment dwellers themselves will do the planting and weeding.

A companion project is being spearheaded by Martin Price, executive director of the Educational Concerns for Hunger Organization (ECHO) in North Fort Myers, Florida. Price will help create rooftop gardens atop two massive Moskovsky apartment buildings. The center brought him and eight other American agricultural experts, including five with ties to Cornell, to St. Petersburg and Moscow in August to assess prospects for urban gardening.

The American experts were pleased to find that Moskovsky's mayor was not the only influential Russian who has gotten excited about the Victory Garden idea.

In St. Petersburg, the center sponsored a one-day urban gardening conference on community, rooftop, and school gardening. Dippery says the conference drew more than 350 people, including representatives of numerous nonprofit groups. A newly privatized geophysical institute gave the center's urban gardening network free office space, complete with hard-to-get telephone lines, and offered the building's seven large roofs as demonstration sites. Two Russian volunteers agreed to begin a seed bank and seed exchange, and will be advised by Kent Whealy.

In Moscow, the visiting Americans made a presentation to the city council. Under an agreement with the council, the center will provide inner-city gardening instructions, seeds, and specialists to assist the elderly, orphans, the disabled, and others especially at risk from food price hikes. The center will also help people gardening unclaimed plots in Moscow, and will support an urban gardening newspaper there.

The center's gardening networks in St. Petersburg and Moscow rely heavily on Russian and American volunteers, but they are coordinated by salaried Russian agriculture directors. Both directors, Dippery says, learned bio-intensive gardening in the United States

from California author John Jeavons.

So where does all of this leave Tennison's vision? After three years of frustration and setbacks, center leaders feel confident that they have begun to generate interest in urban Victory Gardens, especially on the official level. But even Dippery is uncertain about how much will finally be achieved. "It's an experiment," he says. "We're not going to provide the labor, so ultimately it will come down to whether the growers are interested."

Eric Raimy is a free-lance writer based in Oakland, California.

The Center for Citizen Initiatives needs volunteers who can visit Russia to teach skills related to high-yield, small-space gardening, and organizations to provide horticultural internships to Russians visiting this country. For more information contact them at the Center for Citizen Initiatives, 3268 Sacramento Street, San Francisco, CA 94115, (415) 346-1875.

Seedling, a joint United States-Russian newsletter, is available for \$6.95 a year or \$12 for two years. Write Seedling, University of Rhode Island Cooperative Extension, East Alumni Drive, Kingston, RI 02881, or call (401) 792-2900.



From left: Igor, a Russian agricultural scientist; Scott Sheavly, Cornell; Lynn Bagley, executive director of Marin Farmer's Markets; CCI's Gourilov; and Shirley Kozlowsky, Cornell microbiologist, during last summer's CCI-sponsored trip.

COURTESY OF DAN DIPPERY

Tillandsias— Out On a Limb?

While not all air plants are on their last gasp, we may be smothering some species with affection.

B Y M A R G A R E T S L O A N

The pre-Columbian ruin was deep in the rain forest, the trail to it threading through immense tree trunks draped with vines. But where was the lush tropical foliage I had pictured? I saw only some large, silvery plants littering the ground. I looked again. The plants weren't growing in the soil. They had no roots.

"What are they?" I asked the guide.

"*Plantas de aire*," he said. Air plants. "See? No dirt. The wind blew them from the trees." He pointed to the sky.

Looking up, I gasped. There was the real jungle! Great sky gardens climbed high into the forest canopy, blanketing branches and trunks with a riot of plant life in every conceivable shape. Small round plants made the tree twigs fuzzy. Crazy, contorted forms were silhouetted against the limbs. Large green vase-shaped plants nestled in tree forks, and the tree trunks were encased by clumps of the long, silver, grasslike plants I'd first noticed on the ground. "They're beautiful," I exclaimed.

The guide shrugged. "They're just weeds," he said.

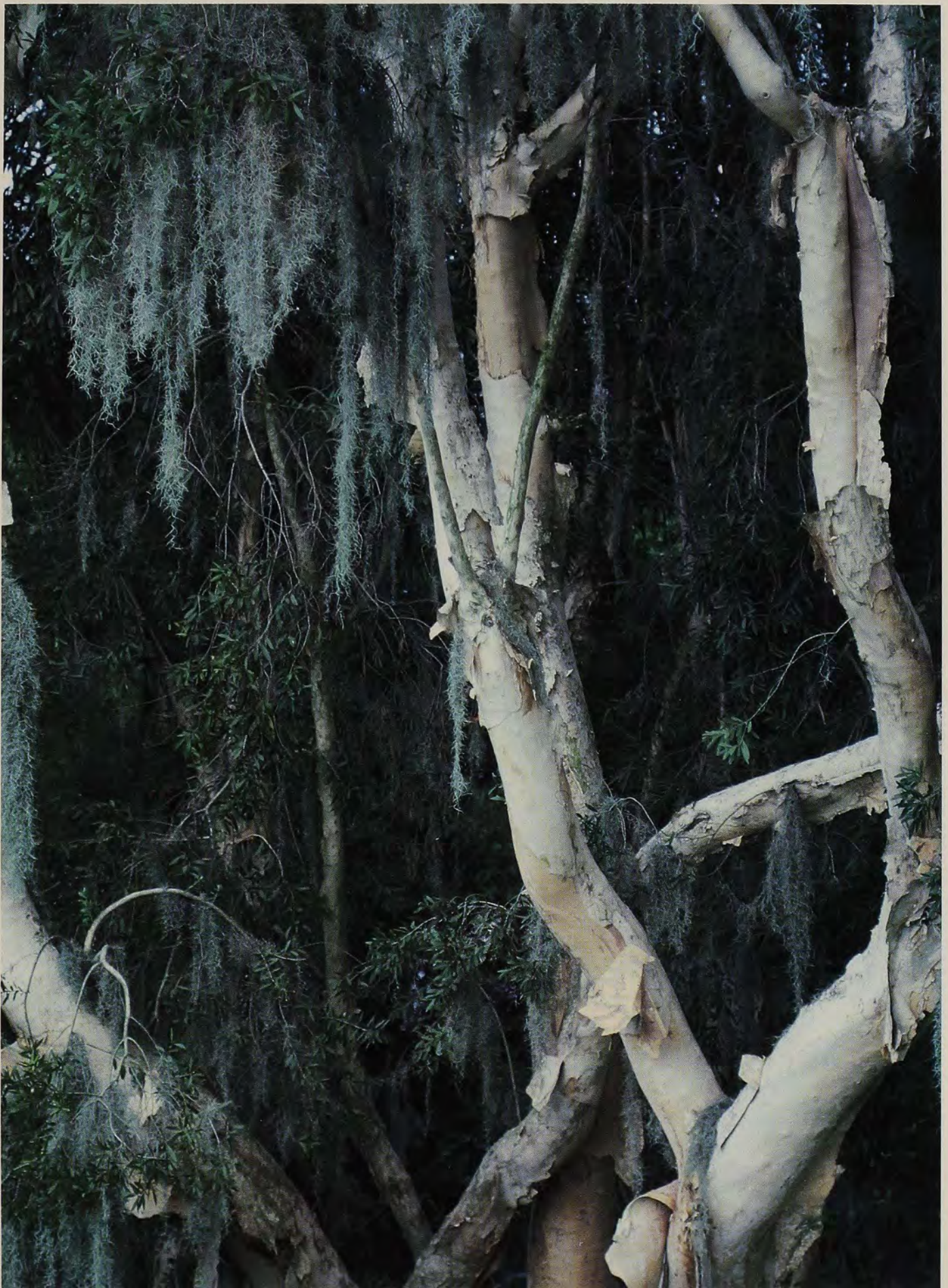
Back in the United States I saw the so-called air plants again, this time in a local garden shop where they were sold glued onto shells, driftwood, and magnets. "Tillandsias," a sign read. "Members of

