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October 1992

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American Horticulturist

Volume 71, Number 10

October 1992

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OCTOBER'S COVER

Photographed by Al Bussewitz:
PHOTO/NATS

The trunk of the dawn redwood, *Metasequoia glyptostroboides*, is buttressed and fluted at the base. Its reddish brown bark turns gray as it ages and exfoliates in narrow strips. While the tree's eventual 70-to-120-foot height makes it impractical for many landscape uses, it makes a beautiful specimen on a large open lawn. Beginning on page 40, the latest in a series of tree histories by Susan Sand details the dawn redwood's rescue from near extinction.

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

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COMMENTARY

In this age of Orwellian doublespeak, "politically correct" education, and leadership based on public opinion polls, it is appropriate for us to examine how a horticultural perspective can be an antidote for much that ails us in both national politics and horticulture itself.

Throughout human history, the garden has yielded more than a mere harvest of fruit and vegetables or moments of quiet repose. From the Garden of Eden to the monastery pea patch of Gregor Mendel, gardens have shaped human events. The plants with which we share the garden

have steadily yielded great secrets to us throughout the millennia. The plant kingdom is the basis of our food, medicine, and clothing.

Yet there are lessons from the garden that we have not applied to our wider world. Our government is in need of repair, and gardening virtues are appropriate for this task: apprehending how elements work together, paying attention to detail, responding to changing conditions, making decisions at the right time, valuing accurate information and knowledge, not applying wholesale solutions, respecting experience, taking risks, dealing positively with failure, planning for the long term. Are these not the attributes of a sound government?

We can create good government as we create beautiful and productive gardens. Yet we create either in our own image. Recent surveys indicate that less than thirty-five percent of those eligible actually voted in the last presidential election. Those who fail to vote are like gardeners who sit on their patios and grumble that the weeds need removing, the pests need controlling, and the overgrown shrubs need pruning.

We need to improve our governance if we are to maintain our viability as a community. Plants and gardens do not play politics, but they can be affected by politics. The role of science—much of which is government-funded and regulated—is critical to each of us in carrying out our stewardships of horticulture. Many controversies beg for careful and patient scientific investigation. In the June 15 *American Nurseryman* Arnold Arboretum Senior Horticulturist Gary Koller points out that kudzu (*Pueraria lobata*) was imported by the U.S. Department of Agriculture for soil stabilization. Had it been tested properly, it might not have been introduced, since it has permanently altered the native landscape in many parts of the South. Similarly, unbiased scientific investigations are needed to clear the thick fog surrounding such controversies as genetic diversity and the regulation of pesticides.

As I write, the humidity of August permeates the walls of my house as its sun ripens tomatoes and melons in my garden. Soon we'll enjoy the bounty we've worked so hard to grow, reaping what we sow as has been done for time immemorial. As you read this, fresh acorn squash may be baking in your oven and home-grown potatoes boiling on the stove. We grow our own edibles because we believe they're better for us. We can elect our officials—and conduct our horticultural affairs—with the same careful consideration and the same goal.

—George C. Ball Jr., AHS President





LETTERS

Gardening With Children

I am happy to know that AHS finds children's gardening important and is seeking to promote it.

To me, as a parent of a preschooler, it is apparent that children are fascinated by nature and eager to explore the earth. Even urban and suburban settings with their limited offerings can be places of discovery and awe. I encourage AHS to campaign to bring plant and gardening programs to youngsters everywhere. Community youth programs centered on gardening would offer children a chance to learn that they are part of a big cyclical universe that sustains them and adds beauty to their lives. Also, ideas for gardening at home would assist parents in instilling an appreciation for gardening and its many rewards, no matter the size of the garden.

I think it is critical that children are involved in the garden as a living classroom. Plants, soil variations, and climatic differences are important to my child's education. Recognizing nature's interconnectedness to their lives can only enhance children's quality of life and in turn enhance the life of our planet. Using the garden as a classroom teaches science and history and can instill a sense of wonder.

I commend AHS for its foresight in recognizing the need for promoting children's gardening and hope to see its goals implemented on local levels.

Anne Gray
Shaker Heights, Ohio

Himalayan Poppy Roots

In Molly Dean's article on poppies (June), she says that the Himalayan poppy must be grown from seeds. However, on the back cover of the Jackson & Perkins 1992 spring catalog is a picture of Himalayan poppies (*Meconopsis betonicifolia*), and the description says "We ship year-old dormant root divisions." Perhaps you would like to check this out.

Marian Wickline
Placerville, California

The Himalayan poppy was a new offering from Jackson & Perkins in their 1992 spring catalog. However, Ron Ferguson,

the nursery's horticulturist, said it will not appear among their fall offerings. The root divisions proved too delicate, both while being shipped to them, and for customers living in most regions of the United States. "We had to have three shipments because they kept overheating," said Ferguson. "It's very specific to cooler climates, and proved too difficult to establish. We'll have to do more research, then we may offer it again because it's such an appealing flower."

Paulownia Rings

I have just read the most interesting article about *Paulownia* by Susan Sand in your June issue. It sums up much that I already know, but mentions the collapse of the *Paulownia* export market about 1979, which I never read about before.

However, she says that "The Japanese look for narrow, evenly spaced growth rings—preferably five per inch." Five rings per inch is considered widely spaced, not narrowly spaced. I have enclosed a table of prices by log grades showing that the most valuable logs must have at least six to eight rings per inch.

Roland H. Ferguson
Retired Forester, U.S. Forest Service
Sykesville, Maryland

Susan Sand checked with forestry specialists, who explained that while the information was correct at the time she conducted her interviews, log specifications change with supply and demand and may even change each year. Sellers of Paulownia therefore need to check with several buyers to gauge the best price. The main thing to look for in evaluating Paulownia wood is evidence of a slow growing, straight tree. Rings per inch is the usual measure of growth rate.

Correction

During the editing of our August issue, a specific epithet attached itself to the wrong genus. In the article "Let's Hear It for Annuals," the annual scabiosa should have been identified as *Scabiosa atropurpurea*. The seasoning sage is *Salvia officinalis*.

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OFFSHOOTS



BILL FIRESTONE

Supermarket Fruit

by Chris Bright

Is your supermarket selling the Fruits of Evil? If you shop at specialty markets, the question might not arise: you might be no more likely to buy fruit in a supermarket than underwear at a garage sale. But for many Americans, nature's bounty is still an aisle at the Value King or the local equivalent. And the King's fruits are almost always in a sorry state. No doubt there are more of them than there used to be and some of the novelties are interesting. But it's the size of the specimens on display that's most striking, and it makes you wonder what His Majesty is up to. He's going for bulk—that much is clear. But whatever else he had hoped to achieve, the results are generally taste-free.

A look around the King's horn of plenty will make the problem clear. You'll notice first that many of these unhappy delicacies have been wrapped in plastic—and with such a vengeance they could be mistaken for forensic samples. Sometimes even cocoons get the cocoon. (Maybe they've been

sterilized. But what would you do with a sterile coconut?) And what does all this packaging protect? Well, here is a cluster of swollen, pale green grapes. They may look a little ominous if this is your first visit, especially if you know about Jumbo Bath Oil Beads. But they offer the palate no offense. In fact, they offer it nothing at all: the flavor has departed with the seeds. It's the same with that chunk of sickly Sky Lab experiment watermelon. That's what dessert is going to be like on the mission to Mars, but if you haven't been eating from a tube for the past month, you won't enjoy it. And how about those pears? Now, with supermarket pears, you usually have a choice. If you pick a green one, it's going to be like chewing on a turnip. If you pick yellow, get ready for a mouthful of congealed Cream of Wheat.

Do you dare to eat a peach? There they are, stacked like ammunition, so uniform it's hard to believe they grew on trees. The high-end supermarket peach can get as big as a croquet ball and is liable to be of similar consistency. Still further up the aisle, you'll find the strawberries, which look like they

Continued on page 8

1993 Gardener's Guide

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1993 Gardener's Guide

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1993 Calendars

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WRITTEN BY LOUISE CARTER AND JOANNE LAWSON

From the writers of Starwood Publishing's award-winning *Three-Year Garden Journal* comes another winner: a region-specific series of gardening guides in wall calendar form. Lavishly illustrated and highly informative, the Gardener's Guides are designed to help you garden successfully throughout the year in any part of the country.

