American Horticulturist

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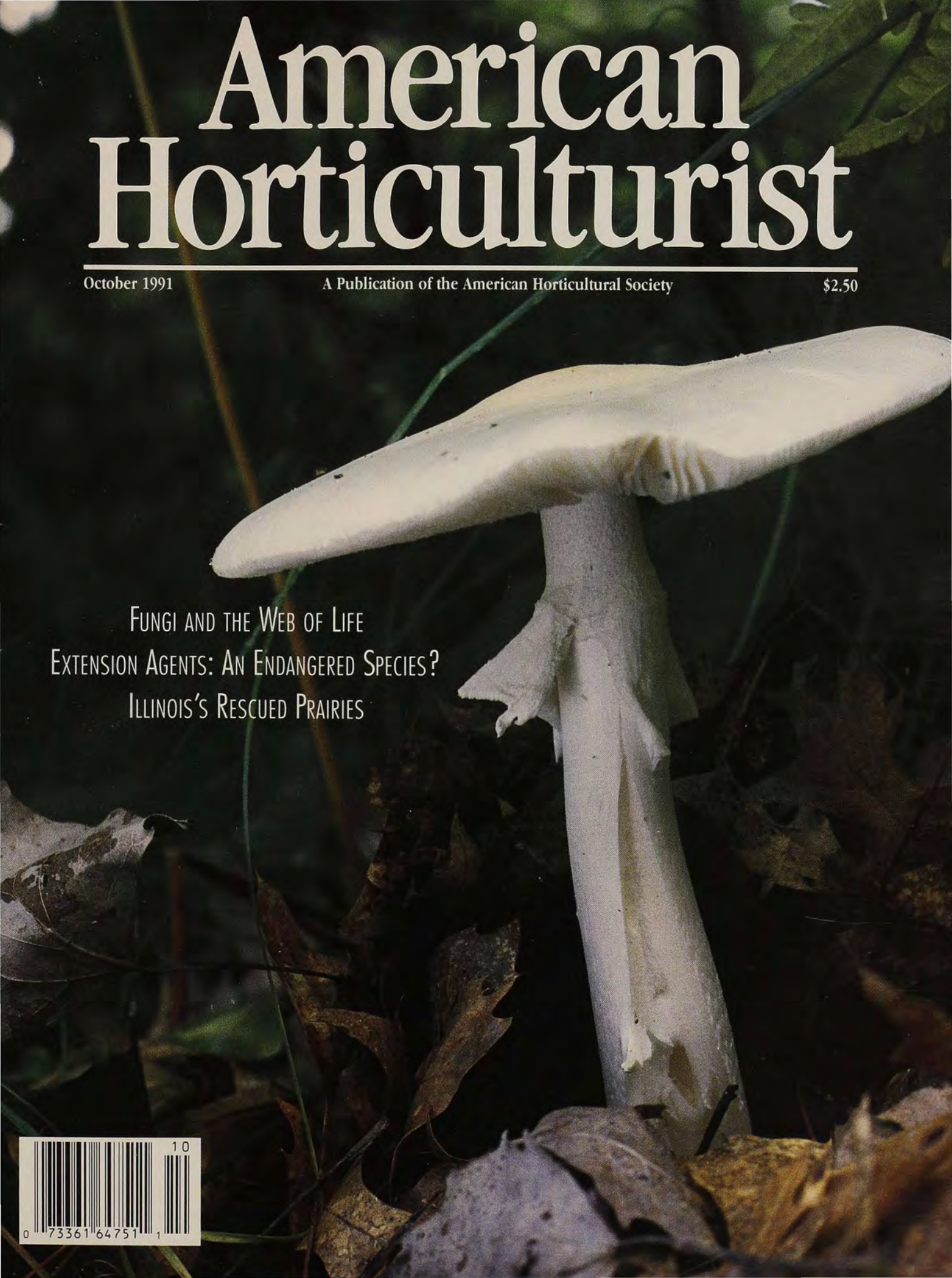

FUNGI AND THE WEB OF LIFE

EXTENSION AGENTS: AN ENDANGERED SPECIES?

ILLINOIS'S RESCUED PRAIRIES

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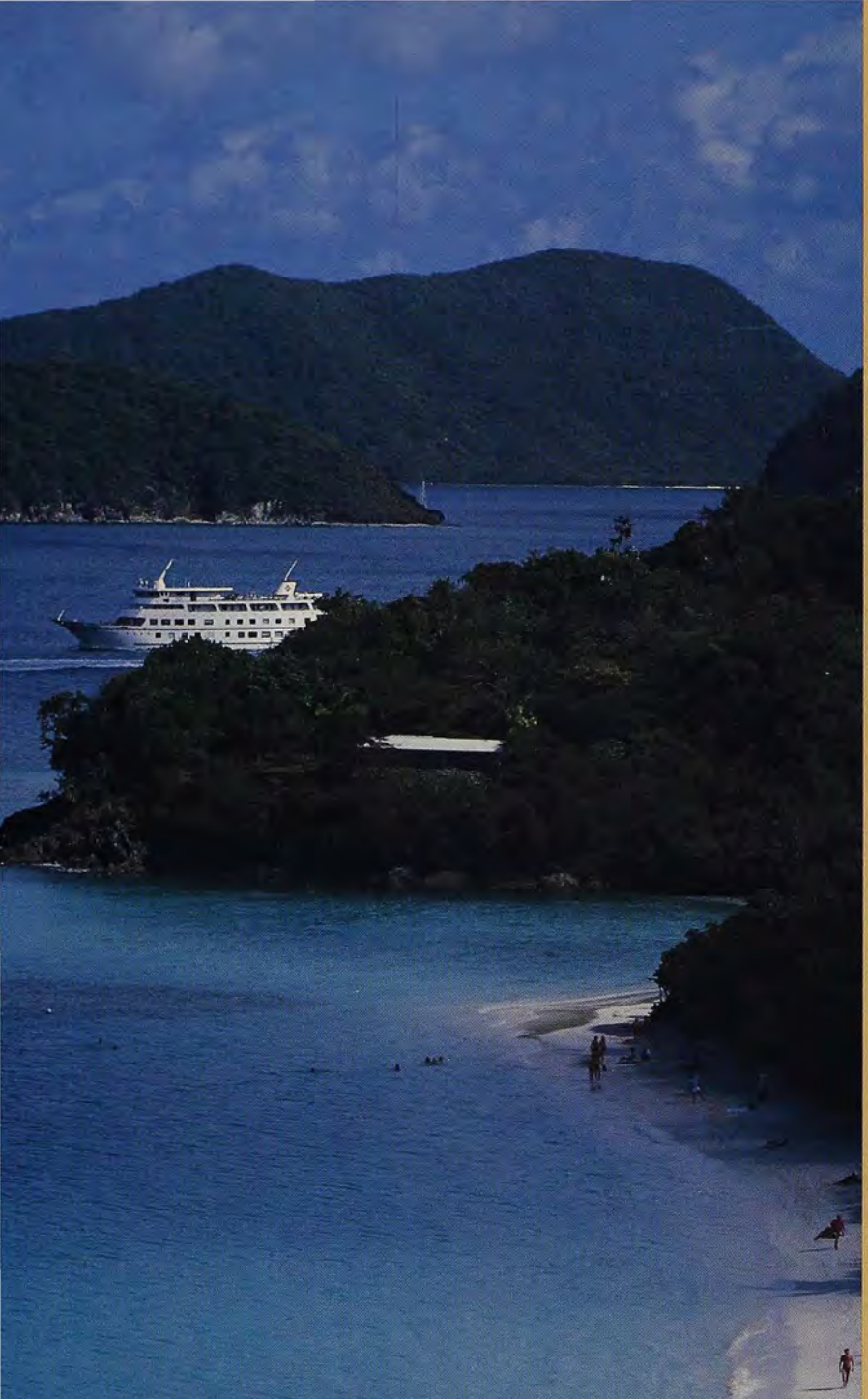

STUDY TOURS

TRAVEL/STUDY TRIPS FOR THE AHS GARDENER

OCTOBER 17-24, 1991
GARDENS OF CALIFORNIA

This will be a most unique voyage in San Francisco Bay from which we will navigate up the Sacramento and Napa Rivers. With the help of AHS members and friends we visit a wonderful collage of private gardens in Woodside, Piedmont, Berkeley, Lafayette, Orinda, Walnut Creek, Sacramento, Davis, and Napa. Program highlights include four private gardens belonging to board members of the historic Filoli estate including James and Lurline Coonan, Mr. and Mrs. Eugene C. Trefethen Jr. of Napa, and Ruth Bancroft, whose garden in Walnut Creek was featured in the October 1989 issue of *American Horticulturist*. This program is being led by Mrs. Harry Van de Kamp of Paso Robles, California, a former AHS Board Member whose collaboration with this program makes it a once-in-a-lifetime opportunity.

JANUARY 25-FEBRUARY 1, 1992
GARDENS OF THE VIRGIN ISLANDS

An exceptional exploration voyage to the British and U.S. Virgin Islands on board the *Nantucket Clipper*. Ports of call will include St. Thomas, St. John, Tortola, Virgin Gorda, and Peter Island. This unique program is being led by former AHS President Carolyn Marsh Lindsay and Bob Lindsay and AHS Board Member Andre Viette and Claire Viette. Participants will see the gardens of the Lindsays and the Viettes' parents and private homes and gardens of their personal friends, including the spectacular gardens of AHS member Paulina du Pont Dean, whose gardens were featured in the December 1989 *American Horticulturist*. The small size of the yachtlike *Nantucket Clipper* makes it possible to sail into isolated bays, quiet anchorages, and deserted beaches known only by experienced yachtsmen who are intimate with these waters.

FEBRUARY 19-MARCH 3, 1992
EGYPT AND NILE CRUISE

Explore the earliest of the Western civilizations and the life-giving influence of the Nile River. The itinerary includes Cairo, Luxor, and Abu Simbel as well as a five-day cruise on the Upper Nile from Luxor to Aswan on board the *Nile Goddess*. Visit numerous historic gardens, including the Manial Palace Gardens in Cairo and the botanical garden on Lord Horatio Herbert Kitchener Island at Aswan. Program leaders are AHS Board Members Helen Fulcher Walutes and Mary Katherine Blount.

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

Members and friends of AHS will sail the Nantucket Clipper *into Leverick Bay, a port of call on Virgin Gorda, during a January trip to the Virgin Islands.*

American Horticulturist

Volume 70, Number 10 October 1991

ARTICLES

DEPARTMENTS

OCTOBER'S COVER

Photographed by Jessie M. Harris

Amanita virosa, the destroying angel, is among the most poisonous of mushrooms. The smell of even harmless mushrooms, wrote Donald Culross Peattie in his 1939 *Flowering Earth*, "can carry you . . . to the old earth's doors of death." But in the last chapter of that book, an excerpt of which begins on page 30, he notes that they are an indispensable cog in the clockwork of life on this planet.

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COMMENTARY

The summer was exceptionally busy for AHS. We sought support for new projects, improved the gardens at River Farm, and developed a more solid relationship among our various constituencies. As President of the Board of Directors, I will concentrate this month on updating you on its recent activities.

We decided unanimously to reevaluate the Society's mission. "Promoting excellence in horticulture" is not sufficiently clear. We have now agreed that the organization is responsible to its members for "acquiring, developing, and disseminating horticultural information and knowledge."

We acquire useful information every day through our publications staff, the Gardeners' Information Service, and our relationship with other societies and gardeners throughout the world. This is reviewed, assessed, and the most timely passed on to members in future publications. Information that is partial or intriguing is investigated and further developed. In the future, we hope to expand this type of work and initiate and support studies in such areas as plant-people interactions, gardening trends, horticultural education, consumer behavior, and environmental problems.

To more effectively disseminate this information, our publications will continually be upgraded, as our finances permit. We will attempt to gain a fuller understanding of the interests of our reader-members by more frequently conducting reader surveys and demographic studies. The data provided by such studies—combined with sufficient funding—will allow us to make our publications more enjoyable, informative, and attractive. In addition, resources will be allocated to expand our seminars, lectures, and other educational programs so that we can reach very specific groups of people with information especially relevant to them.

Our membership provides us with a great resource for dissemination. It not only channels important information to us, but also broadcasts knowledge and news to others. One of the most profound examples of our membership's strength is the Annual Meeting. At the 1991 meeting last April in Birmingham, Alabama, the group took on a life of its own: sharing, learning, and enjoying the pleasures of an association not only with horticulture, but also with each other.

We would like to see this sort of association occurring more than once a year, in more locations throughout the country. To release resources for more regional events, the Board has voted that beginning in 1992, the Annual Meeting will now be held every year in Washington, D.C., in October. It will be focused primarily on our Annual Awards Program—the award recipients and their work—and the official business of the Society. It will also be briefer, although the Board's travel committee is already at work to create optional coinciding tours.

These are the broad areas in which we are working to achieve our mission. Tell your gardening friends that we are committed to helping them, and ask them to join our growing force.

George C. Ball Jr., AHS President

LETTERS

Reason and the Environment

I was pleased to read George Ball's "Commentary" in the June issue of *American Horticulturist*. He spoke so well, putting into words what I have felt for some time. Regarding issues that we are facing today, too few knowledgeable people seem to be speaking out to correct misconceptions, and to remind people to use reason and careful thinking concerning the environment, use of pesticides, etc. I don't understand why the average person is willing to take the word of a celebrity on an issue. Acting well on film doesn't qualify anyone to be an expert in all fields. I also wonder how many people followed up on the statements made in the Alar incident, for example, and discovered the lack of scientific data behind the information generated by a research institute that used a post office box as an address. Also, did all these sympathetic people who refused to buy or eat apples have any concept of the impact this incident had on the apple growers? I sound like I'm on a soap box, don't I?

Thank you for being willing to acquire accurate information and pass it on to the members of our Society. Hopefully, we as individuals and as part of the American Horticultural Society can make a positive difference.

Pat Smart
Carbondale, Illinois

Timely and Needed

I congratulate George Ball on the "Commentary" piece published in the June edition of the *American Horticulturist*. His plea for balance and perspective for environmental issues is both timely and needed. I hope AHS members will catch his zeal and carry it forward to their constituencies!

Jay J. Vroom
President
National Agricultural Chemicals Association
Washington, D.C.

The Cost of Waiting

I was pleased with the content of my first issue of *American Horticulturist*, but not with the lack of understanding for environmental concerns in your "Commentary." I, too, am frustrated with entertainment personalities who become overnight experts in environmental sciences; but this does not make such concerns less valid. I also agree that a balanced view is to be sought, rather than a Ludditelike response to new technology. What I do not agree with is the idea that more environmentally sound gardening will cause hardship to farmers and consumers. I have heard similar arguments about conservation and global warming despite the economic success of both West Germany and Japan, which has been coupled with progressively more energy conservation in those countries.

One of the best arguments on this subject comes from Karl-Henrik Robert, a Swedish doctor who was able to develop a consensus called "The Natural Step" among Swedish scientists and businessmen. In "Educating a Nation: The Natural Step" in the spring 1991 issue of *In Context* he says:

"To argue about the cost of that restoration borders on the absurd. The question is not how much it will cost, but rather how much it will cost to hide in ignorance and wait for the problem to become even bigger. It may have been possible to postpone payment for a few decades, but now the bills are starting to pile up: It is already more expensive to harvest declining fish stocks over wider and wider areas; it is already more expensive to make water fit to drink; and we haven't even started to pay for the cleanup of toxic metals, radioactive and otherwise, that we are constantly injecting into our world."

I would ask you to remember the pleas of farmers and chemical companies when DDT was banned. And now some two decades later who was right, the agricultural business or the environmentalists?

Patricia A. Ashley
Greensboro, North Carolina

AHS Affiliates

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

Botanica, The Wichita Gardens
Dallas Arboretum and Botanical Garden
East Tennessee Horticulture and Landscape Association
Friends of Fellows Riverside Gardens
Youngstown, Ohio
Friends of the University of California Botanical Garden
Berkeley, California
Illinois Native Plant Society
Westville, Illinois
Kentucky Native Plant Society
Richmond, Kentucky
Master Gardeners International Corporation
Matthaei Botanical Gardens
Ann Arbor, Michigan
Memphis Botanic Garden Foundation
Nebraska Statewide Arboretum
Oklahoma Botanic Garden and Arboretum
Texas State Horticultural Society
Wellesley College Friends of Horticulture

AHS MEMBERSHIP SERVICES

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Heightened Awareness

I, like some of your other readers, was disturbed by George Ball's "Commentary" in the June issue. Granted, some of the "celebrities" of which he speaks may be too loud or ill-advised about some of their protests, but I believe that they are helping to make the general public more aware of the policies of industry and the federal government. These groups usually make decisions unknown to the public, ranging from agriculture to tree cutting, which can have long-term effects on all living things. If Rachel Carson hadn't spoken out about the dangers of DDT, we might be living through silent as well as barren springs now.