Bromeliaceae, a tropical family indigenous to the New World. Tillandsias are distantly related to another bromeliad, the pineapple. Tillandsias are easy-to-care for plants that require no potting soil, just water, light, and air."

I bought one, feeling faintly foolish buying a weed. But this charming little plant proved to be a weed with a difference. At the time, I had no idea that my purchase had made me a minor participant in an international trade dispute. For though tillandsias are little valued over much of their native range, they are increasingly prized in North America and Europe. Collectors and casual growers alike are fascinated by their otherworldly blooms, their peculiar way of life, and their extraordinary diversity. But critics charge that by buying so many tillandsias, we may be loving some species to death. What had I bought into?

To understand the concern over their survival, it helps to know how tillandsias have survived until now. With over 400 known species, *Tillandsia* is the largest genus in the bromeliad family. Ranging from Argentina to the southern United States, it includes such well-known plants as Spanish moss, *T. usneoides*. But other species are so rare we can't even agree on their names. Is the Brazilian *T. recurvifolia*, now lumped in with *T. rosea*, really a form of *T. stricta*? Com-

Right: Spanish moss, one of the most common tillandsias, occurs from the southern United States to Argentina.



ANITA SABARESE

NOT ON AIR ALONE

Tillandsias are the ultimate convenience plants, requiring little care and no messy potting soil. Xeric, or gray-leaved species are the most popular and the easiest to grow, and are readily available from the retail nursery trade. They'll thrive indoors if they're given the water, sun, and air circulation they crave, but while they don't ask for much, neither are they maintenance-free.

There's a common myth that tillandsias only need an occasional misting. Not true! A few spritzes once a week probably won't wet the plant long enough for the leaf to absorb the water. Tillandsias need a good shower every few days or a long soak (up to eight hours) every couple of weeks. Like all plants, the amount of water tillandsias need depends on the environment, the species, and the method and frequency with which you water. The warmer and drier the air is, and the more sun they get, the more moisture they'll need.

Some species will tell you when they need water. The leaves of *Tillandsia xerographica* curl into tight ringlets. The leaf bases of *T. argentea* shrivel. Other signs that a tillandsia needs watering is a general dullness to the plant, leaf tips turning dark gray, and inrolled leaf margins. You'll soon learn to "read" your tillandsia.

After watering, make sure that the plants don't stay wet for long as too much moisture can cause them to rot. Remember, in nature tillandsias are used to lots of wind, so give them plenty of air circulation.

In the wild tillandsias are fertilized by decaying organic matter caught in their leaf axils, by passing birds, insects, and bats, and by nutrients leached from tree leaves during the hard tropical rains. Feed yours sparingly spring through fall with half-strength, water-soluble fertilizer, preferably one made for epiphytes. (I do, however, know a person who feeds her thriving plants with water from the goldfish bowl!)

Tillandsias need plenty of light. In general, species with bright white coatings of trichomes like higher light levels than plants with smooth, green leaves. They do quite well in a bright, sunny room, and will grow even better outside, so long as the temperature stays above 50 degrees. There are no hard, fast rules, though, so experiment with placement until the plants are happy.

Other than mealy bugs and scale, tillandsias are remarkably insect and disease free. Daubing pests with alcohol, or spraying an insecticidal soap will control small outbreaks, but if there's a severe infestation, you may want to use a systemic such as Cygon.

Popular methods of displaying tillandsias are by hot gluing them to bits of gnarled wood, sea shells, or rock crystals. I like to hang them on rings made from willow branches, grape vines, or bamboo. The spinning action provides enough air circulation that the plants never rot. Most species can be mounted in any direction—up, down, or horizontally—just so water doesn't collect in the center of the rosette.

Although many people use hot glue to fasten their plants, the heat can damage the tender growing center of the plant, and the glue may come unstuck as the plant gets larger. I use aluminum wire to attach my plants, threading it through the outer leaves or wrapping it around any existing roots. Don't use copper wire, and don't constrict the plant by wrapping it too tightly.

It's important to examine tillandsias closely when you buy them. Healthy xerophytes have an even coating of silvery trichomes over a pale green leaf, while unhealthy plants look moth eaten, with the white coating of foliar hairs worn off in patches, and gray or black leaf color. Don't buy plants that seem shriveled, have brown or black leaf tips, or are dull looking. The leaves shouldn't come off with a gentle tug, but if they do, they should be firm and white at the base, not brown and dry.

