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American Horticulturist

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ARTICLES

DEPARTMENTS

AUGUST'S COVER

Photographed by Kusra Kapuler

The annual sunflower is grown the world over for its seeds as well as its beauty. But *Helianthus annuus* is only one member of a genus that has been cultivated for at least 5,000 years. Among the 150 or so forms of *Helianthus*, there are many that deserve a place in the garden. In her article beginning on page 15, Rita Pelczar looks at the history and the horticulture of sunflowers.

COMMENTARY

Innovations in gardening are rare. Its traditional methods and values have been derived from the timeless quality of the plants themselves.

However, innovations do sometimes come about, both naturally and artificially. Natural innovation occurs through both long-term evolutionary developments and short-term environmental fluctuations. Artificial innovation occurs in the plants themselves as a result of selection and breeding, and in their use, when gardeners choose the plants they will grow, where, and how, based on social, aesthetic, and environmental considerations.

Innovation keeps cultures vital. Therefore, its occurrence cannot be ignored. This is especially true in horticulture, where innovation, although rare, has long-lasting effects. For example, there has been much discussion of "water-wise" or drought-tolerant gardening, particularly in the American West.

Horticultural innovations that have emerged from the southwestern United States and the Middle East include new technologies, such as drip irrigation. Many gardeners in California are converting to native plants that will withstand low water levels—a welcome development. However, care must be taken to maintain aesthetic continuity with the look and feel of more "water-dependent" gardens that represent an important heritage in California and that offer a welcome relief from the western landscape, especially in the state's interior cities. This year's heavy rainfall and snowpack in the Sierras might seem to assure us that there will be much available water in the coming years. However, private and public gardens must continue to use plants innovatively.

This issue of *American Horticulturist* illustrates the wide range of wonderful plants in our country, and the varied uses and meanings associated with them. The plains cottonwood, although rarely thought of as a garden tree, is a sentimental favorite of those in the Great Plains, where its presence led pioneers to water and welcome shade. Native Americans and settlers found many uses for our native sunflower; it took the Russians to develop it as a commercial crop. As is the case with many of us, ancestors of the catmints came from other continents, but their preference for dry soils makes them ideal for those low-water landscapes. The Betty Ford Alpine Gardens in Vail, Colorado, is a perfect example of how both natives and non-natives can be adapted to special situations, in this case high altitude and a short growing season. And we bring you an article on creating a garden book library that matches your own needs and interests, whether you grow prairie flowers on our Great Plains, rhododendrons in the Northwest, or staghorn ferns in Florida.

When your own library fails you, remember that information is as near as our Gardeners' Information Service. Our mission is to disseminate horticultural information and knowledge, and we look forward to sharing that knowledge when you call. *George C. Ball Jr., AHS President*

OFFSHOOTS

BILL FIRESTONE

Neighbors

by Jeremiah Hana

Now that I think of it, Bob Carr's faith in my green thumb was well justified. Thanks to hard work, good luck, and the Almighty, I had one of the best yards in the neighborhood. The thick, velvety front lawn was accentuated by a panoramic perennial and rock garden with abundant flowers in bloom all season.

That was then and this is now. Today, no southern Californian with any sense has a lawn. Not a very big one anyway. Bob Carr, however, is probably still trying to grow the biggest, greenest lawn in his neighborhood.

A week after the Carrs moved in across the street, Bob asked about my lawn. "How do you keep it so green in this dry climate?"

"Fertilizer and water," I said. "Since rain's rare here in southern California, the water bills are astronomical. But it's either that or a lousy-looking lawn."

That Saturday, Bob rang our doorbell early. He wanted to borrow my fertilizer spreader. "Your house's last owner fertilized the lawn less than two months ago," I noted. "I fertilize mine only twice a year."

"Yeah, but yours is already established. Mine needs a little work. Within three months mine'll put yours to shame," he promised as he rolled my spreader from my garage.

Neighbors are a funny lot. Some of them are like family, others are like close friends, and a few become foes. I wasn't sure where Bob would end up on this imaginary scale, but I knew right then that he was working his way towards the wrong end.

Throughout the week, I helped him do heavy lifting, light hauling, various do-it-yourself projects, and shared a two-hour ride to work with him. This would prove to be a bad decision.

Aside from being an authority on everything, Bob talked louder than necessary. He had the bad habit of interrupting before I could finish a sentence. The more familiar we became, the more candidly we spoke to each other. I finally told him to shut up and let me finish, but he was talking too loudly to hear me.

Like a dog, every man has his day. Mine

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was to come as a blessing in disguise. During the spring, many lawns in our neighborhood were attacked by cutworms and almost simultaneously, by a mysterious fungus. Brown spots abounded. While professional lawn services did a brisk business, some of us tried to solve the problem ourselves. Bob came over as I sprayed my lawn. "Hi, Jerry. What're you putting on your lawn now?"

"Insecticide. It's supposed to kill the cutworms."

Five minutes later he returned. "Mind if I use your hose, sprayer, and insecticde when you finish?"

Bob chose not to return the hose, sprayer, and insecticide. Since he still had my fertilizer spreader, my tool rack was beginning to look as bare as Mother Hubbard's cupboard.

That weekend he borrowed my pick-up to go for a load of decorative rock. He told me he'd put in a rock garden that would put mine to shame. He returned the truck with the gas tank half empty.

Since at the time we didn't realize that most of the brown spots were due to fungus, we continued to drown our lawns morning and night, making matters worse. Finally, a neighbor learned about the fungus from some professional lawn care people. The demand for the fungicide they recommended had almost exhausted the supply, but I finally found it in powdered form.

Since Bob and I had stopped carpooling, I had already started to work on my lawn when he arrived home from work. He parked his car and yelled across the street. "Hi, Jerry. What're you putting on your grass now?"

The temptation was too great. Although I had trouble keeping a straight face, I yelled, "Flour."

"Flour?"

"Yeah. I learned about it today at work. It'll get rid of the fungus."

He started across the street. "You're putting me on."

"Believe what you like," I said as I resumed spreading the fungicide, "but don't come over or you'll get flour on your shoes and track it on your carpet."

He turned and went back across the street. Five minutes later he came out, got in his car, and drove away. He returned with twelve, five-pound sacks of flour. Without saying a word, he went into his garage and got my fertilizer spreader.

Bob looked rather odd as he made nice straight passes back and forth over his lawn with the flour. An occasional wind gust sent the white stuff into the air, causing an eerie mist that virtually obscured him as he continued to work. When he was done, he borrowed my hose to soak it in well.

A week later, Bob came over when he got home from work. "I can't tell any difference. Except for the white from the flour, my lawn's still brown as ever."

"Mine's improving," I said.

"Why is it working for you, but not for me?"

"Did you mix it like I told you?"

His eyes compressed into slits. "Mix it?"

"Well, yeah," I said, pokerfaced. "Each bag of flour should be mixed with a cup of sugar, a teaspoon of baking powder, and a pinch of salt."

"You—you're not serious!"

I shrugged. "Well, my lawn's getting green again and yours is still brown, or white, or whatever that is."

Bob reeled around and stormed back across the street. I can't swear to the recipe, but he soon appeared again with my fertilizer spreader and began applying something to his lawn. I went inside, locked myself in the bathroom, and howled.

The weekend came and went. I waited until Bob was due home from work before I took the two dozen eggs out to my lawn. As he pulled up and exited his car, I broke one of the eggs and placed it on my lawn, trying to be as conspicuous as possible.

"Hi, Jerry. What're you doing?"

"Applying the finishing touch," I yelled back.

I counted. It took exactly six seconds for him to reach me. "Eggs?"

"Yep. They'll blend in with the flour and other stuff and really give my lawn a shot in the arm." I cracked a third egg and placed it in line with the other two, about one foot apart. "Be sure you don't break the yolks or they won't work."

Poor Bob reeled around, went to his car, and sped off. His wife came outside as he left. "Where's he going?"

"Not sure, but my money's on the supermarket."

Bob's lawn was a sight to behold: the yellow yolks of the fresh eggs contrasted beautifully with the white-brown grass. Neighbors came from blocks away to see the display: fresh eggs, sunnyside up and a foot apart, all over his front yard.

Eventually, Bob realized I'd duped him. When enough of the embarrassment wore off, he came over to borrow my shovel and wheelbarrow to clean up the mess.

As he went back across the street, I didn't mind any longer about his arrogance. Or about his borrowing so much. After all, what are neighbors for?

Jeremiah Hana, now reformed, is an organic gardener and computer scientist in Corona, California.

HELEN HAYES

1900 - 1993

"All through the long winter I dream of my garden.
On the first warm day of Spring I dig my fingers deep into
the soft earth. I can feel its energy, and my spirits soar."

-Helen Hayes, 1992

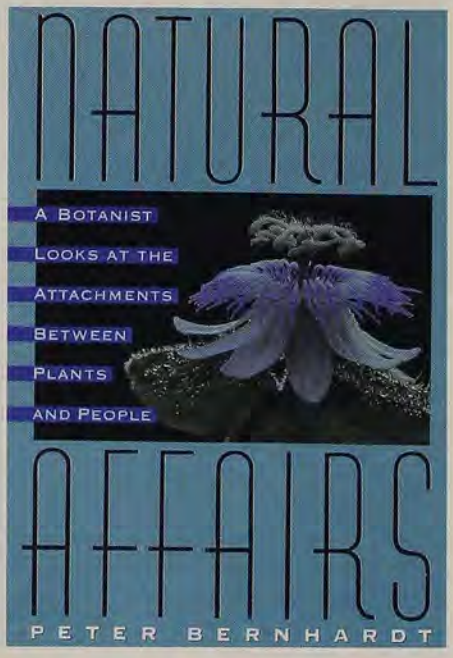
Whenever we are in the garden,
we shall remember our dear friend.

MIRACLE-GRO

BOOK REVIEWS

Natural Affairs

Peter Bernhardt. Villard Books/Random House, New York, 1993. 225 pages. 5¾" × 8½". Color and black-and-white photographs and black-and-white illustrations. Publisher's price, hardcover: $25. AHS member price: $21.25.



With the immense popularity of science writers like Stephen Hawking, Stephen Jay Gould, and Lewis Thomas, every book publisher wants to champion a newcomer who can reliably laicize his or her field of expertise—and sell millions of books in the bargain. Among the strongest contenders from the current field is Peter Bernhardt, a peripatetic botanist who weighs in here with a lively, literate collection of his recent essays. Subtitled "A Botanist Looks at the Attachments Between Plants and People," these observations on the intersections of human and vegetative life will make perfect fodder for summer's end reveries.

Much of the plant trivia in *Natural Affairs* has a kind of "Ripley's Believe It or Not" appeal. There are odd bits of history: the Empress Josephine Bonaparte built an Australian garden at her Malmaison estate, complete with black swans floating on a lake and *wallabies bouncing across the lawn!* And sensational shockers: the sought-after spice saffron can only be collected from the female sex organs of the saffron crocus and is often *worth more than its weight in gold!*

Bernhardt's dramatis personae are plants and people and his plot traces our long history of interaction. His coverage of Victorian flower symbolism is as deft as his up-to-the-minute survey of the edible fruits of *Passiflora* species. In "Muse Under Glass," Bernhardt notes how artists of the sixteenth century and later, in capturing their botanical subjects, were also chronicling greenhouse development and the advance of plant exploration. Thus the tropical jungles of Henri Rousseau assembled congeries of exotics gathered from five continents.

Currently a professor of botany at St. Louis University and a research associate at the Missouri Botanical Garden, Bernhardt has spent two decades studying the plants of Australia and the Americas. After graduate work at the University of Melbourne, he served as a curator and a writer-in-residence at the Royal Botanic Garden in Sydney; he is probably most interesting when waxing wry or rhapsodic on Australian plants, people, and culture. "The Hoon's Nest," for example, is both a scholarly gloss on the *Cannabis* genus and a sidelong glance at its dubious cultivators. (Hoon is colloquial Australian for "a loutish, aggressive, or surly youth.") Elsewhere he relates how rural Australian cemeteries have become excellent wildflower refuges.

"A Sanctuary for the Dreamtime," perhaps the best piece in the book, sketches a moving portrait of one man's bond with nature. Billy Ricketts, a self-taught sculptor, moved to the Dandenong Ranges of eastern Australia in the 1930s and subsequently created a statuary garden dedicated to aboriginal religion. Ricketts's anthropomorphic figures rise from the rock, ensconced in tree ferns and covered in moss, establishing the deep connection of a people to their native land.

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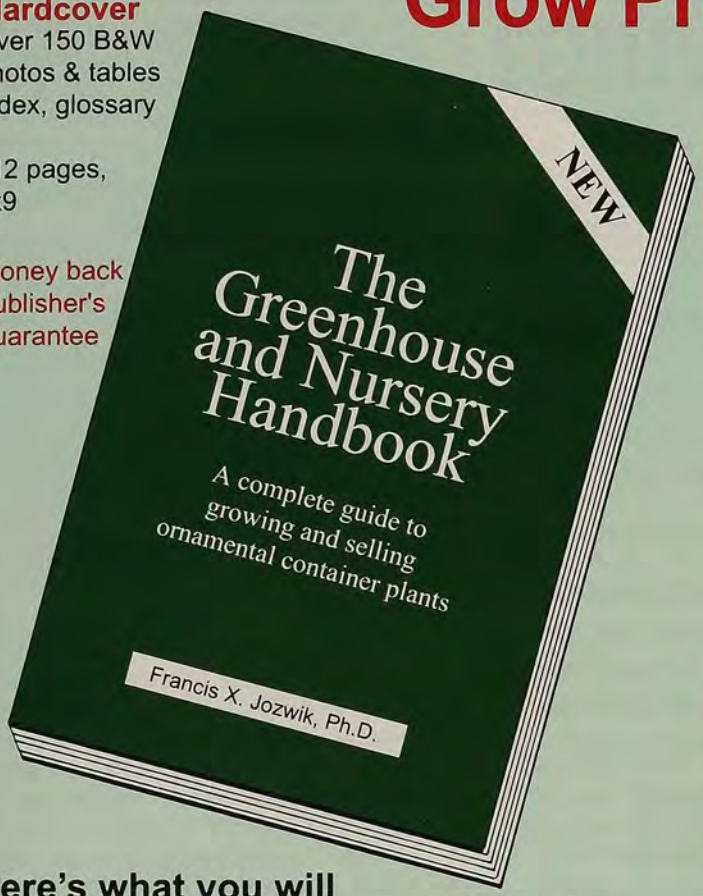

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Here is what respected independent publications say about Dr. Jozwik's new book.

From *Hobby Greenhouse Association Magazine:*
"*The Greenhouse and Nursery Handbook* is a must for anyone with a greenhouse for hobby or business – a great addition to any plant lover's library."

From *Hort Science – Publication of the American Society for Horticultural Science:*
"Whenever it seems as if he (Jozwik) has missed explaining some topic it appears in the very next paragraph."

From *The Small Press Book Review:*
"The voluminous handbook for gardening professionals and serious amateurs covers everything...All this is done in a style that is both knowledgeable and accessible to the general interest reader."

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Former research scientist in U.S. and Australia
Successful commercial grower for 25 years

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ture," Bernhardt writes. "Urania helped the astronomers but paid no attention to the life sciences. Nevertheless, plants inspire all the arts without the aid of the nine daughters of Zeus." Whatever his inspiration, Bernhardt ventures far beyond academic groves to make botany more edifying for us all. —*Steve Davolt*

Steve Davolt is editorial assistant of American Horticulturist.

Hortica

Alfred Byrd Graf. Roehrs Company, East Rutherford, New Jersey, 1992. 1,218 pages. 7½" × 10¼". Color photographs. Publisher's price, hardcover: $250. AHS member price: $210.

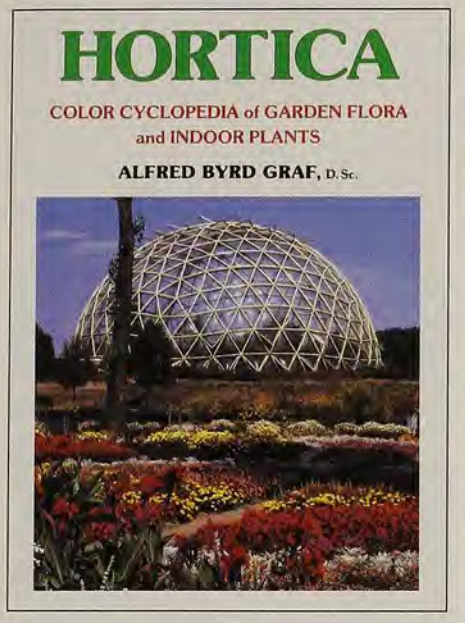
The introduction to my own recent book, *The New Houseplant: Bringing the Garden Indoors*, includes this statement: "The bible I have turned to for house plants more than any other is *Exotica*, the work of Alfred Byrd Graf, a man after my own heart." *Hortica*, Graf's latest book, confirms my judgment.