Margaret M. Lord
Ellicott City, Maryland

Trademarks, Not Cultivars

In Robert Staton's article "Landscaping with Roses" (June), roses in the Meidiland series by the Conard-Pyle Company are all listed by their trademark names as cultivars.

On the surface, this may seem like a relatively small problem. Unfortunately, the trademarking of individual plants and the resulting confusion with cultivar names threatens our ability to make permanent reference to a particular taxon. For example, suppose Conard-Pyle decides to use the trademark name Red Meidiland on a different rose from the one described in Mr. Staton's article? They can do that with trademark names. Subsequent reference to that article will then lead to the wrong plant. The stability of horticultural nomenclature is in serious jeopardy due to confusion on this issue and carelessness with nomenclature. I hope that horticultural publications, trade associations, and public gardens can serve as informed resources for correct nomenclature and advocates for its stability.

Timothy C. Hohn
Curator of Living Collections
Center for Urban Horticulture
Washington Park Arboretum
Seattle, Washington

That's No *Dianthus*

I have been a member of AHS since 1987 and have enjoyed your lovely, informative magazine.

I am writing in regard to the June article, "Comely Companions," by Rayford Redell. The article is wonderful, except I am quite certain that a photo on page 34 incorrectly identifies a plant as *Dianthus* when it is *Lychnis coronaria* 'Alba'. Although there may be a cultivar of *Dianthus* of which I am unaware that so closely resembles *Lychnis*, I do not think that is the case. If this is not my beloved *Lychnis*, please clarify the identification of this plant.

Janice McGee
Newton, Massachusetts

Right you are. Alan Summers of Carroll Gardens, which sells both plants, says that the one in the photograph is "without question" Lychnis coronaria *'Alba'.*

More on *Oenothera*

In Mary Beth Wiesner's article, "Some Enchanted Evenings," in the August *American Horticulturist* she calls *Oenothera speciosa* Mexican evening primrose, while California gardeners universally know that the beloved *O. berlandieri* is the Mexican evening primrose. I have never seen *O. speciosa* offered for sale, but every nursery carries *O. berlandieri*, which blooms pink with yellow centers. If you'd like to see one, just look at the photo on page 19, which is mislabeled *O. speciosa.*

O. berlandieri is not even mentioned in this article, which purports to cover the subject thoroughly! In California, it is as common as pansies in Pawtucket.

Jeff Cox
Sebastopol, California

And More

May I add some more information to your article on *Oenothera* in the August issue of *American Horticulturist?*

Oenothera macrocarpa is very much at home on our glades, those dry, rocky, open slopes without aquifer, and it is not uncommon to see hundreds of flowers from one viewpoint. I have photographed blooms on which the distance from ovary to stigma is an astonishing seven inches. The flowers open quite slowly during the evening. In well-drained garden locations I had as many as twenty-six flowers open on one plant in one day!

O. speciosa never turns "pink after blooming" as your caption for the picture states. The flowers are either pink or white. In Missouri the pink flowers are much seen along roads and highways, often completely covering long stretches of rights-of-way. The species has a very wide distribution in the South and Midwest and was introduced in the Eastern United States.

O. triloba, rare in our parts, has large yellow flowers that open in a few seconds in late evening. Their closing is entirely dependent on temperature. On hot nights they are closed by 3 a.m. But on those rare

cool nights, they stay open until midmorning. On one occasion, when the thermometer went to 40 degrees in June, they stayed open two days.

I would have been much interested to hear about *O. grandiflora*, that robust, large-flowered species, to four feet tall with a long flowering period and masses of flowers. What is its origin?

Edgar Denison
Author
Missouri Wildflowers
St. Louis, Missouri

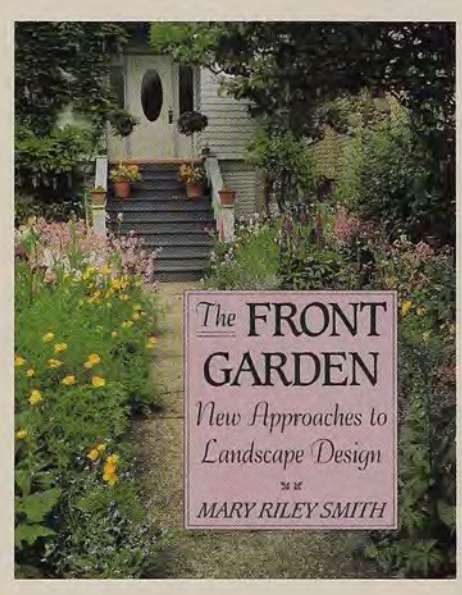
In response to Jeff Cox, as we indicated in the original article, some Oenothera *species have been referred to by several different botanical names. Dr. Peter Raven, director of the Missouri Botanical Garden, and his colleagues have been studying Onagraceae, the evening primrose family, for thirty-five years. They have determined that* O. speciosa *and* O. berlandieri *are the same plant with two different flower color forms—one, the original* O. speciosa, *is white, blooms at sunset, and is native from Kansas to Texas; the other, originally called* O. berlandieri, *is pink or rose purple, blooms at sunrise, and is native to Texas and northeastern Mexico.* O. speciosa, *being the earlier name, is the correct name for both forms, although you will find the rose-flowered form listed in nursery catalogs as* O. berlandieri. *It is available from Lamb Nurseries, East 101 Sharp Avenue, Spokane WA 99202 (Catalog $1) and Forestfarm, 990 Tetherah Road, Williams, OR 97544 (Catalog $3). Sources for* O. speciosa *were listed in the August issue.*

In regard to Edgar Denison's letter, Raven says that some of the white-flowered forms of O. speciosa *may turn pink after they are pollinated.*

According to Dr. Warren Wagner, a former student of Raven's and a taxonomic expert on the Oenothera *genus,* O. grandiflora *is a rare, Southeastern United States native. It is night blooming with large yellow flowers. The name* O. grandiflora *has also been applied to* O. glazioviana, *but there are some differences in the two plants.* O. glazioviana *has wavy leaves and reddish-colored sepals.* O. grandiflora *has flatter leaves and yellowish green sepals. Sources for* O. glazioviana *were listed in the August issue; we were unable to locate a source for* O. grandiflora.

American Horticulturist *welcomes letters concerning the magazine or activities of the American Horticultural Society. Letters may be edited for accuracy, clarity, or length. In writing to us, please include a daytime phone number.*

BOOK REVIEWS



The Front Garden

Mary Riley Smith. Houghton Mifflin, Boston, Massachusetts, 1991. 192 pages. Color photographs. Publisher's price, hardcover: $27.95. AHS member price: $23.75.

Mary Riley Smith's attractive *The Front Garden* sets out to be a guide and tutor for homeowners with a desire to create their own front gardens. She lays out the principles landscape architects use to design an appropriate style of garden, and ways to evaluate your front property's potential.

Passing through suburbia today, one can't help thinking that there must be something more visually interesting than lawns and foundation shrubs. Smith's book is on the correct wavelength. She explains the historic background of our gardens and why we are stuck on lawns with beds and borders. This book opens the mind to the possibilities of a creative landscape, rather than simply a lawn.

The schemes discussed are sufficiently small and within the scope of many homeowners, covering a wide geographic range within the continental United States. The gardens illustrated are designed for efficient movement using paths and driveways, and to display plantings in the most aesthetically appropriate way. The many beautiful photographs show plants in full bloom—I could not help wondering, though, what these front gardens would look like in winter.

Smith mentions several times the need to make use of the front garden as an additional living space or for pool or patio. This promised to be quite exciting, but as I looked through the various examples, none appeared to attempt this brave feat. It seems we are firmly entrenched in the notion that front gardens are for display purposes only. This may be the accepted attitude, but there is a minority of gardeners who are making efforts to use the front as a living area. These gardens are very different in that they usually have fences, walls, or hedges that obscure or partly obscure the house. It is these enclosed gardens or courtyards that will be seen more frequently as America's population density increases.

Plants are discussed, but only as secondary to architectural features. The gardens illustrated appear well planted and composed. What Smith does not discuss in detail is their composition—the schematics of color, form, and seasonal variation that guided the designs.

A stress on decorative values crops up occasionally; for example, it is implied that even a seldom-used front door should have a fully planted and lit approach to effect a good appearance from the street, when perhaps its very existence should be questioned. And a porch, Smith suggests, should be furnished even if not used, to "make the front of your house look more gracious."

On the whole, the book is commendable as a provocative and intelligent introduction to the complex process of garden design, in which the author is clearly well versed. Should this volume provoke the replacement of turf with interesting and better thought-out planting and landscape, then it has served its purpose well.

—Alastair E. Bolton

Alastair E. Bolton is a British architect who practiced on the West Coast for the last ten years. He is currently the AHS horticultural intern.

Perennials: Enduring Classics for the Contemporary Garden

Annuals: Yearly Classics for the Contemporary Garden

Rob Proctor. Color photos by Rob Gray. Harper Collins Publishers, New York, 1991. 160 pages. Publisher's price each, hardcover: $29.95. AHS member price each: $25.45.

These are books to capture one's rapt attention, to engross one's mind, to linger over and savor, once you become aware of the author's intent. For both books, Proctor explains his mission succinctly in his preface to *Perennials:* "This is a book, not about the history of perennial flowers, but rather about perennials with a history." Proctor says he's writing about antique flowers. So what's an antique? In his preface to *Annuals* he defines them as "flowers which have been cultivated at least a hundred years."

The photographs in both books are glorious and abundant. New York photographer Rob Gray has a keen eye for composition, color, and form. Watercolors by Rob Proctor display his artistic bent.

The historical accounts of these flowers are fascinating. The fact is, you won't know you're reading history. Take the story of sweet peas:

". . . when the Bi-Centenary Sweet Pea Exhibition was held at the Crystal Palace (in England) in 1900, more than half of the 264 varieties shown were (Henry) Eckford's. By that time, no dinner table or wedding bouquet in England or America was complete without sweet peas. Rare was the garden that did not sport a fence or trellis of them. Teepee structures of brush and thin wooden stakes were erected for the twining vines to climb. Even city dwellers could enjoy the flowers, for they were raised by the thousands under glass."

Proctor, who teaches at the Denver Botanic Gardens, has been enthralled by flowers since early childhood and this enchantment spills over into his writing. He writes with clarity, brevity, and subtle humor.

These books are not how-to manuals. Rather, they are for leisurely reading. (If I said they're educational, would that turn anyone off? Schoolroom texts should be so palatable, so pleasurable!) These two books easily could be called coffee table candidates. But be wary of the indexes; they are bummers. There are so few subcategories, you almost need to reread the book to find the information you're after. But it's good that plant and seed sources are listed, along with plant societies and educational organizations.

In summary, one could assert (in the terms of the John Denver song) that this duo gives one a Rocky Mountain high.

—Frank Good

Frank Good is the garden columnist for the Wichita Eagle-Beacon.

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- ☐ Annuals $25.45

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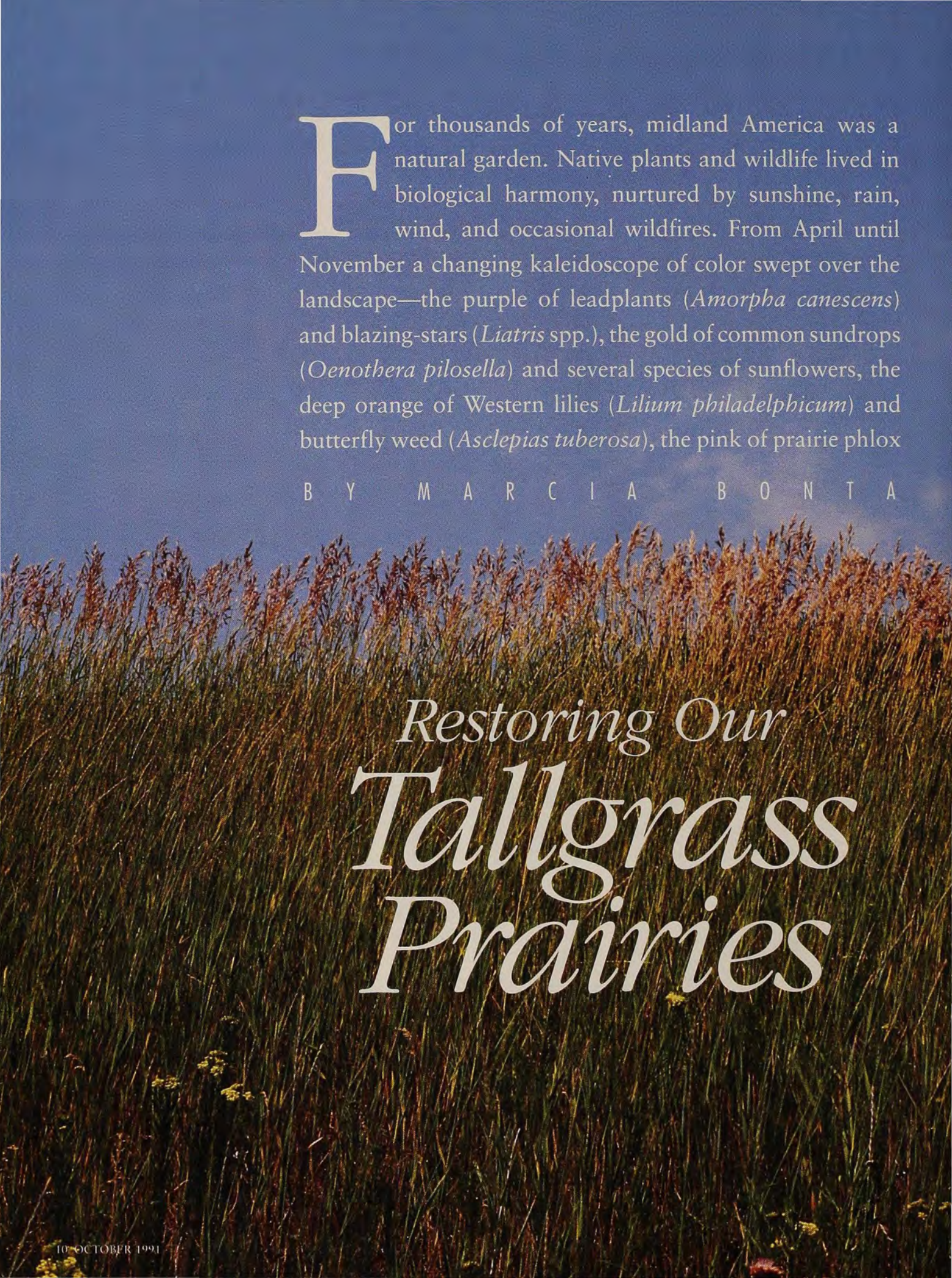


Restoring Our Tallgrass Prairies

For thousands of years, midland America was a natural garden. Native plants and wildlife lived in biological harmony, nurtured by sunshine, rain, wind, and occasional wildfires. From April until November a changing kaleidoscope of color swept over the landscape—the purple of leadplants (*Amorpha canescens*) and blazing-stars (*Liatris* spp.), the gold of common sundrops (*Oenothera pilosella*) and several species of sunflowers, the deep orange of Western lilies (*Lilium philadelphicum*) and butterfly weed (*Asclepias tuberosa*), the pink of prairie phlox

BY MARCIA BONTA

Northern Illinois was once rich in tall grasses and their companion forbs and fauna. A few dedicated individuals are working to bring them back.

Three-quarters of the "lawns of God" were carpeted with little bluestem (Andropogon scoparius) *(left and right) and big bluestem* (A. gerardii).

P. M. BROWN: PHOTO/NATS

DAVID M. STONE: PHOTO/NATS

BRUCE BONTA

*Above: Dr. Gerould Wilhelm, botanist at the Morton Arboretum's Schulenberg Prairie, says such restored areas provide "a bit of a link with the cosmos." Right: Shooting-star (*Dodecatheon meadia*).*

(*Phlox pilosa*), and the violet-blue of spiderworts (*Tradescantia* spp.)—altogether nearly 300 species of grasses and wildflowers.

Vast herds of bison, elk, pronghorn antelope, and white-tailed deer grazed on what John Madson, in *Where the Sky Began, Land of the Tallgrass Prairies*, calls the "lawns of God." Those grasses consisted primarily of big bluestem (*Andropogon gerardii*) and little bluestem (*A. scoparius*), which made up three-quarters of the original tallgrass prairies. Countless insects lived on and pollinated the wildflowers. Predators such as wolves, coyotes, foxes, and prairie falcons preyed on the grazing animals as well as on squirrels, black-tailed prairie dogs, and prairie chickens. Native Americans took advantage of what were probably the richest hunting grounds in the world with a biodiversity that rivaled the tropical forests.