Tillandsias have colorful, exotic blooms that are sometimes fragrant, but be forewarned that while some species may cling to life for a year or more after flowering, most will die soon after. Don't pass up a flowering plant though, because after the blooms fade, you'll be rewarded with offsets that can be left intact to make a clump, or separated into individual plants. Tillandsias can also be propagated by seed, but be prepared to wait. Tillandsia seedlings are slow, taking two to eight years to reach maturity.

—Margaret Sloan

mon or rare, "air plants" are omnipresent in the American tropics.

Many tillandsias thrive in humid jungles, but others, like the spectacular *T. macdougallii*, inhabit cool coniferous forests. Some, like the popular *T. xerographica*, are desert dwellers. Still other species are generalists, occupying a vast range of habitats. *T. polystachya*, for example, can be found all the way from the cypress swamps of Florida to mile-high Bolivian forests. Almost no habitat is too wet or too dry for tillandsias; only prolonged temperatures below 45 degrees limit their range. What is the secret of their success? Tillandsias, like most other bromeliads, are epiphytes—nonparasitic plants that grow on other plants. In fact, tillandsias will grow on just about anything—cliffs, cacti, trees, even telephone wires. Their epiphytic habit allows them to take advantage of fresh air, rain, and sun that ground-level competitors can't reach.

Certain orchids, ferns, other bromeliads, and even cacti use this survival strategy as well. But tillandsias have gone further, developing a complex set of tools to deal with the challenging conditions of their habitat. In his book, *The Biology of the Bromeliads*, David Benzing explains that the early bromeliads had evolved into rosette-shaped plants so that water would be trapped in the center of the rosette, in the axils of the wide, soft leaves. This adaptation—still used today by many bromeliads, including some tillandsias—gave the plants a degree of independence from the soil. Packing their own water, such plants could escape ground-level competition by rising into drier arboreal environments.

But life aloft was no picnic either. The wind that had blown little tufted tillandsia seeds into the trees dried up tender seedlings despite their water storage tanks. The increase in sunlight burned them. And to top it all off, the rains didn't always come with regularity. Tillandsias took a new evolutionary tack. To conserve moisture, they gave up their ancestors' large leaves in favor of smaller, slower-growing ones and fewer of them at that. To conserve energy, photosynthesis was reduced, and their water "tanks" were traded for specialized water storage cells within the leaves.

But how could the leaves absorb the water, when the plants had few or no roots? Tillandsias adapted the "hairs" on the surface of their leaves (a feature of many plant families) into elaborate water transport systems called trichomes. A tri-

chome consists of three layers of cells. Petal-like wing cells surround a layer of ring cells that in turn surround the central disc cells. The cell walls of each layer are flexible and water permeable. The two outer cell layers are dead, but they soak up moisture like blotting paper. As they swell with water, they press themselves up against the trichome core, thereby pulling even more water in towards the disc cells. The disc cells, which are living, absorb the moisture and pass it on to the leaf interior.

After the rain, the wing cells stand erect and wick water away from stomata on the leaf surface so the plant doesn't drown. The ring and disc cells collapse, sealing in the water below. Xerophytic species (those adapted for very dry conditions) are often heavily covered with large, extremely absorbent trichomes. Sometimes even the stomata are capped with trichomes to further reduce water loss. Their dense coating of trichomes is what gives these plants their bright white sheen.

But the trichomes do more than regulate water intake. On desert species, like *T. xerographica*, they reflect sunlight and insulate the plant from heat and cold. The long silky trichomes of the Andean *T. tectorum* help condense water from the clouds that roll over the otherwise dry mountain plains. Those on *T. bulbosa*, which lives in the shady midcanopy of the rain forest, are sparse and flattened against the plant. This helps shed water and allows more light to reach the leaves.

Tillandsias reproduce as efficiently as they conserve water. Most species disperse copious amounts of seed, though the seed is usually slow to germinate. They also produce offsets, called pups, at the base of the parent plant, between leaf axils, or on the spent inflorescence, depending on the species. In some species, plants produce only a few pups in their lifetime. But other species pup prodigiously, forming clumps big enough to overflow a wheelbarrow. Harry Luther, an expert on bromeliads at the Marie Selby Botanical Gardens in Sarasota, Florida, says, "It's common to see several tens of thousands to several million plants per acre."

The changes wrought by evolution have produced a host of bizarre and beautiful forms. There are curly-leaved tillandsias, like *T. caput-medusae*, and straight-leaved ones, like *T. stricta*. The shade-loving *T. cyanea* has dark green leaves with few trichomes, while *T. argentea*, living at the top of the forest canopy, has long, bright