My acquaintance with Graf goes back to the summer of 1959. Graf had already published his first compendium of tropical foliage plants, and I spent that summer writing a book-length manuscript for him on gesneriads. Parts of this have continued to be woven into subsequent editions of his books; when encountered unexpectedly they always evoke a special time in my life—first marriage, first house, first baby, first book. I did the writing in an attic bedroom that included a fluorescent-lighted table with a host of gesneriads for me to interact with and write about.

Graf's first major work, *Exotica,* was a photographic encyclopedia of house plants that became the standard reference work in the indoor plant business. This would have been a solid achievement for a well-funded publisher, but Graf managed it largely on his own, traveling the world to take pictures of plants, many of which had not been properly photographed before. His second opus, *Tropica*, extended his coverage to tropical flora in general.

Now we have the long-awaited *Hortica*, which covers all of the important plant genera, not just those from warm climates, as in the previous works. With over 8,000 color photographs and the last word in botanical nomenclature, *Hortica* is a work that no advanced gardener or collector can afford to ignore.

The book's principal value is for identification. Cultural advice, included in Graf's previous encyclopedias, is lacking here, but this omission is hardly surprising given the



scope of the work. Its thorough photographic coverage puts *Hortica* in a class of its own, and I can testify to the effectiveness of Graf's approach. At the Compleat Gardener, the Houston gardening store where I work, the book has proved invaluable for helping customers, who bring us all manner of plants for identification.

I once inadvertently brought Graf himself a plant. One afternoon several years ago, I returned to my exhibit at the New York Flower Show to find Graf on his knees taking pictures of a ligularia. He thought it a finer specimen than the one he had photographed and said he hoped he had just taken the definitive portrait. Did he? Open up *Hortica* to page 396 and judge for yourself. —*Elvin McDonald*

Elvin McDonald is the author of numerous garden books and a Board Member of the American Horticultural Society.

Trees

Allen J. Coombes. Dorling Kindersley, Inc., New York, 1992. Distributed by Houghton Mifflin Company. 320 pages. 7¼" × 9¼". Color photographs and illustrations. Publisher's price, hardcover: $29.95; softcover: $17.95. AHS member price, hardcover: $26.95; softcover: $16.15.

Allen J. Coombes' *Trees* contains a wealth of technical information in a format that will not deter the amateur.

Hundreds of color photographs illustrate all aspects of the taxa Coombes has included. The photos are accompanied by notes indicating origin, habitat, and references to be consulted if more detailed information is desired.

A schematic drawing of each tree shows it both in full leaf and bare limbed, which allows the reader to get an idea of the mature habit. Each drawing is accompanied by a stick figure so that an instant impression of relative height is possible. This is especially helpful to American readers since the English publisher uses the metric system.

Coombes is botanist at the Sir Harold Hillier Gardens and Arboretum in Hampshire, England. In 1985, he wrote *Dictionary of Plant Names,* and he is currently revising the prestigious *Hillier Manual of Trees and Shrubs.* He visited the United States in 1992, touching base with gardeners of every stripe and indulging his interest in all green and growing things. This interest informs his comments in *Trees* beyond the merely academic. Over 500 species are described in Coombes' book. I hope he lives long enough to describe 500 more. —*Harriett Watson*

Harriett Watson is garden columnist for the Aiken *(South Carolina)* Standard.

The Thunder Tree

Robert Michael Pyle. Houghton Mifflin Company, Boston, 1993. 220 pages. 5¾" × 8½". Publisher's price, hardcover: $19.95. AHS member price: $17.95.

"I'm going to the creek!" was often heard in my childhood home, sometimes in revolt or frustration, but more often as, where else would I be going? The creek was sacred to my brother and sisters and me. Its mysterious black water ran under a 75-year-old rotting rough-hewn bridge. Willows, oaks, and scraggly shrubs and grasses grew on the sloping banks like the tangled hair of a banshee. Our horses and cows languidly drank from it on steaming hot Ohio summer afternoons. It was our moat that we patrolled, our headquarters, our bivouac against the adult world, a place shrinelike and holy, and yet utterly pagan, with its voluptuous waters full of snakes and frogs. Beavers slid down the banks and fat ripe berries hung over the swirling waters. Under the bridge was the netherworld—the subconscious, the forbidden, the world of trolls and evil spirits, which made just looking under it the ultimate dare.

The magic of that unkempt little creek flooded back to me as I read *The Thunder Tree.* In describing the lifelong pull of such childhood places, Robert Michael Pyle gets it exactly right when he writes, "These are the places of initiation, where the borders between ourselves and other creatures break down, where the earth gets under our nails and a sense of place gets under our skin."

The Thunder Tree is a melancholy lovesong for lost innocence and for the increasing loss of wild, untidy places of discovery. It will strike a chord of recognition in anyone who, as a child, formed a deep connection to a specific place—a place that revealed something of nature's joyful yet poignant beauty and mystery. The memories are terribly bittersweet when these special places, like the author's and mine, live on only in the mind, having long since been swallowed by subdivisions and shopping malls.

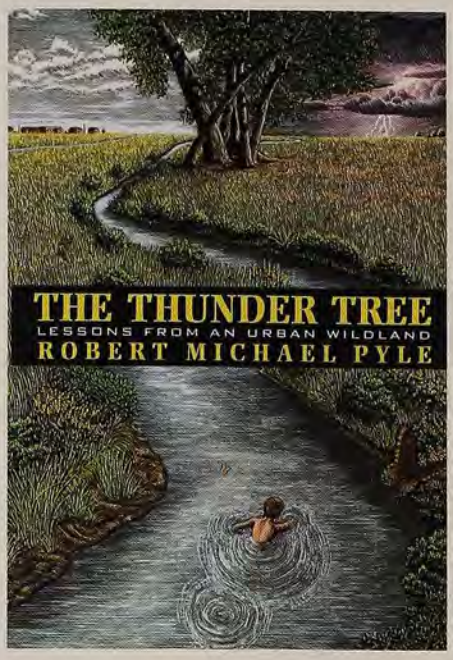
As a child growing up in the mid-1950s outside Denver, Pyle developed a mystical bond with a scruffy weedy canal that ran outside his family's suburban development. The High Line Canal was part of a grand irrigation plan for greening the American West in the late 1880s. For the author and his brother it became a refuge from the mind-numbing sterility of suburbia, which was inexorably destroying farmland and wilderness.

While *The Thunder Tree* can read like a guide to High Line Canal wildlife, it is about any meadow, woodland, marsh, vacant lot, or garden that "weaves a rooted companionship with home ground."

The author muses that the places that bond many people to nature are as unspectacular as his own abandoned ditch. Yet from this ditch, his life flows. "From the time I was six," he says, "this weedy watercourse had been my sanctuary, playground, and sulking walk. It was also my imaginary wilderness, escape hatch, and birthplace as a naturalist." This early connection eventually led him to earn a PhD in ecology from Yale University and to author or co-author five books on butterflies and other invertebrates.

In the first of the book's four sections, "Lifeline," he describes falling in love with the canal and its borders. His recollections are reverential and poetic. While I found much of the description of the High Line's course and history tedious, the writing for the most part moves swiftly with insightful descriptions. One can smell the charred inside of the burned out "Thunder Tree," a huge ancient cottonwood that once saved him and his brother from a potentially fatal hailstorm. One feels the shimmering heat and hears the rustle of cottonwood leaves, the screech of magpies, and feels the downy flutter of butterflies through summer grasses.

I also faintly heard the poet Gerard Manley Hopkins in Pyle's description of the flora and fauna of a certain canal section: "Ragged orange hoodoos and twisted blue junipers guard the ridge above, gray rabbitbrush and scrub oak daub the steep hillsides.



Pebble-furred, big-tailed rock squirrels navigate the fissures and watch from pink promontories, causing pink-pebble slides that splash into the cool, fast flow."

The second part, "Landmarks," describes the disruption of the land by unchecked development. Still Pyle finds hope in continuity with past values and lifestyles. He calls natural landmarks such as trees, fields, ditches, and rocks "the holdfasts in the hurricane of change," without which we lose our physical and spiritual bearings.

His comparisons of his canal to England's famous ley lines recalls the "songlines" of Australian aborigines—sacred routes, discerned through intense listening and a special vision of the landscape, tracks, and relations between landmarks.

The third part, "City Limits," further laments the cancerous rate of unchecked development. Pyle argues that by ignoring natural limits to growth, we are creating cities and towns that can never be self-sustaining, but only sustained "vampirelike" by exploiting resources from elsewhere. Homeowners in the new subdivisions, which have destroyed native grasses and butterfly habitats, tend to hold an "Ortho view of the world," he says. Even those who don't drown their lawns in chemicals plant non-native grasses that will never attract the myriad butterflies that so delighted him as a child. Where is the realization, he asks, that without limits, natural poverty is inevitable?

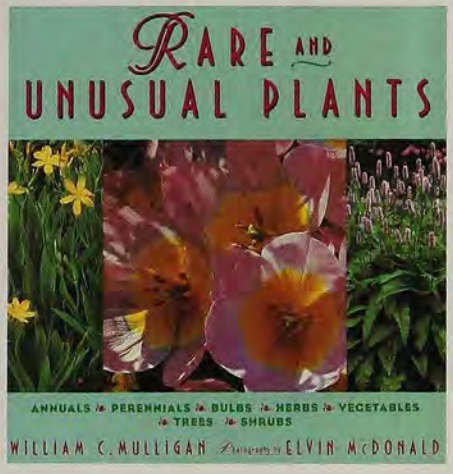
In the last part of the book, "Still Life," he mourns such life passages as his parents' failed marriage, the cutting down of the "Thunder Tree," and development en-

croaching on his beloved canal. He pays homage to the shared interest in butterfly collecting that healed a separation from his mother, lovingly describing her fanaticism, skill, and lack of self-consciousness as she hauled butterfly nets around town.

In the end, his hopes remain high that the High Line and all it symbolizes will prevail. If nature can thrive there, he reasons, nature can reclaim any lost place. A call for the rights of childhood discoveries, of waterways, wildflowers, cottonwoods, rocks, magpies, foxes, and of all extraordinary unspectacular places is well sounded in this haunting book. —*Maureen Heffernan*

Maureen Heffernan is education coordinator for the American Horticultural Society.

An excerpt from The Thunder Tree *begins on page 39.*



The Adventurous Gardener's Sourcebook of Rare and Unusual Plants

William C. Mulligan. Photographs by Elvin McDonald. Simon & Schuster, New York, 1992. 224 pages. 9¼" × 9¾". Color photographs. Publisher's price, hardcover: $40. AHS member price: $36.

William C. Mulligan has written a book for all of us wannabe plant hunters. *The Adventurous Gardener's Sourcebook of Rare and Unusual Plants* is filled with descriptions and beautiful photographs (by Elvin McDonald) of out-of-the-ordinary plants just waiting to be discovered by gardeners who dare to look beyond the average nursery and garden center. The book focuses on plants that "seem to have been waiting in the wings for decades, maybe centuries," Mulligan writes in the introduction.

Within these pages are hundreds of plants arranged in eight categories. Here you'll find selections like *Trachelium caeruleum,* which has fuzzy amethyst blue flowers; a miniature hollyhock with purple-striped lavender blossoms; Mexican shell flower, an iris family member; and purple bell vine, which has a bell-shaped red calyx and tubular purple corolla.

The adventurous gardener will find more than a few plants that he or she can't live without. Mulligan admits that some of the plants may only be available from other gardeners who generously pass around extra seeds. These "folk plants," like the solid yellow blackberry lily, are those "that are mostly given away or bartered from gardener to gardener," he writes. He does provide an extensive list of sources. These are arranged alphabetically by supplier, so if you're looking for sources of bulbs you need to read through the whole list to discover the sources you need.

Any book on rare and unusual plants for the garden should include a warning about collecting plants from the wild and buying plants only from reputable nurseries. That Mulligan doesn't include such a warning yet does include two native plants that are primarily wild-collected in the United States—pink lady's-slipper and pitcher plant—is my only criticism of the book.

In every other respect gardeners with a yen for unusual plants will find this to be an invaluable source. —*Mary Beth Wiesner*

Mary Beth Wiesner is managing editor of American Horticulturist.

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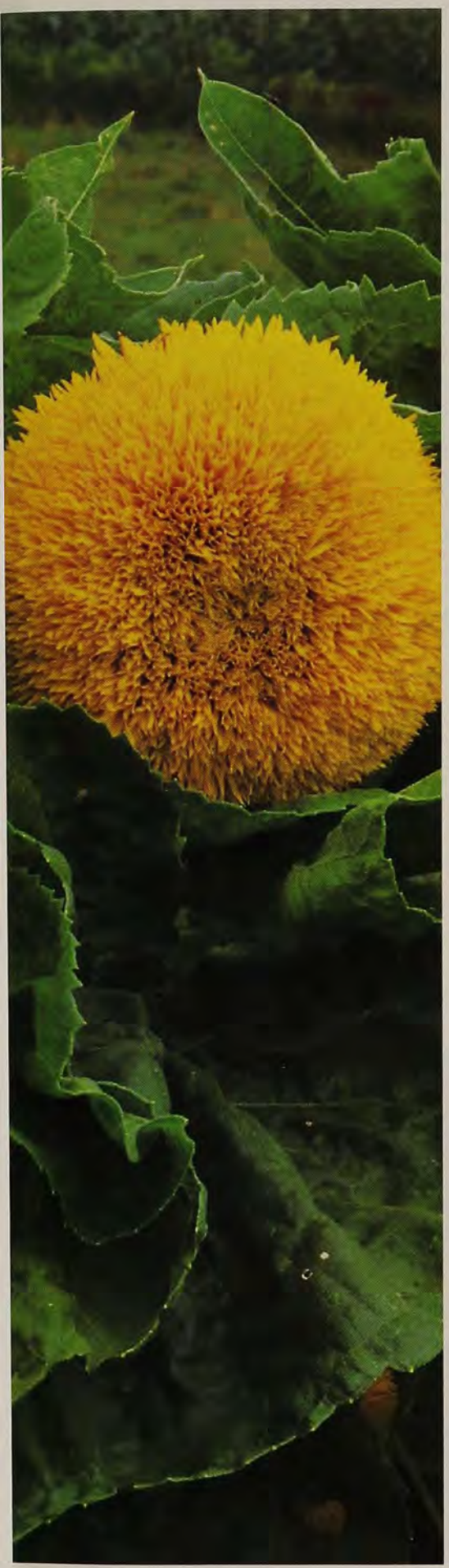


The Prodigal Sunflower

Revered by Native Americans, it was "discovered" by Europeans, beefed up by the Russians, and is back home as a versatile garden plant and potential herbicide source.

BY RITA PELCZAR

There are many ways of looking at a sunflower. To the Incas it was an emblem of the sun god. The North American Ojibwas crushed its root for a wound dressing. Gerard, the herbalist, ranked it above the artichoke in "provoking bodily lust." Today the sunflower ties rapeseed as the world's third largest seed oil crop, behind soybean and cottonseed. Songbirds consider its fruit—an achene—gourmet fare. Interest in native plants and naturalized landscapes has heightened interest in sunflower species; the bright, bold blossoms have found homes in cutting gardens, perennial borders, and wildflower meadows.

Centuries before Europeans set foot on the North American continent, Native Americans were growing the sunflower for food, medicine, and dye. Archeological findings indicate that the sunflower was being cultivated in what is now the southwestern United States as far back as 3000 B.C.

Early European explorers wrote of seeing the seed being crushed and boiled to release its oil, which was used for cooking, making paints, dressing hair, and anointing the body for ceremonies. Grinding the seed between stones produced a fine meal to thicken soups and make bread, cakes, and mush. Some tribes combined sunflower meal with cornmeal and pressed it into seed balls. These were wrapped in buffalo heart skin and nibbled by hunters or warriors to sustain them on long treks.

The Hopi of the Southwest used sunflower meal to bake piki, a waferlike bread cooked on a stone. The Hidatsa of North Dakota used sunflower meal in combination with beans, squash, and cornmeal to create "four vegetables mixed."

The Hopi grew a variety with deep purple achenes that they soaked in water to produce a reddish purple dye, while sunflower ray petals were a source of yellow dye.

The sunflower provided a calendar of sorts for Native American hunters: when sunflowers stood tall and bloomed, the buffalo promised to be fat and the meat good. The Hidatsas referred to the lunar month that corresponds most nearly to April as *Mapi-o'ce-mi'di*—the sunflower-planting moon.