Into this well-balanced human and natural community came the first European pioneers. Emerging from the deep woods of Eastern North America, they confronted a sea of grasses ten feet high. At first they were frightened by the vast landscape, flat to the horizon and dominated by endless sky, a treeless plain with firm yet springy soil. Surely land that could not grow trees was useless for agricultural purposes, they thought.

History does not record the name of the farmer who disproved the doubters by turning the first furrow and discovering a soil of deep loam, black with humus. That soil had been created following the Ice Age when winds lifted clouds of ground rock from extinct glacial rivers and carried it east in dust storms. It fell as powdery Aeolian soil called "loess." Loess is highly permeable and in a hot and dry climate such as that of the northern Midwest 4,000 to 8,000 years ago, it produces luxuriant grasses. During that period prairies advanced as far east as western Pennsylvania, but when the climate became moister and cooler, trees pushed the true prairie farther west where wind and wildfire—prime components of a grassland climate—kept much of the Midwest a vast grassland. Those grasses and prairie wildflowers developed deep roots to resist drought and tough leaves to withstand insect attacks. Most prairie plants are also perennials with deep underground parts that fire can't reach. Fire, in fact, often stimulated them to grow better.

But, in less than a generation, the "lawns of God" were converted into the fields of humanity. Few people mourned or even noticed their passing. So fast did the tallgrass prairie disappear beneath the plow that no biologists had a chance to study it.

The best of the tallgrass prairie was found in northern Illinois, appropriately named the Prairie State. Yet, of the original 40,000 square miles of prairie in Illinois, less than four square miles remain. Those remainders are mostly in bits and pieces, in pioneer graveyards and along railroad rights-of-way, and most of them have been heavily infested with what prairie ecologists derisively call "Eurasian weeds."

Once the prairie was gone, a few voices spoke up in its favor. Back-yard gardeners experimented with prairie restoration, but what they grew were beautiful prairie flowers in isolation. The idea of recreating an entire, integrated ecosystem of grasses, wildflowers, and wildlife took longer to evolve. It began back in 1935, as a result of ecologist Aldo Leopold's urging, with the Curtis Prairies at the University of Wisconsin—Madison's Arboretum. Possibly the world's oldest intentionally restored ecosystem, that pioneer effort spurred on restoration attempts in other prairie states.

Three men provided the catalyst for the prairie restoration movement in Illinois: horticulturist Ray Schulenberg and plant taxonomist Floyd Swink of the Morton Arboretum in Lisle, and biologist and biochemist Robert Betz of Northeastern Illinois University in Chicago. Swink, author of the definitive *Flora of the Chicago Region,* launched the movement by leading field trips to local prairie remnants. Betz joined him on one trip in 1960 and fell in love with the prairie. Schulenberg, who had been working at the arboretum since 1955, similarly fell under the prairie spell during Swink-led field trips. The triumvirate began spending their Saturdays together searching for prairie remnants in the Chicago area.

Once they found them, they started experimenting with ways to enrich the remnants that had been almost completely overwhelmed by mowing and Eurasian weeds. Their major techniques, adapted from the experiments in Wisconsin, consisted of hand weeding and burning. Fire, which the Native Americans had called the "Red Buffalo," had always occurred naturally on the prairies, and they sometimes had helped the process along by setting their own fires to improve hunting. What burning did, Schulenberg and Betz discovered, was kill the shallow-rooted, fast-growing Eurasian weeds and encourage the slow-growing, deeply rooted

prairie grasses and flowers.

In 1962 Schulenberg was asked by Clarence E. Godshalk, then director of Morton Arboretum, to reestablish a prairie on twenty-five acres of newly acquired arboretum land. In the opinion of Dr. Gerould Wilhelm, botanist and Schulenberg's successor at the Morton Arboretum, the site now is "absolutely the richest restored area" anywhere in terms of plant diversity.

Schulenberg began by hand collecting seeds from prairie remants within a fifty-mile radius of the arboretum. The seeds were cleaned and stored under cold, damp conditions while he repeatedly tilled the soil to kill as many weeds as possible. The following spring some seeds were planted in flats and replanted as seedlings into the tilled earth. In other cases several seed species were mixed and broadcast onto the plot, then raked and rolled in to create a more natural looking prairie. A team of workers, squatting on planks to keep from compacting the soil, gave the plot three painstaking hand weedings the first season and one the next year before the prairie plants could hold their own against the foreigners. To keep the latter in check, Schulenberg then began burning the prairie every three years in late March or early April.

By 1980, six years after Wilhelm joined the arboretum staff, the prairie was being burned every year, which "caused it to explode in richness and health," Wilhelm says. Today what began as an experiment in prairie restoration is a success, at least in the eyes of a dedicated botanist.

Although there are no buffalo or antelope here, on a windy June day a visitor can take a seven-tenths-mile trail through the Schulenberg Prairie of the Morton Arboretum and imagine what it must have been like 150 years ago. There are thousands of pale purple coneflowers (*Echinacea pallida*) and wild false indigoes (*Baptisia leucophaea*) with their cones of white flowers, interspersed with pockets of bright lavender wild bergamot (*Monarda fistulosa*), black-eyed Susan (*Rudbeckia hirta*), common purple spiderwort (*Tradescantia ohiensis*), and tall yellow coreopsis (*Coreopsis tripteris*). Their colors are splashed against the variegated greens of prickly rattlesnake-master (*Eryngium yuccifolium*), the stiff, fernlike leaves of compass plant (*Silphium laciniatum*), the enormous elliptical leaves of prairie dock (*S. terebinthinaceum*), and the grassy stems of big bluestem, Indian grass (*Sorghastrum nutans*), switch grass (*Panicum virgatum*), little bluestem, and prairie dropseed (*Sporobolus heterolepsis*). The sight usually makes an instant prairie convert out of every visitor. How much lovelier than what Wilhelm calls the "corporate campus" of mowed annual grass preferred by Midwestern homeowners and developers.

PAMELA HARPER

Above: Yellow coneflower (*Ratibida pinnata*) survives weed competition and helps prepare prairie soil for less aggressive natives. Right: Wild bergamot (*Monarda fistulosa*) and black-eyed Susans (*Rudbeckia hirta*).

The pioneering Schulenberg Prairie is an example of what can be done on a small scale to restore a little of the "genetic memory" of northern Illinois. Although Wilhelm agrees with every other prairie restorer that the prairie "will never be the same as it was," he argues: "It will be better than a monoculture." Wilhelm, a visionary, hopes that "restoration will tune people into native vegetation."

Schulenberg's friend, Robert Betz, went for the gold—a full-scale attempt to restore an entire ecosystem complete with its complement of wildlife. The site he chose for this bygone environment is the very embodiment of the Atomic Age: the grounds of the Fermi National Accelerator Laboratory, a high-energy physics research center thirty miles west of Chicago in Batavia. Fermilab, as it is popularly called, is operated for the U.S. Department of Energy by a consortium of universities and was created to shatter protons to study their composition. The shattering occurs in an enormous, half-buried tube, called the proton accelerator ring, four miles in circumference. Beginning in 1975, a year after Schulenberg launched his experiment, Betz persuaded Dr. Robert R. Wilson, nuclear physicist and the first director of Fermilab, to allow him to restore to prairie the 455 acres within the proton accelerator ring.

With such large acreage, hand weeding, once the seeds were sown, was impossible. Fire became Betz's major tool from the beginning, although he used it more as a stimulant to the native plants than as a deterrent to the Eurasian weeds. But he discovered that only some prairie species, despite the stimulant of fire, would survive weed competition. Those plants he calls the "prairie matrix." By preparing the land for less aggressive native species, they represented the first stage in prairie restoration. Those "prairie matrix" plants include three grass species—big bluestem, switch grass, and prairie cordgrass (*Spartina pectinata*)—as well as legumes such as wild false indigo, rough-headed bush clover (*Lespedeza capitata*), and showy tick-trefoil (*Desmodium canadense*), and the composites—tall coreopsis, compass plant, and yellow coneflower (*Ratibida pinnata*).

Once an area reached that first "prairie matrix" stage, Betz and his team seeded the less aggressive native plants, such as shooting-star (*Dodecatheon meadia*), prairie blazing-star (*Liatris pycnostachya*), and prairie dropseed. Within ten years, 115 prairie plants were thriving and more are being added every year. He has also begun expanding outside the ring. Like his friend Schulenberg, Betz believes in hand collecting seed within a fifty mile radius of the Fermilab, since local plants are already adapted to the area. For this reason, every prairie restoration is dependent on seed-collecting volunteers who are trained to harvest the seeds from prairie remnants at the proper time without damaging the existing ecosystem.

Some of Betz's most valuable ideas for prairie restoration techniques come from his continual work and observation at one of the best remnants of tallgrass prairie—the 100-acre Gensburg-Markham Prairie in a suburb twenty-five miles southwest of the Chicago Loop. Back in 1960, shortly after Betz caught "prairie fever" from Floyd Swink, he went to visit a relative in Markham. Setting out for a walk in a nearby field, he was amazed to find himself in a high-quality prairie. The land proved to have numerous owners who had abandoned it during the Depression and had become scattered throughout the country. Years of Betz's working with local people interested in saving the prairie finally resulted in its purchase, with the help of the Nature Conservancy, by Northeastern Illinois University.

ANITA SABARESE

Markham, in fact, is now known as the Prairie Capital of the Prairie State because three other "old fields" on the outskirts of the town have also proved to be original prairie. Together with the Gensburg-Markham Prairie, they are collectively known as the Indian Boundary Prairies. Recently declared a National Natural Landmark, these prairies are cared for by volunteer members of the Friends of the Indian Boundary Prairies under the watchful eye of site manager Ron Panzer.

Ecologically, the Markham prairies are similar to that existing 8,000 years ago after the recession of the last glaciers. For this reason, they harbor rare butterflies and moths, leafhoppers, grasshoppers, and katydids found nowhere else in Illinois, although once, when prairies were common, the insects that depended on prairie plants were "as common as mosquitoes," says Panzer. But the rarest creatures discovered so far are nine species of the moth genus *Papaipema,* each of which is dependent on a different prairie plant, according to Panzer.

It is also the only prairie in Cook County large enough to support prairie-loving bobolinks, eastern meadowlarks, Henslow's sparrows, and the elusive yellow rail.

*Above: Switch grass (*Panicum virgatum*) is among the plants biologist Robert Betz calls the "prairie matrix." Right: Green or prairie milkweed (*Asclepias hirtella*).*

Another indicator of high-quality prairie is the presence of the rare, smooth green snake and the gray fox, now rare for Illinois but which has two or three dens here. Also found here is Franklin's ground squirrel, a tallgrass prairie native whose primary foods are prairie grasses and tender herbaceous plants. Shorter than a gray squir-

TO BECOME PART OF THE SOLUTION AND LEARN MORE ABOUT PRAIRIES

If you live in northern Illinois, you can become a volunteer steward and work to save literally dozens of prairie remnants in McHenry, Lake, Kane, DuPage, Cook, and Will counties by writing to the Nature Conservancy, 79 West Monroe Street, Chicago, IL 60603 and asking about the restoration efforts in your area.

The Friends of the Indian Boundary Prairies, P.O. Box 394, Markham, IL 60426, offers several levels of membership. For $5 you receive a one-year subscription to their *Paintbrush Prairie* newsletter. For $25 you become a contributing member and receive an original eight-by-ten color photograph of the prairie in addition to the newsletter. Fifty dollars makes you a "friend" and earns you a personal guided tour of the Markham prairie of your choice. This grassroots organization also sells note cards and has frequent fundraisers. The Gensburg-Markham Prairie is open to visitors seven days a week free of charge. George Derkovitz, the Friends' president, recommends the Fourth of July week as the time when the prairie plants are at their most spectacular.

The Morton Arboretum offers a 1,500-acre oasis of woods, fields, and gardens, interlaced with trails. Other native plant communities include a bur reed marsh and the best surviving example of an oak-maple forest in the Chicago area. It has a visitor center, restaurant, and coffee shop, so you can comfortably spend an entire day there. Grounds are open every day of the year from 9 a.m. until 5 p.m. and later during the summer months. The Sterling Morton Library, a circulating library of horticulture, landscaping, natural history, ecology, and related topics, with its attendant May T. Watts Reading Garden, is a treasure. For more information write to the Morton Arboretum, Lisle, IL 60532 or call (708) 968-0074. Located twenty-five miles west of Chicago on Illinois Route 53, just north of Interstate 88, the arboretum also has an active membership program.

The Chicago Botanic Garden is open daily from 8 a.m. until sunset. Visitors can dine at the restaurant in the education center or at designated picnic spots. Owned by the Forest Preserve District of Cook County and managed by the Chicago Horticultural Society, it is twenty-five miles north of downtown Chicago on Lake Cook Road in Glencoe, Illinois. Follow the Edens Expressway (94-41) north to Lake Cook Road and go east one-half mile to the entrance. Call (708) 835-5440 for further information about the garden and about membership. The garden also has an excellent book shop with many dozens of books on natural landscaping and prairie plants.

—Marcia Bonta

ROB AND MELISSA SIMPSON

rel, it has a less bushy tail, shorter ears, and a tawny body. Panzer has collected the squirrels in unprotected prairie areas and set them loose at Markham. Betz and Panzer are trying to reintroduce some prairie animals at the Fermilab, as well.

One of Panzer's greatest discoveries has been *Papaipema eryngii,* a prairie moth thought to be extinct and which feeds only on rattlesnake-master. His codiscoverer, George Derkovitz, is a volunteer steward and the president of Friends of the Indian Boundary Prairies. You can find him at the prairie most Saturdays, hand weeding, cutting out invasive woody shrubs, or applying herbicide on such pests as alder and honeysuckle. Burning does not touch those plants. Because burning will kill susceptible insects, such as nine species of root-boring moths when they are in the larval or pupal states, it is done in sections in a three-year rotation, and if the wind causes the flames to skip some areas, they are left alone. This so-called "skip policy" mimics the kinds of burns that would occur naturally.

To Derkovitz, just being there "gives me peace of mind." Janice Graden, vice president of the Friends, is also totally hooked by the incredible diversity of plant and animal life. "You don't want to leave. You might miss something." On a June day bobolinks, Henslow's sparrows, eastern meadowlarks, and grasshopper sparrows are easily visible against a panorama of color hard to believe. In one section, *Phlox glaberrima* reigns supreme. Both the indigos (*Baptisia leucantha* and *B. leucophaea*) grow in abundance. According to Derkovitz, no other preserve has hundreds of *Lilium philadelphicum* as they do. Earlier in the season, the prairie violet (*Viola pedatifida*) produces thousands of blooms. There is also a large population of green or prairie milkweed (*Asclepias hirtella*), another relatively rare prairie plant in Illinois. Panzer claims that "97 to 98 percent of all the life that ever lived here still exists on the prairies in Markham. This is the crown jewel."

Places such as the Markham prairies have inspired incredible interest and pride in the natural prairie communities indigenous to the Chicago area. Another experiment in prairie restoration was begun at the Chicago Botanic Garden in 1982. Their eventual goal is to have a sampling of six different prairie communities—tallgrass, wet, gravel hill, fen, sand, and bur oak savanna. Since the area they have available—fifteen acres—and the long-disturbed soil is not conducive to true prairie restoration, they see the major function of their prairie project as education. With half a million visitors each year, they hope to provide interested people with a primer on prairie ecology that emphasizes biodiversity. Says Dave Sollenberger, director of the project: "Our prairie is a generic prairie. We don't have a prairie soil profile. The dirt is brought in from all over, so it will never be a pristine, natural prairie." But the illusion is there and so are many of the familiar prairie plants such as tall coreopsis, butterfly weed, compass plant, rattlesnake-master, and blazing-star.

For a gardener, the Chicago Botanic Garden restoration may provide the best help in trying to go home and do likewise. This small-scale project, attempted on insufficient soil and with six models to choose from, should encourage experimentation and innovation. Already, thousands of people throughout the Midwest have created so-called pocket prairies in their back yards and even their front lawns. The results are both beautiful and economical; once established, pocket prairies need little of the care required by standard lawns. Even large corporations are jumping on the prairie restoration bandwagon instead of seeding their grounds with Kentucky bluegrass.

Western lilies (*Lilium philadelphicum*) appear by the hundreds in the Gensburg-Markham prairie.

To restore a prairie, as Schulenberg and Betz have done, is "not science, but art," Gerould Wilhelm says. In fact it goes beyond most art, he says, by providing "a bit of a link with the cosmos." In these latter days of the twentieth century when destruction of the earth's natural systems seems irrevocable, to be part of the prairie restoration movement is to be part of the solution. With gardeners, botanists, entomologists, homemakers, and volunteers from all walks of life joining in the effort, the Midwest is producing the very best kind of citizens' army.

Marcia Bonta, a frequent contributor to American Horticulturist, *is the author of* Women in the Field.