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

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

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

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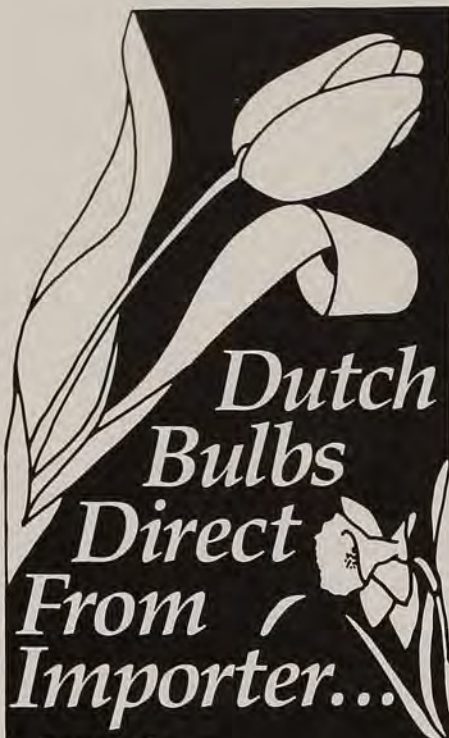
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Offshoots Continued from page 6

belong in a documentary on Chernobyl or in a medical museum. Some of them might be cartoon giblets. Some are hollow inside, and those little plastic baskets always contain a few weirdly anemic ones that seem to have five-o'clock shadow. And the taste? It's the Untaste. It's generic fruit pulp. You could almost be eating melon balls made from the cantaloupe retreads across the aisle.

Something unwholesome has infected the King's cornucopia. His fruits swell to ever greater magnitudes, but they never really ripen. Have you noticed, for instance, that the bananas start to blacken before they're fully yellow? And have you ever eaten a supermarket nectarine? Until you have, you don't know how unripe a fruit can get. That dense, permanently immature flesh makes the nectarine, well, kind of pro-active, to use a current buzzword. When you bite into one, you usually encounter just enough give to anchor your incisors before the flesh cracks in a seismic spasm that leaves you sucking a hunk of chilled particle-board. This is an event that will never be documented in a denture adhesive ad.

But take a fruit we all think we know: the apple. America has produced apples practically since the colonists began to torture the soil of this promised land. An imported variety called 'Roxbury Russet' was here by 1650. And by the beginning of the nineteenth century, American farmers had developed dozens of varieties. These old apple strains are as distinctly American as the Conestoga wagon or the Declaration of Independence.

Unfortunately, they have not been as carefully preserved. Many are so long forgotten that you might not know they were apples from their names: 'Sheepnose', for example, or 'Blue Pearmain', 'Peck Pleasant', 'Winter Banana', or (no kidding) 'Rambo'.

In 1900, the seventh edition of the *Cyclopedia of American Horticulture* was published. If you look up "apple" in it, you'll find a list of the "leading commercial varieties in North America" that is twenty-seven entries long, from 'Albamarle Pippin' to 'York Imperial'. The total number of strains available as nursery stock is said to be "not far from 1,000 kinds." Why so many different apples? The old horticultural manuals will tell you that each variety has its special virtues. One can withstand the coldest winters, for example. Another bears fruit that is exceptionally sweet, or especially good for baking. Still another bears very early in the season, and so on.

But if you look through one of these manuals, you're bound to conclude that the real reason for this profusion of fruit is much simpler than all that. The real reason is that people appreciated the abundance of flavors that breeders had managed to coax from the tree. The real reason, in a word, is taste. Today, American nurseries probably stock less than one tenth the number of apple varieties available at the turn of the century.

Now back to the Value King. How many types of apple do we find there? On a good day, maybe four. There are the red and yellow varieties of the misnamed 'Delicious', and there is the green and unforgiving 'Granny Smith'. And then, if we're lucky, there is the 'McIntosh', which is as close to a real apple as we're going to get. But all four of these will be accepted as real apples, because we don't remember the fruit any other way. We've forgotten that real apples don't taste like wet Styrofoam. We've forgotten that they don't look like the Fatal Fruit in the Disney version of Snow White, and that they come in sizes smaller than a baby's head.

Is there a cure for what ails the apple, and the King's other fruits? It might be helpful to buy local produce, when it's available. After all, if farmers don't have to worry about how a pear will survive 2,000 miles of interstate in the back of an eighteen-wheeler, they might concentrate on growing one that's edible. But there's probably no sure-fire remedy, and maybe that's just as well. You may remember the passage on blueberries in *Walden Pond*, Henry David Thoreau's account of the two years he spent in the Massachusetts woods in the 1840s:

It is a vulgar error to suppose that you have tasted huckleberries who never plucked them. A huckleberry never reaches Boston; they have not been known there since they grew on her three hills. The ambrosial and essential part of the fruit is lost with the bloom which is rubbed off in the market cart, and they become mere provender. As long as Eternal Justice reigns, not one innocent huckleberry can be transported thither from the country's hills.

So the next time you pick up a package of the King's bloated blueberries, think of Thoreau. And remember that there was a time when the huckleberry grew wild and free.

Chris Bright, formerly a free-lance writer specializing in environmental topics, joins the staff of American Horticulturist this month as an assistant editor.



BOOK REVIEWS



The Natural Shade Garden

Ken Druse. Clarkson Potter, New York, 1992. 280 pages. 8¾" × 11¼". Color photographs. Publisher's price, hardcover: \$40. AHS member price: \$34.

Nature abhors a monoculture. Yet every spring, armies of homeowners rush forth to plant grass under shade in an effort to make their homescapes identical. We are all in debt to Ken Druse for writing *The Natural Shade Garden*. No longer will fescues and "shade mixes" be necessary. The areas under trees where dust bowls develop each July can now be the centerpieces of the yard.

Ken Druse called on me for resources while he was putting together this book. Because I enjoyed his last one, *The Natural Garden*, so greatly, I was looking forward to seeing this one. It is even better.

Druse takes readers on a guided tour of gardens throughout the United States, pointing out gardens that thrive under conditions that most people have been told are impossible. The photographs are a joy to behold. They inspire the reader to try new and unusual plant combinations, to experiment, not just with foliage in the shade, but to add breadth and height to the plantings, and to create islands of plants under the shade, using not only cultivated plants

but native and wild plants as well.

The plants used in many of the gardens portrayed in the 500 color photographs are not just small specimens, but range to dwarf trees and numerous shrubs. Throughout the text, there are lists of plants grouped by their uses. Plants for deep shade are arranged by their color and growth habit. There are photos of variegated possibilities and suggestions for mixing types of plants. Imagine ground covers with spring bulbs blooming through them! Shade gardens can be filled with colorful blossoms. Even three hours of sun can make many plants flower.

The last two sections offer suggestions for those unfortunate enough not to have any pre-existing shade. There are guidelines for selecting ornamental trees to provide shade as well as a series of photographs offering broad vistas of successful and stunning shade gardens.

In the "Sources" portion of the book, one can find lists of plants arranged by color of bloom and growth habit, as well as an extensive collection of mail-order sources. There are books listed as suggested reading and an extensive collection of "Places to Visit" in each state of the union.

The Natural Shade Garden will be an essential reference for those who want to reduce their dust-bowl summer mowing and beautify their homescapes with greens and grays, yellows and reds. —Keith Crotz

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

The Private Gardens of Charleston

Louisa Pringle Cameron. Wyrick & Company, Charleston, South Carolina, 1992. 96 pages. 8½" × 11". Color photographs. Publisher's price, hardcover: \$39.95. AHS member price: \$33.95.

The Private Gardens of Charleston by Louisa Pringle Cameron bears the stamp of an enthusiastic gardener wedded to the ancient sensibilities of this port city. Photo-

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graphs of the old and new are described in tandem—nice! This book is not a salute to past glory, nor is there undue deference to modern trends.

Charleston gardens reflect an attitude of secure individuality that has marked the city ever since its heyday, when the culture of rice and indigo and Sea Island cotton lined its pockets.

Harold Nicholson, who designed the gardens of Sissinghurst, commented on this when he visited Charleston in 1933. The city, he said, was populated with people of civilized tastes. The photographs in Cameron's book attest that it still is.

Restoration of Charleston's architectural heritage has gone hand in hand with its tradition of gardening. Its many sideways houses, built to admit cooling breezes, mandate long sideways gardens visible to passersby through their gates. Casual invitations to enter are frequent and warm if owners are puttering about.

The book describes twenty-four gardens designed by several imminent landscape artists. Many originated from designs by Loutrel Briggs, a landscape architect who lived in and loved Charleston. His work spanned four decades during the first part of this century, and his name is invoked with due respect.

Hugh and Mary Palmer Dargan are much sought-after through Hugh Dargan Associates. They offer extensive research into old garden plans and hands-on uncovering of vanished flower beds and pathways. They bring to newly renovated landscapes the best of today's ornamentals as well as plants treasured by generations of knowledgeable Charlestonians.

Robert Marvin, long established as a pre-eminent consultant in affairs of the garden and winner of the American Horticultural Society's Landscape Design Award for 1991, has designed for both commercial and private clients in this city.