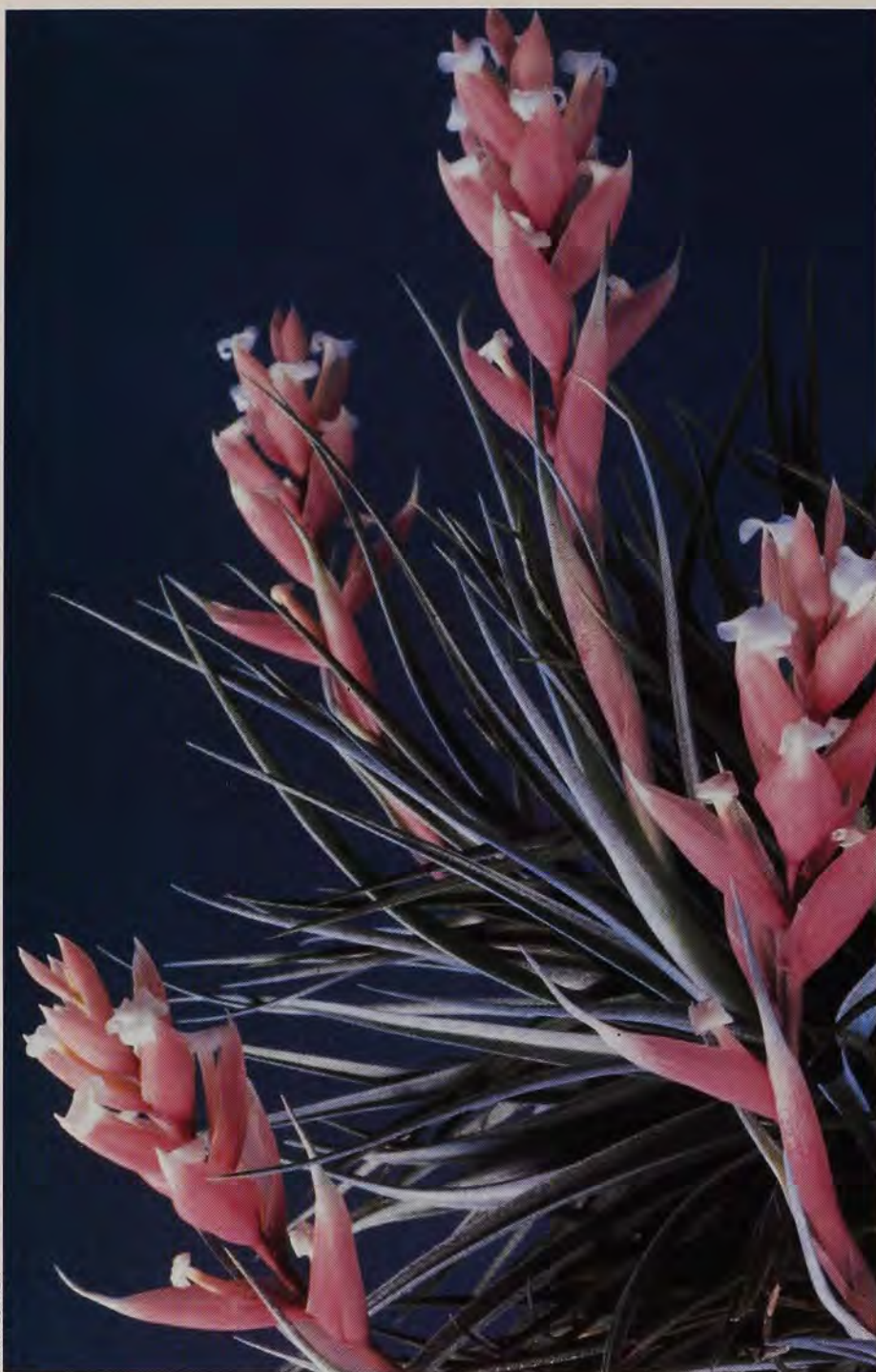


HAL HOROWITZ/PHOTONATS



HARRY LUTHER

The blooms of the easily grown Tillandsia stricta, above, are considered among the most beautiful in the genus. T. macdougallii, left, is another spectacular bloomer, but much harder to grow.



white trichomes. Some tillandsias are large, like the terrestrial *T. grandis*, a vase-shaped plant that can measure five feet across. Others are as minuscule as the tiny, moss-like *T. bryoides*. A few, like *T. deppeana*, seem even to have reversed evolution. These species begin life within the forest canopy as succulent, trichome-covered atmospheric. But they mature into "tank" tillandsias, with soft green leaves covered only sparsely with trichomes.

Given all of this fascinating variety, it's no wonder the trade in "air plants" is booming. It's difficult to come up with precise figures, but Nina Marshall, an ex-

pert on the wild plant trade for the World Wildlife Fund (WWF), estimates that over 250 species are sold in the United States. Most species are bought only by collectors and sell in very small numbers. But for the most popular tillandsias, like *T. xerographica*, *T. brachycaulos*, *T. caput-medusae*, *T. juncea*, and *T. ionantha*, sales volume can reach 10 million plants a year in the U.S. alone. In Europe, the trade is even heavier, and the output from some of the exporting countries is astronomical. In Guatemala, for instance, several nurseries are reported to be producing in the range of 12 million plants annually.

The extent of the trade has raised fears that collecting may be damaging wild *Tillandsia* populations. In March, at the annual meeting of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the treaty organization that regulates trade in endangered species, Germany and Austria introduced motions to list the genus *Tillandsia* as endangered by trade. The entire genus did not make it onto the CITES list, but seven species did: *T. harrisii*, *T. kammii*, *T. kautskyi*, *T. mauryana*, *T. sprengeliana*, *T. sucrei*, and *T. xerographica*. The listing means that special certification will now be required to bring any of these species into a country that is party to CITES. Greenhouse-grown plants will now require documentation that they have not been wild collected. Wild-collected plants can only be exported by scientific researchers or others with especially strong claims.

The proposals in their original form were poorly received. "It's a bad proposal," said Don Thompson, the official at the U.S. Department of Agriculture who oversees enforcement of CITES plant provisions in this country. "There was no reason to list the genus. They're propagated widely. It lends itself to vegetative propagation." Selby's Luther agreed. He said the Austrian proposal in particular had so little scientific merit that it was "off the wall." Even the WWF's Marshall said that listing the entire genus would have been "very inappropriate."

Some of the plants that made their way onto the list are rare in nature, but are they being endangered by trade? Marshall thinks they may be, but Luther considers the listing justified for only two of the seven. There is, he said, "a pretty good consensus that *T. xerographica* has been overexploited in its native habitat," though he added that it's widely propagated in the trade these days. The other worthy candidate is *T. sprengeliana*. Of its three known populations, resort development has wiped out two and the other is being damaged by collecting. Luther said the other five species haven't aroused much commercial interest. Even *T. sprengeliana* is just a collector's obsession. "I doubt," he said, "that there are twenty plants in the U.S."

Will the CITES listing help conserve tillandsias? According to Dennis Cathcart, owner of Tropiflora, a bromeliad nursery in Sarasota, Florida, preventing trade may have the opposite effect. "The plants that have a dollar value are being propagated,"

he argues, “and if you prohibited trade, they would be relegated to their native habitat and they may die out as that habitat is eliminated.” To this responds WWF’s Marshall, “Collectors always argue that way.” Because commercial populations often derive from only a very few specimens, she says, their gene pool is very limited and their value in conserving a species is usually slight.