SOURCES

LaFayette Home Nursery, Inc., Rural Route 1, Box 1A, Lafayette, IL 61449, (309) 995-3311. Catalog $2.

Landscape Alternatives, Inc., 1465 Pascal Street, St. Paul, MN 55108, (612) 647-9571. Catalog $1.

Prairie Nursery, P.O. Box 306, Westfield, WI 53964, (608) 296-3679. Catalog $3.

Prairie Ridge Nursery, Rural Route 2, 9738 Overland Road, Mount Horeb, WI 53572, (608) 437-5245. Catalog $2.

Prairie Seed Source, P.O. Box 83, North Lake, WI 53064. Catalog $1.

The Many Faces of HORTICULTURAL THERAPY

These programs offer 18-year-olds with head injuries a means of independence and 80-year-old nursing home residents a way to stay in touch with the world. Last of two parts.

BY THELMA E. HONEY

It's nearly impossible to persuade most teen-agers to help with the garden. But Larry Harned was different. Raised in a California farming community, he had enjoyed helping his family raise vegetables from the time he was thirteen. He continued experimenting with new crops after he entered the service. But in May 1987, a bullet wound to the spine left Harned a quadriplegic.

Today, 23-year-old Harned is still able to enjoy gardening. Through the horticultural therapy program for spine-injured patients at the **Long Beach** (California) **Veterans Administration Medical Center,** he has learned to use various types of mouth sticks to plant seeds, pick beans, and cultivate his crops. He uses a straw to water the seeds.

Harned's success story is just one from the horticultural therapy programs across the country serving individuals of all ages and a wide range of disabilities.

In the 1950s, psychiatrist Dr. Karl Menninger, who later established the famous Menninger Foundation in Topeka, Kansas, introduced greenhouse operations at the Winter Veterans Administration Hospital in that town. Today, it is one of a half dozen Veterans Administration medical centers

COURTESY OF THE JEWISH HOME

A resident of Atlanta's Jewish Home and a second grader from a nearby school plant a dish garden together.

with horticultural therapy programs.

Jim Bradford, vocational rehabilitation therapist who supervises the Long Beach program, insists like so many other horticultural therapists that plants are only a by-product. "Our patients' garden is something we are proud of, but unlike regular gardens, our primary product is the recovery of our patients," says Bradford.

He works with a mix of spinal cord, psychiatric, and chronic pain inpatients and outpatients, usually about thirty-five patients at a time. Patients with spinal injuries garden in raised, wheelchair-accessible beds. Those unable to use their arms, like Harned, plant seeds using "bird-beek" mouth sticks. Patients with more mobility help maintain the front flower beds on the medical center grounds and more recently, the "Blue Star National Monument." Previously a fountain in an outdoor eating area, it was too thirsty to maintain through California's drought and has been converted to a colorful flower bed.

The garden has 100 trees, shrubs, and vines, which produce bananas, kiwis, apricots, apples, pears, guavas, peaches, figs, and avocados. Tomatoes, lettuce, cabbage, cauliflower, potatoes, beans, peas, zucchini, and other vegetables are produced year-round. Once a week, patients in the center's psychiatric day center prepare a meal under a therapist's supervision and serve it to other patients. In this way, patients reap the rewards of a constructive task.

This season for the first time, program participants began selling some of their produce—primarily tomatoes and cut flowers—with all of the proceeds going to the patients, says Bradford. "And Larry, because of all the help he gives us planting seeds, has done a lot to make this possible."

Another outstanding veterans' program, also in California, is at the **Brentwood VA Medical Center** in Los Angeles.

Horticultural therapist Ida Cousino started the program in January 1986 in an overgrown garden area that had been abandoned for three years. The fifteen-acre "Vet's Garden," hidden in the northeast corner of the Brentwood complex, now produces gourmet vegetables and herbs for some of Los Angeles's finest restaurants. Crops include 'Lemon Boy' and 'Yellow Pear' tomatoes, arugula, baby lettuce, chocolate bell peppers, French sorrel, chicory, Swiss chard, Asian sweet corn, chrysanthemum greens, European strawberries, and raspberries. Many of them are grown to accommodate a client restaurant's special needs. Produce is picked and delivered the same day. "Everything is almost still alive!" one chef exclaimed.

COURTESY OF TAMARACK, INC.

The purpose of the program is to integrate clients into mainstream life. For psychiatric patients, the peaceful setting reduces anxiety. "We're five minutes from the San Diego freeway," Cousino notes, "but it seems like we're in the country." The hard work of landscaping, planting, weeding, and harvesting provides exercise and allows them to work out aggression. Selling and delivering the produce develops social and business skills including punctuality, responsibility, and initiative and teaches marketable skills in grounds-keeping or landscaping work.

Seventy percent of the money received goes to the patients as a work incentive. The remainder goes back to the program, so that it pays for itself with the exception of staff salaries and the cost of running the facilities—a fifty-by-100-foot greenhouse, a fifty-by-eighty lath house, two offices, and a classroom.

As at the Long Beach VA and many other horticultural therapy programs, volunteers are essential to the program's success. These include seniors, children, Master Gardeners, and college and high school students, including some students who are developmentally disabled.

"Work here is a leveler," says Cousino. "We have a common denominator. We love our jobs. At day's end, we have dirt on our hands, sweat and dirt on our faces, mud on our shoes. And we're dead tired. These guys are so proud of the work they do and the things they grow. It's great because they are not getting recognition for being a vet who's sick but for being a person who's doing something worthwhile."

Some of these veterans' programs have individuals with crippling injuries among patients with other disabilities; other horticultural therapy programs deal solely with such clients, and prepare them for jobs.

Tamarack, Inc., in East Lansing, Michigan, offers transitional and semi-independent living programs to help those with head injuries regain lost skills while offering them and their families some financial support. Tamarack's philosophy is that cognitive, emotional, social, and vocational skills can best be relearned in a suppor-

COURTESY OF BRENTWOOD VA MEDICAL CENTER

Opposite: A patient prepares gift boxes of apples at Tamarack, Inc., in East Lansing, Michigan. Left: A veteran and his son work together in the greenhouse at the Brentwood VA Medical Center in Los Angeles. Below: Patients, staff, and volunteers at Tamarack's annual spring garden party.

COURTESY OF TAMARACK, INC.

tive environment that provides real-life activity and practical experience. Maria Gabaldo, the horticultural therapist who heads the program, explains that rehabilitation is aimed at regaining mental and physical losses, and teaching compensatory strategies for dealing with abilities that can't be regained. The extent of these losses varies greatly; the degree of neurological damage depends on such things as the severity of the impact to a patient's head, how long they were unconscious, and what part of their brain was damaged.

The program serves about 120 patients a year, most between 20 and 35 years old. About eighty-five of these are in day treatment; the rest live in the program's two residential homes, each of which accommodates six people.

Clients may be given individual therapy or join groups for prevocational evaluation and training.

The goals of individual therapy may be improving motor skills, organizational skills, or self-esteem. Clients are supervised and assisted with such activities as plant propagation and care, greenhouse maintenance, and flower arranging.

Those able to work in groups work in the greenhouse twelve hours a week. Their behavior and ability to follow written and verbal instructions is recorded and feedback is offered each day; the client and therapist work together to develop ways to compensate for the client's limitations. After this assessment phase, the client may participate in the less structured advanced vocational training work group. This group is responsible for planning and finishing such projects as building a compost bin, laying a sidewalk, painting a shed, constructing perennial beds, and pruning trees and shrubs. This allows them to practice their compensatory strategies and problem-solving skills.

The greenhouse provides material for nonvocational activities such as wreath-making, indoor plant maintenance classes, crafts, and a fall harvest party.

At the Tangram Nursery, part of the **Tangram Rehabilitation Network** in San Marcos, Texas, clients 18 and older with brain injuries get vocational training in a real business setting. Working in this wholesale/retail nursery set on thirty-seven acres, clients earn money, learn social skills, and gain self-confidence. This prepares them for a more independent lifestyle and competitive employment.

"From beginning to end," says horticultural therapist Harlan Shoulders, "the employment is treated as a real job with real consequences such as being fired, getting raises, and arranging for time off." The client fills out an application and is interviewed before being "hired." Clients in wheelchairs or walkers can work in the seed program. Those who are able are given more complicated jobs such as planting, grounds maintenance and landscaping, sales and deliveries, or greenhouse operations.

In addition to the 75,000 square feet of greenhouse space, there is a large container tree production area, four acres for field trees, an acre each of pecan and peach trees, and a bonsai area. There is a retail sales area of plants and tools where clients can practice social skills by interacting with customers.

An important aspect of Tangram is the client buying and selling program. Clients purchase plants, which are kept in the greenhouse, and are responsible for their

YOU CAN HELP!

The horticultural therapy programs profiled in this series are run by trained therapists, most with bachelor's or even advanced degrees. About half of the therapists have passed the registration requirements of the American Horticultural Therapy Association.

But there are too few trained therapists to meet the needs of all the special populations who could benefit from interacting with plants. And as we have noted many times throughout this article and part one in the August issue, volunteers are the lifeblood of most programs.

To be an effective volunteer, no special skills are required—just the desire to make life a bit easier or more enjoyable for another person. If our series hasn't mentioned a program in your area, check with local rehabilitation and vocational organizations, hospitals and nursing homes, mental health facilities, garden clubs, or senior centers, or call or write the American Horticultural Therapy Association to see if there is a program near you.

If not, you can help to start a program by introducing some of horticultural therapy's benefits. Nursing homes and day care and rehabilitation centers often welcome potted plants for foyers, dining rooms, and recreation rooms. Offer an easy-care plant or two with the commitment to go once a week to water and care for it. If you are a garden club member, suggest a modest project of planting a small outside garden.

Paul Allison, a horticultural therapist in British Columbia, notes that even viewing a garden from a window can be of tremendous value to patients confined indoors or to wheelchairs. Patients who can venture outside will benefit from safe paths with rails and fences to help with their sense of balance. Gardens should encourage exploration through contours and trellises that screen the view around the corner. These can pique curiosity and stretch ability to reach a gate or the next curve. And as noted in the main story, contrast in texture, scent, size, shape, and color can provide sensory stimulation.

If you are a caregiver, you and your patient might benefit from a potted plant. Your time is already full, so stay with a low-care plant. As Sandra Epstein of the Jewish Home in Atlanta points out, horticultural therapy can be as simple as a seed in a pot. Even simpler is the preplanted container. Pots of indoor plants, bulbs, and herbs, as well as dish gardens and terrariums are readily available from nurseries and other outlets. Mail-order catalogs offer gift pots filled with bulb assortments that will put out a series of blooms over several bleak winter months.

There are many ways to introduce the benefits of horticultural therapy. Be innovative, and your rewards will be many. *—Thelma E. Honey*

For more information on horticultural therapy, write to the American Horticultural Therapy Association, 9220 Wightman Road, Suite 300, Gaithersburg, MD 20879.

COURTESY OF THE JEWISH HOME

Above: A resident of the Jewish Home plants bulbs for forcing. Right: Larry Harned uses a mouth stick to plant seeds at the Long Beach (California) VA Medical Center.

care. If the plants reach maturity in good health, the nursery buys them back and the client profits; if not, the clients lose their investment. Clients may invest in trees that they learn to shape into bonsai in the plant classes, where a different plant and its care is emphasized each week.

Boston ferns in hanging baskets are the main crop at the nursery. Clients not only propagate and grow them but also package and sell them through wholesale and retail markets, thus getting an opportunity to see the fruits of their labors. This is more literal in the case of some other products: peaches, which clients learn to prune, thin, harvest, and sell; blackberries, tomatoes, and pecans, which are sold at a roadside stand and farmer's markets. Field-grown trees are sold in bags. In addition to landscaping and grounds maintenance, clients may take on less plant-oriented jobs, such as janitor, tool maintenance, and even gamekeeper for the exotic pheasants, ducks, pigeons, and doves in the aviary and the tame ducks on the pond.

While some Tangram clients live at home while they participate in the program, those served by the **Traumatic Brain Injury Rehabilitation Systems of Iowa, Inc.,** share two large homes with other clients for six to twelve months.

Located in rural Reinbeck, Iowa, this program provides an array of services, many of which overlap to create a comprehensive rehabilitation program. In addition to the residential homes, there are fifty acres of woods with a large stream, eight acres for farm animals, a vocational center, auto repair shop, and a greenhouse. In this natural environment, the greenhouse almost seems to be an extension of the woods. Here, planting seeds and caring for plants reinforces the idea that life is something the client can control.

Kelly Conrad, a horticultural therapist technician, said the program has twenty-two clients at any given time. A few of them are long term, staying longer than a year. Each client tends a garden area, in addition to caring for the farm animals that they choose to work with. "We overlap the farm animals and the horticultural programs to show how everything revolves around something else," said Conrad. Clients decide what to plant, do the planting and harvesting, and sell the produce. Thus, they reconstruct a life for themselves while still living in a home environment that offers emotional and educational support.

For the young clients in these head injury programs, learning horticultural skills can mean earning a living independently for

COURTESY OF LONG BEACH VA MEDICAL CENTER

many years in the future. For nursing home residents, flowers and plants are a stimulating change from institutional walls.

"Providing horticultural therapy in a nursing home can be as simple as planting one seed in a pot, or as extensive as maintaining a greenhouse, outdoor raised planting beds, or establishing planned garden areas," says Sandra Epstein, director of recreation therapy at the **Jewish Home** in Atlanta, Georgia.

The home began its horticultural therapy program in September 1986 in a newly built greenhouse. The population of 120 includes people with various levels of impairments; 80 percent have been diagnosed as having some type of dementia.

Epstein, who works with an assistant and a volunteer committee, chose the greenhouse's contents based on the sensory stimulation they would provide: lamb's-ears for their soft texture; narcissus and hyacinths for their fragrance; tulips and flowering annuals for their bold colors; vegetables and herbs for their taste. Even the sense of hearing is stimulated by the hum of the cooling system and the sounds of watering and greenhouse maintenance.

For those residents who can't come to the greenhouse, Epstein takes the greenhouse to them once a week on a cart: a rolling garden on a framework hidden in a mass of herbs and flowers.

Mobile patients come to the greenhouse weekly to plant seeds, propagate plants, transplant seedlings, and pot flowering bulbs. For a resident flower show, they forced more than 300 daffodils and 100 tulips. Each participant received a blue ribbon.

"Success for the residents is identifying with their plants and establishing new relationships with staff and the volunteers who share these rewarding experiences," says Epstein.

Second graders from a nearby school have joined the residents in making tussie mussies and planting dish gardens with plants they propagated. Younger children come with their mothers each week to share gardening activities with the residents. Friendships blossom along with the plants as these different generations share ideas and experiences. Children get a positive image of elderly people and the self-esteem of residents is enhanced as they teach the children. Each child, parent, and senior receives a special, positive, and enriching experience in the natural, nonthreatening atmosphere of working with plants.

Each week the residents create floral arrangements to decorate their dining room tables on the Sabbath. The homey warmth of the centerpieces makes weekend dining festive; later, they are recycled as potpourri.

Although it would be impossible to describe all of the varied horticultural therapy programs throughout this country—and there are also programs in Canada, the West Indies, England, the Netherlands, Germany, and elsewhere throughout the world—here are just a few other outstanding programs that deserve mention:

- The **Chicago Botanic Garden** has set up year-round horticultural programs at more than sixty organizations and facilities that serve older adults and those with mental or physical disabilities.
- The **Carrier Foundation** in Belle Mead, New Jersey, a private nonprofit psychiatric hospital at the foot of the Sourland Mountains between New York City and Philadelphia, offers horticultural therapy as part of intensive treatment programs for all psychiatric disorders in adults and adolescents. The treatments are designed to return the patient to mainstream life as quickly as possible at the least possible expense.
- Recreation therapy programs at **St. Augustine Manor,** Cleveland, Ohio, offer indoor and outdoor gardening to some thirty nursing home residents, many of them dependent on wheelchairs.
- The **Corrine Dolan Alzheimer Center** in Chardon, Ohio, has a two-acre therapeutic park developed in cooperation with the **Holden Arboretum's** horticultural therapy program. Patients can look out the large picture windows or meander through the wheelchair-accessible garden paths. These always lead back to the building so patients don't feel lost on a dead end. To ensure safety, the park is unobtrusively secured.
- **Desert Survivors** in Tucson, Arizona, provides community-based, vocational training and employment to clients who are mentally retarded or who have behavior problems that have kept them institutionalized much of their lives.

Thelma Honey is on the publications committee of the American Horticultural Therapy Association and is a former board member of its Rocky Mountain chapter.

Whatever Happened to The County Agent?

For most of the twentieth century, our county Extension Services have been there with advice for farm and garden and much more. Will they still be here for us in the twenty-first?