As they searched for treasures of gold and silver, early Spanish explorers were conscious of other sources of wealth awaiting discovery in the "New World." As early as 1510, sunflower seed was collected and transported to a botanic garden in Madrid. By the 1580s it had become established as a garden flower and curiosity. English and French explorers also imported the seed to their countries, where its bold, spectacular blooms delighted

***'Teddy Bear', a dwarf of* Helianthus annuus.**

collectors of New World plants. In 1716 an English patent was granted to Arthur Bunyan for the "invention" of sunflower oil for use in manufacturing. He considered it ". . . of great use to all persons concerned in the woollen manufacture, painters, leather-dressers, etc. . . . such oyle so to be made is to be expressed from the seed of the flowers commonly called & knowne by the name of sunflowers of all sorts, both double & single."

The sunflower was further dispersed along trade routes of the day to Italy, Egypt, India, China, and Russia. By some accounts, it was Peter the Great who introduced it to Russia, where its value as an edible crop was exploited and refined. The Russian Orthodox Church can probably take some credit, albeit unintended, for its ready acceptance as a food crop. The church traditionally was very strict in prohibiting the consumption of oil-rich foods during the forty days preceding both Christmas and Easter. Because the sunflower was newly introduced, it did not appear on the list of forbidden foods and was quickly incorporated into the Russian diet.

As their use of sunflowers as a food crop increased, Russian peasants began selecting varieties with a shorter growing season and a higher oil content. About 1915, organized breeding programs were begun to improve yield, develop pest resistance, and to continue raising the percentage of oil.

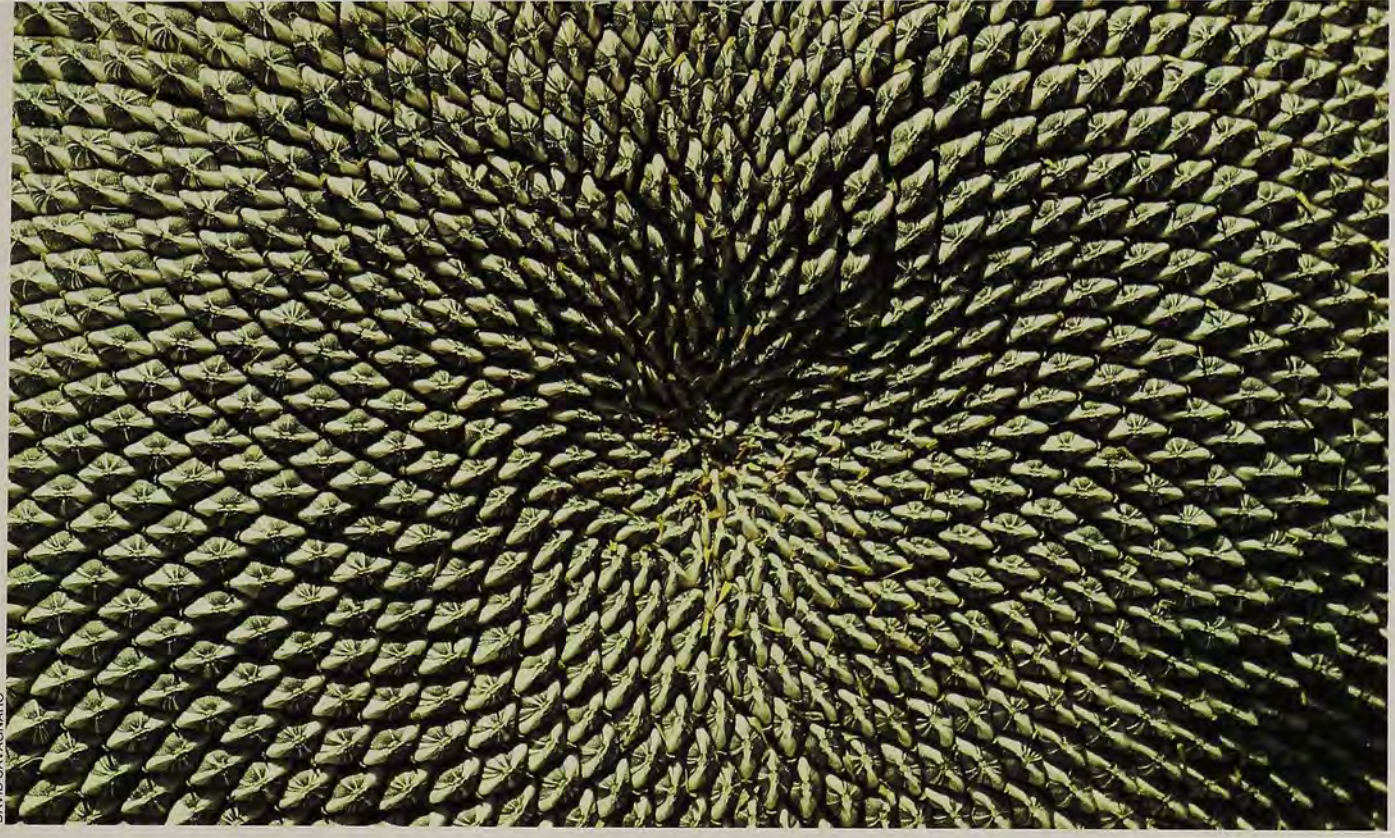
Back in its indigenous land, settlers found that sunflowers answered many needs of pioneer life. Taking cues from the Native Americans, the settlers ate the seed raw or roasted, ground into meal, and crushed and boiled for oil. Seed oil was used to make soap, hulls were boiled to make a coffee-type beverage, and the dried leaves were smoked like tobacco. Chickens were fattened on the seeds while leaves and stems were fed to pigs and cows. Some early American settlers even planted sunflowers around their cabins, believing they would ward off malaria.

Widespread cultivation of sunflowers, however, awaited the crop's reintroduction from the Old World. The breeding work in Russia significantly increased the value of the sunflower as an oil crop. Mennonite immigrants who settled in Manitoba and Saskatchewan in Canada in the 1870s carried with them seed of 'Mammoth Russian' sunflower, a superior selection they had grown in their native Russia. By the 1880s 'Mammoth Russian' sunflower seed was being offered in U.S. seed catalogs. It was grown in northern and western states primarily as a silage crop for livestock until World War II, when interest increased in its edible oil. Today acres of yellow sunflowers, grown for their high quality seed oil as well as for a snack food and birdseed, brighten the prairies across the Midwest.

Most of the 150-odd species and subspecies of *Helianthus* are native to North America. They include both annuals and perennials, with fibrous roots and taproots. Some produce tubers and rhizomes. Most of the annual species are native to the western states, while the numerous perennial species are distributed from the East Coast to the West. This diversity and the success of breeders with interspecies hy-

The maximilian sunflower, below, is a giant perennial that got its name from a Prussian prince who studied North American flora in the 1830s. The common sunflower, right, is an annual with many natural varieties and garden cultivars.

LEFT: JESSIE M. HARRIS; RIGHT: TED AND GWENDOLYN BRAND



DAVID CAVAGNARO

Sunflowers owe their success to their seeds. An important source of cooking oil, the seeds are also used for livestock feed, snack foods, and birdseed. Above, a head of Helianthus annuus *'Mammoth Russian', brought to the United States by immigrants in the 1870s.*

bridization have given rise to a broad selection of ornamental sunflowers.

Perennial sunflowers grow wild in habitats ranging from roadsides and abandoned meadows to the banks of shady creeks. Cultivated selections can be found in elegant borders and in casual wildflower gardens. They flower from late summer to early fall, and for the most part are quite tall, well suited for the rear of the garden. In recent years, the variety of perennial sunflowers available from nurseries has increased substantially.

The swamp or narrow-leaf sunflower *(H. angustifolius)* is frequently found in moist, often shady locations, east of Texas and south of New York. It is sometimes confused with *H.* × *simulans,* a hybrid between *H. angustifolius* and *H. maximiliani,* but *H.* × *simulans* is taller and more robust. Both produce glossy lanceolate leaves along multiple stems and at six to eight feet tall are naturals for dressing up a fence or garage, or for the rear of a mixed border. Cutting them back by a third early in the summer will make them bushier with more flowers. At Niche Gardens in North Carolina, *H.* × *simulans* is the last perennial to bloom, drawing late butterflies and putting on quite a show in October and November amid other garden giants, including a variety of perennial grasses, Joe-Pye weed, and *Salvia leucantha.*

The maximilian sunflower *(Helianthus maximiliani)* was named for a Prussian prince who studied native North American plants in the 1830s. This is another tall species, easily reaching ten feet. The leaves are grayish green and up to twelve inches long. Like the swamp sunflower, it develops a large clump of branches. These sometimes dip so low their tips touch the ground. This produces quite an unusual effect midsummer through fall when the dainty two- to three-inch flower heads appear all along the stem at the leaf axils. *H. maximiliani* spreads by rhizomes and may become invasive, so place this robust bloomer where it will not encroach upon smaller plants. Effectively grown as a screen or against a bare wall, it wants a lot of sun, but it is adaptable to a wide range of soils and is impressively resistant to insects. In fact, *H. maximiliani* has been used in breeding programs to impart this trait to other sunflower species.

The hairy wood sunflower *(H. atrorubens)* varies in height from about four to eight feet. It is sometimes called the dark red sunflower, a reference to its red disk flowers and purple-veined bracts. A good choice for the rear of the sunny wildflower border, it produces several five-inch blossoms on each flower stalk from August through October.

The willow-leaf sunflower *(H. salicifolius)* gets my vote for perennial sunflower with the most to offer a herbaceous border. It sports attractive, slightly drooping, linear leaves densely along its stem. Forming a clump of stems six feet high, it contributes a fine, willowy texture to a garden throughout the growing season. The two-inch flowers appear abundantly in August and September.

Hybrids between species of *Helianthus*

'Taiyo', above left, a cultivar of the common sunflower, will make an effective summer hedge. It grows reliably to five feet. The Jerusalem artichoke or sunchoke, above right, is a dual-purpose perennial. If it becomes too invasive in the garden, you can harvest the excess plants for their edible tubers.

PHOTOS BY DAVID CAVAGNARO

are common where their natural ranges overlap, which has led to some interesting cultivated selections. The many-flowered sunflower *(H. × multiflorus)* is a naturally occurring hybrid between *H. decapetalus* and *H. annuus.* All of the progeny of this cross are sterile triploids, so its cultivars must be propagated either by division or budding of the rhizomes. 'Flora Pleno' is a particularly showy strain that produces large sprays of double, bright yellow flowers from midsummer to fall. At a maximum height of six feet (usually less), it adds color to the rear of a sunny border, where its bright green foliage serves as a lush background for earlier-blooming plants.

A perennial sunflower with a dual purpose is the Jerusalem artichoke, or sunchoke (*H. tuberosus*). Next to *H. annuus,* this is the most widely cultivated species of sunflower. Common as a wildflower in the eastern two-thirds of the United States and Canada, it develops many three- to four-inch flowers from August to October. Though it may become invasive in a garden, you can help keep it under control by digging and eating its tasty, enlarged tubers.

I discovered the Jerusalem artichoke many years ago when a neighbor left a bag of its knobby tubers on my front door stoop. Not recognizing them, I wasn't sure if I was supposed to eat them or plant them. The neighbor suggested I do both. Their flavor is delicate—reminiscent of artichoke—while their texture is more like a potato. I like them best steamed and buttered with a little parsley and chives, though they can be eaten raw or added to soups or stir fries.

Native Americans introduced this food to settlers, who found that it reliably produced abundant tubers year after year with little care. Now commercially grown in California, it is said to be an excellent carbohydrate food for diabetics because it is rich in the fruit sugar called inulin. Some nurseries offer selections such as 'Mammoth' (standard, white-fleshed tubers), 'Fuseau' (large, elongated tubers), and 'Magenta' (brightly colored tubers).

The sunchoke is remarkably resistant to a variety of economically devastating pests. Because it crosses freely with several other species of *Helianthus,* it can be tapped for this trait by breeders.

Among our annual sunflowers, the most familiar is *H. annuus,* whose varied forms are common throughout the western two-thirds of the United States. But there are a few others worthy of a gardener's attention.

The silver-leaf sunflower *(H. argophyllus)* is prized as much for its downy white foliage as for its bright yellow to orange flowers. Smaller than those of most species, with heads only an inch or two across, the flowers are borne prolifically along its three- to nine-foot stalks from August through October.

Unlike most annual species, the Italian yellow sunflower *(H. debilis)* is native to areas east of Texas. Its multiple stalks grow six feet tall and bear an abundance of lemon-colored, four-inch, cactus-type flower heads. While it is a stunning performer in the garden, *H. debilis* makes a poor cut flower—the stems are too short and the flowers just don't last.

The annual sunflower *(H. annuus)* is found in gardens all over the world. It is also the commercial source of sunflower oil, birdseed, and the seeds used for snacks and garnishes. There are a multitude of distinctive and delightful ornamental varieties, from the ten-foot giants whose majestic blooms soar above the tomatoes in my vegetable garden to the two-foot dwarfs that brighten the front of my flower

'Mammoth Russian' produces single heads up to fifteen inches across. Developed as a commercial crop, it's a bit coarse, but if you have space it makes an interesting addition to the vegetable patch.

border. The problem lies not in finding one suitable for your garden, but in selecting the ones you like best.

They are fascinating plants for kids—they grow very fast and are easy to care for. Children love the giant flowers and delight in harvesting the seeds to feed birds. When my daughter came home from kindergarten last year clutching the sunflower seedling she had planted, we decided then and there to establish a sunflower garden. We chose six different annual varieties. With her seedling from school as its centerpiece, the sunflower garden maintained her interest all summer long, provided the house with a continuous supply of delightful cut flowers, and fed the birds as well.

For a long flowering season, the branching types are the ticket. These are also the varieties to choose for indoor arrangements (although van Gogh might take exception to my cut flower preference). Cut them freely—the more you cut, the more flowers you'll get. Dead-heading spent flowers will also increase the number of blooms and extend the flowering season.

My favorite of the branching types is 'Italian White'. The cream-colored, four-inch petals of the ray flowers are surrounded by a circle of neat, pointed, bright green bracts. The center of the head is dark brown. No fancy arrangement beats a large vase full of these summer bloomers. The stout main stem supports the four- to five-foot multiple branches with no need of staking. Unlike many of the annual varieties whose leaves can look a bit ragged, the foliage of 'Italian White' is attractive, bright green, and neatly indented.

If you like lots of color, try either 'Color Fashion Mixed' or 'Sunburst Mixed'. The blossoms range from pale yellow to gold, bronze, and crimson, and include some bicolors. At six to eight feet, 'Color Fashion Mixed' is a bit harder to incorporate into a mixed border than the 'Sunburst Mixed', which only grows to four feet. Both need lots of space. They develop multiple branches bearing an abundance of flowers that add panache to both the garden and indoor arrangements.

For a summer hedge, 'Taiyo' or 'Valentine' are good choices. Each grows to a uniform five feet, producing flowers the size of an open hand. The blooms of 'Taiyo' are bright yellow with dark purple centers, while 'Valentine' is lemon yellow with black centers.

'Sunspot' is a two-foot dwarf sunflower that produces ten-inch, yellow blossoms on sturdy stalks. It's a bit of an oddity with its dinner plate-sized blooms on such a short plant, but kids love it. 'Teddy Bear', three feet tall with five-inch flowers, seems more in balance. Its blossoms are bright yellow and completely double, like fluffy chrysanthemums. My favorite dwarf is 'Music Box', a tough little performer in our sunflower garden last year. It grows just over two feet tall and bears four-inch flowers in a range of colors from creamy yellow to mahogany red.

Of course, if you cut all these flowers for indoor arrangements or dead-head them to prolong their blooming season, you'll sacrifice seed. If you are more interested in feeding the birds than in growing flowers for cutting or bedding, the nonbranching, single-headed varieties are your best choice. They also provide a spectacular, if short-lived, flower display.

'Mammoth Russian', the variety introduced in 1875, is still well worth growing. Under favorable conditions it may reach ten feet or more, with twelve- to fifteen-inch, single heads. Its texture is too coarse for my flower beds, but I love to plant a row across the back of my vegetable garden. The giant heads shine down on the tomatoes and zucchini where they seem to fit in perfectly. 'Tarahumara White' is another giant, reaching ten to twelve feet. Its flower heads are golden yellow, but its seeds are pure white. 'Sundak', an outstanding seed producer, grows to about six feet and flowers two weeks ahead of 'Mammoth Russian'.

As if the beauty of their bloom and the utility of their fruit were not enough reason to grow them, sunflowers also discourage weeds. Many species of *Helianthus,* including *H. annuus* and *H. tuberosus,* are allelopathic—that is, they produce substances that inhibit the growth of other plants. These substances include a number of phenolic compounds and fatty acids. The weed-suppressing action is rather complicated because so many compounds are involved, and results may vary with the climate, soil type, and interactions with soil-borne microorganisms. Furthermore, only certain plants respond to the allelopathic compounds.