But if the tillandsia trade is mostly in propagated plants, why put them on the CITES list? Luther says that though nurseries rarely sell collected plants, because of their “bug holes and broken leaves,” the nursery-grown plants may come from collected stock. Marshall says that one purpose of the listing is to collect information on the trade, since there are conflicting reports on the quantity of wild plants being collected for sale.

One thing that all observers seem to agree on is the need to do a better job protecting native tillandsia habitats. As Cathcart put it, “It’s silly to put anything on a protected list if you don’t protect its home.” Cathcart argues that for every tillandsia collected, there are probably a hundred lost to agricultural clearing, logging, and development. He cites as an example the effects of sun-tolerant varieties of coffee and cacao, which are replacing the old fashioned, sun-sensitive types grown in forest shade. The older arrangement favored many epiphytes, but farmers are cutting the forests to plant the new varieties. “Don’t waste time protecting the plant that’s growing in the tree,” he says, “unless you protect the tree.”

The reaction of my guide in the rain forest is common; in Latin America tillandsias are commonly destroyed as parasites or weeds. Some species are harvested for their flower spikes; others are knocked from the trees for foraging livestock. Benzling says the growing tips of *T. maxima* and *T. rubella* are considered a delicacy in Bolivia and Argentina. He warns that this could “hasten their extinction.”

One reason for our uncertainty about how to conserve tillandsias is our ignorance of their ecology. The roles tillandsias play in their native ecosystems are complex and subtle. Large tillandsia clumps, for instance, can house insects, reptiles, birds, even small mammals. Their bulbous bases often shelter ant colonies—a survival tactic that benefits both parties. The tillandsia uses the colony’s waste as a nutrient source, and the ants get a safe place to live, away

from the hazards of the ground.

This relationship has another facet, one I learned about first hand one day along a hot, desert road in Mexico. I had stopped to examine a beautiful tillandsia growing in a thorn tree. I reached into the tree to dislodge it, and suddenly I was doing a dance in the middle of the road, my arm covered with tiny, biting ants. Needless to say, I left the tillandsia in the tree.

Margaret Sloan is a free-lance writer, landscape designer, and compulsive plant collector who has traveled extensively in Mexico and Central America.



JESSIE M. HARRIS

The famous and the obscure. Tillandsia polystachya, above, is a well-known species found from Mexico to Brazil. But the tillandsia opposite, also a native of Brazil, is rare and hard to classify. Once called T. recurvifolia, it is now considered a variant of T. rosea.

It would be hard to think of a group of plants that has played a more important role in the history of plant life than the ferns and their close relatives, the club mosses and horsetails. Collectively called the pteridophytes, these were the first truly successful land plants. Our modern plant communities owe their origins to them. And today the pteridophytes, ranging from the simplest to the most elaborately adapted, are still an important part of our environment.

I am curator of the fern collection at the Marie Selby Botanical Gardens in Sarasota, Florida. Selby's fern collection includes over 250 live species and 2,000 dried specimens. Many of our ferns are rare or native to areas that are remote and little-studied. Our research focuses on reproduction, particularly in epiphytic ferns. (About a third of all fern species are epiphytes, meaning that they grow on other plants without parasitizing them.) We would like to learn more about hybridization and polyploidy—the presence

The Ferns of Selby

*Through the study of primitive
plants we can travel back before
the days of the dinosaur.*

BY RAUL E. RIVERO

PHOTOS BY VERN SAWYER



*Millions of spores cluster in just one patch on a staghorn frond at left. In *Elaphoglossum latifolium*, above, spores darken the undersides of fertile fronds.*



KRISTINE RASMUSSEN

Tree-sized club mosses, the ancestors of our inconspicuous “ground pines,” dominated the swamp forests of the Carboniferous era.

of more than the normal number of chromosomes—in the hope of understanding the extraordinary diversity of ferns. Let’s take a closer look at a few of these amazing plants.

The most primitive living pteridophyte is the whisk fern, *Psilotum nudum*. It occurs from the American Southeast to northern Argentina, but it is rare throughout its range. Sometimes called a living fossil, it has one of the simplest anatomies among the modern plants. It consists merely of a forked, aerial stem anchored by a rhizome, which is really an underground stem, rather than a true root. It has no leaves, which explains its scientific name (*psilos* means “bare” in Greek and *nudum* means “bare” in Latin).

Simple though they may be in comparison to modern flora, plants like *Psilotum* were a radical evolutionary advance when they first emerged. These were the first plants to develop vascular tissue—the system of vessels that allows for the transfer of water and nutrients from one part of a plant to another part. The earliest known vascular plants date from the mid-Silurian, about 380 million years ago. The importance of this development would be hard to exaggerate: Vascular tissue was an adaptation essential for colonizing the land. It’s easy to see why the whisk fern is called a living fossil. Botanists consider it one of our most significant links to the flora of the remote past.

Another group of pteridophytes with an illustrious past are the club mosses, the genus *Lycopodium* (from the Greek *lycos*, meaning “wolf” and *pous*, for “foot”). Despite their common name, the lycopods are not really mosses. True mosses belong to the division Bryophyta, a group of simpler plants that also includes the liverworts and hornworts. Bryophytes generally lack any protective outer layer and are confined to damp habitats. Club mosses require damp conditions too, although they will tolerate periodic drying out.

Modern club mosses are small but ubiquitous. Since their taxonomy is not well understood, estimates of the number of species vary greatly, from around 200 to over 500. They occur the world over, but more than half of them live in tropical America. Some of the tropical club mosses, like the Ecuadorian *L. subulatum*, are pendulous epiphytes. Other lycopods like *L. cernuum*, which is widely distributed in tropical America, dwell on the forest floor. Because they are low-growing and ever-

VISITING SELBY

green, club mosses are often called "ground pines."

Despite their unassuming stature today, the lycopods were the giants of a bygone era, and represented another major evolutionary advance. They are believed to be the first plants to have developed leaves. Their success made them a dominant terrestrial flora during the Carboniferous period, about 345 to 280 million years ago. Carboniferous plants are the source of our gas, oil, and coal deposits. That period saw the development of club mosses 150 feet tall and six feet thick at the base, with leaves a yard or more long. These plants formed the canopy of the period's immense swamp forests, but disappeared when the swamps dried up some 250 to 200 million years ago.