COURTESY OF THE COOPERATIVE EXTENSION SYSTEM

BY ART ODE

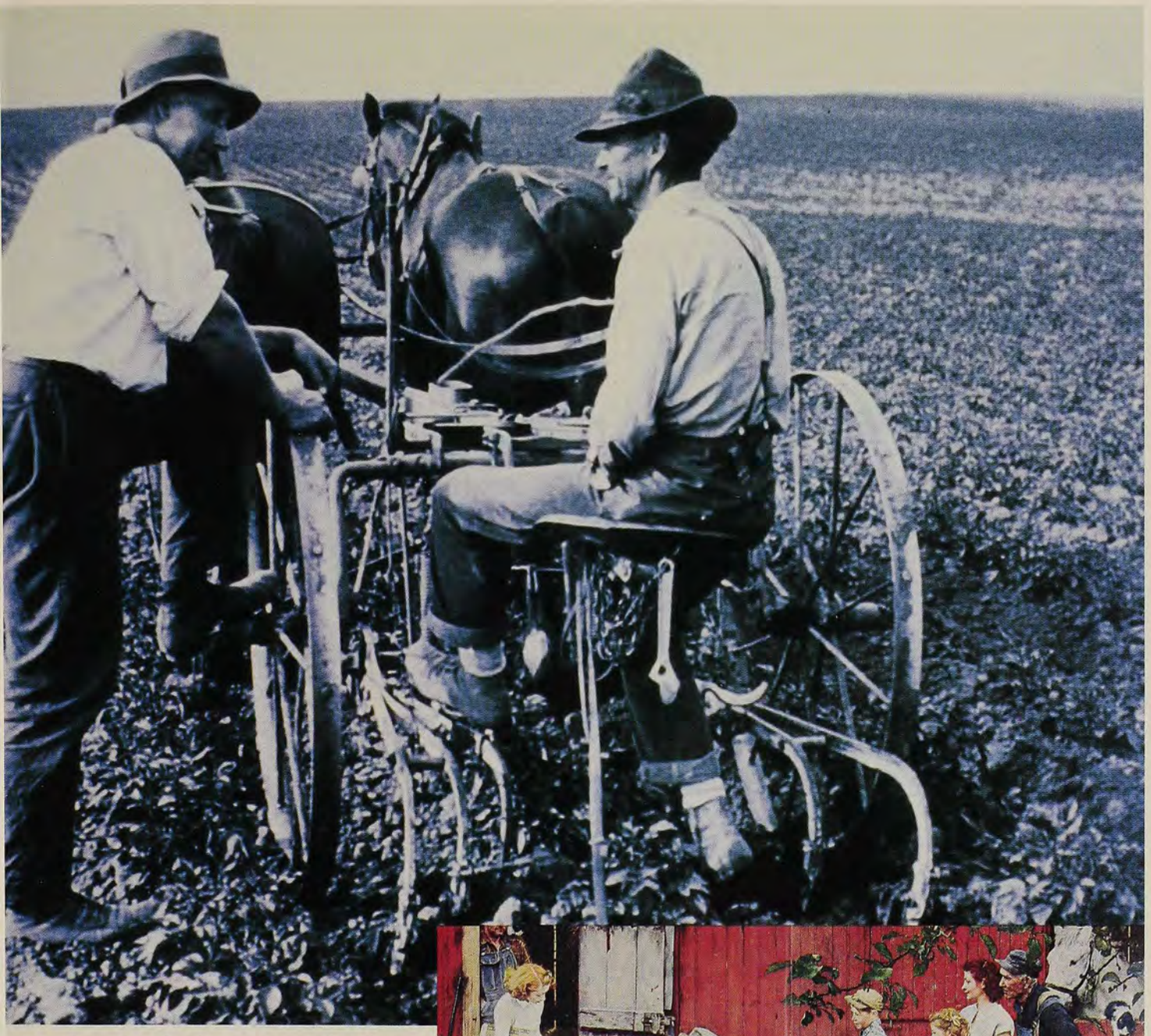
To a city boy growing up in the 1940s and early '50s, the farm held considerable fascination. My country cousins often seemed larger than life, driving tractors and loading hay bales. This made the boys seem like men, and the girls glowing and self-assured. But perhaps the most appealing aspect of country life was the spirit of family and community. Boys and girls alike raised calves, pigs, and horses to show in county fair competition, while their mothers baked pies and made preserves with which to compete for coveted blue ribbons, and whole families worked to grow prize garden produce.

I didn't realize it then, but the heart of all this uplifting activity was the Cooperative Extension Service. And its soul was the county agent, personified by Norman Rockwell in his 1948 painting by that title.

That painting now hangs at the University of Nebraska Center for Continuing Education, and I have viewed it often, trying to decipher its analogies, and separate fact from fiction. Norman Rockwell was an idealizer of life, producing less than literal depictions of America. But I cannot help but feel that the county agent—helpfully advising a teen-age girl on the condition of her 4-H show calf, and surrounded by family members, family collie, and scratching barnyard chickens—is a very accurate representation of my own nostalgia for an almost bygone era.

For in these more than forty intervening years, the rural, farming population has declined to a fraction of what it was then, and an increasingly urbanized population has less and less contact with what remains of farm family life, which also is much changed. Now when most of us think of the county agent we think of an urban or suburban scenario, the scene no longer barnyard, but back yard, the objects in the picture no longer calf and chickens, but rose beds and shade trees, and the questions asked are about lawns, ornamental plants, and horticulture. The idyllic family scene is also likely changed, with today's challenges not projects for the county fair, but of nutrition, a healthy lifestyle, and children at risk. The county agent, as well as the Extension Service behind him or her, has changed with us.

But unfortunately, both urban and rural America are increasingly finding that the



Extension Service programs they have relied upon for generations are less and less available, leaving gaping holes in the gardening information network, as well as down on the farm. Increasingly, the question is asked, "Whatever happened to the county agent?"

To try to answer that question, one has to know the history of this quintessentially American institution. For even though the concept of Extension has been adopted throughout much of the world, particularly in developing countries, its roots lie in uniquely American political and social ideas. That should make its survival in our own land all the more important to us.

Americans have generally seen education as an individual right and opportunity and as a socially uplifting force, rather than purely an instrument for the advancement

NORMAN ROCKWELL VISITS
A COUNTY AGENT

Top: A county agent and farmer discuss the potato crop prospects in Oregon in 1925. In those years, county agents were oriented more towards agriculture than today. Above: Norman Rockwell's 1948 county agent inspects a show calf for a 4-H member and her family.

COURTESY OF THE COOPERATIVE EXTENSION SYSTEM

Over the years, Cooperative Extension has taught farming and gardening skills to women, especially during national crises such as World Wars I and II and the Depression.

of the state. Consequently, government's role in American education has been basically to empower people and institutions to nurture their own views of education. And in no sphere of education has this been more apparent than in agriculture.

Agriculture as the basis for a democratic society was an American ideal personified by Washington and Jefferson, the latter seeing the yeoman farmer as the bastion of liberty. Although America quickly became an industrial nation, the concept of an educated yeomanry remained strong. Agricultural societies in the early and mid-nineteenth century lobbied for agricultural colleges that would be schools of practical research and education for the common man; the first state colleges of agriculture were founded in New York and Michigan before the Civil War.

By the time of the Civil War there was so much support for public colleges to teach scientific agriculture and the mechanical arts to the common people that in 1862, Congress agreed to establish both a federal Department of Agriculture and to finance a nationwide system of agricultural and industrial arts colleges. The latter bill—introduced by Senator Justin S. Morrill of Vermont, and bearing his name—granted each state 33,000 acres for each of its senators and representatives. The land was sold to provide trust funds for the establishment and operation of a land grant university in each state. The Second Morrill Act was passed in 1890 and provided direct annual appropriations to each state and these universities.

Meanwhile, farmers' organizations were promoting the idea of experiment stations to research agricultural problems and methods and demonstrate the results. In 1887 the Hatch Act established and funded an experiment station for each state.

But at the turn of the century, a vast constituency of farmers was still not being reached by these new educational efforts. The need to educate rural folk in not only scientific farming methods, but in health, nutrition, and community development remained apparent. The Farm Bureau and other organizations were trying to meet these needs through farmers' institutes (community short courses), and Chautauqua and other "movable schools." In 1899, George Washington Carver of Tuskeegee Institute developed a plan for a demonstration wagon, which carried seeds, tools, and techniques to rural black farmers, and the idea of "taking the university to the people" began to crystallize. In 1906, in response to a devastating boll weevil infestation, the first "county agent" was appointed in Smith County, Texas, funded by a mix of private, school board, and federal monies. The idea began to spread.

Rural youth also became a focus of activity, and boys' and girls' clubs for advancing domestic arts, home economics, and community spirit became a part of the rural education movement.

These efforts culminated in the Smith-Lever Act of 1914, which established the Cooperative Extension Service to foster practical scientific education in agriculture and home economics. The county Extension agent and 4-H clubs were born.

The structure and function of Cooperative Extension has been unique, and so has its basic instructional philosophy of relying on practical scientific experimentation, demonstration of proven new methods and knowledge to the lay person, and learning by doing, with neighbor learning from neighbor, child from teacher, and parent from child.

This institution and its approach served the nation well in a series of crises, beginning with World War I, when the new Extension Service educated the public to maximize food production and protect themselves against the influenza epidemic.

In the prosperous years immediately after the war, Extension and its service personnel taught the intricacies of farm loans and credit. The farm economy felt the edge of the Depression well before the crash of 1929, and although hard times

reduced the Extension work force, it managed to help farmers cope with constricted finances, foreclosures, and malnutrition, and taught women home canning. With the institution of the alphabet agencies of the New Deal, a more adequately funded Extension helped lead the way in rural electrification, flood control, and youth activities.

In World War II, Extension backed the production of food for the Allied war effort, helped local draft boards determine exemptions for farmers, and initiated the enormously effective victory garden program, which for the first time extended its area of concern beyond the farm into the cities and suburbs of America.

After that war, Extension and the county agents were at the forefront of the agricultural revolution, instructing both farmers and homeowners in the new techniques of chemical fertilization and weed and pest control. A national farm policy would not have evolved without the Cooperative Extension Service.

But the history of Extension does not reach the present on a happy note. This unique educational vehicle has fallen upon hard times.

The American agricultural economy went into severe recession in the early 1980s when a world market for farm products that had seemed to be exponentially expanding abruptly deflated. Farmers who had been encouraged to borrow heavily to buy land and machinery for a booming market suddenly found themselves facing bankruptcy. Farm land values declined drastically, leaving owners with greatly reduced collateral. At the same time the federal government, trying to reduce the budget deficit, proposed slashing its contribution to Cooperative Extension.

Today the farm economy is emerging from its recession and the federal government has acknowledged the need for adequate Extension funding. But now many states are in a deep recession and cutting back drastically on their share of Extension activities and personnel.

Programs have been particularly hard hit in Massachusetts, other New England states, the Southeast, and California. New York may also face cutbacks. "Whatever happened to the county agent?" is no longer a hypothetical question.

Dean Robert Helgeson, Extension director for the state of Massachusetts, maintained this summer that Cooperative Extension is "alive and well in Mas-

EXTENSION'S MASTER GARDENER PROGRAM

One of the Extension Service's most popular forays into horticulture is the Master Gardener education program. First launched in Washington state in 1972, it has expanded to hundreds of programs in forty-five states, the District of Columbia, and four Canadian provinces. In Master Gardener lectures beginning gardeners receive expert and wide-ranging horticultural training at a nominal cost, and then pay the program back with some form of community service in horticulture.

COURTESY OF THE COOPERATIVE EXTENSION SYSTEM

Volunteers with Extension's Master Gardener program provide a variety of services to help gardeners diagnose and solve plant problems.

Since programs are tailored to local needs and resources, they vary considerably among jurisdictions. Specialists from the state land grant universities (or from the Provincial Department of Agriculture in Canada) and other local experts usually provide the instruction. The number of hours of training offered ranges from thirty to 120, and fees charged range from none to several hundred dollars. In some areas, advanced training and refresher courses are offered. The most common form of volunteer payback is staffing plant clinics and plant information telephone lines. Master gardeners also take part in community beautification projects, work with children in school or 4-H programs, research and write horticultural fact sheets, test and evaluate new varieties of plants, write gardening columns, speak to citizen groups, and bring horticultural therapy to special groups such as people with physical, mental, or other disabilities.

After a rapid expansion of the Master Gardener program in the last two decades, it is now, like all things government sponsored, facing budget cutbacks and serious financial challenges. According to Jane Meyer, president of Master Gardeners International Corporation (MaGIC), many Extension agents must cut back on the amount of time they can devote to Master Gardener programs; some must make the programs more self-supporting, which requires raising fees; and, in some cases, agents are required to redirect their time and resources to commercial rather than community-based horticultural activities. Not only have programs for which there was little demand been eliminated, but very popular programs have been cut throughout Massachusetts and in some counties in other states such as California and Virginia. But Meyer warns that states may lose much more than they expect when they trim Master Gardener programs. Master gardeners benefit their communities in diverse ways through community volunteer activities and the use and communication of scientific horticultural practices that affect local environmental conditions.

—Thomas M. Barrett, Assistant Editor

To learn about Master Gardener programs in your area call your local Cooperative Extension office. Or, send for MaGIC's Directory of Master Gardener Programs in the United States and Canada 1991, *available for $10 to MaGIC members, $15 for nonmembers, and $50 on IBM-compatible disk (address below). AHS's Gardeners' Information Service offers a resource bulletin,* State Contacts for the Master Gardener Program, *available for 50 cents.*

To join MaGIC, an organization of Master Gardeners, Extension agents, and others interested in community horticulture, send $10 (for Master Gardeners and Extension personnel involved in Master Gardener programs) or $25 to MaGIC, 2904 Cameron Mills Road, Alexandria, VA 22302. Members receive the quarterly newsletter MaGIC Lantern *and are eligible for product discounts.*

LISA MILLER

Green Guerilla Sandi Anderson with local youths at a community garden that Cooperative Extension helped develop on New York's Lower East Side.

sachusetts." But the obviously brave statement hides some painful realities: currently there is no budget set for 1992. Fourteen of fifty-four state Extension agents have been let go. (The "county agent" no longer exists since agents have multiple-county jurisdictions). Community and family-oriented programs such as family finance and nutrition education programs will be dropped or reduced. Extension horticulture for homeowners has been eliminated.

The priority programs in Massachusetts are now commercial agriculture and horticulture and anti-drug programs. Private support is being sought for the popular Master Gardener program, and remaining services may be on a fee basis. Agents can no longer visit individual farms or even answer questions by telephone.

In short, Extension is still in business in Massachusetts, but only the highest priority or most traditional needs will be met, and the future is highly uncertain. Urban horticulture education, by providing advice on the responsible use of chemicals, was helping to protect the environment; no one can predict what effect its elimination will have on soil and water pollution.

Is the situation in Massachusetts an extreme anomaly or a disastrous wave of the future for the rest of the country? Robert L. Crom, executive director of the Extension Commission on Organization and Policy of the National Association of Land Grant Colleges in Washington, D.C., insists that the federal commitment to Cooperative Extension under the Bush administration has been very strong. But since federal funds must be matched by state and local funds, economic crises in jurisdictions nearer home may determine which local Extension programs live or die.

Massachusetts is an extreme case, but Crom estimates that thirty to thirty-five states are in economic trouble, and many of these are in deep difficulty, including California, Virginia, and Maryland. Many states not only have had years of deficit spending that is now catching up with them, but also have made unrealistic income projections. The situation is complicated by the fact that many of them had been picking up their counties' contribution, so all matching funding is in jeopardy.

On the positive side, Cooperative Extension has for the past ten years been engaged in a massive long-range planning effort through the land grant universities and the state Extension divisions and has made some tough programming decisions. What had become increasingly seen as a stodgy bureaucracy has taken the initiative toward self-directed change. Programs are being oriented towards issues, and resources are being redirected to address them. Consequently, Cooperative Extension nationally is developing programs to address water quality, food safety, youth at risk, rural development, sustainable agriculture, waste management, and international marketing of agricultural products. The challenge now is to implement and fund these priority programs, many of which cut across urban-rural boundaries, at the local level.

But in many areas where state and local funding is being slashed there has been a disconcerting lack of complaint or alarm on the part of the public. Crom attributes this to changing demographics, with an increasingly urban population not knowing the role that Extension plays in their lives, not only in their horticultural concerns but also in helping ensure a safe food supply and supporting 4-H and other youth and family programs. In order to build a supportive constituency among voters and taxpayers, Extension programs—particularly those that address urban needs—will have to be made more visible. This will be especially difficult to do in states that have already cut urban-oriented programs such as homeowner horticulture and nutrition education.

Nebraska is a traditionally agricultural state in which most of the population now resides in urban areas. Dr. Kenneth Bolen, Nebraska Director of Cooperative Extension, feels that despite the current budget problems, Extension's issue-based priority programs have put it in a good position to

serve the public in the future.