Broadleaf weeds are more susceptible than narrow leaf or grassy weeds. Wild mustard, jimsonweed, and bindweed are significantly reduced in fields where sunflower refuse has been left on the soil. Dr. Gerald Leather of the United States Department of Agriculture's Agricultural Research Service has seen this phenomenon dramatically demonstrated in Colorado, where bindweed is a serious pest. In areas otherwise infested with bindweed, a perfect circle, free of the weed, forms around sunflowers.

Sunflowers don't have to be yellow anymore. Cultivars like 'Color Fashion Mixed' extend the genus's ornamental possibilities, but be careful to check the maximum height before you plant. 'Color Fashion Mixed' can reach eight feet.

DAVID CAVAGNARO

JESSIE M. HARRIS

ANITA SABARESE

A single species can serve both commerce and ornament. Left, the common sunflower,* Helianthus annuus, *in production. Above,* H. annuus *'Italian White' is so elegant it can be used as a cut flower.

Using sunflowers to help control weeds can reduce the need for herbicides. In field studies Leather demonstrated a direct reduction of certain weeds where sunflower leaves and stems were left in and on the soil. He used both sunflowers and herbicides to control weeds over a four-year period and found that the weed biomass was reduced equally in plots planted with sunflowers, whether or not herbicides were applied.

Many other allelopathic plants lose this trait when cultivated varieties are developed, but cultivated varieties of sunflowers seem to have as much allelopathic potential as their wild parents, Leather has found.

On the down side, another crop planted where sunflowers have been growing may also be susceptible to this allelopathic interaction. The sunflower also demonstrates autotoxicity—its residue in a field actually inhibits the growth of subsequent sunflower crops when they are grown in succession.

In 1982 researchers at the University of Saskatchewan made a misguided attempt to establish another use for sunflowers—incorporating the hulls into a potting mix. Thanks to allelopathy, the results were decidedly negative. The mix with the hulls inhibited both root and top growth in snapdragons and coleus, and hull extracts reduced germination of lettuce seed.

In the home garden sunflowers are known to adversely affect morning-glories, radishes, and several varieties of beans. It's likely that many other plants are adversely affected, but little research has been done to identify them. Therefore it's worth noting any problems with plants growing near sunflowers in your own garden.

The complex nature of the mechanism responsible for allelopathy in sunflowers and the potency of the compounds involved have so far limited its applications. But it's possible that someday these substances will be used in developing organic herbicides that don't persist in the environment.

Few plants can boast the interesting past and present usefulness of our native sunflower. With a better understanding of its allelopathic potential, it may rise to even greater heights. It is already a garden giant in every sense of the word.

Rita Pelczar grows her sunflowers in Chesapeake Beach, Maryland.

SOURCES

Andre Viette Farm and Nursery, Route 1, Box 16, Fishersville, VA 22939, (703) 943-2315. Catalog $3. *H. maximiliani, H. salicifolius,* and *H. annuus* 'Flore Pleno'.

Native Gardens, Route 1, Box 464, Greenback, TN 37742, (615) 856-3350. Catalog $2. *H. angustifolius, H. atrorubens,* and *H. maximiliani.*

Park Seed, Cokesbury Road, Greenwood, SC 29647, (803) 223-7333. Catalog free. *H. annuus* 'Italian White', 'Taiyo'.

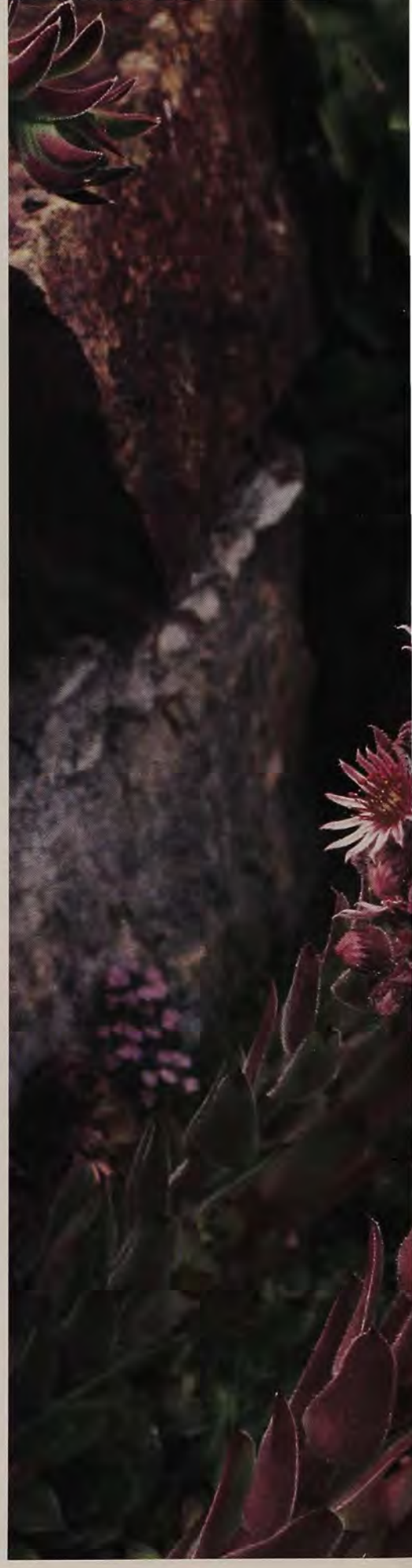
Richters, Goodwood, Ontario, L0C 1A0, Canada, (416) 640-6677. Catalog $2. *H. annuus* and *H. tuberosus.*

Thompson & Morgan, P.O. Box 1308, Jackson, NJ 08527, (800) 274-7333. Catalog free. *H. annuus* 'Italian White' and 'Sunburst' hybrids.

A Garden With an Altitude

How many plants will grow at 8,200 feet? Two thousand and counting.

BY MARTY CARLOCK



It's July, and it's springtime in the Rockies.

Developers of the Betty Ford Alpine Gardens in Vail, Colorado, say that at 8,200 feet, this is the highest public alpine garden in the world. One of them, Helen Fritch, is with me in the perennial garden, gazing up at even loftier ridges, the Gore Range. In midsummer the sun is warm but mountain chill is latent in the air.

"July and August are the peak months up here," says Fritch, president of the board of the Vail Alpine Garden Foundation. "People come from other places where spring is long gone, and they have a second spring here."

Eight years old and still in progress, the gardens lie in a wide and open valley east of this resort town, the first in America developed specifically as a destination ski resort. The garden is a half-mile walk from Vail's center, but a pleasant one, along paved paths that border the churning waters of Gore Creek. Fritch estimates that the half-acre developed so far boasts more than 2,000 plant varieties. "We get a lot of older visitors, people who can't hike up into the mountains," says Fritch. "Here they can see what the mountains have to offer."

Betty Ford, the former first lady, was not involved in founding this garden, as she was in her famous alcohol and drug treatment centers. During Gerald Ford's presidency the couple owned a vacation home in Vail, and local officials, pleased by the Fords' occasional presence in their town, gave his name to a park and amphitheater, and hers to the adjacent garden. The Fords now own a home in Beaver Creek, Vail's sister community a few miles down the valley.

Fritch says Vail landscaper Marty Jones was the originator and spark plug for the garden's development. Others say Fritch, who with her husband Bob owns the Sitzmark Lodge in Vail, deserves credit for making Jones's vision happen.

Fritch calls Jones "a long-time local." No one over 30 is a native of Vail, a community created from scratch just three decades ago. Fritch came here from Illinois twenty years ago; Jones transplanted himself from Omaha about the same time.

In the early 1980s, Jones began stirring interest in alpines with his slide shows of "these cute little flowers from the mountains," recalls Fritch. Their alliance began the day that she and a friend saw Jones by the side of the road with his truck broken down. They gave him a ride. They talked. Fritch took up the cause. An informal group, Friends of the Alpine Garden, was organized in 1984.

Gerald R. Ford Park, extensive acreage intended to encompass playing fields, tennis courts, and an amphitheater, was in the planning stage. "Our group strongly pushed the idea of an alpine garden," Fritch recounts. "There are so many sports here, people are so active, we thought it would be nice to have some quiet activities."

The town agreed to set aside an acre of open space for the garden and by 1985, when the supporting foundation was incorporated, garden advocates had raised

PHOTOS BY MARTY CARLOCK

Left: Sempervivums are outstanding performers in a rocky wall. Above: The alliance between garden founders Marty Jones and Helen Fritch began when she rescued him from a roadside truck breakdown.

LEFT: JESSIE M. HARRIS; RIGHT: MARTY JONES / COURTESY OF VAIL ALPINE GARDEN FOUNDATION

Above: **Penstemon linarioides** *is among the Colorado natives featured in the Betty Ford Alpine Gardens. Right: The garden is designed, says Helen Fritch, so that "you'll always feel like you have to explore."*

$50,000, enough to build a showpiece minigarden in 1987.

"Fund-raising has always been a chief concern," Fritch says. "We wanted to show the community what we had in mind, what the finished garden is going to look like." So in an oval at the amphitheater entrance, Jones built a minimountain, about twenty feet high, and anchored its summit with a dead Utah juniper (*Juniperus osteosperma*), commonly seen at this high altitude. The juniper has become the Betty Ford Alpine Gardens' picturesque logo. Then adjusting soils knowledgeably, he created four microclimates that host some 500 plant varieties within a few square yards.

On the south side is the semiarid habitat, where the soil is 70 percent gravel. Here are penstemons and paintbrushes, Mexican ball cactus, and hardy ice plants. To the north, in the shade of the central mound, Jones mimicked cooler woodlands with an 80 percent peat soil that satisfies rhododendrons, primula, and heather. At the east and west edges of the minimountain, an equal mix of gravel and loam provides cliff gardens for alpine and subalpine plants, and the top of the hillock is filled with loam for dwarf conifers, small deciduous trees such as the amur maple (*Acer ginnala*) and purple-leaf sand cherry (*Prunus* × *cistena*), and larger flowering perennials.

During a break between directing volunteers and receiving a delivery of twenty tons of rock, Jones joins us to talk about the plants. "Marty will have to answer the horticultural questions," Fritch had told me. "I'm just an organizer."

Although the garden contains Rocky Mountain plants, it isn't limited to them. "We have South African plants, Mediterranean plants, Mexican plants, Australian plants," says Jones. He fingers one of his unusual specimens, fleece-form *Raoulia australis*. "This grows bigger up in the mountains of Australia, and if you look up at it, it looks just like a flock of sheep." Here also are as many species of gentians as Jones could find. "And edelweiss, of course."

He points out pink-flowered *Acantholimon* from Turkey, *Rolax glebaria* from the Falkland Islands, and an ice plant, *Delosperma congestum*, from South Africa. "Then we have this *Phlox hoodii* from right here in Eagle County. And *Penstemon linarioides*, another Colorado native."

Jones received no formal education in horticulture, but elicited much of his knowledge from another self-educated botanist, Panayoti Kelaidis, curator of the rock alpine section at the Denver Botanic Gardens. Fritch says that Andrew Pierce,

chief propagator at the Denver gardens, has also been a crucial advisor, particularly in helping design beds for the perennial garden.

The Vail garden has had "wonderful cooperation" from the Denver garden in obtaining many of its plants, says Fritch. Jones grew the rarer plants himself, from seeds obtained through exchanges, or cuttings. A rancher who gave them permission to collect on his land was the source of their trademark juniper. Asked about the rarest plant in the garden, Jones points to a shady spot behind a bench. "Right there. Himalayan blue poppy, *Meconopsis horridula.* Grew them from seed I got in a seed exchange. I doubt if there are more than a handful of those in North America. They're in the Northwest, if anyplace." Jones says this species is even harder to grow from seed than the better known *M. betonicifolia.* "And the color is often muddy, so we're pleased that we have such a bright clear blue."

We linger beside the silver-foliage garden Jones designed to the right of the entrance gate. Most of these plants bloom white or blue. "But there's this Mexican phlox (*Phlox mesoleuca* 'Arroyo'), this pink color I like with the silver." He points out white-flowered *Salvia argentia, Tanacetum densum* var. *amani* (partridge feather), *Veronica incana, V.* 'Crater Lake Blue', four varieties of *Cerastium,* and lamb's-ears (*Stachys byzantina*) started from cuttings from the Denver Botanic Gardens. The beds are punctuated with *Yucca glauca* and ornamental blue fescue.

This "alpine" garden is not limited to mountain natives. The perennial garden, the second area to be planted (between 1988 and 1989), is intended to demonstrate what kinds of ornamentals can be grown in mountain-area gardens, says Fritch, "instead of what we call the three 'p's'—pansies, poppies, and petunias."

Just inside the gate of the perennial garden is an artificial mountain spring, a gift from the Fords. The spring seeps from rock that comes, with Forest Service permission, from Camp Hale, a site Coloradans know as the training ground for the Tenth Mountain Division, which invaded Italy during World War II. Camp Hale provided the warm-toned quartzite that forms walls and cliffs in the perennial garden.

The perennial garden is subtly sunken, shielding visitors from the traffic noise of Interstate 70, a few hundred yards distant. "You never see the entire garden from one spot," Fritch observes. "You'll always feel like you have to explore."

Strolling gravel paths where smooth river-washed boulders artfully intrude, we stop to admire a wall whose crevices sprout beautifully healthy sempervivums, their blossoms rising on scaly, muscular stems. "These bloom fantastically here," says Fritch. "We also have a superb primula collection, an iris collection, twenty-two varieties of poppies."

Some plants just won't grow at this altitude, however. Visitors receive a list of garden plants coded according to how they have fared, and while G for "good" predominates, there are also some D's for "dead." "We're learning by experience," Fritch says. "The rose garden looks shaky. Bush roses do very well here, but certainly not all roses. When we wanted a forsythia, we had to get an especially hardy one from Minnesota," *Forsythia* × *intermedia* 'Northern Sun'.

Because the montane growing season is short, plants that might bloom in different months at lower altitudes will bloom together here. Many herbaceous perennials winter surprisingly well, Fritch says. "Snow is a wonderful mulch." Although most of the Rockies are in USDA Zone 4 and the highest elevations are Zone 3,

"I doubt if there are more than a handful" of* Meconopsis horridula, *a Himalyan blue poppy, in North America, says Marty Jones.

MARTY CARLOCK

some Zone 5 plants have done well here.

Jones comments that there are two winter climates here—one above the snow surface, and the other below it. "Below, it's 32 degrees. Above the snow, it could be 20 below or colder." In summer, he says, blooms seem to last longer in the cool air—"It's kind of like a florist's refrigerator"—and higher levels of ultraviolet light make the colors more vibrant. There are also fewer of the insect and disease problems that plague lowland gardeners. On the other hand, it's hard to grow deciduous trees, he says. "They get sunscorched. The perennials stay under the snow, and if the voles don't chomp 'em up they do very well."

Voles aren't the only rodents that wreak havoc here. Gophers, ground squirrels, and moles join winterkill as forces that constantly reshape the gardens. "Their natural predators—the hawks, coyotes, and owls—don't come into the garden, so we have to bait for them," says Jones. "The ground squirrels are listed as pests here. They're not your cute little chipmunks."

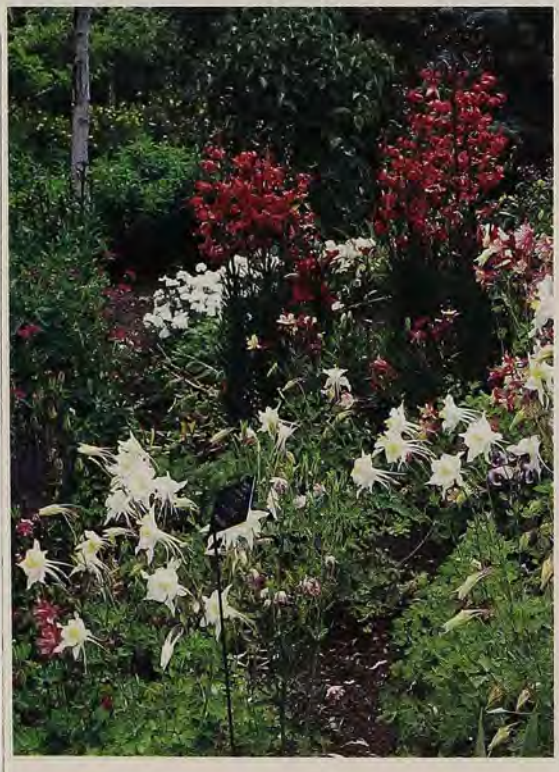
From the perennial garden, designed in the English tradition, twisted dead junipers act as gateway and transition into the Mountain Meditation Garden, finished in 1991. Lush blossoms give way to a severe minimalist landscape of oriental style, using Rocky Mountain plants instead of rocks, sand, and water. A waterfall and pool are surrounded by a carpet of ground phlox, blooming hot pink. There is little else in the space except an occasional iris or exclamatory yucca, a weeping crab apple, a few judiciously placed rocks—the grayer granite here also came from Camp Hale—and a bench or two.