Also inhabiting the Carboniferous forests were the seed ferns, a group of plants related to modern ferns. Now extinct, these plants were the first to reproduce by seed, rather than by spore. The seed, with its tough outer shell and internal food supply, was the key to the conquest of practically every type of terrestrial terrain, and it is the basis for the diversity of modern flowering plants.

Modern ferns display adaptations as fascinating as those of their Carboniferous ancestors. For instance, the staghorn ferns (*Platycerium* spp.) are the largest epiphytes ever recorded. (See "Staggered by Stag-horns," *American Horticulturist*, December 1990.) Native mainly to the Old World tropics, some staghorn species have leaves up to six feet long. The staghorns dramatically demonstrate the accommodations an epiphyte must make. How, for instance, can a plant obtain a constant supply of water if it doesn't touch the ground? The staghorn's solution is the nest of dead leaves that forms at the base of the plant. Sometimes called the "niche leaves," they soak up rainwater like a sponge and serve as a reservoir upon which the plant can draw. At Selby, the staghorn is one of our symbols, not only because of its majestic appearance but also because of its wide popularity among fern lovers.

Staghorns also exhibit a peculiar adaptation called leaf dimorphism, in which two kinds of leaves are present. The "fertile leaves"—the ones that bear the spore cases—are large, hairy, and often forked like antlers. The "sterile leaves" are generally smaller and rounded. They clasp the tree on which the fern is growing, while the fertile leaves hang free. The spore cases on

Located in Sarasota, Florida, the Marie Selby Botanical Gardens is a center for both the research and display of tropical plants. Selby specializes in epiphytes and is perhaps best known for its collection of over 6,000 orchids. Its seven greenhouses and eleven acres of open-air gardens contain more than 20,000 plants. Many of these were collected by the gardens's own researchers, on the nearly 100 tropical rain forest expeditions in which they have participated. The gardens opened in 1975 and are host to over 100,000 visitors a year. Selby is open from 10 a.m. to 5 p.m. daily. For more information, write Marie Selby Botanical Gardens, 811 South Palm Avenue, Sarasota, FL 34236, or phone (813) 366-5730 or 366-5731.



PHOTOS BY VERN SAWYER



In *Elaphoglossum peltatum*, above, leaf dimorphism is carried to extremes. The filigree sterile fronds look so different from the entire fertile fronds that you might think they belonged to different plants. At left, the whisk fern, the simplest pteridophyte, bears its spores in cases at intervals along its stems.



BOB WANDS

The "fiddleheads" of the tree ferns are among the most impressive structures in the kingdom of ferns.

a staghorn's fertile leaves occur at the tips in some species, but in others, like *P. superbum* from Australia, they are concentrated at the bases.

In many ferns, leaf dimorphism is part of the reproductive strategy. For instance, species of the genus *Elaphoglossum* (from the Greek *elaphos*, for "deer" and *glossa*, for "tongue") produce a wide range of dimorphic leaf arrangements. *Elaphoglossum* is primarily an epiphytic group widely distributed in Central and South America and in Africa. Some species produce very dissected leaves, as in *E. peltatum*, while in others, like *E. latifolium*, the leaves are entire. The fertile leaves are longer than the sterile leaves in most species, and it is thought that this extra length helps to disperse the spores.

A more complex adaptation, often seen in epiphytes, is symbiosis, a relationship with another plant or an animal in which both parties benefit. In the epiphytic Costa Rican fern, *Solanopteris brunei*, for example, the rhizome produces numerous hollow balls more than an inch in diameter. Holes in the balls allow the fern's own roots to penetrate them and to grow along the interior walls. The balls are inhabited by ant colonies and, in exchange for shelter, the ants' secretions supply the fern roots with nitrogen. Symbiosis may also be at work in the staghorns. Many species of insects and sometimes even small lizards live inside the rhizomes of the larger staghorns. It is possible that the plant is repaid for its hospitality when its guests die and furnish it with compost.

One of the focuses of our research at Selby is to learn more about reproductive adaptations in ferns. Ferns propagate in several ways, and these are not all well understood. Sexual reproduction in ferns begins with the dissemination of spores, which are single cells that grow into tiny, inconspicuous plants. These little plants release sperm and egg cells and the fertilized eggs grow into new ferns. Because they are so small, fern spores are incredibly mobile. Winds have spread spores up to 2,000 miles from their parent plants. This mobility explains the existence of some fern species on islands and in other remote areas.

But some ferns also reproduce asexually, without the intervention of spores and sex cells. This type of propagation is present in many other plants, such as in grass runners and potato "eyes." In the spleenwort ferns (*Asplenium* spp.), for instance, the tips of

the leaves produce tail-like extensions of up to two feet. Wherever these tails touch the soil, a new plant may grow. This habit of reproduction has earned the group the nickname of "walking ferns." In the genus *Tectaria*, whose members, from both the Old and New World tropics, are called "halberd ferns," buds form on the tops of the fronds. When the frond dies and drops from the plant, the buds take root and grow, producing a new clump of ferns.

The most striking of the modern ferns are the arborescent, or tree ferns. One such fern, actually a subarborescent, is *Blechnum brasiliense*, with its imposing stems over six feet long and its thick, leathery leaves of up to four-and-a-half feet. *B. brasiliense* grows in streamside communities in the lowlands of Colombia, Uruguay, and Brazil. Other members of this genus occupy high altitude habitats. *B. werckleanum*, for example, a cycadlike plant with stiff, erect leaves, lives at elevations over 10,000 feet on the Cerro de la Muerte, a mountain in Costa Rica.

The palmlike tree ferns of the tropical rain forests represent the climax of arborescent architecture in ferns. *Sphaeropteris cooperii*, for example, is a colossal tree fern native to Australia. It grows over thirty-five feet tall and supports a crown of leaves twelve or more feet long. In tree ferns, the distinctive spirals of the unfolding fronds—the "fiddleheads"—are thickly covered with scales. They make the plants look as if they belong in the fern forests of the distant past.