The assistance and advice of such professionals have not resulted in repetitive mass production. Cameron's photographs and detailed descriptions speak clearly of owners who have personally taken pleasure in wielding spades, laying bricks, and imposing discipline upon the private gardens of Charleston. —Harriett Watson

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

Encyclopedia of Perennials

Christopher Woods. Facts on File, New York, 1992. 350 pages. 8½" x 11". Color photographs. Publisher's price, hardcover: \$50. AHS member price: \$42.50.

For many years American gardeners had no reference books in which they could

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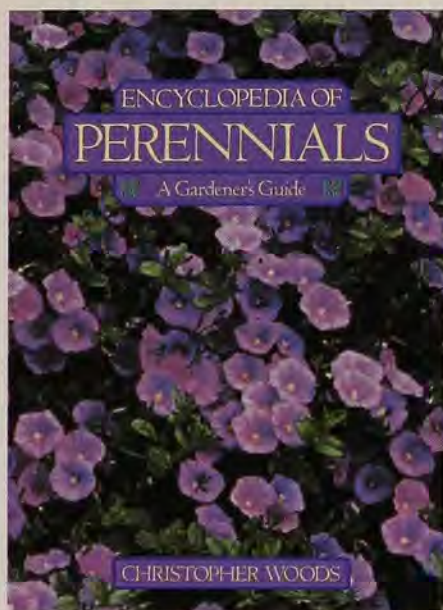
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research perennials they were interested in growing. They had to look for them—often in vain—in a complete garden encyclopedia or in a number of general garden books. Pamela Harper and Fred McGourty's *Perennials: How to Select, Grow, and Enjoy* was excellent but not large enough. True, the plant one was looking for was probably listed in *Hortus Third*, but if one wanted personal information about it, such as what kind of soil it preferred, when it bloomed, whether it was prone to disease or insect damage, and how much heat or cold it could stand, one was out of luck.

Then in 1989, two perennial reference books appeared almost simultaneously: *Herbaceous Perennial Plants* by Allan Armitage and *Perennials for American Gardens* by Ruth Clausen and Nicolas Ekstrom. Some gardeners bought one, some the other. Those who could afford it bought both. And now we've been presented with a third—Christopher Woods's *Encyclopedia of Perennials*.

Although Woods was born, bred, and trained in England, where he held several important positions, he is currently manager and horticulturist at the formal garden called Chanticleer in Pennsylvania. Since his book is meant to serve the same pur-



pose as the other two, a comparison might be useful.

It's easier to find the genus you're looking for in the Woods book than in the others, although species are clearly indicated in all three, and cultivar listings are easiest to find in Clausen/Ekstrom.

The Clausen/Ekstrom and Woods books list roughly the same number of genera and

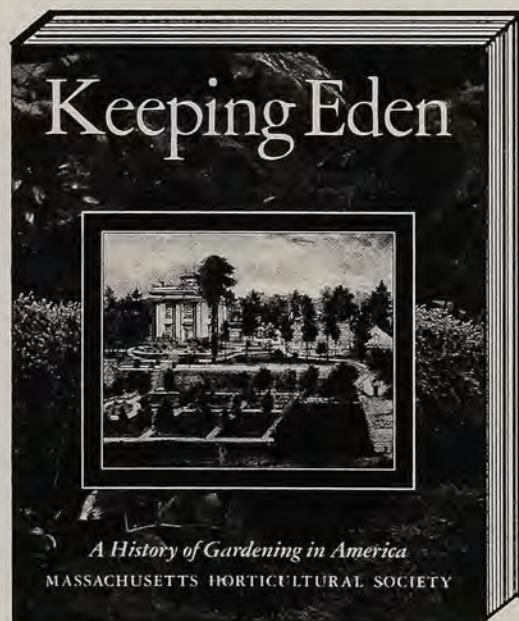
species (Armitage's publisher didn't count his, nor did I.) and both contain a wealth of color photographs, although those in the Clausen/Ekstrom book are larger and appear of better quality. Those in the Armitage book are smaller and fewer, although line drawings are plentiful.

The books offer different special sections in addition to their plant listings and descriptions. In the case of the Woods book, these include a cross-referenced index of common and scientific plant names and special lists of plants—those suitable for shade, sun, wet or dry conditions, rock gardens, and native plants. He also furnishes a directory of perennial societies and a bibliography.

In his excellent introduction, Woods allies himself with environmentalists by promoting Integrated Pest Management as opposed to spraying with chemical insecticides. He cautions against fertilizing everything willy-nilly, since many perennials don't require and may even do badly in rich soil. He pleases this gardener especially when he protests the use of wood chips in perennial gardens. —*Elisabeth Sheldon*

Elisabeth Sheldon is the author of A Proper Garden and a frequent contributor to American Horticulturist.

A Lush Celebration of Gardening in America



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El Capitan de las Flores

*If you've ever planted impatiens or
petunias, you've probably touched
the work of Claude Hope.*

B Y D I A N E J U K O F S K Y

Although Claude Hope hasn't lived in Texas for more than sixty years, he looks like a Texan. Tall and imposing at the age of 85, he maintains a courtly and commanding physical presence. But forget the stereotype who blusters with bravado about his amazing deeds. Picture instead John Wayne's "Aw-shucks, ma'am, it was nothing." Hope modestly dismisses any hint that he was responsible for a revolution in hybrid bedding plants, or for taking a pretty wildflower and turning it into the world's number-one ornamental flower. But while Hope didn't invent the impatiens, he did invent the market for them, and with it, the world market for the bedding plants called F₁ hybrids.

F₁ hybrids are the offspring of two inbred, genetically stable, and unrelated plant lines. They are a boon to nursery professionals and to consumers who buy bedding plants, because they can be relied upon to be uniform in size, shape, and color. If your desire is to have a massed planting of pure white impatiens for an evening garden, for example, you can rest assured that no lipstick red blossoms will rear their heads to spoil the cool effect.

From the perspective of his flower-seed farm in the Costa Rican country town of Dulce Nombre de Jesus, where he has lived for the past four decades, Hope seems genuinely puzzled about why he was chosen this year for the American Horticultural Society's highest award, the Liberty Hyde Bailey Award. "There must be more eligible candidates," he insists.

His colleagues disagree. "Claude Hope is the foremost figure in F₁ hybrid flower-seed production," says Richard Craig, professor of plant genetics at Pennsylvania State University. "He is not only number one in production size, but also a plantsman *par excellence*. He has the innate ability to do two things very well: to recognize in a plant something promising and then to make that promise an economic success. He's an entrepreneur who's also an artist."

Dr. Leon Glicenstein, a breeder with Yoder Brothers who worked with Hope in Costa Rica for four years, seconds the vote. Yoder Brothers produces stock plants for commercial greenhouses and is receiving an AHS Commercial Award this year. "Claude took hybridization in entirely new and different directions," says Glicenstein. "He's responsible for the development of many new plants in the horticultural world. He is also a

*Physically imposing yet self-effacing,
Texan-cum-Costa Rican Claude Hope
towers over the greenhouse beds at
Linda Vista.*



CHRIS WILLE



It is a pleasure to turn up an old garden flower of real merit once in a while, particularly if it is one that has suffered neglect by gardeners, and more particularly if it is one of easy culture. Just such a plant is Lavatera Loveliness, the annual mallow.

— CLAUDE HOPE

"The Gardener's Pocketbook"

The National Horticultural Magazine

January 1940

gentleman and an unselfish teacher."

Claude Hope says he can't remember when he didn't want to be involved with plants. He grew up on a dairy farm in Sweetwater, Texas—not exactly a garden spot, but "there were lots of annuals in the springtime, when it rains." He majored in ornamental horticulture at Texas Tech, a member of the college's first four-year class in that subject. "There were only three of us," he recalls. "We had two professors, so we got a lot of attention. It was an exciting time in the development of the science."

Hope spent several years with the U.S. Department of Agriculture (USDA) experiment station at Sacaton, Arizona, as a junior horticulturist, studying the propagation and disease-prevention of field cotton on an Indian reservation. "I was fortunate. It wasn't easy to get a job then," he says. In 1935 he resumed his formal education at Michigan State College. A classmate there was Charles Weddle, also a Texas Tech graduate. "Charlie and I made an informal deal that if and when conditions were favorable, we would go into the seed business. The seed business has to be a disease; it's not for everyone. But I always wanted to do it, and Charlie did too." It would take a decade and a vagary of a World War to bring about those favorable conditions.

When Hope had finished his course work for a master's in floriculture, the USDA again offered him a job, this time at the plant introduction station of the Division of Plant Exploration and Introduction at Glenn Dale, Maryland. It was from here that he would be drawn into the orbit of Benjamin Yoe Morrison, who headed that division and was serving as editor of *The National Horticultural Magazine*, forerunner of *American Horticulturist*.