Fritch pauses to chat with two volunteers who are weeding industriously. They confess that it's their first day and they don't know much about the garden yet. She invites them to tag along.

We walk to a small hill on the north edge of the garden. It was formed from dirt excavated from the amphitheater and the sunken perennial garden. An area as large as the other three gardens put together, this spot is destined for the fourth habitat, the Rock Alpine Garden, and a visitors' center. Right now the area blooms with yellow and white clover and the blue-eyed flowers of prairie flax.

Where the hill towers over our heads, Jones would dearly love to create an artificial canyon. "I'm still not sure what direction its style should take," he says. "I really wanted to create a dryland slot, typical of what you might see in our four corners area," where the states of Colorado, New

Below: **Aquilegia caerulea,** *a blue native columbine, is the Colorado state flower, but the garden features many species and cultivars, including 'Alba'. Right: Silver foliage predominates in this garden designed by Marty Jones.*



PHOTOS BY MARTY CARLOCK

Mexico, Arizona, and Utah come together. But creating such a different climate may prove too difficult, so his eventual canyon may be more typical of the central Colorado Rockies.

We climb up, survey the sunny landscape, and descend to find a bench under a tree, near another waterfall. Cascading water is an important component of the gardenscape, echoing the rushing mountain streams nearby.

Jones and Fritch calculate that the Vail Alpine Garden Foundation spent about $400,000 building the first three gardens. And the heart and soul of it, the Rock Alpine Garden, is still on the drawing board. This year the foundation launched an ambitious "Campaign to Complete the Gardens," aimed at raising $750,000 to build the Rock Alpine Garden, $1.5 million for an earth-sheltered visitor education center, and $1 million to endow the gardens and support a strong educational program "to tell people more about what's here," Fritch says. Besides the gardens, the foundation sponsors seminars and workshops and an annual beautification effort during which it recognizes landscaping efforts of businesses and private individuals in the Vail valley.

The foundation's major fund-raiser is a winter ball, which has featured both the Denver and Colorado Springs chamber orchestras. There is no admission fee to the gardens, so Fritch has no idea how many people the garden draws, but she knows there are more every season. "Our only indication is the voluntary donation box," she says, "and there's no way to know what percentage of visitors puts something in. We do know it's increasing. It used to be, we might get $50 all summer long. We got over $2,000 last year."

In late June, Vail was the site of the annual national conference of the American Rock Garden Society, "for one reason," Fritch says with satisfaction: "the garden." The meeting was sold out, with 500 attendees.

Jones bids farewell; it's time to take his rock delivery. I pause to talk to a volunteer who wears a no-nonsense garden tool belt, cut-off jeans, a straw hat, and a name tag identifying her as Nancy Rondeau. It turns out that she is director of volunteers; she's been grubbing around the garden once or twice a week each summer since emigrating from Greenwich, Connecticut, five years ago.

"It's kind of a dream come true," she says. "I've always loved gardening, and here I have *this*." She's transplanting some sage that has become too aggressive in the silver garden.

Rondeau tells me that some fifty volunteers work here. Last year, they put in a collective 4,500 hours. At least ten or twelve show up for the work mornings, usually Mondays and Thursdays. It rained this Monday, so they are making up lost time today. "It's a new garden, so you have total weed control," says Rondeau. "If you keep after them."

She keeps after the labor force, too. Rondeau wants to set up a visiting volunteer program by placing brochures in the inns and hotels to invite tourists to come help. "Even if you're only here for a week. You can't play golf *all* the time. And you could learn something."

Remember that if you're in Vail. Monday mornings. Tools provided. And the ambience is exquisite.

RICHARD QUATAERT

SUSAN FISHER / COURTESY OF VAIL ALPINE GARDEN FOUNDATION

Top: Edelweiss is a must for any alpine garden. Above: Cascading water echoes Colorado's rushing mountain streams.

Boston free-lancer Marty Carlock writes about nature, art, and education for the Boston Globe *and other publications.*

The Betty Ford Alpine Gardens are open "dawn to dusk, snowmelt to snowfall." For more information write the Vail Alpine Garden Foundation, 183 Gore Creek Drive, Vail, CO 81657, or call (303) 476-0103.

Shhhh!

A Pro's Library Secrets

In building a garden book collection, think love, not money.

BY KEITH CROTZ

Building a horticultural library is very much like the art of gardening. It takes planning, patience, time, and knowledge gained from experience. But like gardening, the first steps can be a little intimidating: you glance through the bibliographies of your first few books and realize that you'll never master the literature completely. So how do you decide which books will best answer your interests?

Begin by deciding what you expect your library to do for you. What's your focus? Do you enjoy growing a particular type of plant, like dwarf conifers? Do you concentrate on a particular type of garden, like the rock garden? Or do you have some broader perspective, like the history of garden design?

Whatever your interest, you need to haunt the library for relevant bibliographies. Resist the temptation to pull out *Books in Print* at this point: its vast unannotated listings won't get you anywhere. Instead, check the most recent catalogs of publishers that print horticultural literature. Two of the best are Timber Press, in Portland, Oregon, and Capability's Books, in Deer Park, Wisconsin. Timber's catalog is one of the most extensive lists of garden titles on particular types of plants. Capability's catalog includes other publishers' books as well as their own. It lists nearly every really good garden book available, from recreational reading to the principles of landscape architecture. If these catalogs aren't in your library, you can get them directly from the publishers (see "Resources," page 33). They will almost certainly contain a few promising titles. Check for the titles in the library's card file and if they aren't there, ask for them through interlibrary loan.

The bibliography of a well-written tome will launch you on the path of knowledge. Suddenly a vast array of authors and titles is offered for your perusal. But then you will realize that some of the most interesting books were published in the 1920s, or the teens—or even before the turn of the century. Since I'm a bookseller specializing in out-of-print books, you might be expecting me to offer my services in finding these hard-to-locate titles. Not! I come into the picture later; the proper route now is the interlibrary loan desk at your local library. Order your most interesting titles in small batches, say three at a time, so that you'll be able to compare them easily. Look for completeness, ease of reading, and good illustrations. Keep notes on your reading: start building an annotated bibliography of your own. And of course, check the books' bibliographies for even more promising titles.

Don't expect to buy your library all at once. You probably know a few gardeners afflicted with what I call book buyer's virus. These people must have each and every new garden book as soon as it's published, and they have an answer for just about any question you ask them—if you give them time to "look it up." Don't let the virus infect you. In libraries, small is often better. Take your time and try to master the relevant bibliographies before you start laying out serious money.

Right now, for instance, I'm in the process of building a collection on growing the genus *Dianthus*—pinks and carnations. Why carnations? I don't know; maybe it's all the memories of high school dances or

BILL FIRESTONE

Assembling a collection around a particular interest is one of the best ways to build your expertise—and that new expertise can really pay off in the garden.

BILL FIRESTONE

maybe I just like their colors and good looks. So far my collection numbers thirty-three titles and includes works published from 1839 to 1988. I've spent three years putting together this little library. That might seem like a very long time for collecting just thirty-three books, especially for a professional. But it isn't really: I take the time to read and learn from each volume I buy. After all, that's what they're for.

Assembling a collection around a particular interest is one of the best ways to build your expertise—and that new expertise can really pay off in the garden. More and more people who own older homes, for instance, are reorganizing their homescapes to reflect the design tastes and plant choices popular when their homes were built. This individualized form of restoration has a lot to teach. Homeowners become better versed in landscape techniques and methods. How were sweeping borders and star-shaped patterns made and maintained? And they learn some garden history. What plants were popular in your area a century ago? Actually tracking down the plants can be a challenge, but many botanic gardens and arboreta can assist you. Contact the Council on Botanical and Horticultural Libraries for a list of member libraries that maintain seed and nursery catalog collections (see "Resources"). You may discover heirlooms that are little used today, but worthy of a spot in your plan. Unusual plants will grace your homescape, thanks to what you've learned from out-of-print books and little-known seed catalogs.

You might object that my approach can only lead you backwards—ever further into the past, as you look through those forgotten bibliographies. But backwards is usually the best way to build a horticultural collection. Older books often prove the most useful because their authors are more likely to have labored long in the garden before taking up the pen. No recent work, for instance, even approaches Fearing Burr's *Field and Garden Vegetables of America*, originally published in 1865, and reprinted by my press. Or take Louise Shelton's *Continuous Bloom in America* (1915): no one has ever bettered her explanation of how to maintain masses of garden bloom from May to September. Good introductions to our "heirloom" writers, incidentally, are available in *The American Gardener: A Sampler*, edited by Allen Lacy, and *American Garden Writing*, edited by Bonnie Marranca.

Modern "coffee table" writers often lack the depth of experience evident in the works of their antecedents. Instead, we often get stunning photos of plants that will grow as shown only if you live in just the right spot—say, England. These coffee table wonders have done more harm to American gardens than any soil nematode or overdone dusting of an insecticide.

Actually buying the books is simple

YOUR REFERENCE SHELF

Every library needs a few basic reference books. But with so many on the market, you might feel you need a reference book to choose your reference books. The problem, however, is not as tough as it seems. People who answer gardening questions for a living say they find themselves reaching again and again for a small number of volumes.

❦ ***Chris Beairsto*** listens to gardeners' problems at the Massachusetts Horticultural Society's library. Some of his standard references might be too pricey for most gardeners' shelves. "The home gardener doesn't really need *Hortus Third,*" he says. And although the *New York Botanical Garden Illustrated Encyclopedia of Horticulture* "has really good cultural information," it's a ten-volume set. More affordable and still very useful, he suggests, is *Wyman's Gardening Encyclopedia. Rodale's All New Encyclopedia of Organic Gardening* recently appeared on his shelves and he finds himself reaching for that too, but mostly in conjunction with Wyman's. He also finds the *Manual of Woody Landscape Plants* by Michael Dirr very valuable.

For pest and disease problems, Beairsto suggests Pascal P. Pirone's *Diseases and Pests of Ornamental Plants*, Rodale's *Encyclopedia of Natural Insect and Disease Control*, and *Westcott's Plant Disease Handbook*.

❦ ***Renee Jensen*** assists puzzled gardeners at the Andersen Horticultural Library of the Minnesota Landscape Arboretum. She relies heavily on *The Random House Book of Perennials*, by Roger Phillips and Martyn Rix. Dirr's manual is a standard recourse there as well.

Jensen says most of her questions have to do with the problems of gardening in the north central states. For northern orchardists, she recommends *Growing Fruit in the Upper Midwest*, by Don Gordon. "A lot of fruits can be grown in Minnesota," she says—if you know what you're doing. Another important reference work for the northern zones is *Trees and Shrubs for Northern Gardens*, by Leon Snyder, late director of the arboretum. Unfortunately, Jensen says, it's out of print. But Snyder's *Flowers for Northern Gardens* is still in print and well worth having. Jensen considers this a first-rate reference for species, but since Snyder died in the late 1980s, it doesn't cover the more recent cultivars. Northern flower gardeners would also profit from John and Evelyn Moyle's *Northland Wild Flowers*.

Jensen gets a lot of source questions, for which she refers to the library's extensive collection of nursery and seed catalogs. As for the library's own publication, the *Source List of Plants and Seeds*, "I use it all the time. I wouldn't say that an hour goes by that I don't use it."

❦ ***Maureen Heffernan*** directs the Gardeners' Information Service at the American Horticultural Society. "A book we use all the time," she says, is *The National Arboretum Book of Outstanding Garden Plants* by Jacqueline Heriteau with H. Marc Cathey—a concise guide to a broad range of proven garden performers. "Of course we use Dirr a great deal, and we use Steven Still's *Manual of Herbaceous Ornamental Plants* as the herbaceous equivalent to Dirr." Heffernan thinks "everybody should have a seed book." She uses *Park's Success With Seeds* by Ann Reilly. Both the Reilly and Heriteau books are available from Capability's Books (see "Resources").

Like Beairsto, Heffernan tries to solve disease problems first from Pirone. Also on her shelf are *Rodale's Color Handbook of Garden Insects* by Anna Carr and *The Healthy Garden Handbook* by the editors of *Mother Earth News*. Both are excellent organic guides to handling pest problems. For looking up sources, Heffernan uses Barbara J. Barton's *Gardening by Mail* and the Andersen source list. "Andersen," she says, "is one of our bibles."

❦ ***Chip Tynan*** is a garden columnist for the *St. Louis Post Dispatch* and an advisor at the Missouri Botanical Garden's Horticultural Answering Service. "If people could only own one book," he says, "it should be the *Reader's Digest Guide to Creative Gardening*." The book won Tynan over because it's comprehensive and has good plant lists and clear drawings. Another of Tynan's favorites is *The New House Plant Expert* by D. G. Hessayon. "It's British," he says, "but house plants are house plants the world over." Doris Hirsch's *Indoor Plants: Comprehensive Care and Culture* is unfortunately out of print but still widely available in used book stores. Very useful for trouble-shooting is *Commonsense Pest Control* by William Olkowski and others. There are two more books that Tynan says he "can't live without"—Dirr's manual and the Andersen Library's source list. —*Chris Bright*

Chris Bright is assistant editor of American Horticulturist.

enough when they are in print—order them from a local bookstore or directly from the publisher. The real trick, of course, is getting the out-of-print titles. Your first step should be to make sure they really are out of print. The past few years have seen the reprinting of many an old garden classic—often as a facsimile of the original edition. And the reprints are almost always cheaper than a copy of the original edition. To see if your titles have been reprinted, go ahead and check *Books in Print*, along with the most recent issues of its bimonthly supplement, *Forthcoming Books*. If you can't find your books, now is the time to contact your friendly out-of-print bookseller and request a search for the titles you cannot possibly live without.

Assembling your library shouldn't cost an arm and a leg. You're after books that will mirror your interests in the garden, not investment-quality books. Unless you have large sums to spend and twenty years to wait, buying books as an investment cannot be justified. Your returns would almost certainly be less than those from your passbook savings account. Since you're aiming for books you can use, some defects in condition shouldn't put you off.

But condition is an important determinant of price. If, for instance, you are looking for a really scarce title, like H. Clifford Crook's *Campanulas and Bellflowers in Cultivation* (1959), you should expect to pay up to $50 for a copy in perfect condition. A well-worn copy might cost just half that. In a case like this, buy the perfect copy if you can find it. But if a battered copy turns up first, don't hold out for a better specimen. It might take a decade before you get another chance to add the title to your library.

But just how far can you let condition slide when the book isn't all that rare? If the cover is worn, torn, or stained and the contents are perfect, you should never hesitate. But what if the first page of the introduction is missing? What if two of the

WHAT THE WRITERS ARE READING

So many books and so little time: what's the novice garden librarian to do? We asked four prominent garden writers to name half a dozen of their favorite books.

❦ ***Allen Lacy,*** a former newspaper columnist, now publishes his own newsletter, *Homeground*. His most recent book is *The Gardener's Eye*. Lacy also wrote the foreword to *The Gardener's Reading Guide* by Jan Dean, an annotated bibliography of garden literature that was published in June by Facts on File. His favorite books "are those in which two things shine through: a passion for plants and a highly personal voice." He sees these qualities most clearly in:

An Island Garden by Celia Thaxter (1894), reprinted "in a facsimile edition reproducing the charming lithographs by Childe Hassam. Thaxter was a popular poet who wrote little prose—but, whether her topic was slugs or poppies, what prose it was!"

Louise Beebe Wilder, but with her, "I'd cheat, and insist on two books, *Colour in My Garden* (1916) and *The Fragrant Path* (1932), both recently reprinted, and both classics."

The World Was My Garden by David Fairchild (1938), "a plant and travel memoir of one of America's best plant collectors. It captures a bygone time when travel was long and arduous, and communication was slow and difficult."

A Southern Garden by Elizabeth Lawrence (1942). "Lawrence had an encyclopedic knowledge of plants, combined with a sense of story that shines through all her wonderful books."

Onward and Upward in the Garden (1979), a set of essays Katharine White wrote for *The New Yorker*. "I think that White taught an entire generation of American writers that gardening was an inexhaustible topic to explore, and a topic with the widest intellectual and cultural underpinnings."

The Essential Earthman by Henry Mitchell (1983). "Mitchell has a great sense of comedy, and a wicked eye for human foibles, including his own. He proved that newspaper columns could endure long beyond their first occasions, standing up extremely well under repeated readings."