In Nebraska, as in Massachusetts, Extension is no longer county based. The ninety-one counties have been assembled into twenty-one service units, called Extension Program Units. This is not only more efficient and in tune with population shifts, but it allows the traditional county agent, who had to have broad general knowledge to serve his constituency, to be increasingly replaced by specialists with highly relevant technical backgrounds that fit their particular audiences.

Bolen observes that the population is not only urbanizing, but also expanding. Extension personnel will have to rely increasingly on new methods of information dissemination to teach a vastly greater audience, using not only written brochures, but radio, TV, video, and classroom satellite transmission.

An example of those putting these ideas into practice is Don Janssen, Extension horticulturist in Lincoln, Nebraska, who sees a future of increasing specialization of knowledge in an ever more complicated world, where mass media will be the most practical way to reach his audience.

Janssen isn't precisely the tough-but-kindly county agent depicted by Norman Rockwell, but he is by all accounts just as busy and dedicated, putting in fifty-hour, six-day weeks, at least in the busiest seasons. He answers up to 100 phone calls a day, some of them at home, and visits back-yard gardens for a ten dollar fee to the Extension coffers, gives lectures, and has a radio talk show.

Janssen sees Extension horticulture as not only a highly visible way to serve urban gardeners, but also as very necessary. For instance, many homeowners are still unaware of the dangers of overuse and misuse of garden chemicals. By offering a ready source of up-to-date information, these services help safeguard the environment. Ornamental or "amenity" horticulture is an increasing concern of the urbanite, and questions about lawns, trees, perennials, and annuals have far surpassed those regarding vegetable gardening. The Extension agent is considered an unbiased source of information in what can often be a jungle of advertising claims for fertilizers, pesticides, and new cultivars.

Janssen also works closely with the nursery, florist, and landscape industries, promoting new products, methods, and plants and working to increase business awareness of environmental concerns.

In addition to Janssen's horticultural services, his office, which encompasses four counties in the Lincoln metropolitan area, provides expertise in community resource development, 4-H, home economics, commercial agriculture, food and nutrition, water quality, and waste management.

MARK A. HANSEN

The new breed of county agent: Nebraska Extension horticulturist Don Janssen on his radio talk show.

The Cooperative Extension Service at the millennium is in some respects an American institution in crisis, suffering from severe budget problems, a public image of serving only a narrow stratum of modern society, and a popular perception that it is somehow a nostalgic anachronism.

The other side of the coin, however, is that it is a quintessentially American idiom for the translation of scientific knowledge into public policy, that it has changed its agenda through self-examination and planning in a way that few institutions have ever done, and that it stands at the threshold of a new era of public service to both rural and urban populations.

The Cooperative Extension Service's altruistic endeavor of "bringing the university to the people" has been undertaken successfully by no other nation in history. It has served us well, and saved us often. If we can get our public finances in order, it will continue providing the American people with an appreciation of the scientific method and the latest problem-solving information. Then we will be able to say with perfect honesty, "Why, nothing ever happened to the county agent. He's still out there, doing his job, bringing the university to the people."

Art Ode, director of the Nebraska Statewide Arboretum, writes about horticulture and the environment.

THE WEB OF LIFE

The smell of fungi seems to emanate from the doors of death. But they are threads that help to hold earth's fabric together.

BY DONALD CULROSS PEATTIE

They had been pushing up by stealth for some time, I think, rimming stumps with punky brackets, appearing on old plants and water-logged twigs. They had been proliferating, stalk and cap, inside the hollows of senescent trees, and spreading out in widening rings on the grass, where the first frost brushed lightly sometimes in the night.

But I was deep in a book, and late with it, and working all the time, if not on paper, then in my head. The rains kept me housed,

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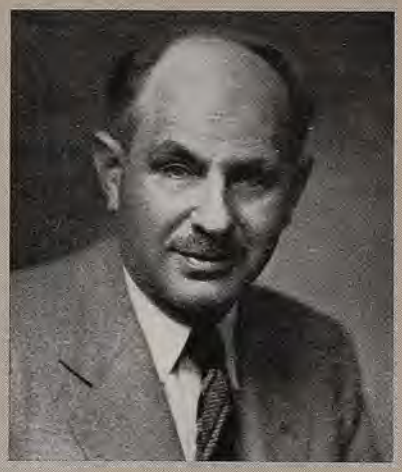
Excerpted with permission from Chapter 18 of Flowering Earth *by Donald Culross Peattie,* © *1991 by Indiana University Press.*

JERRY PAVIA

THE POPULAR NATURALIST, DONALD CULROSS PEATTIE



Donald Culross Peattie (1898-1964) was one of America's best-known naturalist writers and for many years a roving editor for *Reader's Digest.* His father, Robert Burns Peattie, was a journalist and editor in Chicago, Omaha, and New York; his mother, Elia Wilkinson Peattie, was a novelist and literary critic.

Donald Peattie inherited his parents' love for the written word and edited the literary magazine of his high school, University High School in Chicago. There he accepted the poems of a fellow student, Louise Redfield, whom he married when he was 24. He first attended the University of Chicago, majoring in French, but soon moved with his parents to New York City and became a reader for the publisher George H. Doran.

Long a lover of nature, Peattie was fond of taking bird walks and botanizing in the city. He secretly kept a botany manual in his desk drawer "in that high New York office." With furtive glances into its pages, his imagination was pulled to flowers he did not know, in deep mountain woods and high prairies and cypress bottoms. After visiting the New York Botanical Garden, Peattie quit his job to start training to be a botanist, propelled by his realization, as he says in *Flowering Earth,* "that the very weeds would go along companionably, if I could name them. And that a tree on the king's land would be mine, if I knew how the sap got up in it in spring." After spending the summer of 1919 on the southern Appalachian Trail collecting, identifying, and drawing, he entered Harvard that fall.

Graduating with a B.A. in 1922, Peattie worked for two years under David Fairchild in the Bureau of Foreign Seed and Plant Introduction in Washington, D.C. Fairchild took a liking to him and one day invited Peattie to accompany him on a plant hunt in the Andes. But days later, Peattie innocently announced that he was about to marry a beautiful girl and Fairchild told him that was impossible. "I can't take a married man with me! You have to be able to walk rope bridges over swollen torrents." Fairchild pointed to a man sitting at a desk nearby. "That man has been with the Department of Agriculture sorting seeds for fifty years, and I don't know what else you will have to look forward to if you insist on getting married." He got married, left the department, and entered into a career of free-lance writing.

Peattie had a column on the seasons in the *Washington Star* from 1925 to 1934 and wrote numerous books including *Flora of the Indiana Dunes* (1930); *An Almanac for Moderns* (1935), a collection of reflections on nature in almanac form; *Green Laurels* (1936), a history of the great naturalists; *A Prairie Grove* (1938), an "ecological novel"; and the autobiographical *Flowering Earth* (1939).

By the time Peattie became an editor for *Reader's Digest* in 1943 he had established a wide readership for his mixture of history, biography, and natural history, and a style that fit engaging scientific detail into finely crafted prose.

His final major books were two of his projected four volumes on the trees of North America, *A Natural History of Trees of Eastern and Central North America* (1948) and *A Natural History of Western Trees* (1950), and a children's book, *The Rainbow Book of Nature* (1957).

Peattie was unusual in being a scientific writer of eminence that had no teaching post. His interests were always broader than those of a pure researcher. Says his son Noel, "He would have been a good teacher, up to a point, but he wasn't a people person. He wanted to be left alone with his sequoias." He died after a ten-year illness that had brought a premature end to his writing. His wife—worn out by nursing him, says Noel—died ninety-nine days later.

—Kathleen Fisher, Editor

moreover, for we were having that rare weather, for Illinois, a torrential and warm autumn. The very acorns were beginning to sprout, that September. For three years my prairie grove had parched in a drought cycle; now all the precipitation in arrears was paid in, as if the violent, fickle climate were trying to square its debts before the year was out.

Warm as it was, I kept a fire burning in the cabin where I worked, to fight the dampness that crept in from the forest outside. Yet I noticed one morning, as I threw down my books upon the table, a thin and glaucous cast upon the unpainted wood, that looked like dust but sent up into my nostrils the unmistakable dry choking smell of mold. The foot of the great burr oak just outside the open door had a low fungal bracket on it; when I threw back the tarpaulin from my stack of firewood, I pulled out with my faggot a whole nest of dainty little gilled fungi that turned to ink upon my fingers. . . .

When an elegiac sunshine broke at last, and I stepped out to feel its watery warmth, I saw that the shingles of the cabin roof had blossomed out with brilliant orange effusions like tongues of flame. I ran them down, in my neglected books on mycology, to the genus *Flammula*—a good name, that, "little flame." Under my fingers the plates with their unholy colors flickered past; the eaves dripped; outside there on the burr oak bole the polypore, I saw, jutted now with the strength of a stout bookshelf. For three years past, those sunburnt years of drought that had scorched the prairie to copper and dried the deepest sloughs, only a handful of wizened fungi had visited my grove, and now the smell of them filled the woods, and I took the faggot basket from the hearth and went out, for the fungi will not wait for you; they vanish swiftly as they come.

First I found a beautiful old favorite, that some call hen-and-chickens; it looks to me less like a fowl fluffing her wings over her little ones than like a hoop skirt of mouse gray, flounce upon flounce bordered with black velvet. Next I came on the jack-o'-lantern, that brilliant orange growth that glows, in its decay, by night with a soft phosphorescence. Many of the trees bore brackets, soft ones that shapelessly, with the form of cumulus clouds, seemed to bubble from the hole, or woody hard ones with red-lacquered tops, and another of a poisonous yellow

like flowers of sulfur. The leather fungi formed shelves too, but thin and rubbery, flecked with the indwelling presence of blue-green algas come to perch there.

On the ground little earth-tongue fungi stuck out their tongues; impudic phalloids ejaculated their spores; sidesaddle fungi, branched coral fungi, black fungi like tough truffles rose from the sodden earth. And everywhere the smell of mold spreading through the ground-water capillaries filled the grove with that venerable odor that all at once brought back the memory of the abandoned moat of an old fortification near Grenoble, which once was on my daily path.

It is a long way from American woods to the history-sodden soil of Europe, but the smell of fungi can carry you farther in a breath—as far as to the old earth's doors of death, and to surmise of what is working behind them. A late September day, after rain, in the woods, has the sad beauty of finality in it, but already what you smell under the wet dead leaves is something very like next spring. It filled my senses, when I stooped to gather some boleti, those toadstools whose dome tops contrast in tint with the spongy porous underside; when you bruise them, the colors change. These, added to my basket, filled it, for I had gathered polypore brackets of geranium red, of cinnamon and orange and ochre and old gold, big blue cortinarias still gleaming in a cobweb veil, and a mess of hydnums oozing what looked like blood. I came on an immense bear's-head fungus, rather like a shako, and carrying this in my left hand I was making my way back, toward a pure gold wing of light shining in the west under the edge of more gathering rain, when I nearly stepped on a giant puffball—on two, half a dozen, twenty of them. With my basket on my arm and both hands full, I had to pass a wild garden of earth-stars, their points flattened on the ground, the tiny puffball at the center ready to breathe spores, millions of violet spores fine as smoke, at any lightest tap.

That was a season whose like I have not seen come again, and I knew then that I had better make the most of it. So I went looking for amanitas, the warty, red-topped fly amanitas, and the carrara-pallid death-cups; they had a fatal sort of odor, not so vile as suffocating. The inky-caps were coming on, and when the honey-colored mushrooms appeared on the edge of the woods, so did furtive strangers—Bohemians and Poles and Hungarians strayed hungrily out

ROB SIMPSON

Page 30: Boletus mirabilis. *Clockwise from left: the branched* Ramaria spinulosa *(coral fungi);* Boletus frostii *(boleti, whose domed tops contrast in color with their undersides, were favorites of the author); the blue* Cortinarius violaceus; *and* Amanita muscari, *the warty, red-topped, and poisonous fly amanita.*

MICHAEL S. THOMPSON

ROB SIMPSON

JERRY PAVIA

of the city—come for this mushroom which is too strong for my taste. But they are mad for it; they even eat the fly amanita which, when boiled in several waters, keeps a dilute poison that sends its epicures into that state of intoxication where no hurt is felt and no inhibitions stop the brute in us.

On the lawns the oread mushroom, that makes the "fairy rings," appeared once again. Its hyphae, its spawn, which are the enduring vegetative part of a mushroom, lie underground, delicate pallid threads like cobwebs, like the strands of alga but without chlorophyll. In the oread fungus the hyphae gradually widen out, as a colony, the center dying; a ring of lush, fast-growing grass usually follows just inside the hidden, expanding ripple of the spawn. Many a year may go by, however, before the visible toadstools rise. This year we saw them, sprung overnight.

It was a year when living decay caught hold like some eery damp fire. There was bunt in the oats; the black flags of poisonous ergot waved from the rye; smuts and rusts got into every field. When you had an eye for fungi everywhere, as I did, you came to feel the world was going to rot, that season.

Yet the next spring the trees that had been hung with parasitic growth leafed out clean and sound as ever; the woods where I had gathered my ghostly spoil were tender with the fresh mist of spring-beauties, and only a few innocent little morels came up to represent the fungal tribes. That horde had vanished off the face of earth, underground, to await another season when high humidity and high temperature should be transiently met. The spores and the hyphae endure long and resist much; they bide the strategic moment of fruit and disseminate above earth. Even on the Mojave desert there dwells a fungus flora, cryptic and unlikely, that may not appear for twenty years or more; it never dies; nothing can kill it. The fungi are the underworld of plant life, that lives clandestinely, by its unconscious wits, taking to cover in unfavorable times, rioting at another.

Those that are not scavengers are parasites. Man has a loathing for this form of life, which battens upon the effort of others. Determined to slay all his enemies, he is out to slay also the enemies of his friends, the domestic animals, the cereal crops, and useful trees. As claw and fang, speed and strength, fertility and cunning are the weapons of other animals, intelligence is his weapon. But he cannot play

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physician to the whole of Nature. And this is well, for she has another plan than his. It is grander and more reckless and with no compassion in it—an immense productivity that is checked from over-production by the cost of supporting natural parasitism in all its forms. So perpetual, so terrible is the fecundity of earth that but for natural enemies any species would swiftly rise to domination, crowd itself to the point of starvation and past the point, exhaust the very chemical elements on which it lives, and die ignominiously upon the pile of its triumphs. Die of its own appalling life.

Therefore do the fungi weave in and out through the web of life, colorless threads that help to hold the whole fabric together. In and out, back and forth, they take their cunning way. . . .

The fungi, the parasitic ones, are, like death itself, levelers. But there are others that take apart the already fallen house of life. These are the saprophytes, that feed upon dead matter. Breaking up the debris of what was living, releasing the precious materials in it, these fungi, and certain bacteria, retrieve the vital elements from what would otherwise be a permanent and cumulative and ultimately disastrous loss. They are part of what we call decay, but they are as much a part of life. They turn over its wheels; they are responsible for keeping the phosphorous and sulfur cycles evolving, and still more importantly the nitrogen and carbon cycles, as well as a host of other tinier wheels in the clockwork of life—the cycles of rarer chemical elements, indispensable but present only in delicate quantities. If any cog should catch, break, or slip, the whole clock would stop. And who can point to the key that should wind it up again?

In this vital machinery, carbon has a master place. It is the keystone atom in

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Left: Omphalotus olearius, *the jack-o'-lantern mushroom, which glows in the dark as it decays. Top:* Geastrum triplex, *an earth-star, which has a puffball center. Above:* Cortinarius iodes, *a cortinaria called iodine cort or viscid violet cort.*

every molecule of living tissue, the most versatile combiner and joiner. Written simply as "C" in chemical equations, it is traditionally the initial letter of the formula of every cell in the body of man or the bole of a beech. The animals can obtain it only from plants. The green plants can take it only from the atmosphere, where it exists as carbon dioxide and constitutes but one part in two hundred and fifty, of the planet's gaseous envelope. . . . The drain upon it, all over the green kingdom and the red, is constant. True that the animals breathe it out as a waste product; true that volcanoes and fumaroles liberate a slow leakage of it, and so do all the fires, furnaces and reeking chimneys of our world. But all this makes a trifling replacement. Only plants adequately restore the atmospheric balance. Though green plants give off carbon dioxide in respiration, as animals do, it is the fungi and bacteria which are its strategic source. For they break carbon out of its fast-bound combination in dead matter, and set it free into air.

Nor can protoplasm be created without nitrogen. This is the commonest of all gases, abundant in our atmosphere, but although we breathe it in, we send out all that entered our lungs, unaltered. Animals cannot acquire it save through plants, and plants cannot absorb it from the air. They must take it up through their roots, as dissolved salts in soil water. These nitrates in the earth are produced by autotrophic bacteria, last link in a long chain of decay.