For a short time Hope lived in Morrison's house and served as his chauffeur, since Morrison never learned to drive. "I helped him with his huge garden just beyond his house, where he grew narcissus and azaleas. I learned a lot, and I had a little hand in the magazine." In fact, between 1938 and 1940, Hope contributed sixteen articles—a favorite topic was amaryllis (*Hippeastrum* spp.)—and provided dozens of photographs. Many more of his photos appeared in the mid '40s. (See boxes.)

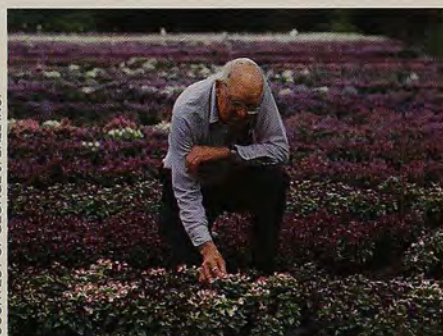
Hope worked in Glenn Dale for six exciting, productive years. But the clouds of war had been gathering, and in June 1941 Uncle Sam gave Hope the call to basic training in the Army. Then 34, he requested



CHRIS WILLE

and was granted a discharge because of his age. The rules would change six months later with the bombing of Pearl Harbor. Hope was recalled and, having completed officers training school, was assigned to the 34th General Hospital at Brigham City, Utah. The day before his unit was to depart for desert maneuvers, he was ordered to report back to the Washington area.

Morrison had foreseen some of the war's dangers. The Germans already had most of the world's quinine, and troops fighting in the Pacific theater, where malaria was rampant, faced a life-threatening shortage of the drug. Working as an advisor to a joint committee of the Board of Economic Warfare and the War Department, Morrison had laid a plan for safeguarding *Cinchona calisaya* (formerly *C. ledgerana*), a shrub from which quinine alkaloids are processed. Just before the Japanese captured a quinine factory in the Philippines, as well as the quinine plantations there, a U.S.



COURTESY OF GEORGE J. BALL INC.

Top: A study in color contrasts, this breeding stock is used to produce 'Spectra', the only New Guinea impatiens available as seed. Above: Stooping to conquer, Claude Hope examines one of his tiny creations. Left: A majority of the greenhouse workers at Linda Vista are women, employed for their light, precise touch in pollinating blossoms.

CHRIS WILLE

Army colonel escaped the island with four million *Cinchona* seeds.

Hope was ordered to establish a nursery in Costa Rica to raise the seedlings. "The nursery was a success," Hope says, adding quickly, lest this quiet statement be considered vainglorious, "I can say that without bragging."

But the remote mountainous site of the plantation to which the seedlings were to be transplanted was quite another story. Details of the half-century-old experiment remain clear in Hope's mind, perhaps because it was one of the few times he has ever been associated with a failed venture. The committee that chose the site included a soils expert, a fruit expert, and a pathologist, among others.

"The only access to the area was by horseback," recalls Hope. "The pathologist must not have gotten off his horse. The area had a few trees of a species of *Cinchona*, but without the quinine content. When it first became apparent that our seedlings were diseased, I thought we might use seedlings of this species as root stock upon which we would graft the quinine-bearing trees. When I brought some in, they died faster than the good seedlings. Then I looked up all the native trees I could find and they were all infested with the fungus that was causing the problem. It was easy to spot."

Fortunately, the development of a synthetic antimalarial compound before the war's end lessened the impact of this horticultural disaster. Hope returned to the United States in 1943, but in four years he was back.

He had seen in Costa Rica just the favorable conditions that could lead to that dreamed-of joint venture with Charles Weddle. "Costa Rica's climate was what attracted me," he says. "The temperature stays about 80 degrees year 'round, falling to about 70 degrees every night, so I wouldn't need heat or cooling. The relative humidity is always high. This was, and still is, a stable country, and labor costs are low. In hindsight, I can't imagine where I could have done better."

Meanwhile, Weddle had been working for W. Atlee Burpee & Company, trying to sell them on the idea of double petunias. "Charlie had a thing about petunias," Hope says with a chuckle. Before the war, the Japanese had a monopoly on petunias. But Japanese horticulture was devastated by the war, and Weddle took the opportunity to concentrate on learning more about



Bryophyllum tubiflorum (Harvey)
shares with

B. daigremontianum the
distinction of being the most
common plant of the genus, and it,
too, is usually available in the five
and ten cent stores. . . .

Of its high rank among showy
flowering plants, there has never
been any doubt. As a house plant,
it may not be more than a novel
foliage plant.

— CLAUDE HOPE

"Some Bryophyllums and a Kitchingia"
The National Horticultural Magazine
April 1939

petunias' genetic makeup in the hope of getting improved petunias on the market before the Japanese economy recovered. But Burpee wasn't interested.

So the two former classmates established the PanAmerican Seed Company, with Weddle continuing his breeding in western Colorado, and Hope setting up production facilities in Costa Rica. After a false start in the Turrialba Valley, which proved too wet, Hope founded his seed farm, Linda Vista, or "pretty view," outside the colonial town of Cartago, Costa Rica's original capital. The native of Sweetwater had found a second home in "sweet name of Jesus," or Dulce Nombre de Jesus.

By the time Linda Vista was established on twenty acres in 1950, Hope and Weddle had already begun breeding work on two petunias that would become All-America Selections (AAS) winners—the red *Petunia* 'Comanche' and *P. 'Ballerina'*. They would have six AAS winners before 1960. They also developed *Browallia* hybrids and salvias.

If Weddle had a thing for petunias, Hope had a pet plant as well. Trouble was, nobody had ever heard of it.

Impatiens sultanii, now *I. wallerana*, a native of equatorial Africa, had by then naturalized widely throughout Costa Rica. "No one seems to know how it got to this country," says Hope, "although a person very knowledgeable in such matters tells me that it was not known here before 1880." It is commonly seen in fence rows, which tend to be shady, but also grows well in full sun in Costa Rica. Hope wasn't familiar with the flower until he moved there, and he was "immediately enchanted." Starting with five colors, he developed new ones, as well as the first dwarf, compact, free-flowering *impatiens* hybrid, *I. 'Elfin'*.

Hope's *impatiens* were introduced to the U.S. market in the early '60s. George J. Ball, Inc., with whom PanAmerican formed a partnership in 1962, introduced *I. 'Elfin'* to this country four years later.

Hope recalls that Vivian Ball, whose husband Carl was at that time vice president of George J. Ball, Inc., planted a few *I. 'Elfin'* plants in their front yard in Glen Ellyn, Illinois. "Everyone who passed by knocked at her door, wanting to know what the beautiful plant was," Hope says with a satisfied smile. The commendations from England's Royal Horticulture Society began rolling in, for the scarlet, then white, and orange hybrids. Hope knew all along that it would be a winner, although he might not have predicted that *impatiens*



CHRIS WILLE

would become North America's most popular garden flower. He expanded the color range of the original *I. 'Elfin'* hybrids as well as those of the even more flowery *I. 'Super Elfin'*. *I. 'Super Elfin Red'* remains his favorite. "I think it has always been the best red on the market." After the 1970 collection of the New Guinea *impatiens* and their release by the USDA, Hope began working with those as well, producing a 1989 AAS winner with *I. 'Tango'*.

Seeing the promise in a bewitching wildflower is one thing, but getting it to market in vast numbers and healthy condition is quite another. Hope worked magic heavily backed by science in Linda Vista's greenhouses, and helping him was much of the population of Dulce Nombre, whom he carefully trained in the painstaking, extraordinarily precise science of hybrid pollination. His workers show their respect by calling him "El Capitan," the rank he held when discharged from the Army.



Top: Workers set out the seedlings that will produce most of the Impatiens seed sold in North America. Above: Impatiens 'Super Elfin', a modern incarnation of the I. wallerana that tickled Claude Hope's fancy a half-century ago. Left: Torenia 'The Clown', nearly squelched in developmental stages when Linda Vista changed hands in 1981, went on to become an All-America Selections award-winner.

Today Linda Vista encompasses four farms totaling more than 400 acres there and in neighboring Dulce Nombre and Llano Grande ("great plain"). There are seventy-five acres of greenhouses under polyethylene and fiberglass. More than 1,700 Dulce Nombre citizens work in the greenhouses, practicing the science that Hope perfected. Most of the greenhouse workers are women, because Hope believes they are more dexterous than men, more able to rapidly emasculate petunias to prevent self-pollination and, with a light and accurate touch, pollinate them with pollen from another line.

In a white room loud with the clattering of pollen-sifting machinery that Hope himself invented, the horticulturist pauses to watch women removing anthers from mounds of petunia blossoms. "Some of our workers are thirty-year veterans," he says, as the women's hands move through the pile of blossoms nearly as quickly as the mechanical sieves.