❦ ***Peter Loewer*** is a frequent contributor to *American Horticulturist*, a newspaper columnist, and an illustrator. His most recent book, illustrated with his own drawings, is *The Evening Garden*. Looking through his extensive garden library, he says, "I've found the following six books to have the most worn edges and thumbprints":

Old Time Gardens, Newly Set Forth by Alice Morse Earle (1901). "Invaluable for a browsing machine dealing with turn-of-the-century gardens and gardening in America."

Flowers, A Guide for Your Garden by Ippolito Pizzetti and Henry Cocker (1975). "Two volumes of flower history and sage advice for common and unusual perennials."

Perennial Garden Plants by Graham Stuart Thomas (1990). "The third edition is a great sourcebook for the best cultivars and cultivation of the great modern garden perennials."

Wildflower Perennials for Your Garden by Bebe Miles (1976). "Simply the best book ever written about the best wildflowers for the garden."

The English Flower Garden by William Robinson (1901). "A treasured book with wonderful illustrations and each time it's opened, it offers surprising uses of unusual plants in unusual situations."

Green Grows the City by Beverley Nichols (1939). "One of the best books ever written about designing a garden on a city lot."

❦ ***Ken Druse*** is a photographer as well as a writer, and both of his talents are on display in his latest book, *The Natural Shade Garden*. Druse's tastes in reading run to reference works and to some basic environmental texts.

Native Trees, Shrubs, and Vines for Urban and Rural America by Gary Hightshoe (1987) is a horticultural account of American woody plants. Druse finds it especially useful for the Northeast. "Although this is a reference, it is the book which is currently wearing a dent in my chest at bedtime."

This Incomparable Lande (1989), a collection of American nature writing edited by Thomas Lyon, is "a book to read and re-read, good for the bedside and to read aloud in the car (by a passenger, please)."

American Garden Writing, a collection edited by Bonnie Marranca (1988), is "a lovely book of many of the greats, living and dead, but Ms. Marranca's introduction is one of the best things in it."

The Opinionated Gardener by Geoffrey Charlesworth (1987) is "opinionated, yes, and very funny. This delightful view of years in a rock garden would appeal to any gardener."

A Sand County Almanac by Aldo Leopold (1949) describes the author's transformation "from 'game manager' to wildlife and wild land champion." Leopold was "the father of American nature writing and some say, the father of the environmental movement."

Requiem for a Lawnmower by Sally and Andy Wasowski (1992) is "a terrific read. It is really funny and incredibly up-to-the-minute."

Siftings by Jens Jensen (1939) is an "American classic of environmental consciousness and conservation. Jensen has been called the Frank Lloyd Wright of landscape architecture."

❦ ***Tovah Martin*** is senior horticulturist at Logee's Greenhouses in Danielson, Connecticut. A contributor to many national magazines, her most recent book is *The Essence of Paradise*. "It was mighty hard to keep my list down to a mere half dozen favorite titles," Martin says. But apart from the reference books she uses at work, she offers selections from three categories: new books, books to travel with, and a dream book.

The new titles are Druse's *The Natural Shade Garden* (1992) and *The Garden Tourist 1993*, edited by Lois Rosenfeld. Druse's "is a gorgeous book to behold and solid, thought-provoking reading material as well." She calls Rosenfeld's indispensable: "It fills me in on what's going on."

Candidates for Martin's luggage include Elizabeth Lawrence's columns for the *Charlotte Observer*, compiled by Bill Neal as *Through the Garden Gate* (1990), and *Duck Hill Journal* by Page Dickey (1991), a year in the life of a New York state gardener—the author's first book and an instant classic. "Or, if I can only carry a very lightweight paperback, I slip a copy of *The Education of a Gardener* by Russell Page (1985) into my bags." Page's book is an account of his own development as a garden designer. All three, says Martin, are "sheer enjoyment."

"Who can resist opening a handsomely photographed picture book once in a while?" she asks. "When I want to dream, I feast my eyes upon *Contemplative Gardens* by Julie Moir Messervy and photographed by Sam Abell (1990)." —*Chris Bright*

BILL FIRESTONE

The perfectionist will insist that the dust jacket, cloth cover, and contents all be in mint condition. If perfection tempts you, bear in mind that it's an expensive way to build a library.

illustrations have crayon marks? And what if that color photo you saw in the interlibrary loan copy, the photo that proves your specimen really is *Oenothera fruticosa* and not the inbred *O. tetragona*—what if that precious photo is gone? Now the decision—to buy or not to buy—gets difficult. Where pages or illustrations are lacking, my advice is to pass, with regret, and hunt for a better copy. The perfectionist will insist that the dust jacket, cloth cover, and contents all be in mint condition. If perfection tempts you, bear in mind that it's an expensive way to build a library.

As you buy your books, take the time to measure them against your own interests. How well do they serve your purposes? No doubt you will modify your interests somewhat as you read. As this process matures, so will your library. And since yours is a horticultural library, the potential rewards are as great as all outdoors.

Keith Crotz is owner of American Botanist Booksellers in Chillicothe, Illinois, and a member of the American Horticulturist *Editorial Advisory Board.*

RESOURCES

American Botanist Booksellers, P.O. Box 532, Chillicothe, IL 61523, (309) 274-5254.

Anchor & Dolphin Books, 30 Franklin Street, P.O. Box 823, Newport, RI 02840, (401) 846-6890.

Beth L. Bibby Books, ABBA, 1225 Sardine Creek Road, Gold Hill, OR 97525, (503) 855-1621.

Capability's Books, 2379 Highway 46, Deer Park, WI 54007, (800) 247-8154 or (715) 269-5531 or (715) 269-5346.

Council on Botanical and Horticultural Libraries, Inc., c/o John F. Reed, New York Botanical Garden, Bronx, NY 10458, (718) 817-8705.

Elizabeth Woodburn, Books, Booknoll Farm, P.O. Box 398, Hopewell, NJ 08525, (609) 466-0522.

Gary Wayner Books, Route 3, Box 18, Fort Payne, AL 35967, (205) 845-7828.

Hortulus Books, 139 Marlborough Place, Toronto, ON M5R 3J5 Canada, (416) 920-5057.

Hurley Books, 1752 Route 12, Westmoreland, NH 03467, (603) 399-4342.

Raymond M. Sutton Jr. Books, P.O. Box 330, Williamsburg, KY 40769, (606) 549-3464.

Second Life Books, P.O. Box 242, Quarry Road, Lanesboro, MA 01237, (413) 447-8010.

Timber Press, 9999 S.W. Wilshire, Portland, OR 97225, (800) 327-5680 or (503) 292-6607 or (503) 292-0745.

V.L.T. Gardner Botanical Books, 625 East Victoria Street, Santa Barbara, CA 93103, (805) 966-0246. No catalog; requests only.

The Catmint Muddle

Name confusion is rampant among these pungent herbs.

BY ELISABETH SHELDON

JERRY PAVIA

For many years I've been growing, but not particularly enjoying, a catmint I got as *Nepeta faassenii (mussinii)* or *N. mussinii (faassenii)*. The catalogs always seemed to imply, by means of parentheses, that these plants are the same thing. I would look at my floppy little plant with its grayish green leaves and idly wonder why the British gardening books made such a fuss about it; it wasn't even "grey," as they said it was. I did like its pungent aroma and its spikes of lavender flowers. Then, a few years ago, I began to acquire different species of the genus and now I'm deep into nepetas, wanting to sort them out and find more garden-worthy kinds.

As soon as I got out the books I found that the taxonomy is fairly muddled, with the same nepeta going by several names, or even being listed alternatively under *Dracocephalum* (dragonhead), a closely related genus. The distinction is a subtle one, relating to the dragonheads having a calyx—the flower part made up of sepals—that has two lips and fifteen nerves, and an upper stamen pair longer than the lower pair.

The catmints are aromatic perennial or annual herbs in the Labiatae, or mint family, with square stems, opposite leaves, and small tubular flowers of lavender, white, or yellow in whorls on long racemes. Although a couple of the dragonhead species are native to North America, all those classified as catmints come from hot sunny areas of Europe, Asia, and North Africa where the soil is somewhat sandy or gritty. So naturally, they want to be planted in light soil in well-drained, sunny parts of our gardens. Surprisingly, most of the garden varieties are hardy through USDA Zone 4.

Of the 250 species in the genus, the best known is probably catnip, *Nepeta cataria,* an Eurasian native that has gone wild in America and elsewhere. While most of us gardeners find the aroma of other nepetas pleasing, I find that of catnip revolting. To me, catmints smell pungent, minty, or at worst, medicinal, while catnip seems rank and almost poisonous. There is a subspecies, *N. cataria* subsp. *citriodora,* said to have a faint lemon scent, but I'm not sure this would help.

Catnip is no beauty either. It has a weedy habit and its negligible pink flowers fail to lift the soul. But because of its herbal qualities it has a place in the herb garden, rather than the ornamental garden. The sweet-flavored catnip tea is said to induce a good night's sleep and cure colds and fevers. The Shakers sold concoctions of it that they claimed would cure infant diseases, regulate menses, and settle upset stomachs.

Only a few nepetas are generally used in flower gardens, although many of them deserve to be. We gardeners have got in a rut, as we so often do.

The most widely grown is the *N. mussinii/faassenii* that I spent so much time puzzling over. Imagine my surprise when I found the following sentence in a scholarly article in an old volume of *Baileya* at Cornell: "For somewhat over 100 years it has been known to botanists and horticulturists that all was not well with the plants that were passing under the name *Nepeta mussinii.*" If it's been known for a century, wouldn't you think they would have done something about it?

It appears that the species *N. mussinii* was introduced into western Europe in 1803 by a Russian count named Apollos Apollosovich Mussin-Pushkin, who

brought it back from an expedition to the Caucasus. It was named in his honor, as was *Puschkinia,* the genus of spring-flowering bulbs.

Apparently, *Nepeta mussinii* later crossed naturally with the small white-flowering *N. nepetella,* which had been introduced into British gardens about 1760. The resulting hybrid, superior to both of its parents, was at some point named *N.* × *faassenii.* When British gardeners began to use it, however, its name was confused with that of the species and they've been confused ever since.

This is odd, since in appearance and behavior the two are quite different. *N.* × *faassenii* is twelve to eighteen inches tall while *N. mussinii* is around eight to ten inches high. *N.* × *faassenii* has one-and-a-half-inch long, narrow, wedge-shaped silvery leaves and

MICHAEL S. THOMPSON

Nepeta × faassenii *or* N. mussinii? ***In spite of what many books and catalogs intimate, they're not the same. A deciding factor is the leaf. The rounded leaves of the plant at left indicate that this is the more easily obtainable* N. mussinii.**

PHOTOS BY JERRY PAVIA

Gardeners usually relegate catmints to the herb garden. Top: The author feels catnip is one that deserves to remain there, but here it has been used to create bold swaths in a formal garden with boxwood and wisteria. Above: A Eurasian native, catnip has gone wild in America and elsewhere.

those of *N. mussinii* are one-inch rounded and grayish green. *N.* × *faassenii* is sterile, while *N. mussinii* sets seed and even seeds itself around the garden.

How could they possibly be confused? Yet one of England's greatest plantsmen wrote in 1960 that "*faassenii* is the new name for *mussinii*" and Roy Hay and Patrick Synge, authors of the *Color Dictionary of Flowers,* imply that the names are interchangeable.

I ordered *N.* × *faassenii* from several nurseries, hoping to get the real thing, but received nothing but more *N. mussinii* — they're smaller than *N.* × *faassenii* is described as being, their foliage isn't really gray, and they self-sow. Then last season I placed an order from Carroll Gardens for what they described as "the true sterile species; vegetatively propagated." I may have succeeded at last. These plants are taller and bigger all around than *N. mussinii,* and so far they're not making babies.

There's a larger form (or possibly a hybrid) of *N.* × *faassenii* called 'Six Hills Giant' (sometimes called *N. gigantea*) offered at last by a few U.S. nurseries, and if it is the real thing, it will be a silvery plant three feet tall by three feet wide that should have a lot of eager gardeners lined up to buy it.

All three of the nepetas I've mentioned so far billow about a good deal, distributing their many lilac-colored blossoms generously on and around their neighbors. If they are sheared back halfway when the first flowering is over they'll do it again in late summer. A couple of selected forms of *N. mussinii*—'Blue Wonder' and 'White Wonder'—are widely available. I've got the white one and like it well enough, but don't consider it a wonder.

A summer or two ago I grew several nepetas from seed I obtained through seed exchanges. Plants from a packet labeled *N. sibirica* grew one and a half feet tall (if you can call a flopping stem "tall"). The crenelated leaves are one and three-quarters inches long and the lilac flowers grow in ten- to twelve-inch racemes on dark red stems. Not many flowers open at the same time. The seeds may have been mislabeled, however, since some references describe *N. sibirica* as about twice as tall and with longer leaves than mine produced.

N. grandiflora is quite tall—two and a half feet, and upright—and its scalloped green leaves are two and three-quarters inches long. The stems are green and the lilac flowers on long open spikes are similar to those of *N. sibirica.*

These are both pleasant plants, but don't, I feel, deserve a place in the border. I have raised several that do. One is *N. nervosa.* It is low (six to eight inches), compact, and has small, dark green, lance-shaped ribbed leaves. Its dense spikes of lavender blue flowers with a paler lip are held straight up and close to the plant. Their color is more nearly blue than that of any other nepeta I've seen, and certainly its habit is the best—at least the neatest. I find that, while I enjoy the sight of plants intertwining with and embracing nearby plants, I have a deep-seated fondness for those that keep to themselves. They're so easy to tend, so controlled, so organized. I'm putting some of these small catmints in the front of the border with mat forms of *Dianthus, Armeria,* and other self-contained subjects.

Another fine nepeta came from seed labeled *Nepeta* 'Souvenir d'André Chaudron' (or alternately, 'Blue Beauty'). Since cultivars rarely come true from seed I doubted the name, although I liked the way the French name rolled off the tongue. However, mine matches the descriptions of 'Souvenir' that I've found in books. This is one of the catmints that some people want to classify under *Dracocephalum.* Others say it is a form of *Nepeta grandiflora,* some say *N. sibirica,* but it doesn't resemble either of them. It does resemble a plant that Liberty Hyde Bailey, in his *Standard Cyclopedia of Horticulture,* calls *N. veitchii.* My plant is about two feet tall (taller when flowering); has smooth dark green leaves that are jagged, pointed, and two to three inches long; and produces tiered racemes of wonderful deep violet-blue flowers each

one and a half inches long. The leaves have a strange, wild aroma, and the whole plant is a great success, unless you want to hold against it a tendency to sprawl (only after a storm, I quickly note in its defense). It does spread from the roots, but since every piece is welcome, who's to complain?

Another seed-exchange nepeta is one that came as *N. camphorata*—a lovely, pungent, small-leaved, very silvery creature that produced cascades of pale lavender blooms in its first year. I'm not sure how many years I'll be able to keep it, since it's from southern Greece. The temperature here in upstate New York (two days before I wrote this) went from 70 degrees during the day to 19 at night. The next night it was 12 degrees. I did pot one of the plants and bring it in to my enclosed but drafty back porch, but I think I should have taken it to bed with me instead. It must have been about 20 degrees on the porch. Are these plants ever dealt such cruel blows in Greece?

One of the catmints in the garden is a real mystery. It was given to me as *N.* 'Dropmore', but it looks very much like *N. camphorata*—small, cordate, stalked, and deeply notched gray leaves, racemes of pale purply flowers flung about with complete abandon. Very floriferous, very long-blooming.

A couple of years ago, one major catalog listed a 'Dropmore' described as having roundish green leaves rather than long notched gray ones. Another perennial catalog describes their 'Dropmore' as having gray and toothed foliage, like mine.

And although 'Dropmore' was said to be hardy to Zone 3, while it has staggered triumphantly through quite a few nasty winters with the help of evergreen boughs, it sometimes doesn't pull itself together here until the end of May. Who was I to believe?

The name 'Dropmore' marks it as an introduction of Canadian breeder Frank Skinner. In his book, *Horticultural Horizons,* Skinner says that his 'Dropmore Hybrid', a cross between *N. mussinii* and *N. ucranica,* has "neat grayish foliage, quite a bit like that of *N. mussinii.*" That solves one puzzle—the first catalog was right—but creates another. Exactly what is it that's growing in my garden?

An almost white-foliaged little nepeta, *N. phyllochlamys,* came from a botanic garden seed exchange. Its leaves, on long petioles, are perfect triangles, not more than a quarter-inch on a side, crinkled, soft, and furry. I have this native of Turkey in

THE CHEMISTRY OF CATNIP

Your cat sniffs, then bites his catnip mouse. Soon he's caught up in an orgy of purring, rubbing, rolling, leaping, and batting at butterflies that don't exist. He's obviously having a good time, but what exactly is going on?