A tree in the forest, old with too many springs, is conquered by flourishing fungal parasites; on a day of high wind, it falls. The saprophytes slowly devour the log's tissue, and, themselves decaying, feed other saprophytes. The bacteria take over, many linked species, each reducing the dead stuff to forms more elemental, until at last the nitrifying bacteria, both by their living and by their multitudinous dying, release nitrates to the soil. Rain and soil water dissolve them. The roots of bracken, sprung where the old tree grew, absorb them, and they are life again.

The fabric is whole and strong; the web is intricate to unravel. We are ourselves part of it. The farmer sowing alfalfa in his overworked field is weaving himself right into this pattern of exchange and balance. For alfalfa, with beans, peas, vetch, and almost all the wild legumes, entertains upon its roots bacteria with the rare power of taking raw elemental nitrogen out of the air, and making nitrates of it. These they yield to the leguminous plants, taking carbon from their hosts for their own need. So that alfalfa root and bacterial colony, constantly eating and fighting each other, yet achieve a mutual benefit, and, uniquely,

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Coprinus ephemerus, *or ephemeral inky cap. Members of the genus look like closed umbrellas when young. The cap and gills "melt" into a black inky liquid when mature.*

leave the soil richer than they found it. This balanced way of living together is called a symbiosis. . . .

In my prairie grove, that wet warm autumn, all those fantastic outgrowths that touched the air with a sad, eery smell were not chimeras, not whimsy, not futile spawn. The amanitas, the puffballs, the earth-stars and my favorite boleti were the final fructification of the hyphae on the roots of the forest trees. Beneath the ground the silvery web of hyphae, finer and more numerous and more absorptive than even the hairs of the roots, are believed to serve with water and nitrates the towering woody vegetables above them, the maples and lindens, all those great burr oaks, and the poplars that shiver down their golden leaves. The trees, for their part, supply carbohydrates to their hidden allies. Only in autumn, and most passingly, the hyphae overnight push up, take some soft eccentric form, sow spores and melt away.

More than all other forest trees, the conifers are ancient addicts of the symbiont habit. Tiny fungi are the link between even lordly Sequoia and the soil. In my Carolina glen, in that lightsome Appalachian flora in which the heather family shines, the partner fungus invades azalea and rhododendron to the tip of the leaf and the very ovule of the flower.

Among the orchids the scheme of alliance with an enemy reaches its most precarious extravagance. They have abandoned root hairs, rootlets, all but given up roots entirely, in their dependence on their parasites. The fungi seem equally enslaved, since they are not found apart from their exquisite hosts. Not only are the orchids unable to thrive long in a soil without them, but many cannot germinate without help of the fungi; the embryo will not awaken in the seed unless hyphae of the invader have followed it from the ovule and irritate it to activity. . . .

So that if you look again at the fact of symbiosis you see that in principle it is universal. For all organisms are part of the web; their underlying and vital relationships are one vast multiple symbiosis. And when they turn your gaze thus upon the web of life, then indeed you are entered upon the deepest science. Here are gathered together and interbraided the scattered researches, the papers in fifty languages and in a thousand journals, the investigations of remote and curious phenomena reported in the most technical terminology. They all weave together, they all essentially indicate one thing; they illustrate, they elucidate, they predict, the action that one living gesture will have upon other living things, so fabulously formed, so densely crowded, upon this spinning ball of earth.

Outside my study window, the long window running to the floor, which shows me what the very ants are at in the garden, I can see the hanging nest that a bush-tit left. She wove it of many lichens, that she knew well how to find. There are species in it that I have not, myself, discovered, with all my looking hereabout. The inside is soft-lined with down from the button balls of the canyon sycamores; she flew far for those. I see the ants carrying their aphid cattle home from sucking on the pasture weeds. I see the honeybee clinging under the small white bells of a bush that has just come to flower. I do not yet know its name, but the insect distinguishes it clearly. All day she has been busied at these shrubs only, bringing home nectar unalloyed with any other. My little fig, I see in the late light, has come of bearing age since I began to write this book; it has male galls upon it, and the fig flies will be laying there, this year. This is the pattern, too great ever to see whole; this is the little world, green-blooded, red-blooded, sent traveling through the stars.

One half, the green half, of all this living, gives no tongue save to the walking wind. It is that earthly paradise, that clean temple, where no wrong is ever done. The Green Kingdom embraces our restless one, is nurse to it and grave to it. In childhood we have no willful ignorance for it and do not refuse to learn even its soft names. Only later, when we are grown so wondrous wise, we dwell apart with millions of our kind, walk through stone vaults, and breathe our own vapor.

But in the end our friends come and make us a last home out of a log, and plant a flowering tree by which to remember us as fairer than we were. Then it will be too late to walk alone and smiling through the flicker of beechen shade, or to lie side by side on the wild sod. When brambles throw their arms around our knees in the road, we had best be partaking of the brusque offer of fruit. And if in this life we never tended brave young seedlings, in what other world do we expect to see them jump up responding, their split seed shells cocked aside their heads?

For the fates of living things are bound together, and a wise man can grow wiser, learning it. The perilous balance, the dangerous adventure, the thirst, the needs, the crashing end—they are impartially allotted to us all, tall man or taller tree. What we the living require is most of all each other. Progeny we must have, company, provender, friends, and even enemies. The whole long vital experiment on earth is symbiotic by chains of cause and relation past glib explaining.

It is not explained why there is for us all but one life, but it is plain enough that all life is one. It breathes the same air, grows by the same fiat, was conceived alike—if one compares equal evolutionary levels—and was born through the same strait port. We die together too, in each other's arms, and of each other, for life is its own best enemy, and to die is functional in living. We mate together and, welding a life to a life, get our seed, and so give, as we were given, a time to walk upon this flowering earth.

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A Tree History
THE OSAGE ORANGE

Maclura pomifera *has been used to make bows, wagons, hedges, and cockroach repellent.*

BY SUSAN SAND

Although little used today, the Osage orange (*Maclura pomifera*) is a prized tree of American history, intimately associated with the livelihood of both Native Americans and pioneers. Used for bows and arrows, war clubs, and dye by the Osage Indians and other tribes west of the Mississippi, it later allowed settlers to fence the prairie.

The large, warty-surfaced, spherical green fruits of the female trees are the most recognizable characteristic of Osage orange. A member of the mulberry family, Moraceae, it was named three times by French-American naturalist C. S. Rafinesque—*Ioxylon pomiferum* in 1817, *Toxylon pomiferum* in 1818, and *Joxylon pomiferum* in 1819. Thomas Nuttall, an English botanist who collected plants in North America, named it *Maclura aurantiaca* in 1818 to honor the American geologist William Maclure. The name accepted today, *Maclura pomifera*, is a reference to both the fruit (pomifera meaning pome bearing) and Maclure.

The common name Osage orange is derived from the orangelike appearance of the fruit and the fact that the Osage Indians of Arkansas and Missouri used the wood

ANITA SABARESE

The pioneers used Osage orange fruit to rid their cupboards of cockroaches.

for bows. (For this reason, early French explorers called it *bois d'arc*, meaning "bow wood.") A medium-sized, twenty-to-forty-foot thorny tree (one will occasionally reach sixty feet), it has an irregular crown with gnarled branches growing in equally irregular patterns. Its glossy dark green leaves are simple, alternate, and smooth margined, two to five inches long with an oval shape that ends in a slender point. In late autumn, these leaves turn a clear, shiny yellow.

A native of Arkansas, Texas, and Oklahoma, the Osage orange was one of the many valuable plants brought back East by the Lewis and Clark expedition. The first to see them in cultivation was a Scottish traveler, John Bradbury, who in 1810 found two trees growing in the garden of Pierre Chouteau, one of the first settlers of St. Louis. They had been introduced from a settlement of the Osage Indians.

Native Americans had used the tree, recognizing its usefulness for weapons and dyes. Stronger than white oak and as tough as hickory, Osage orange bow wood was so desirable that, according to Bradbury, Indians living on the Great Plains would trade a horse and blanket for a bow made of Osage orange. Today it is still highly valued by archers. Indians also used the tree's yellow sapwood and dark orange inner bark to produce yellow dyes for coloring their blankets.

This tree is perhaps best known for its use as a hedgerow, which extended its range from Colorado to southeastern Canada and most of the area east of the Mississippi. In the plains states, its fruits are still called hedge apples.

Since the prairies were treated as common pasture with settlers living in scattered groups at the edges of groves and streams, there was a great need for inexpensive but effective fencing, and lumber was in short supply. After the 1848 introduction of Osage orange to the Midwest by Professor Jonathan B. Turner of Illinois College and John A. Wright, editor of *The Prairie Farmer*, a Chicago newspaper, farmers of central prairies were finally able to enclose their stock, using Osage orange as hedges.

Turner was convinced that "God designed osage orange especially for the purpose of fencing the prairies," and he called it "the greatest blessing ever introduced upon the farms of the west." Resistant to drought, heat, and wind, it developed dense, thorny stands with zigzag branches down to the ground. It grew rapidly and

PAUL F. SAND

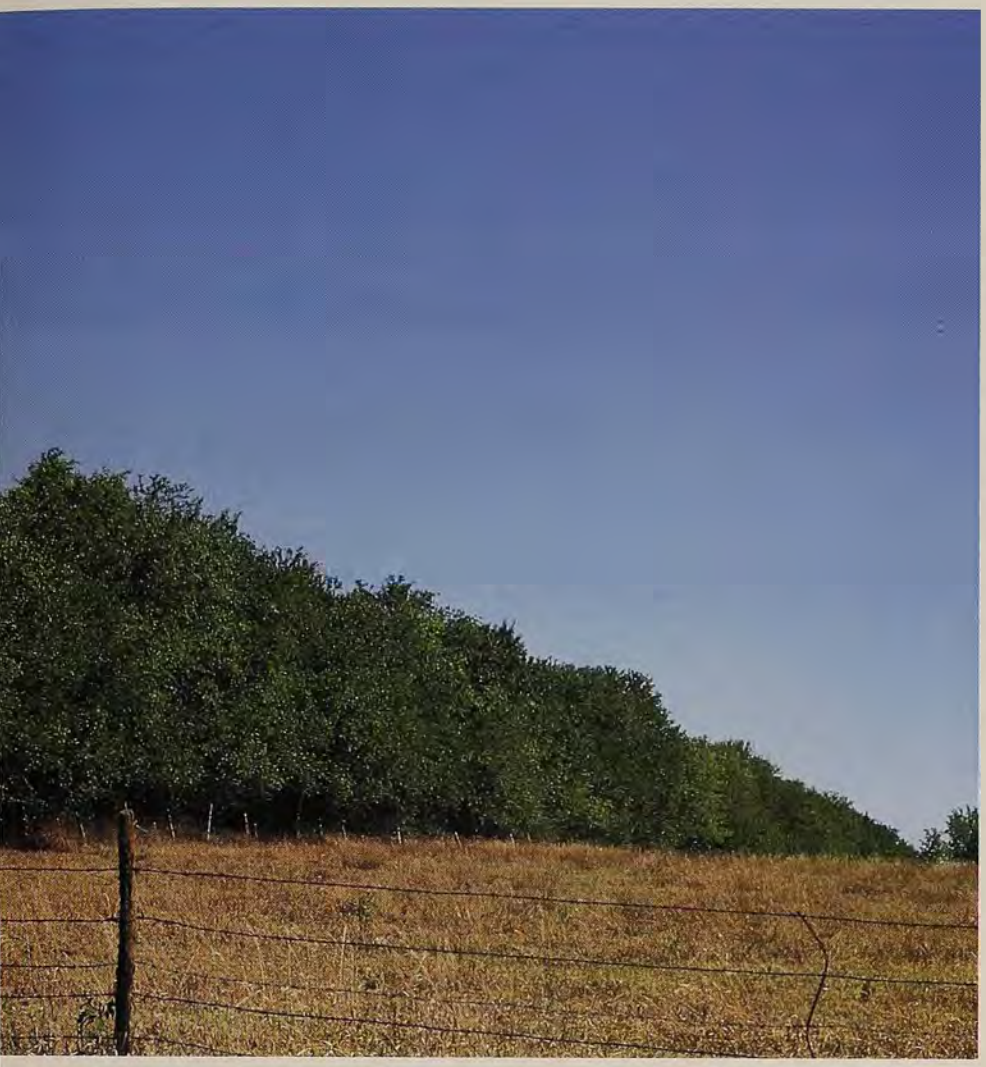
easily from seed without becoming so tall that it shaded crops and met the old requirement that a hedge plant be "horse-high, bull-strong, and pig-tight."

By 1855 Osage orange had made it practical to fence entire farms. A trade in seed and plants arose; farmers could purchase Osage orange locally and from Eastern sources. Ads placed by local businessmen boasted, "Splendid are the Nebraska Osage plants and cheap too at Price and Beach's" and "Osage orange seed and plants warranted fresh and good at Reed Brothers." Farmers responded with enthusiasm, and until the invention of woven and then barbed wire, it was the standard fence. *The Nebraska City News* of February 12, 1868, reported: "Osage orange—miles of this everlasting fence will be set out during the spring by farmers of Otoe County. Mr. Fielding, who is improving a quarter section of land 4 miles southwest of the city, has contracted with eastern parties for enough plants to enclose the entire quarter."

Within several decades thousands of miles had been planted. In Kansas alone, between 1865 and 1939, farmers planted 39,400 miles of single-row shelterbelts and hedges of Osage orange. Besides fencing the land and acting as windbreaks, these hedgerows promoted an increase in small game, especially quail and rabbits, by providing cover and a food source.

Farmers maintained the hedgerows at a height of approximately four feet. Tall, overgrown shoots up to fifteen feet high were cut on one side of the stem only, so they would not die and could be bent without breaking. They were then laid over along the top of the hedge to thicken it and fill in open spaces.

By 1875, the hedgerows were gradually being replaced with wire fencing, which did not require annual clipping and patching. In 1948, farm forester Wendell H. Harmon reported that there had been continuous destruction of hedgerows for seventy years, with the loss of more than 160 miles in southeastern Nebraska in the previous year alone. He hoped that a greater understanding of the value of hedgerows—windbreak benefits, cover for wildlife, and production of fence posts—would encourage farmers to preserve this inherited resource. Nevertheless, forty-three years later the high value of land has



PAMELA HARPER

Top: Hedgerows of Osage orange trees once lined the plains from Colorado to southeastern Canada. Above: Native Americans and early settlers used Osage orange bark for a dye.

provided even more impetus for their removal and replacement by wire fences requiring less space. Those hedges that remain have become full-size trees—mere remnants of prairie history.

This versatile tree served the pioneers in numerous ways besides providing hedgerows. Like Native Americans, early settlers also used Osage orange bark for a dye, primarily for wool. Because the wood was strong and resistant to decay, it was hewn into cabin supports and railroad ties. Its durability and resilience put it in great demand for both hubs and rims of the wheels of horse-drawn vehicles.The famous Texas cattleman Charles Goodnight used it to build his new invention, the chuck wagon, enabling the vehicle to endure the punishment of bumping over the Texas panhandle.

Even the curious fruit was useful to the pioneers, who placed it in their cupboards to keep out cockroaches. More recently, research has shown that a single Osage orange hedgeball in one room will prevent cockroaches, apparently because of its cedarlike aroma. A stronger smelling distillate made from the fruit has also been found to be effective in repelling pests. Nevertheless, some animals do eat the fleshy fruits or the seeds within them. In the Midwest, fox squirrels carry fallen fruits up the tree and drop them to smash them open; black-tailed deer in Texas browse on them; and crossbills pick out the seeds.

Even after its replacement by wire fencing the dense, decay-resistant orange wood of *Maclura pomifera* continued to be widely used for fence posts. This is the most important modern use for Osage orange wood, and many Midwestern farm communities engage in a brisk local business in these posts. The stumps sprout readily and grow to adequate size in fifteen to twenty years; 1,000 posts can then be cut from one-quarter mile of hedge. More durable than any other untreated fence posts used in the Midwest, they have been known to last for sixty years.

Perhaps because of its coarse fruit and thorny ruggedness, Osage orange has never become a common landscape plant. In the United States it has occasionally been planted for its shade, the ornamental value of its shiny leaves, and its hardiness and drought resistance. As long ago as 1868, Osage orange was recommended for use not only as a hedge, but also as a specimen planting for small lawns; in the late eighteenth century, the first specimen sent to England in a botanical collection brought a high price as a curiosity. Although its wide-spreading shallow roots require ample space, this roughhewn beauty is virtually free of insect or disease problems, and provides lovely dark green foliage, unusual fruit, and bright yellow fall color. When planted in the home landscape as a unique specimen of historical interest, Osage orange is a reminder of American frontier culture—like the log cabin and covered wagon, a symbol of courageous pioneer spirit.