The skill of these workers ensures that every blossom is from the same inbred line so that the pollen, when applied to another inbred line, will produce seed that will in turn grow into exactly the shape and color of plant that Hope—and his buyers—expect. There is no room for surprises in the seed business.

When he describes the process of F₁ hybridization, Hope draws diagrams, explaining each step slowly and in detail, just as a genetics professor might. "Certain principles of pollination cannot be violated," he emphasizes, but those principles are quite simple, particularly for the impatiens. The seed parent does not produce pollen and cannot set seeds spontaneously, so there is no need to emasculate it. "We simply take a flower of the male parent and touch the stigma of the female parent with its pollen. The pollen from the male parent line is simply harvested by picking off the flowers every morning."

This is the gentleman scientist whose reputation, according to former co-worker Glicenstein, is so impeccable that "companies would send their own lines to him for breeding, knowing that he would not use them for his own work. Inbred lines are not handed over very readily, but Claude's handshake, his word, is enough."

In addition to being extremely ethical, Hope also has a prodigious memory, says Julio Navarro-Monzo, a former president of PanAmerican Seed. "I remember him finishing a tour of forty-acres of grounds,



Our bulbs (Hippeastrum candidum) were collected by the Allison V. Armour Expedition in 1933 near Port-au-Prince, Haiti, where they were said to be growing wild in dry, rocky soil. Immediately questions arise. Was our plant indigenous or an escape?

If an escape, when was it introduced to Haiti? If indigenous, how odd that it was overlooked for so long! And how peculiar that it should occur in two such distant and different localities!

— CLAUDE HOPE

"The Gardener's Pocketbook"

The National Horticultural Magazine
July 1939

returning to the greenhouse and asking, 'Where's my coleus?' He had missed a single plant among all those thousands." Navarro-Monzo recently called him seeking information for a woman who had met Hope for only a few minutes two years ago at a nursery industry event in Illinois. "Do you know her?" Navarro-Monzo asked. "Sure, we met at the Ball picnic," Hope responded. "Isn't that incredible?" the woman asked one of Hope's co-workers later. "No," the co-worker answered, "That's Claude."

Linda Vista built its stellar reputation on impatiens, petunias, salvias, and coleus. Hope sold the farm to George J. Ball, Inc., in 1981.

The vast knowledge that Hope holds in his head needs a permanent repository. Much of that task falls to Fernando Villalta, who in 1984 became general manager of Linda Vista. Villalta started working there in 1963, when he was 13. Hope singled him out as ambitious and creative and started an aggressive training program for him.

"I started weeding petunias, then planting, watering, pollinating, emasculating, harvesting," says Villalta. "Claude sent me to the United States to work for other seed companies to see how they do things. He sent me to business administration school."

Villalta says he always admired the way Hope ran Linda Vista, especially the scrupulous care he took in maintaining the highest quality seeds. "But the only way we could stay competitive and keep up with quality was to bring in computers and new technology. Claude was a bit reluctant about that."

The Hope tradition melded well with Villalta's desire to modernize: Since 1983, Linda Vista has doubled its business. Today Linda Vista also produces seed geraniums, pansies, and snapdragons.

Because Hope was on the scene from the beginning of modern plant breeding, he has seen a lot of changes and certainly a lot of growth. "I was lucky to have started when I did," he says. "I've been able to see the whole development of ornamental horticulture. The first yellow roses were just becoming available when I got into the business. Gladiolus had just been put on the market."

He started Linda Vista, he points out, just as the whole industry revolving around bedding plants blossomed. "The development of plastic had a lot to do with it," he says. "Before the plastic tray, there was no



CHRIS WILLE

easy way to grow individual seedlings. Customers would have to take their chances with plants dug out of a wooden flat."

The nursery industry also got a boost after the war from the movement of millions of young families to new suburbs, where they wanted to fill their gardens with bright, colorful, and care-free flowers. Hope stood ready to fulfill their fantasies with his rainbow of hybrids.

Not all changes have been for the better, in Hope's opinion. Back then, breeders set the market, while today, he says regretfully, the large bedding plant growers run the industry, "and if they don't like it, it's dead. It does stifle creativity a bit. We in the producing business have always thought

Top: With the dexterity of concert pianists, skilled veterans emasculate a pile of petunias. Left: Impatiens 'Super Elfin Cherry' blends well with almost any ground cover.



that there are certain things the public would buy if we could push them through."

Hope says that after PanAmerican was sold to Ball, the company "killed off some of my introductions." Ball initially squelched his Egyptian star flower (*Pentas lanceolata*), and flowering maple (*Abutilon* spp.), although they eventually went back to them.

"They would have done the same to my *Torenia* if I hadn't had it underway when they bought the company," he says, just a bit indignantly. "Of course, it's quite profitable for us now." Hope's *T. 'The Clown'* went on to win an AAS award.

Neither semiretirement nor frustration with the industry keeps Hope away from the breeding grounds. He continues to work on several breeding projects. The most demanding, he says, is *Lisianthus*. "There's already one on the market, the pot-plant type called 'Blue Lisa', which won a FloraStar award. But I have many others in the works. And late this year, we will have some anthuriums on the market for indoor pot use."

He is also working on kalanchoe for seed reproduction and small pot use, and he continues to tinker with *Abutilon* and *Pentas*. "I can always imagine a better plant and I'm continually trying to achieve one." And his industry affiliates note that he meets regularly with company breeders from North America, Asia, and Europe to pass his knowledge and wisdom along to future generations.

Hope won't admit that venturing in the 1950s to establish a flower-seed business in the then little-known country of Costa Rica was anything remarkable. "What did I have to lose?"

Bent over the radiant pink blossoms of impatiens crowded together on wooden tiers in one of Linda Vista's sprawling greenhouses, he senses that this explanation won't satisfy, and tries again. "I'm a workaholic who has never done much of anything else."

But anyone who has brought a garden alive with his double petunias or solved a shade problem with his dwarf impatiens would argue that what he has done at Linda Vista is quite an achievement, indeed. And it's exciting to know that there is a lot yet to come from Claude Hope's magic science.

Diane Jukofsky is co-director of the Conservation Media Center, a project of the Rainforest Alliance.



COURTESY OF GEORGE J. BALL, INC.

The Sage of Salvias

A chemist by day, Richard Dufresne works nonstop nights and weekends to promote his favorite plant.

B Y T O V A H M A R T I N

If the phone rings late one night, don't be alarmed. It's probably just Richard Dufresne calling to check out your salvia situation, wondering if your *Salvia buechananii* has blossomed yet. No? Well, he hopes it's still thriving because his plant just burst into an extravaganza of extremely showy, fuchsia red, fuzzy flowers. And have you got *Salvia confertiflora*, by any chance? If not, you'll need to add that one to your collection for sure. His specimen blossomed last month, crowned with an array of coral blooms peeking from the depths of dark chocolate floral bracts. He'll bring you one the next time he comes to visit.

Even if you're glued to your favorite "Masterpiece Theatre" series when the phone rings, Dufresne is fully capable of turning anyone's attention from "Brideshead Revisited" to matters much more herbal. He can describe any botanical in such tantalizing terms that it becomes totally irresistible. At the onset of the conversation, you might have no desire to look another salvia square in the eye. No matter. This fellow is dangerous. With velvet tongue and silken speech, he will have you begging for any salvia he chooses to describe. Your salvia bench may already be groaning under the weight of too many

plants, but there's always room for one more . . . possibly two. . .

Meet Mr. Salvia. Richard Dufresne (pronounced "du-frane") probably dreams of salvias when he sleeps. Certainly salvias, and other members of Labiatae, the mint family, occupy most of his waking hours. His friends are all fellow salvia fiends, his vacations are spent salvia-hunting, and rather than read a novel, he prefers to spend a quiet evening curled up with a juicy monograph on Labiatae.

This is no fleeting affair. His fervent affection for all things with fragrant foliage has burned relentlessly for nearly two decades and shows no signs of abating. If anything, Dufresne's love for labiates has grown stronger as the years march on. No one will ever accuse this gardener of being a dabbler. He estimates that he devotes approximately two hours nightly to his favorite plant family, as well as virtually all his weekend time. He collects salvias, conserves salvias, propagates and distributes salvias, and lectures on them extensively. Dufresne hopes to start a salvia nursery someday, but at present, he usually barter the salvias he raises for others not in his collection. His efforts on behalf of Labiatae are really a labor of love.

Says Panayoti Kelaidis of the Denver

DAVID STONE: PHOTONATS



TOVAH MARTIN

Richard Dufresne, above, says that the aroma of pineapple-scented sage, left, was what first attracted him to the Salvia genus. Many other salvias are memorable for their odor as well as their flowers. "It's not salvias themselves that I find fascinating," he says. "It's the experience of the plant. Salvias resonate."