Catnip (*Nepeta cataria*) is ecstasy for about two thirds of all cats, according to Arthur and Sharon Tucker, whose 1988 article in the journal *Economic Botany* remains the definitive overview of catnip research. But catnip's effects seldom last longer than fifteen minutes and they are usually followed by a one-hour "refractory period," during which the mint loses its nip. A cat's talent for intoxication is known to be inherited, but mood is important as well: friendly, happy cats get higher than nervous, withdrawn ones.

Catnip's main active ingredient is a chemical called nepetalactone. Cats that like catnip are so sensitive to airborne nepetalactone that they can detect it at concentrations of one part per billion. And it's not just the domestic cat that comes under the chemical's spell. Thanks to a few brave and energetic scientists, we know that catnip will seduce many other members of the Felidae, including lions, leopards, ocelots, and bobcats—although their enthusiasm varies considerably. Jaguars are reportedly crazy about catnip; tigers react but don't usually seem to like it; cheetahs may not be affected at all.

Besides nepetalactone, thirteen other chemicals are known to trigger the ecstatic behavior that scientists call the "catnip response." Some of these other substances also occur in catnip or in other *Nepeta* species. But many are produced by entirely unrelated plants. Valerian (*Valeriana officinalis*), for instance, is commonly cited as a feline intoxicant. Valerian attracts other animals too. One researcher has even suggested that valerian is what the Pied Piper used to lure the rats away from the town of Hamelin. *Actinidia* species, including the kiwi (*A. chinensis*), also attract and intoxicate cats. It is reported that the Chinese used to burn plants of this genus in order to round up unwanted stray cats.

ANN REILLY: PHOTO/NATS

Cats can detect airborne nepetalactone in a one part per billion concentration. This one has found the catmint* N. mussinii *'White Wonder'.

What these chemicals actually do for the plants that produce them is still a mystery. But it is known that some insects produce similar compounds, apparently to repel other insects that prey on them. Since some bugs don't seem to like compounds of this sort, one theory holds that the plants, too, are engaged in chemical warfare. Perhaps their chemicals evolved as a defense against leaf-eating insects.

What the chemicals do in the cats isn't well understood either, but the Tuckers suggest that they may stimulate the brain in the same way that some of the cat's own scents do. Cats have several scent glands and an extensive vocabulary of odors that they use to spell out territorial and sexual ambitions. The Tuckers base their hypothesis on the fact that many elements of the catnip response also occur in scent-stimulated behavior.

Whatever the explanation, catnip appears to be a harmless pleasure, although some authorities warn against overindulgence. Not all of the pleasurable plants, however, are as innocuous. Cat-loving gardeners should be aware that at least one—the silver vine (*Actinidia polygama*)—is thought to be addictive to cats and repeated exposure may cause brain damage. —*Chris Bright*

MARTHA ANANDAKRISHNAN

The common catmint species,* Nepeta mussinii, *will self-sow and has rounded leaves (left). The hybrid,* N. × faassenii, *is sterile, and its leaves are narrower (right). There are a lot more catmints to try, but they're not easy to find.

gritty soil in a raised bed where it huddles itself into a rosette about three inches high. It seemed to die the first winter, three years ago, then last summer it rose from the dead on the old roots. You can be sure I potted it up last fall before the hard frosts began and put it in the bay window in the parlor. It hasn't yet produced flowers, which are described as pink and white or pink and red spotted.

The Hardy Plant Society seed exchange recently included ten nepetas, several of which are described by garden authorities as being excellent candidates for the border. I'm hoping their next list will repeat those offerings. Since nurseries don't carry them, we'll have to raise our own.

Not on that list or available from nurseries is *N. nuda,* which one writer describes as reminiscent of the white *Verbascum chaixii* with its grayish basal leaves and five-foot branched stems, spikes of small white flowers, sometimes tinged with lavender, with bronzy lilac calyces. I wonder why such a fine plant isn't in circulation? Sounds like a perfect subject for a dry garden.

In *Perennials for American Gardens,* Ruth Clausen and Nicolas Ekstrom praise *Nepeta tuberosa,* a catmint from Spain and Portugal that bears spikes of purple flowers with deep rose calyces. Would it have a chance of being hardy? The Hardy Plant Society had the seed for it and for a bushy three-by-two footer, *N. govaniana,* a Kashmiri with rounded green leaves and racemes of small creamy yellow blossoms. This is one catmint that likes a cool moist spot. English writer Graham Stuart Thomas uses the words "beautiful," "charming," and "graceful" when describing it, and is mystified at its lack of popularity, since it's been growing for all to see at Kew for years.

None of the nepetas in my garden seem to concern themselves unduly with the confusion about nomenclature but get on cheerfully with their job of being decorative and aromatic. Well might they be cheerful, as they seem not to suffer at all from any diseases or insects. They should probably be divided once in a while so as to liberate their crowns from crowded growth, but other than that—no problems.

When the taxonomists finally succeed in straightening out names and origins, perhaps more nurseries will make more catmints available to us. Meanwhile, my plants couldn't be happier.

Elisabeth Sheldon is author of A Proper Garden.

SOURCES & RESOURCES

For information on the Hardy Plant Society write membership secretary Simon Wills, The Manor House, Walton-in-Gordano, Clevedon, Avon, England BS21 7AN.

Busse Gardens, 13579 10th Street N.W., Cokato, MN 55321, (612) 286-2654. Catalog $2. *N.* × *faassenii, N.* 'Six Hills Giant'.

Carroll Gardens, 444 East Main Street, P.O. Box 310, Westminster, MD 21157, (301) 848-5422. Catalog $2. *N. cataria, N.* 'Dropmore Hybrid', *N.* × *faassenii, N. mussinii* 'White Wonder', *N. sibirica, N.* 'Six Hills Giant'.

Garden Place, 6780 Heisley Road, P.O. Box 388, Mentor, OH 44061, (216) 255-3705. Catalog $1. *N.* 'Dropmore Hybrid', *N. mussinii, N.* 'Six Hills Giant'.

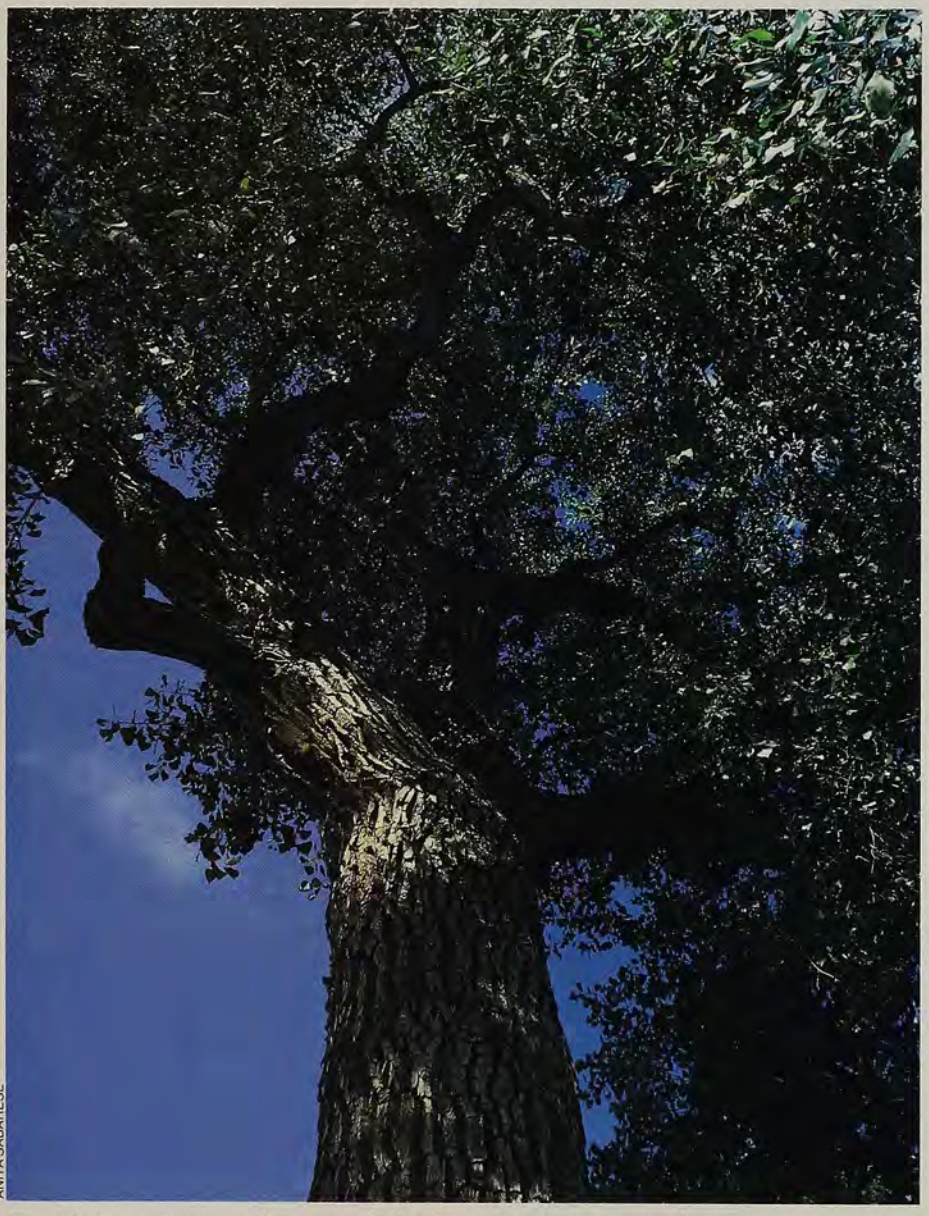
Milaeger's Gardens, 4838 Douglas Avenue, Racine, WI 53402, (414) 639-2371. Catalog $1. *N. mussinii, N. mussinii* 'White Wonder', *N.* 'Six Hills Giant'.

Siskiyou Rare Plant Nursery, 2825 Cummings Road, Medford, OR 97501, (503) 772-6846. Catalog $2. *N. phyllochlamys.*

Thompson & Morgan, P.O. Box 1308, Jackson, NJ 08527, (800) 274-7333. Catalog free. *N. cataria, N. grandiflora.*

The Plains Cottonwood

A naturalist pays homage to this giant native, and to the hollow tree that once saved his life.



ANITA SABARESE

The plains cottonwood can reach heights of sixty to ninety feet.

BY ROBERT MICHAEL PYLE

There are stars in cottonwoods. If you grasp a cottonwood twig, neither too green nor too rotten, and snap it at a wrinkled growth node, a perfect five-pointed star may be revealed on the broken ends. The star is the darker heartwood contrasting with the paler sapwood and new growth.

The Arapaho people believed that the stars in the sky, like all else, came from the earth. They moved up through the roots and trunks of the cottonwoods to wait near the sky at the ends of the high branches. When the night spirit desired more stars, he asked the wind spirit to provide them. She then grew from a whisper to a gale. Many cottonwood twigs would break off, and each time they broke, they released stars from their nodes.

As the only tall tree encountered frequently by the Arapaho and the Cheyenne, the plains cottonwood naturally assumed a powerful and procreative role in their cosmos. They observed how summer brought snowstorms of "cotton" from the trees' catkins, which gave rise to ranks of new cottonwoods along the prairie watercourses. They found that its white wood could be easily worked and hardened by fire. Maker of stars and trees, giver of starlight by night and welcome shade by day, provider of bowls, bows, and arrows, the cottonwood must have inspired reverence and affection among the High Plains' first residents.

European settlers, too, took pleasure and comfort from the plains cottonwood, adapting it as well to many uses. In *A*

THE COTTONWOOD: NOT IN MY BACK YARD

Although beloved by naturalists, the plains cottonwood gets low marks as a landscape tree. Not even we natives of the plains, so short-changed in the tree department, are unqualified in our adoration of this fuzz-generating giant. Burton Barnes of the University of Michigan, who has made *Populus* species his life work, feels the roots of most make them simply too troublesome under drains and sidewalks. "The plains cottonwood," he says, "might be okay in a park."

"Impressive in river bottoms and should remain there," says Michael Dirr's *Manual of Woody Landscape Plants* of the eastern cottonwood, *P. deltoides.* Donald Wyman's *Trees for American Gardens* lists only the Fremont cottonwood, *P. fremontii,* and recommends it "only for the dry, alkaline soils of the southwestern part of the country where it is difficult to get any trees to grow." For James E. Eckenwallder, a professor of botany at the University of Toronto and a taxonomist specializing in *Populus,* it's the fragile branches falling in such profusion that make the cottonwood an irritation in the landscape. Since we had found *P. sargentii* listed under two other botanical names, we asked Eckenwallder which was correct. "I prefer the subspecies name, *P. deltoides* subsp. *monilifera,*" he said. "But maybe you should just list *P. sargentii* and the varietal name, *P. deltoides* var. *occidentalis.* Otherwise it will be too confusing."

By any name, if you hope to ignore the experts and obtain a plains cottonwood of your very own, you might do better to find a wild seedling and ask the property

GALEN GATES

TED AND GWENDOLYN BRAND

The fragile twigs of* Populus deltoides, *far left, and other cottonwoods can litter a landscape.* P. fremontii, *left, is recommended only for the Southwest, "where it is difficult to get any trees to grow."

owner if you can dig it up. The nursery trade apparently agrees that no one in his or her right mind would grow the plains cottonwood intentionally.

Kevin Mosley is a sales representative for Little Valley Nurseries, Inc., in Brighton, Colorado, which offers the plains cottonwood wholesale. In spite of following many leads from Mosley, we failed to find a retail mail-order source. Mosley, a big fan of the plains cottonwood, says it's now illegal in Colorado to sell any seed-bearing forms of the tree, so Little Valley's customers won't find themselves plagued by big drifts of cotton. "It's really very popular here," says Mosley. "We've been sold out since last year, because it was used extensively in the new Denver airport."

He conceded that the plains cottonwood's height, girth, and particularly its spreading crown, make it too big for most home landscapes. Some alternative choices he suggested are *P.* × *acuminata*, the willow-leafed cottonwood, which has a more oval head; *P. angustifolia*, particularly the cultivar 'Empire'; and *P. balsamifera*, "but it's hard to come by." But Eckenwallder says the first is really suitable only for higher elevations, and the latter two species sucker badly. Nor does he know of anyone trying to breed a cottonwood for the suburban back yard. "Most of the breeding work is aimed at improving fiber production," he says, particularly for use in paper pulp.

Here are a few retail sources that we did find:

P. × *acuminata,* Plants of the Southwest, Aqua Fria, Route 6, Box 11A, Santa Fe, NM 87501. Catalog $1.50.

P. fremontii, Forestfarm, 990 Tetherow Road, Williams, OR 97544, (503) 846-6969. Catalog $3.

P. fremontii 'Bakersfield' and 'Zapata', Las Pilitas Nursery, Star Route BX 23X, Santa Margarita, CA 93453, (805) 438-846-7357. —*Kathleen Fisher*

Kathleen Fisher is editor of American Horticulturist.

Natural History of Trees, Donald Culross Peattie related that Missouri River pirogues were fashioned from them, and that two such craft lashed together could transport ten to fifteen tons on the river. He went on to describe the wagon trains' dependence on the great trees:

"This cottonwood grows naturally in low moist ground, in the vicinity of streams, water holes, and old buffalo wallows. So in the days of prairie schooners immigrants sighted their way on the Santa Fe trail and the Oregon trail, from one grove of the Great Plains Cottonwoods to the next, sure that they would find water, fuel, and shade in the burning day. Upon that shelterless sea of grass 400 miles wide, these Cottonwood groves were the wayside inn, the club, the church, the newspaper, and the fortress when the wagons drew up in a circle beneath the boughs. Whether the traveler 'nooned it' or by night sent the sparks of Cottonwood logs flying to the stars, here he was sure to meet other travelers and with them exchange the vital news of the trail."

The Arapaho had long since been herded off to Oklahoma by the time the cottonwood my brother and I would come to call the Thunder Tree was a sapling. In 1890 or so, pioneer William Smith wanted to green up the district of his arid homestead in Aurora, Colorado. He pulled up seedlings from Cherry Creek and carried them back to plant along the High Line Canal in saddlebags of wet sand. A few, subjected to a range of stresses, would become hollow. The Thunder Tree, the greatest of the cottonwoods in Smith's domain, would also become the hollowest, offering shelter to two small boys caught in a hailstorm sixty-four years later. Each of the poplars along the High Line Canal has given me its particular gifts, but only one would offer life itself.

The plains cottonwood is otherwise known as *Populus sargentii.* The genus *Populus* belongs to the willow family and includes the black, silver, and willow-leaved cottonwoods, the Lombardy and other poplars, and the aspens of montane and northern boreal forests. The specific epithet honors Charles Sprague Sargent, author of the classic *Manual of the Trees of North America.* America's greatest dendrologist of the day, Sargent served as professor of arboriculture at Harvard University and director of the Arnold Arboretum.