These and other ferns have much to teach us. We are, for example, only beginning to understand the practical implications of fern biochemistry. Recent research has demonstrated that some ferns produce substances with antibiotic or antifungal properties—a discovery that helps explain the use of ferns in traditional medicine the world over. The spores of the club mosses produce oils used to lubricate condoms, surgical gloves, and other rubber products. But beyond the practical value of ferns, we still have larger lessons to learn, about how ferns fit into modern ecosystems and about their part in the history of life. For these ancient plants had a major role in one of the earth's greatest dramas—the conquest of the dry land by green plants.

Dr. Raul E. Rivero is a fern taxonomist and curator of the Marie Selby Botanical Gardens's fern collection.

Book Reviews Continued from page 5

approach. But serious gardeners, even those who prefer informal styles, will find useful information, inspiration, and food for thought.
—Anne Halpin

Anne Halpin, an editor and professional gardener, is the author of The Year-Round Flower Gardener and several other books.

Genius in the Garden: Charles F. Gillette and Landscape Architecture in Virginia

George C. Longest. Virginia State Library and Archives, Richmond, Virginia, 1992. 228 pages. 11" x 8 5/8". Color and black-and-white photographs and illustrations. Publisher's price, hardcover: \$39.95. AHS member price: \$35.95.

This book is interesting both as a social document of turn-of-the-century America and as a biography of a designer and a description of the elegant gardens he made.

The author aptly uses a Dickensian analogy to describe Wisconsin-born Charles Gillette's boyhood and apprenticeship. At 14, he was sent to further his education in Madison where he worked in return for room and board. But it was mostly drudgery and exploitation and little education. His family couldn't afford to educate him beyond secondary school, but he was blessed with the most important gift a boy could have: a supportive father.

Orlando Gillette was a farmer and herbalist with a gift for healing. He instilled in Charles, his tenth child, a love of plants and seasons, and the "magic of man's relationship to his natural surroundings." Working later at the Wisconsin Home for the Feeble-minded, the elder Gillette was one of the first to discover and use nature therapy to benefit those with mental disabilities.

In 1909, Charles Gillette found an apprenticeship in the Boston landscape architecture office of Warren Manning, who had been Frederick Law Olmsted's apprentice for eight years. Manning was so pleased with Gillette's progress that he cut short his training after only a few months and sent him as his representative to Chelmsford, an estate in Connecticut. Chelmsford's grateful owner gave him a European trip to round off his studies. Two years later, Manning sent him to complete work at the University of Richmond; there Gillette found "his town," where he and his wife spent the rest of their lives.

Gillette learned from Manning the lush, romantic appeal of combining native and imported plants and how to improve and trust his own design instincts. He made imaginative choices of plant material and always incorporated brick, flagstone, and granite in ingenious ways.

Gillette was fortunate to practice when many increasingly wealthy families wanted their new homes to have established elegance. There were unlimited funds for a designer who could interpret the "English country cottage" and translate the European and Mediterranean influences into appropriate gardens for the American scene.

George C. Longest very ably charts the triumphs and travails of this handsome, energetic, and gifted man who was also mercurial, disagreeable, charming, paranoid, a devoted churchman, and a generous teacher. The appendix credits to Gillette an awesome 786 projects, many of which are still visible. He is most admired for residential gardens, but he designed extensively for colleges, schools, and religious, civic, and commercial projects.

Although the photographs are a mixed bag, they do give us an idea of his remarkable work.
—Faith Jackson

Faith Jackson, a former Miami Herald book review editor, is a Master Gardener.

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too-bur-OH-suh

Asplenium ass-PLÉE-nee-um

Blechnum brasiliense BLEK-num
brah-zil-ee-EN-suh

B. werckleanum B. work-lee-AY-num
Brassia BRASS-ee-uh

Bromeliaceae bro-mih-lee-AY-see-eye

Camellia kuh-MEEL-yuh

Cattleya labiata var. *autumnalis* KAT-lee-uh
lay-bee-AY-tuh var. aw-tum-NAL-iss

Coreopsis rosea koh-ree-OP-sis roh-ZAY-uh

C. verticillata C. ver-tih-sil-LAY-tuh

Cymbidium sim-BID-ee-um

Elaphoglossum latifolium
el-ah-foh-GLOSS-um lat-ih-FOE-lee-um

E. peltatum E. pel-TAY-tum

Heuchera americana HYEW-ker-uh
ah-mer-ih-KAN-uh

H. × brizoides H. × bry-ZOY-deez

H. cylindrica H. sih-LIN-drih-kuh

H. micrantha var. *diversifolia* H.

my-KRAN-thuh var. dih-ver-sih-FOE-lee-uh

H. sanguinea var. *alba* H. san-GWIN-ee-uh
var. AL-buh

H. sanguinea var. *splendens* H. san-GWIN-ee-uh
var. SPLEN-denz

H. villosa var. *purpurea* H. vil-LOW-suh var.
per-POO-ree-uh

× *Heucherella* × hyew-ker-EL-uh

Lycopodium cernuum lye-koh-POH-dee-um
SER-new-um

L. subulatum L. sub-yew-LAY-tum

Odontoglossum oh-don-toe-GLOSS-um

Oncidium on-SID-ee-um

Orchidaceae or-kih-DAY-see-ee

Paphiopedilum maudiae coloratum
paf-ee-oh-PED-ih-lum MAW-dee-eye
kuh-ler-AY-tum

Platycerium superbum

plah-tih-SEE-ree-um soo-PER-bum

Psilotum nudum sigh-LOW-tum NEW-dum

Rudbeckia fulgida var. *sullivantii*
rood-BEK-ee-uh FULL-jih-duh var.
sul-ih-VAN-tee-eye

Salvia nemorosa SAL-vee-uh nem-or-OH-suh

Solanopteris brunei so-lan-OP-ter-iss
BREW-nee-eye

Sphaeropteris cooperii sfee-OP-ter-iss
koo-PER-ee-eye

Tectaria tek-TAR-ee-uh

Tiarella cordifolia var. *collina* tee-ah-REL-luh
kor-dih-FOE-lee-uh var. koh-LEE-nuh