Botanic Garden: “There’s no question in my mind that salvias are the most versatile genus of plants suitable for most continental parts of this country. And Richard is the main link in the network I call ‘The Salvia Underground.’ He is one of the most valuable horticultural contacts I’ve made, and I feel a tremendous debt to him. Richard sends me wonderful shipments of plants, and all of them have ornamental merit.”

By day, Dufresne works as a flavor chemist at the Lorillard Research Center in Greensboro, North Carolina. He obtained his PhD in chemistry in 1972 from Carnegie Mellon and then continued his studies with post-doctoral positions at the Johns Hopkins University, Brandeis University, and the University of Massachusetts. But it seems that his professional career was merely an excuse to indulge his passion for aromatic-leaved plants. It was a fascination with the scented-leaved yarrow growing in the yard of his childhood home, he says, that got him interested in chemistry in the first place. And spending eight hours a day immersed in a plant-related career wasn’t nearly enough exposure to quench his thirst.

I guess I’ve known Richard Dufresne since the very inception of his salvia insanity. During what he calls his “bohemian period” in the early ’70s, he made his first excursion to Meadowbrook Herb Farm in Rhode Island to begin collecting aromatic-leaved plants. Not long after, he wandered through the front door of Logee’s Greenhouses in Danielson, Connecticut, where I work as head horticulturist. He told me recently that we were the second stop on this herb-collecting spree. But that was ages ago. Nowadays he usually brings more plants through the door than he takes away. You always know where Richard Dufresne has been—several new flats of salvias are invariably blossoming in his wake. Why salvias? Like many gardeners, Dufresne prefers plants with a gimmick. “Members of the mint family possess color, scent, and texture—they are interesting in a synesthetic sense. I’m fascinated by the same sorts of things that an alchemist might find intriguing. I enjoy the technicolor symphonies of shade, form, and scent.”

And salvias offer plenty of diversity to explore. During his twenty-year love affair, he has had few dull moments. In the edible realm, there is much more to salvias than the common cooking sage, *S. officinalis*. And in the ornamental sphere, salvias go far beyond the ever-popular fire engine red annual, *S. splendens*. Salvia species, which

are scattered throughout the globe, display an incredible diversity of leaf shape and texture as well as a broad range of heights, ranging from the diminutive and temperamental *S. jurisicii* from Yugoslavia to the thirty-foot-tall jolly green giant, *S. regla*, a native of Mexico. Dufresne recalls one of the high points of his career: “I walked into the Harvard herbarium and found sheet after sheet of herbarium specimens of salvias not yet collected for cultivation.”

Although the blossoms all feature variations on the mint family’s basic gaping-

nose as camphorous, but at other moments seems to imitate sour lemon. “It’s not salvias themselves that I find fascinating,” he likes to say. “It’s the experience of the plant. Salvias resonate.”

This alliance is a two-way street. Both Dufresne and salvias have reaped benefits from their ongoing relationship. He derives pleasure, they are gaining exposure.

Mingling with like-minded enthusiasts and hobnobbing with his “extended family of aficionados” may be the aspect of this hobby that he savors most. He has for-



J. FAIREY / COURTESY OF YUCCA DO NURSERY

mouthed theme, they come in all sizes and often emerge from ornamental calyces. The color spectrum of salvia flower shades is incredibly broad, including white, all shades of blue from clear summer sky to royal purple, and every thinkable shade of pink from peach to screaming red. *S. discolor* sends nearly black blossoms jutting from its sparkling silver calyces. And bicolored blossoms are a common occurrence in salviadom.

The flowers are intriguing to be sure, but it was the smell that enamored the flavor chemist to the genus in the first place, and it’s the scent that continues to hold him transfixed. He dotes on the expansive roster of aromas emitted by salvia leaves. He still harbors a soft spot for *S. rutilans* (also called *S. elegans*), the pineapple-scented sage that was the first salvia to make his acquaintance. And through the years he has met with many equally intriguing fruity, nutty, and otherwise-scented salvias. He finds some baffling, like the essence of *S. clevelandii*, which sometimes hits his

saken jazz, a fancy for folk dancing, and a predilection for super-hero comics to spend his time among salvia friends. “When you’ve got a passion, you tend to utilize all your faculties. That’s what I really find fascinating about fellow salvia fanatics.”

He spends hours on the phone every evening with salvia recruits old and new, trading research findings, swapping sources, and sharing observations. When John Fairey of Yucca Do Nursery in Waller, Texas, questioned whether a plant he had was *S. blepharophylla* or a close look-alike, he called on Dufresne, who quickly cleared up the confusion. “Richard knows salvias upside down and backwards,” says Fairey. “He’s the world’s leading expert.”

Although he networks primarily within North America, Dufresne enjoys the international contacts that salvias have brought him. He has made travel arrangements for several salvia buddies from abroad to tour this country and take back seeds. In the summer of 1991, he attended a conference on “Advances in Labiatae Science” at Kew



JESSIE M. HARRIS



DAVID M. STONE: PHOTO/NATS

Salvia greggii, opposite, is native to the arid Southwest. Dufresne has used it to breed new cultivars that bloom in a range of colors. For example, *S. greggii* var. *microphylla*, above, was the parent for Dufresne's 'Cherry Chief'. The nearly black blossoms of *S. discolor*, left, are among the most striking in salviadom.

Gardens. The symposium drew 120 chemists, botanists, and taxonomists eager to learn more about this plant family.

Finding its valuable members and preserving them by dispersing them throughout the world is an immediate concern of Dufresne and other like-minded souls. "Many salvias are being lost to overgrazing and development," says Fairey. "Richard is instrumental in distributing and preserving those endangered plants."

Fairey, Dufresne, and other kindred spirits recently explored the wastelands of the Southwest and Mexico, searching for color variants of *S. greggii* and recording the altitude, soil pH, and companion plants at the site of each newly found salvia. Dufresne has found twelve *S. greggii* variants to date, and on that trip, he discovered an extremely drought-tolerant form, *S. greggii* var. *microphylla*, which he used as a parent for his own colorful and stalwart hybrid, *S. 'Cherry Chief'*.

Dufresne has a reputation as a very discriminating breeder—if Richard Dufresne introduces a hybrid, you can be sure that it's a knock-out. He has created several new hybrids, such as *S. 'Cherry Chief'* and *S. 'Raspberry Royale'*, that have expanded the colors of *S. greggii*. He has also single-handedly popularized *Agastache*, a genus within Labiatae closely related to *Nepeta*, and brought new colors to that genus with his five hybrids: *Agastache 'Tutti Fruti'*, *A. 'Firebird'*, *A. 'Apricot Sunrise'*, *A. 'Pink Lemonade'*, and *A. 'Pink Panther'*. Says Panayoti Kelaidis: "I credit Richard Dufresne with virtually creating the genus *Agastache* in the public's eye."

For future reference, he donates germ plasm to native plant archives and presses herbarium specimens. In his spare time, he tends an impressive collection of salvias planted in beds surrounding his house; he estimates that he cultivates at least 1,300 square feet of salvias and other Labiatae. In winter, he grows his salvias in a twenty-by-thirty-foot greenhouse, in cold frames with heating coils, and under fluorescent lights. At last count his collection boasted 170 salvia species and cultivars, but that number is always upwardly mobile.

If salvias are hot at the moment—and horticultural luminaries like Allen Lacy claim that they are definitely rising stars—then Dufresne is primarily responsible for their ascent, since he is their self-appointed public relations agent. With the exception of *Salvia officinalis* and *S. splendens*, salvias were a little-known group when he

first pulled into our parking lot nearly two decades ago. Now he will gladly add your name to a list of no fewer than 208 kindred spirits from Austria, Australia, Denmark, South Africa, and elsewhere around the globe. "I see myself as a missionary for mints, always looking for converts," he eagerly explains. In addition to the Denver Botanic Garden, several other public gardens, including the Norfolk Botanic Garden in Virginia, Bok Tower Gardens in Florida, Longwood Gardens in Pennsylvania, and Huntington Botanic Gardens in California, have benefited from his efforts.

At his urging, many herb suppliers have added rare salvias to their catalogs, and several mail-order herb businesses (see "Sources" below) feature Dufresne plants and even boast in their catalogs that the introductions were originally part of the Dufresne Salvia Collection. Park Seed has listed seeds of basil that came from him.

As Christopher Jayne of Sandy Mush Herb Nursery put it, "Richard is probably the most instrumental person in getting new salvias out. He's a pretty amazing plant person, there's no doubt about it."

Not everyone knows Richard Dufresne by name. But most nurseries—both large and small—have had a brush with "that salvia fellow" who phones in the dark hours and comes bearing flats of brightly colored herbs. You'll know if he's ever wandered through your door: Richard Dufresne is the one who won't leave until you've agreed to grow a few salvias.

Tovah Martin is the author of Once Upon a Windowsill and The Essence of Paradise.