In describing "his" tree in his 1905 manual, Sargent says that *P. sargentii* normally

grows sixty to ninety feet in height, often becoming six or seven feet in diameter. The Thunder Tree exceeded both these dimensions. The species grows erect, with spreading branches forming a broad, open head, its profile not unlike that of an English oak. Pale brown bark, thick and deeply fissured into broad ridges, ascends the stout trunk.

The leaves are ovate, almost heart-shaped. They can be two or three inches long, three or four broad. Light green above, bluish below, and lustrous as they quiver on the prairie wind, the leaves bear rounded teeth along their margins. They spring from buds coated with balsam, a volatile resin, sticky and aromatic, though not as cloying as the balsam poplar of the north woods.

In autumn the leaves of cottonwoods go bright yellow, warm dirt brown, or the color of old gold, before falling away. Underfoot, they give off an aroma of cured tobacco sweetened by the slightest tincture of balsam. Then the tree stands bared, silvery, shadowed by its own deep furrows. Almost luminous, it blends into the winter sky, and only against snow at a distance on the moonlit night does it look dark. In the gaunt days before spring, the cottonwood makes a gray frame for the black-and-white magpies who have nowhere else to light or a perch for the survey of rough-legged hawks, immigrants who will disappear before the buds swell with balsam and tender green leaves once more.

Cottonwoods bear their sex in catkins on separate trees. The male trees put out two-inch staminate catkins, fuzzy caterpillar-type danglers that seed the spring skies with vast batches of pollen. Pistillate catkins launching four to eight inches from twigs on the female trees are lined with green capsules that burst fine white hairs. These seeds float great distances from their mothers, filling the summer sky with the cottony fluff that gives the trees their name while making soft summer snow.

Like thistledown or dandelion parachutes, cottonwood seeds are capable of spreading the species across many miles. Spiderwebs and pools become clogged with the sheer mass of kapoklike stuffing released at seed time. Any patch of suitable soil is likely to receive one or many seeds. It seems surprising that cottonwoods do not cover the plains, given this fertile fallout, until one realizes that they cannot grow except where sufficient moisture exists—in other words, along the watercourses. And these tend to be so thickly vegetated that potential new ground for seedlings is severely limited.

ANITA SABARESE

In summer, female trees create snowstorms of cotton.

Nor do cottonwoods rely strictly on their seeds. Like willows, their frequent consorts, they possess a second elegant mechanism of colonization. The trunks, branches, and twigs of cottonwoods tend to be brittle. As the Arapaho legend confirms, storms rend pieces from the trees and scatter them over the ground. Some spear the rain-soft soil, rooting directly. Should they fall into a stream below, the orphaned branches might be swept far downstream. Coming to rest on a muddy bank not yet occupied, such a castaway might take root. Stumps send up new shoots and bright red suckers spring from waterside roots.

The plains cottonwood ranges through the foothills and the plateaus on their hems from Saskatchewan and the Dakotas to Texas and New Mexico. It is the signature tree of these zones. The lowlands ecosystem sometimes known as the cottonwood community is also characterized by peachleaf and sandbar willow, wild plum, rose, snowberry, milkweed, poison ivy, and Virginia creeper. Since Europeans arrived, American and Chinese elms, green ash, and tamarisk have moved into many cottonwood communities. The amount of cottonwood has changed, varying with the width of the floodplain, agriculture, grazing, logging, and burning. Still, on certain rivers such as the lower South Platte that runs through Denver, forests of plains cottonwoods grow along the floodplains—broad galleries of pallid trunks meeting in a closed canopy of shining green. Elsewhere their distinct domes, clumped or single filed in loopy lines, trace the path of moisture through the drylands. Following water across the plains, the green ranks of cottonwoods define a countryside otherwise nearly featureless. Often the mere presence of one or two great poplars gives away the location of a buried lateral ditch of a long-forgotten homestead. Groves of cottonwoods on the lone prairie almost always secrete a farmhouse, or its remnants.

Tiger swallowtails and Weidemeyer's admirals are only the most conspicuous of the hundreds of species of insects that feed on its foliage. Many birds nest here—Bullock's orioles in their woven scrotal bags hanging from branches over water, magpies in their flimsy stick tenements, and red-shafted flickers in holes of their own making among them. The flickers dig for wood-boring beetles, part of an insect medley performed beneath the bark. Kestrels, chickadees, and many other cavity nesters occupy abandoned woodpecker holes. Such hollows grow—through influence of fire, fungi, and insects—into homes for owls, bees, spiders, and raccoons. Mourning cloaks hibernate in hollows, while thirteen-lined spermophiles dwell in burrows among the massive root systems. Squirrels tumble leaves and twigs into nests among the branches. Ants, beetles, and other invertebrates flourish among fissured bark, feather, and fur.

ANITA SABARESE

Cottonwood seeds, like dandelion parachutes, can float for great distances, spreading the trees across many miles. But the seeds will only grow in areas with sufficient moisture.

For years after the devastating hailstorm in which the Thunder Tree saved my life and my brother's, I'd assumed it was hollowed chiefly by lightning. Then longtime High Line ditchrider George Swan told me what happened. By 1938 the hollow tree was a flicker tree and a bee tree, though not yet very hollow. One day, Swan saw smoke along the lateral and found flames leaping from the old cottonwood. Farm kids had apparently built a fire at the base, hoping to smoke out the bees and snatch the honey. But the woodpecker holes and insect workings caught fire from sparks, acted like flues to fan the flames, and turned the whole area into a blazing chimney. The tree survived but smoldered for two days. That was when the reaming of the hollow tree began in earnest.

Summer winds and winter gales scraped and planed the ebony cracked throat of the great tree. Rot and insects ate away at the bole. Tom and I, sucked out of the storm and into the belly of the hollow cottonwood that day in July 1954, were just another minor tool of erosion. Rubbing up against the wet charcoal within, we helped the wind and the rain and the rot to shape the graceful contours of this grand plant we came to call the Thunder Tree.

Though tree holes are common in cottonwoods, they tend to be of a size suitable for squirrels or kestrels, raccoons at most. Hollowing trees usually fall to the current or the cutters before their homes get big enough for kids. The Thunder Tree made a spectacular exception, and Tom and I were its beneficiaries.

In the spring of 1979, a quarter century after that lethal hailstorm, I visited my father in Aurora, arriving at night. The next morning, as he drove me around Del Mar Circle on an errand, I looked across the park to take in the familiar comforting form of the beloved cottonwood. But it wasn't there. Instead of the great green globe of its canopy, I saw a hole in the horizon with Mount Evans showing through. I was incredulous, then inconsolable. It was the first time my father had seen me cry for years. He held my shaking shoulders.

Through Bruce Waldo, director of the Aurora Parks Department, I learned that a severe windstorm accompanied by heavy snow had split the "historic hollow cottonwood" down the middle. Half fell across the High Line Canal, and the other half was leaning to the west in a very precarious position. The city forester concluded that the tree could not be saved and presented significant danger to any person in the area.

Waldo enclosed the work orders that documented in clipped and clinical terms the cutting, brushing, and removal of the Thunder Tree. The foreman's notes revealed that the diameter at twelve feet was forty-nine inches. A three-foot stump was left at first. Sadly, they cut this too, flush to the ground, where the diameter expanded to seventy inches. The remains of the great tree were disposed of without ceremony. The work order reads "Level 1 cottonwood & haul logs to dump."

Last summer I took my brother Bud to the site of the hollow tree to show him the cottonwood stars. We searched together and he found some good ones. Then we gazed up at the gap in the skyline where that tree once stood. I thought of the hundreds of descendants it must have left all the way to Nebraska from branches carried downstream, the thousands from its copious cotton seeds. And I thought of all the stars released into the winter night when the wind spirit finally brought the Thunder Tree to earth.

Robert Michael Pyle holds a PhD in ecology and lives in Gray's River, Washington. One of his five previous books, Wintergreen, *won the John Burroughs' Medal for the best natural history book of 1987.*

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In keeping with the conference theme, participants will consider Mexican and Russian initiatives through Master Gardeners of North America. And awards will be presented in the areas of youth gardening, environmental programs, consumer education, and Master Gardener education.

The conference will be held at the Marriott River Center, downtown on San Antonio's famous Riverwalk.

For more information call **(800) 633-2862** or **(210) 228-0417.**

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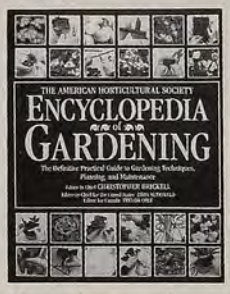

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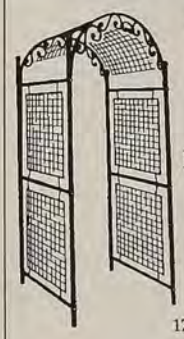

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Pronunciations

Acantholimon ak-an-THOL-ih-mon
Acer ginnala AY-ser jih-NAY-luh
Actinidia chinensis ak-tih-NID-ee-uh chy-NEN-sis
A. polygama A. pol-IG-ah-muh
Aquilegia caerulea ah-kwi-LEE-juh seh-ROO-lee-uh
Armeria ar-MEER-ee-uh
Campanula kam-PAN-yew-luh
Cannabis KAN-nuh-biss
Cerastium seh-RASS-tee-um
Delosperma congestum del-oh-SPER-muh kon-JES-tum
Dianthus die-AN-thus
Dracocephalum drak-oh-SEF-uh-lum
Forsythia × *intermedia* for-SITH-ee-uh × in-ter-ME-dee-uh
Helianthus angustifolius hee-lee-AN-thus ang-gus-tih-FOE-lee-us
H. annuus H. AN-yew-us
H. argophyllus H. ar-go-FIL-us
H. atrorubens H. at-row-ROO-benz
H. debilis H. DEB-ih-liss
H. decapetalus H. dek-ah-PET-al-us
H. maximiliani H. maks-ih-mil-ee-AN-eye
H. × *multiflorus* H. × mul-tih-FLOR-us
H. salicifolius H. sal-iss-ih-FOE-lee-us
H. × *simulans* H. × SIM-yew-lanz
H. tuberosus H. too-bur-OH-sus
Juniperus osteosperma joo-NIP-er-iss ah-stee-oh-SPER-muh
Ligularia lig-yew-LAIR-ee-uh
Meconopsis betonicifolia me-kah-NOP-siss bay-tah-nih-kih-FOE-lee-uh
M. horridula M. hoe-RID-yew-luh
Nepeta camphorata NEP-eh-tuh kam-for-AY-tuh
N. cataria **subsp.** *citriodora* N. cat-AH-ree-uh subsp. sih-tree-oh-DOR-uh
N. × *faassenii* N. × fas-SEN-ee-eye
N. gigantea N. jy-GAN-tee-uh
N. govaniana N. go-van-ee-AN-uh
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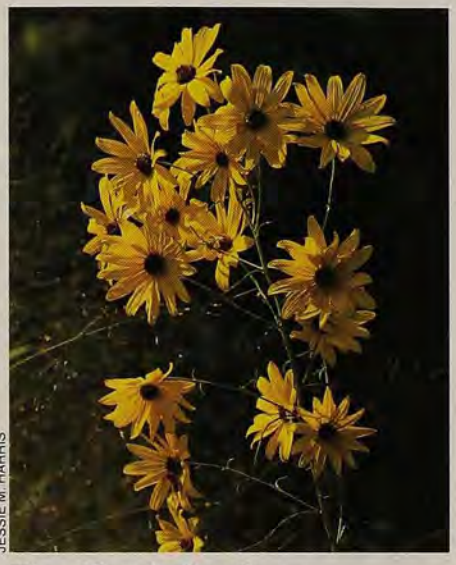
Oenothera fruticosa ee-no-THEE-ruh froo-tih-KOH-suh
O. tetragona O. teh-trah-GO-nuh
Passiflora pass-ih-FLOR-uh



JESSIE M. HARRIS

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P. mesoleuca P. mez-oh-LOO-kuh
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P. angustifolia P. ang-gus-tih-FOE-lee-uh
P. balsamifera P. bal-sam-IF-er-uh
P. deltoides **subsp.** *monilifera* P. del-TOY-deez subsp. mon-ih-LIF-er-uh
P. deltoides **var.** *occidentalis* P. del-TOY-deez var. ahk-sih-den-TAL-iss
P. fremontii P. free-MON-tee-eye
P. sargentii P. sar-JEN-tee-eye
Prunus × *cistena* PREW-nus × siss-TEEN-uh
Puschkinia push-KIN-ee-uh
Raoulia australis row-OO-lee-uh aw-STRAY-liss
Rolax glebaria ROH-laks glee-BAR-ee-uh
Salvia argentia SAL-vee-uh ar-JEN-tee-uh
S. leucantha S. loo-KAN-thuh
Stachys byzantina STAY-kiss by-zan-TY-nuh
Tanacetum densum **var.** *amani* tan-uh-SEE-tum DEN-sum var. uh-MAN-eye
Trachelium caeruleum trah-KEE-lee-um seh-ROO-lee-um
Valeriana officinalis val-air-ee-AN-uh oh-fiss-ih-NAL-iss
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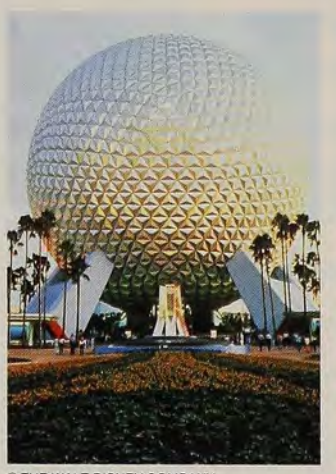

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Our Annual Meeting is AHS's event of the year, when we honor our Annual Award winners, undisputed leaders in horticulture from across the country. Chosen for high achievement in plant breeding and development, landscape design, horticultural therapy, communications, plant conservation, and new technologies, this year's winners will present a series of lectures during our 48th Annual Meeting at Disney's Village Resort.

Our 1993 Program, designed especially for AHS members, also includes two special horticultural tours at the WALT DISNEY WORLD® Resort:

▲ EPCOT® Center will be our living classroom during the "Gardens of the World" Program. Horticulturists will highlight specific plants and gardening techniques and explore the importance of landscape themes during this 3½-hour walking field trip.

▲ During "Planting Ideas: The Art and Science of Gardening at the WALT DISNEY WORLD Resort," we'll explore the 120-acre WALT DISNEY WORLD Nursery and Tree Farm for an up-close look at the extensive horticultural operations at MAGIC KINGDOM® Park.

We expect a great deal of interest in this year's Annual Meeting. If you're planning to attend, please fill out the coupon at right and mail it as soon as possible.

☐ Yes! I'm interested in attending the 1993 Annual Meeting at Disney's Village Resort.

☐ I'm interested in information about the AHS Young People's Program at the Annual Meeting.

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MAIL TO: 1993 AHS Annual Meeting, Dept. M, 7931 East Boulevard Drive, Alexandria, VA 22308-1300.

STUDY TOURS

TRAVEL/STUDY TRIPS FOR THE AHS GARDENER

SEPTEMBER 22-OCTOBER 2, 1993 GARDENS AND FALL COLORS ALONG THE MISSISSIPPI

A steamboat voyage on board the magnificent *Mississippi Queen* up the Mississippi River from St. Louis, Missouri, to Minneapolis, Minnesota. The program includes a two-night stay in St. Louis, a seven-night voyage on board the *Mississippi Queen,* and a one-night stay in Minneapolis. We'll view the fall foliage color at its peak along the Mississippi and visit the homes, gardens, and clubs of AHS members and friends, including the shade and perennial gardens of Mike and Ann Case in St. Louis and the unique Bickelhaupt Arboretum in Clinton, Iowa. Former AHS President Everitt L. Miller and his wife Cass will lead the program.

NOVEMBER 3-7, 1993 GARDENS OF SANTA BARBARA, CALIFORNIA

A very special four-night program to Santa Barbara, California, where we have an opportunity to see an exceptional number of private gardens. We are extremely indebted to AHS members Robert and Ann Jones, Mary Ann Green, and James and Shirley Bartlett, who have opened their homes, gardens, and clubs to us. Included in the program will be a luncheon visit to Lotusland, creation of Madame Ganna Walska, acclaimed as the Smithsonian of gardens. Tour participants will stay at the world famous Four Seasons Biltmore. Leading the program for AHS is Mrs. Harry Van de Kamp of Paso Robles, California, a past Board Member of AHS. This exceptional program has been made possible through Mrs. Van de Kamp's personal contacts.

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

AHS members traveling to Santa Barbara, California, in November will tour Bud Baumes's garden. The hillside garden, which was designed by Isabelle C. Greene, overlooks Santa Barbara, Montecito, and the Channel Islands.

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