Tillandsia argentea tih-LAND-zee-uh
ar-JEN-tee-uh

T. brachycaulos T. brak-kih-KAW-lus

T. bryoides T. bry-OY-deez

T. bulbosa T. bul-BO-suh

T. caput-medusae T. KAP-put-mih-DOOS-eye

T. cyanea T. sigh-AY-nee-uh

T. deppeana T. dep-pee-AY-nuh

T. grandis T. GRAN-diss

T. harrisii T. hair-RISS-ee-eye

T. ionantha T. eye-oh-NAN-thuh

T. juncea T. JOON-see-uh

T. kammii T. KAM-ee-eye

T. kautskyi T. KOWT-skee-eye

T. macdougallii T. mac-doo-GAL-ee-eye

T. mauryana T. mar-ee-AY-nuh

T. maxima T. MAKs-ih-muh

T. polystachya T. pol-ee-STAKE-ee-uh

T. recurvifolia T. rek-er-vih-FOE-lee-uh

T. rosea T. roh-ZAY-uh

T. rubella T. roo-BEL-uh

T. sprengeliana T. spreng-gel-ee-AY-nuh

T. stricta T. STRICK-tuh

T. suerei T. soo-k-ray-eye

T. tectorum T. tek-TOE-rum

T. usneoides T. us-nee-OY-deez

T. xerographica T. zih-roh-GRAF-ih-kuh

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The cultivation of native plants, trees, shrubs, annuals, perennials, lawns, herbs, vegetables, and house plants are all covered in the Gardener's Guides. Also, monthly "ECOTIPS" will give you the newest advice on organic gardening.

Each Gardener's Guide features magnificent images of gardens and flowers in its zone photographed by award-winning photographers such as Ken Druse, Jerry and Joanne Pavia, Saxon Holt, Carole Ottesen, Charles Mann, and Mary Gray Hunter. These lavish photographs will inspire any green thumb and brighten any wall.

The calendars' spacious layout allows you plenty of room to keep personal notes on planning gardening tasks and to chronicle growth among your plants.

TO ORDER THE 1993 REGIONAL GARDENER'S GUIDES JUST FILL IN THE COUPON BELOW AND MAIL TO AHS CALENDARS, 7931 EAST BOULEVARD DRIVE, ALEXANDRIA, VA 22308-1300. OR CALL TOLL FREE (800) 777-7931.

A single calendar is just \$11 postage paid for AHS members. Each additional calendar is only \$9.50 postage paid. Virginia residents add 4 $\frac{1}{2}$ % sales tax.

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1993 Calendars



STUDY TOURS

TRAVEL/STUDY TRIPS FOR THE AHS GARDENER

JANUARY 23-FEBRUARY 2, 1993 GARDENS OF THE LOWER CARIBBEAN AND THE VENEZUELAN RAIN FOREST

An exceptional voyage of exploration on board the *MV Yorktown Clipper* in the Lower Caribbean. Ports of call include Trinidad, Tobago, Ciudad Guayana, the atoll islands of Venezuela's Los Roques Archipelago National Park, Bonaire, and Curacao. This program is led by former AHS President Carolyn Marsh Lindsay and Bob Lindsay and AHS Board Member Andre Viette and Claire Viette. Visits to many beautiful private gardens have been arranged, with lunch to be served in the Trinidad gardens of Clayton and Judith Procope. The Proscopes have won numerous gold medals at the Royal Chelsea Flower Show and their talents are reflected in a truly magnificent garden.

FEBRUARY 18-MARCH 12, 1993 AROUND THE WORLD IN SEARCH OF FLORA, TIGERS, AND TEMPLES

This Around-the-World expedition begins in Bangkok, Thailand, and continues to Nepal and India. In Nepal, the itinerary includes Kathmandu and a side trip to world-famous Tiger Tops in Royal Chitwan National Park. The Indian cities to be visited are Varanasi, Khajuraho, Agra, Bharatpur, Jaipur, and Delhi. Joining the program are regional horticulturists Pushpa Man Amatya and Uttar Bahadur Shrestha, who both hold posts with the Ministry of Forests, His Majesty's Government in Kathmandu. Dr. U. S. Kaicker, principal scientist, Division of Floriculture and Landscaping at the

Indian Agricultural Institute in New Delhi, will travel with the group in India. Leading this tour for American Horticultural Society will be Helen Fulcher Walutes, acting executive director of AHS.

MARCH 16-29, 1993

NATURAL GARDENS OF PANAMA AND COSTA RICA

Our voyage on board the *MV Yorktown Clipper* begins in Panama, ends in Costa Rica, and offers daylight transit of the Panama Canal. The horticultural treasures of Costa Rica are revered by botanists the world over and one of the program's many highlights is an excursion from San Jose to Cartago to visit Linda Vista, the creation of Claude Hope. If you have ever planted petunias or impatiens in your garden, it is most likely the seed came from Linda Vista. AHS is proud that Claude Hope will be the 1992 recipient of the Society's Liberty Hyde Bailey Award, awarded for outstanding service to horticulture. Leading this program is former AHS Board Member Roy Thomas, a graduate of England's Royal Botanic Gardens at Kew and recognized expert in tropical horticulture. Joining Roy is his wife Margaret, with whom Roy led our very successful program on board the *MV Yorktown Clipper* in the Leeward Islands of the Caribbean in 1989.

APRIL 28-MAY 2, 1993

GARDENS OF BARBADOS

This once-in-a-lifetime program, offered in conjunction with the Barbados National Trust, features an exceptional collection of historic homes and gardens where our hosts have invited us for special luncheons and dinners. A dinner reception at "Mallows," home of Paul and Rachelle Altman, provides a cordial welcome to Barbados. Mr. Altman is vice president of the Barbados National Trust. We also visit Andromeda Gardens, creation of Iris and John Bannoche. Started in 1964, this garden is acclaimed as the finest botanical garden in the Caribbean, home to thousands of tropical trees, shrubs, and flowers collected by the Bannoches from around the world. AHS Board Member Beverley White Dunn, from Birmingham, Alabama, will be the leader for this tour.

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