SOURCES

Companion Plants, 7247 North Coolville Ridge Road, Athens, OH 45701, (614) 592-4643. Catalog \$2.

Glasshouse Works, P.O. Box 97, 10 Church Street, Stewart, OH 45778-0097, (614) 662-2142. Catalog \$1.50, deductible.

Logee's Greenhouses, 141 North Street, Danielson, CT 06239, (203) 774-8038. Catalog \$3, deductible.

Sandy Mush Herb Nursery, Route 2, Surrent Cove Road, Leicester, NC 28748, (704) 683-2014. Catalog \$3.95.

Well-Sweep Herb Farm, 317 Mount Bethel Road, Port Murray, NJ 07865, (908) 852-5390. Catalog \$1.

Yucca Do Nursery, P.O. Box 655, Waller, TX 77484. Catalog \$2.



JESSIE M. HARRIS

Salvia confertiflora, left, produces unusual coral and chocolate blooms. One of the most unusual scents among the salvias is that of *S. clevelandii*, above. Dufresne likens its odor to camphor or to sour lemon.

John Quincy Adams served only one term as president, but nonetheless, he had a highly successful political career, as a senator from 1803 to 1809 and a representative from 1831 to 1848, and especially as James Monroe's secretary of state, during which period he completed Thomas Jefferson's work of expanding the nation's boundaries from the Atlantic to the Pacific.

Being president was another matter. Because he was a largely invisible one, most Americans today recognize nothing about him except the fact that his name is the same as John Adams's but with a "Quincy" in the middle.

Nevertheless he left an important legacy to those of us concerned with agriculture and horticulture. Coupled with the scholar's reliance on books was the enthusiasm of the dirt gardener. Adams never worried about his fingernails or that some might find it amusing that the president of the United States should range over the woods in pursuit of acorns. In order to plant them in Washington, Adams publicly retrieved several acorns from under an oak in Baltimore that had been struck by enemy musket bullets during the War of 1812. The local men who accompanied him must have spread that story far and wide. To Adams, the budding forester, the act was as natural as

Solace for a President

*Unhappy in the nation's highest office,
John Quincy Adams turned to horticulture
for comfort.*

B Y B A R B A R A M C E W A N

breathing. He was truly gratified that the Washington woods contained five species of oak and saw to it that he secured and planted acorns from each.

What had driven Adams to botanical matters were the barbs he experienced as chief executive. Politically he was a minority president whose election was due to the House of Representatives, because Andrew Jackson had a plurality although not a majority of the electoral vote. Washington's weather and social life did not agree with Adams. His marital life did little to sustain him emotionally. His health, reflecting the aches and pains of so many Americans of the age, became far from good. Finding his usual refuge—his books and his pen—no longer a source of refreshment as they had once been, he consciously expanded his physical activities. He increased the length of his walks and his horseback rides while his swimming feats became legendary—and he began a serious love affair with plants.

He wrote in his diary in June 1827, two years after assuming the presidency: "My health and spirits droop, and the attempt to sustain them by . . . botany, the natural history of trees, and the purpose of

Excerpted with permission from White House Landscapes: Horticultural Achievements of American Presidents by Barbara McEwan, published by Walker and Company.



Inset: John Quincy Adams, who served as the sixth president of the United States, was unhappy in office but found comfort in his pursuit of botany. Left: Anthony St. John Baker immortalized the sparse White House landscape of Adams's era in his 1826 watercolor.



RIGHT: THE HUNTINGTON LIBRARY; INSET: COURTESY OF THE U.S. BUREAU OF ENGRAVING AND PRINTING

naturalizing exotics is almost desperate.” He pursued this new occupation at the White House, where he was then spending most of his time. He was not satisfied, though, with just those grounds. While he had always been drawn to the family hearth in Quincy, Massachusetts, his birthplace now assumed an additional importance, for it provided him with good and sufficient land all his own on which to pursue his new dedication to planting and experimentation.

When Adams arrived at the White House as president, the scene was still a rather stark one. Planning of the grounds had not begun until Jefferson’s term of office and little had been accomplished then. James Madison had had the War of 1812 and the destruction of the new government’s public buildings by the British to contend with. James Monroe was beset by the need to finish the rebuilding.

The White House Adams entered was flanked by two low wings that included space for a stable and a small dairy. Immediately to the north of the mansion were only three private residences and a church. Across Pennsylvania Avenue and the President’s Park there was open country west of 16th Street. To the south beyond the area that Jefferson had planned for the formal gardens was a two-block-wide meadow that sloped to the river a few hundred yards away. A cow or two kept for milk and butter for presidential use grazed there, as did a few sheep whose major duty was to help mow the grass. Adams did little to enhance the building itself, but he made his mark on these grounds. Large numbers of plants were

purchased or collected by the president and others to adorn the largely barren landscape. On the south lawn an elm planted as a seedling by Adams endured until 1991.

Adams’s original gardening goal in 1827 was a nationalistic one, paralleling his goals as secretary of state and president. His garden was to contain a collection of American plants, most notably trees. He followed Jefferson’s landscape plan and located the main ornamental garden, ultimately of two acres extent, to the right of the south entrance gate. More growing space was achieved by the use of cold frames to the south and north of the main garden. The garden itself was fenced with parallel boards and included a cistern to catch rainwater. This was supplemented by a pump at the well serving the nearby Treasury Building. Jefferson’s Treasury vault, gutted by British fire, became the garden tool house. While the president appreciated these physical features, he had another treasure in the person of John Ousley (probably an Englishman). Adams hired Ousley in August 1825 to replace Charles Bizet, a Frenchman who had failed to distinguish himself after being hired by President Monroe as “Gardener to the President of the U. States.” Ousley served his employer—and future presidents—well.

At this period of his life Adams could look back over the years with some bemusement. He had come from a background of farming and horticulture; John and Abigail Adams’s lives were founded on both. Their son would write wistfully in 1833, almost two years into his term in the House of Representatives: “My natural

propensity was to raise trees, fruit and forest, from the seed. I had it in my early youth, but the course of my life deprived me of the means of pursuing the bent of my inclination. . . . Had my life been spent in the country, and my experiments commenced while I was at college, I should now have a large fruit-garden, flourishing orchards of native fruit, and very valuable forests; instead of which I have a nursery of about half an acre of ground, half full of seedlings, from five years to five days old, bearing for the first time perhaps twenty peaches, and a few blossoms of apricots and cherries; and hundreds of seedlings of the present year perishing from day to day before my eyes.” The cry was real, but what Adams suffered from the most was an inability to recognize that first and foremost he was, and always had been, a political man.

When he wrote these words he must have thought back to those terrible days midway through his presidency when he understood that, during this period at least, his qualifications and the requirements of the office did not match. By 1826, looking to escape his increasingly unhappy situation in office, he wrote: “As on many occasions, I have betaken myself to a pursuit which already absorbs too much of my time, and would, if indulged, soon engross it all.”

He *had* been unobservant. He wrote in his diary on April 9, 1827, after noting the unfolding of new leaves on the trees: “The variety in their manner of vegetating is so remarkable that I am humiliated by the heedlessness with which I have suffered this process to pass at least fifty times



COURTESY OF WOODROW WILSON HOUSE / NTHP—WASHINGTON D.C.



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before my eyes without bestowing a thought upon it.”

The immediate jolt to action had been a resolution by the House of Representatives requiring a manual to be developed on cultivation of silkworms in preparation for establishing a silk industry in America. This idea had been pursued since the earliest colonial period as official policy. It had come to nothing despite the personal interest of men like Jefferson. Adams also became concerned about reviving the East Coast's forests—particularly live and white oaks because of their importance to American ship building. This formerly abundant resource had been destroyed to a large extent during 200 years of occupation by Europeans.

He recognized well how little he knew about forestry, so characteristically he decided to study books, supplementing this

by experiments. In his nursery he proposed to concentrate on oaks, hickories, and chestnuts. Within days he had made arrangements with the son of Judge Richard Peters, a leading Philadelphia agriculturist and horticulturist, to obtain from the senior Peters's garden chestnuts that had been planted there by that gentleman and George Washington. He acknowledged to his diary that he should have commenced the project thirty years previously but consoled himself that the public would ultimately benefit even if he had not. He pointed out, truthfully, that he had never had a permanent address, by which he meant one from which he never strayed.