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SOURCES

Dabney Herbs, Box 22061, Louisville, KY 40252, (502) 893-5198. Catalog $2.

Mellinger's Inc., 2310 West South Range Road, North Lima, OH 44452, (216) 549-9861. Catalog free.

MRS. FRANCIS KING

'Dean of American Gardening'

This club founder and popular author brought gardening home to countless Americans in the 1920s.

BY VIRGINIA LOPEZ BEGG

Prince Henry of the Netherlands punned in a 1925 toast to Louisa Yeomans King, "I drink to the King of America." In the gardening world at least, the prince's play on words was not far from the truth. *House & Garden* called her the "fairy godmother of gardening in America" and the "dean of American gardening." Others waxed religious and pronounced King the "patron saint" or "Mother Superior" of American gardeners. She was called the American Jekyll and described with affection as "the best-beloved and best-known American woman gardener."

Known professionally as Mrs. Francis King, Louisa Yeomans King (1863-1948) was a writer, lecturer, and founder of two national garden groups, the Garden Club of America and the Woman's National Farm and Garden Association. She produced nine garden books between 1915 and 1931 and wrote innumerable magazine articles. She was general editor of the nine-volume Little

Right: Louisa Yeomans King holds a prize gladiolus from her garden at Orchard House in Alma, Michigan. Gladiolus, daffodil, and tulip cultivars were named for her.

Garden series, writing two of these herself and persuading influential friends like Fletcher Steele to pen the others.

King's friendships were an important part of her career. She corresponded often with many of the garden luminaries of her day, including Charles Sprague Sargent, Ellen Shipman, and Gertrude Jekyll. It was King who preached the Jekyll gospel to many new American gardeners in the 1920s. They, too, wrote to King and she often answered two dozen letters a day.

King's honors included having a daffodil, a tulip, and a gladiolus named after her, but her greatest came in 1921 when the Massachusetts Horticultural Society awarded her its George Robert White medal. The first woman to receive the prestigious award, she joined a list that included plant explorer E. H. Wilson, designer and writer William Robinson, and French hybridizer Victor Lemoine.

The early twentieth century was a golden age for American horticulture. The automobile encouraged the growth of suburbs and millions of Americans took up gardening, stimulating a flood tide of books, magazines, nurseries, garden clubs, and plant societies. The variety of available plants increased geometrically too, as plant explorers and hybridizers strove to meet the demand.

The booming economy of the Roaring Twenties allowed many families to spend money on their gardens for the first time, while industrial giants like Ford, Phipps, and others acquired great country estates to reflect their wealth and ape English horticultural precedent. The "country place era" stimulated interest in the garden as fine art and the emerging profession of landscape architecture. Underlying the fervor for gardens for rich and middle class alike was a deeply felt reaction to industrialization and the pace of modern life, and King rode the crest of these sentiments. Not until World War II absorbed the country's energies did the passion for gardening abate.

Louisa Yeomans was born in Washington, New Jersey, in 1863. Her father, a Presbyterian minister, was from Massachusetts and her mother from Baltimore. One of five children, she was brought up to value reading, religion, and music. She met her future husband visiting friends in Chicago, and always referred to herself as Mrs. Francis King in her professional activities, although other women of her generation, like Louise Beebe Wilder, chose to use their own first names.

COURTESY OF THE SCHLESINGER LIBRARY, RADCLIFFE COLLEGE, AND WNFGA ARCHIVES

COURTESY OF THE SCHLESINGER LIBRARY, RADCLIFFE COLLEGE, AND WNFGA ARCHIVES

Left: King worked with the Women's Land Army, a World War I agricultural project. This advertisement was aimed at the group's volunteers. Right: Officers and speakers at a meeting of the Woman's National Farm and Garden Association. King is the third from the left. Far right: King contributed to both House & Garden *and* House Beautiful.

King was introduced to gardening by her mother-in-law in Elmhurst, Illinois, in the Gay Nineties. Her mother-in-law, she recalled fondly, "long before the gracious art was generally practiced in the Middle West, had an old-fashioned formal garden, on the order of that at Mount Vernon. . . . In her garden of herbs were as many as 210 varieties." Louisa King began to explore the latest English garden writings, which described a new sort of hardy garden, quite different from the bedding-out schemes of flagrant annuals so dear to Victorian hearts, and quickly became a convert to the gardening ideas of William Robinson and Gertrude Jekyll.

At the turn of the century, Francis King became ill and moved into an Alma, Michigan, sanatorium to recover. Louisa King, now a mother of three and never a fan of urban life, determined to move the family permanently to the rural community. The couple built a large home, Orchard House, where King began the gardens that would become famous through her books and a destination of garden pilgrimages for many years. Overflowing perennials made the formal beds seem new and exciting, an effect enhanced by loose groups of flowering shrubs.

Meanwhile other Americans, especially women, were also discovering perennials, called hardy plants in contrast with the tender annuals that had prevailed for decades. Victorian mores and garden practices had kept many women from the physical labor of gardening. But 1898 had seen publication of a little volume called *Elizabeth and Her German Garden*. Written anonymously, the book purportedly was about a young matron making a garden near the Baltic Sea but in fact contained a good deal of thinly veiled feminism. The book caused a sensation in England and the United States. Then in 1903, a New Jersey woman named Helena Rutherfurd Ely wrote *A Woman's Hardy Garden*, and the book enjoyed instant success. King gave equal credit to these two books for "the great impetus to general gardening in America. . . . The former created the desire to garden; the latter gave practical advice towards the garden's making."

In 1910, King published her first article in *The Garden*, an American magazine modeled on the more famous English publication of the same name. She wrote about succession of bloom in the garden and how one plant can enhance another. Tulips, she pointed out, "absolutely lack backbone" and spring storms often leave them lying in the mud. Why not plant them among oriental poppies, she suggested. "The leaves of the poppy, upright and hairy, form a capital support for the misbehaving stems of [tulips] and the poppies, having thus lent the tulips aid in time of need, go a step farther and cover their drying foliage with a handsome acanthus-like screen of green surmounted by the noble scarlet and salmon blooms of early June." Other ar-

PHOTOS BY VIRGINIA LOPEZ BEGG

ticles followed and, in 1915, a collection of her writing was published as *The Well-Considered Garden*, with a preface by Gertrude Jekyll.

As her career blossomed, King joined the burgeoning garden movement. In 1912, she helped to found the Garden Club of Michigan and served as its first president. In Philadelphia the next year, she was a founder and vice president of the Garden Club of America (GCA), arguably the most influential garden group in that era. And in 1914, she helped found and became the first president of the Woman's National Farm and Garden Association (WNFGA).

With the outbreak of World War I, King, like many Americans, threw herself into war work. The WNFGA and the GCA organized the Women's Land Army in New York City and, by war's end, had placed 15,000 "farmerettes" on farms throughout the country. Farmers were at first suspicious about the abilities of female workers but, when crops began to rot in the fields, they overcame their reservations and the experiment was a success. King later won a bronze medal from the National War Garden Commission for her efforts in food production through WNFGA.

At the close of hostilities, garden enthusiasm reached even higher levels. Suburbs, the product of an expanding economy and the rapid spread of automobile ownership, sprouted everywhere, and more homeowners set out to make their first gardens. King had found a new audience.

She wrote seven books in the 1920s, three of which were specifically aimed at owners of small properties, like the new suburbanites: *The Little Garden* (1921); *Variety in the Little Garden* (1923); and *The Beginner's Garden* (1927). The first two were part of the Little Garden series, for which King served as general editor. She seemed to know everybody in the garden world of her time and gently twisted a few arms to get writers for other titles. Through the GCA she knew landscape architect Fletcher Steele, and persuaded him to write *Design in the Little Garden*. Mrs. Edward Harding, who shared her prize peonies with King, wrote *Peonies in the Little Garden*. She is known today through the old peony cultivar, 'Alice Harding'.

King's persuasive powers were also brought to bear on total strangers. A friend once reported that, in the time span of an elevator ride, the enthusiastic writer had recruited two new garden club members. Even at the close of her life, her zest did not flag. In a hospital bed, shortly before her death, she convinced her nurse to join the WNFGA. This enthusiasm came through in her writing; books seemed to fly out of her typewriter. Her other titles include *Pages from a Garden Notebook* (1921) and *Chronicles of the Garden* (1925), both collections of her magazine articles; *The Flower Garden Day by Day* (1927), a garden diary with a forward by Gertrude Jekyll; and *The Gardener's Colour Book* (1929), an English color guide reworked for use in this country.

In addition to her books, she produced magazine articles year after year. She wrote for garden magazines, women's service magazines, popular periodicals like the *Saturday Evening Post,* and shelter magazines, most notably *House & Garden* and *House Beautiful.* The latter published her column, "Chronicles of the Garden," for several years in the '20s.

The theme of all of her writings was the perennial garden. She wrote of "the soft sight of many blooming flowers, the sweet scents in the dew, the rich greens of foliage and turf in the fading light" and how to achieve such effects. She had little to say about pests or diseases, but wrote about the design of the garden, the plants it contained, and especially its color scheme.

Design was crucial. "It is the lack of plan that is responsible for most that is ugly in America," King believed. She was an ardent champion of landscape architects for those who could afford them, and full of ideas to help those who could not. Reading and visiting other gardens were then, as now, sources of inspiration. Among her recommended authors, she believed Liberty Hyde Bailey and Jekyll were the two necessities. For those who couldn't travel, she shared descriptions and pictures of gardens from California to Tennessee to Massachusetts and abroad.

No one, she counseled, should be without a garden notebook, whether visiting gardens or just working at home. Miss-

KING AND THE AMERICAN HORTICULTURAL SOCIETY

Mrs. Francis King was a Vice President of the American Horticultural Society from 1928 to 1932 and had two articles published in *The National Horticultural Magazine,* the previous name of *American Horticulturist.* In April 1933, she wrote a tribute to Gertrude Jekyll on the event of the Englishwoman's death, and in January 1941, she wrote about "The Pleasures of Gardening." The passage below is taken from the latter:

"In the sweet stillness of an afternoon in late September I sit in the Chaucerian corner of the stone seat at Kingstree, look on present beauty and think on what is past. The arching sweetbriars beyond the two curved benches at the far edge of the paved garden are hung now with bright hips; great pots of petunias fling their lavender flowers about, and other petunias self-sown in the cracks of paving rise strong and bright with violet and white flowers above many tufts of that green-white sweet alyssum of Sutton's that I like best. Two charming altheas, all that are left of eight (no subjects for this climate) are in full pink flower, palest pink with deep crimson center, while below one of them an azaleamum (horrible name!) is also pink with bloom. The Long Walk of grass is flanked by orange and yellow annuals, cosmos Klondyke at the back, fine calendula and marigold below, while now and again rise miniature sunflowers overtopping the cosmos and at every ten feet a young new plant of aster, King George. All this has asparagus foliage as a background, with lilac and peony as the stronger subjects between. Crickets are sounding, the sun descends and lights the mountain with gold, the sky above is azure, all below is green and quiet. The smell of corn tassels from the garden, of nicotines from the paved garden, of fresh-cut hay in the meadow below, becomes pungently sweet and I look at this loveliness and breathe in the autumn fragrance and realize as a hundred times before the good fortune of one who owns land both productive and beautiful."

ing her own notebook while in a London garden, she once impulsively wrote the name of a plant on a handkerchief, using her little girl's back as a desk.

The trial garden was another technique to help the gardener learn. She maintained a hidden corner where she grew plants before she let them into her main display. Here she would often carry a cane-seated chair, not to rest, but to try various color combinations in its holes.

King shared her love of color with Gertrude Jekyll, whose mastery of the subject no one has since equaled. In agreeing to write a preface for King's first book, Jekyll told her: "All your garden ideas are so sympathetic that it will be an easy and pleasant task." While advanced gardeners knew of Jekyll's garden ideas, there is no doubt that King's frequent references introduced them to a much wider American audience.

But King was no slavish Anglophile. She once described searching for an obscure grape variety for English writer, Eden Philpotts, who had mentioned his wish for it in one of his books. Just after she joyfully located the plant, she read Philpotts's arch remark that the only hospitality Americans required was to be fed squash pie and allowed to brag about their country. King bristled in print: "In so far as I can achieve it, Mr. Eden Philpotts has gone, goes, and shall go grapeless."

King influenced American gardens not only through her writing but also through the organizations she helped to found. In her days, the doors to higher education and the professions were firmly closed to most women. Women's clubs developed after the Civil War as women sought expression outside the home for their energy and creativity. These clubs had many purposes—political, moral, educational—and it was only natural that when the gardening fever struck, garden clubs should follow. In 1904, just one year after the publication of Helena Rutherfurd Ely's book, the Garden Club of Philadelphia was organized, and that group invited other clubs to form the Garden Club of America in 1913. King was one of the small group who met to hammer out the details; she and Ely were two of the four vice presidents.

The GCA played a pivotal role in American gardens of the era. Its founders were among the most influential women in the country—the Biddles of Philadelphia, the Ridgeleys of Baltimore, the McCormicks of Chicago—and its influence helped to preserve historic gardens and to make a wider variety of plants available to all Americans. For her efforts on its behalf—writing for its bulletin, lecturing, holding office—King received the GCA's top honor, its gold medal, in 1923.

King ardently believed that gardening and garden clubs were great forces for democracy. Underlying all her writing was a conviction that a love of growing plants could break down differences between economic groups as well as neighbors. Along with Thomas Jefferson, she believed that rural life served the human spirit far better than "life in cubicles." Echoing the seventeenth-century English writer Sir William Temple, she wrote: "Rich or poor, bond or free, when we garden we are at the same work; we work with the same great elements; we work in faith that the seasons will still roll for us and for our sowings and plantings. There is no other such meeting-ground: there is no community of interest such as this of gardens."

These beliefs were an important part of King's commitment to the Woman's National Farm and Garden Association. The WNFGA was organized for a variety of reasons, all close to King's heart. It sought to encourage careers for women in agriculture and horticulture, to bring together city and country women, and to bridge the isolation of rural women. The organization included these women as well as influential champions of rural and outdoor life like King's friend, Mrs. Henry Ford.

The issue of women's advancement was important to King. In her writings she quoted letters that proved to her that only by owning their own businesses could women hope to overcome the obstacles in their paths to success. Other professionals among early WNFGA leaders were landscape architect Elizabeth Leighton Lee and Jane Bowne Haines, the founder of the Pennsylvania School of Horticulture for Women. Other members included a cattle breeder, a beekeeper, truck gardeners, and ornamental plant sellers. The group provided scholarships for women seeking admission to agricultural colleges and schools of landscape architecture. King believed outdoor careers "would bring the pale stenographer, the teacher who cannot and who should not teach . . . into the fields and gardens of this great land of farms and gardens." In her memory, the organization dedicated a garden of dogwoods at the U.S. National Arboretum, which they maintain today. At its dedication in 1952, arboretum director B. Y. Morrison recalled how King had warmly encouraged his own early efforts at writing, as she had those of so many others.

King's last book was *From a New Garden* (1930), which she wrote after the death of her husband in 1927 forced her to sell their cherished Orchard House. She wrote in her garden notebook: "The beauty of the four apple trees over the crosswalks, pleached to form a bower of leaves and fruit; the happy repetition of squares of brick and gravel in this upper garden, the delicate little distances of flower-bordered walks, of thick tunnellings of green, of lilac, of deutzia, and of apple—all is so sweet, so exquisitely dear, each leaf and blade is so known and loved, that soon to see it in other hands is a martyrdom. But this—and more—gardeners must sometimes endure. And the hope is that somewhere, somehow, another garden waits to be created."

And so it came to be. Perhaps attempting to recover from her losses, she traveled to Europe. She had returned at the height of the 1928 presidential campaign and she volunteered for Herbert Hoover and the Republican cause. Returning from a speech in Schenectady, she impulsively got off the train in South Hartford, New York, in the foothills of the Adirondacks. There she bought an old farmhouse and began a new garden. She christened the place Kingstree, after a majestic elm near the house.

King continued to write, though at a slower pace. In 1932 she wrote the chapter on American gardens in *The Story of the Garden* by Eleanour Sinclair Rohde, one of England's best-known garden writers. Montgomery Ward asked her to be its garden advisor in 1943, and published her *Planning Your Planting*, a series of garden plans.

As she approached and entered her 80s, King continued to lecture, and dashed off notes to friends about speaking at the homes of such well-known people as Mrs. Thomas Edison. Following World War II, she became a strong supporter of the ideals of the United Nations, and proposed the idea of an International Horticultural Society. "Gardeners never fight with each other," she said. As ever, she optimistically believed in the love of gardening to break down differences between people.

King died in January 1948 at her daughter's Massachusetts home. As she had desired, her ashes were scattered over her much-loved garden at Kingstree.

Virginia Lopez Begg is a landscape historian with a special interest in the role of American women. She is writing a biography of Mrs. King.

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