It was not until the following spring, though, that he began his silvicultural or even general horticultural studies in earnest. At his instigation a few books on the subject had been found in London and

Paris and were forwarded to Washington. Adams could not have helped but be impressed with these foreign volumes. Even this otherwise indefatigable scholar despaired of conquering John Claudius Loudon's 1,240-page *An Encyclopedia of Gardening* and his 1,224-page *Encyclopedia of Agriculture*, not to mention the five treatises Hamel Du Monceau needed to cover the subject of forests. The French botanist André Michaux, who had already made his mark with earlier U.S. presidents, would do so with this one too—although through his son, Francois André Michaux, whose *North American Sylva* Adams read eagerly. In writing *Sylva*, John Evelyn had encouraged his fellow Englishmen to plant millions of timber trees and his book encouraged this American president to do the same. The poor president found that the more he studied, the more questions he



Top, left to right: Among the trees John Quincy Adams planted at the White House and at his home in Quincy, Massachusetts, were black walnut, willow oak, and sycamore maple, which he called bottomwood. In fact, Adams may have studied these same prints, which appeared in Michaux's *North American Sylva* and other botanical reference works in the early to mid-1820s. Left: Loose livestock often damaged early White House plantings, but Adams was among those who kept sheep as lawn-mowers. Woodrow Wilson continued the tradition with these orderly munchers.

THE WHITE HOUSE LANDSCAPE

Nearly all of our early presidents were farmers. Some of them were also adept at landscaping, passionate about botany, or were hands-on ornamental or vegetable gardeners. In later years, it was more often the first lady who had a fondness for roses or tropical greenery. These interests did not always translate into improvement of the White House grounds: With the White House yet unbuilt, Washington had to confine his energies to Mount Vernon; Jefferson, although extravagant with his private properties, was frugal with public funds. Tight budgets forced revamping of some administrations' grand landscape designs. Lady Bird Johnson's love of wildflowers, on the other hand, had an impact far beyond the White House.

From Barbara McEwan's *White House Landscapes: Horticultural Achievements of American Presidents*, here's a look at some of the ups and downs of the nation's First Yard:

Thomas Jefferson (1801-09). The White House grounds are divided into a public area to the north and private grounds to the south. Plans call for a dense planting of trees as screens, and garden areas for ornamentals and edibles to the southeast. Lombardy poplars are added as temporary features along Pennsylvania Avenue.

James Madison (1809-17). Jefferson's plans are carried out, with a forest of woody plants—willow oak, sugar maple, horse chestnut, white pine, hemlock, mountain ash, and holly. The British burn the mansion in 1814.

Andrew Jackson (1829-37). The President's Park, an expanse to the north and south of the White House, comes of age with extensive grading, reshaping of the driveway and fences, and the addition of "a proper lawn." Head gardener John Ousley adds dwarf rose trees, and tends spring bulbs, flowering shrubs and trees; a second gardener, William Whelen, is in charge of a separate vegetable bed. City gardener and nursery owner Jemmy Maher adds horse chestnuts, sycamores, maples, and magnolias to the grounds, replaces Jefferson's Lombardy poplars with elms, and oversees construction of an orangery, an arbor, trellises, fences, and benches for the flower garden.

Martin Van Buren (1837-41). Potted fruit trees are added to the orangery, and cast-iron chairs and benches to the grounds. Congressman Charles Ogle rails against future expenditures for collecting "both native and exotic plants."

Millard Fillmore (1850-53). Landscape gardener Andrew Jackson Downing, young editor of *The Horticulturist* magazine, devel-

ops an ambitious plan in an English romantic style for landscaping what is now the Mall. John Ousley is dismissed after twenty-five years' service. Congress authorizes a botanic garden at the foot of Capitol Hill.

Franklin Pierce (1853-57). New gardener John Watt tears down the orangery to make way for a working greenhouse where the president can enjoy camellias, ferns, and fruit trees. Four years later it is razed to make way for expansion of the Treasury Building, and a new and even more elaborate greenhouse is attached to the mansion.

Ulysses S. Grant (1869-77). A statue of Thomas Jefferson is moved from the White House to the Capitol and replaced with a parterre centered on a pond with a water jet. A seventy-five-foot pool with a fountain is installed and the greenhouse expanded.

Rutherford B. Hayes (1877-81). Lucy Hayes spends a quarter of the maintenance budget on greenhouse upkeep, building a separate glasshouse for roses at the site of the present Rose Garden and enlarging a passageway from mansion to greenhouse as a "conservatory promenade." There are a dozen buildings in all.

Theodore Roosevelt (1901-09). White House expansion leads to the dismantling of the conservatory. Sixty-six extravagant beds to the north, featuring thousands of bulbs and other ornamentals, are removed. Two formal, colonial style gardens are created south of the colonnades at the back of the house.

Woodrow Wilson (1913-21). Beatrix Farrand redesigns the easternmost of these two gardens with a rectangular lily pool and four L-shaped parterres. George Burnap designs the west garden as a walk for the president, with a statue of Pan as a focal point for Ellen Wilson's rose garden.

Franklin D. Roosevelt (1933-45). Frederick Law Olmsted produces a master design whose outlines are retained today. The east and west flower beds are enlarged.

John F. Kennedy (1961-63). Rachel Lambert (Bunny) Mellon redesigns the west garden, the Rose Garden where formal events are now held, adding crab apples and magnolias, and the east garden, now the Jacqueline Kennedy Garden, with American holly topiaries and bulbs.

Lyndon B. Johnson (1963-69). Lady Bird Johnson leads a campaign to beautify much of Washington, D.C., with woody ornamentals, bulbs, and plants. A children's garden is added to the White House grounds.

had. He complained to his diary: "I believe ten summers of unrelaxing attention will be necessary to accomplish anything useful for posterity, and, after all, it may terminate in disappointment."

On April 24, 1827, Adams set forth in earnest on his practical scheme, realizing that he could spend only an hour daily on "this fantastical humor." He and Antonine, his long-time steward, planted nuts of large Pennsylvania walnuts, Quincy walnuts, hazelnuts, and three more of the chestnuts from Judge Peters's son, supplemented by seeds of apple.

Within weeks he set his sights higher.

Perhaps as a result of his new reading agenda, he decided that in addition to American trees there were foreign trees, fruits, and herbaceous plants beyond those staples that had already been imported that could profitably be introduced in America. His proposed agents were captains of U.S. vessels who visited distant ports. The secretary of the treasury was instructed to send every U.S. consul a circular explaining that the president was looking for "forest trees useful as timber; grain of any description; fruit trees; vegetables for the table; esculent roots; and, in short, plants of whatever nature whether useful as food for

man or the domestic animals or for purposes connected with manufacturers or any of the useful arts. . . ." In this he was following the example of Jefferson, who had solicited the support of American consuls at all foreign ports to transmit seeds of the finest fruits and vegetables growing in the host country.

This was followed by pages of instructions about the information needed for each plant. These included where the plant was found, the soil it grew in, and insect pests. Additional pages gave detailed instructions regarding how the seeds, roots, nuts, or plants themselves should be

packed to survive a long voyage by sea. Adams wanted success in an undertaking few Americans had even thought of, let alone attempted. The ship captains, for their part, must have marveled at their president's boldness to think that many seeds, let alone living trees and shrubs, would survive the ordeal. The president was also perhaps presumptuous in supposing that everyone involved in this feat, from collector to the man who finally delivered the bounty, would do so for free. Congress had provided no money.

But Adams's audacity proved justified. In just three months he got his first shipment, Spanish chestnuts, immediately followed by another box of chestnuts and one of cork oak. He had his son George retrieve them from the customs collector in Boston. The president paid the charges himself. Shrewdly he asked the collector, a farmer and gardener as well, how to keep the chestnuts over winter and authorized George to give the man some nuts in return. This goodwill gesture would ensure enthusiastic treatment of future shipments. Meanwhile, George was instructed to divide the remainder, plant some in Quincy, and send the rest to Washington. The president was gratified that other shipments followed on a regular basis. On April 22, 1827, for example, Charles, another son, picked up forty English oak trees, twenty-two buttonwoods, and sixty elms, all sap-

lings, which he took to Quincy. Soon Adams was also getting gifts of nuts, seeds, and plants from friends at home and abroad.

Indoors at the White House he busied himself with watching the development of several silkworms. The president wanted to know the life history of the insect that might at last launch a silk industry in America. In addition to these duties he kept an almost hourly watch on the development of plants growing in three flower pots. Outdoors he already had put a respectable variety of plants into the ground.

In June 1827 he wrote:

In this small garden, of less than two acres, there are forest- and fruit-trees, shrubs, hedges, esculent vegetables, kitchen and medicinal herbs, hot-house plants, flowers, and weeds, to the amount, I conjecture, of at least one thousand. One-half of them perhaps are common weeds, most of which have none but the botanical name. I ask the name of every plant I see. Ousley, the gardener, knows almost all of them by their botanical names, but the numbers to be discriminated and recognized are baffling to the memory and confounding to the judgement. From the small patch where the medicinal herbs stand together I plucked this morning leaves of balm

and hyssop, marjoram, mint, rue, sage, tansy, tarragon, and worm-wood, one-half of which were known to me only by name—the tarragon not even by that.

John Quincy's world was broadening fast.

To keep up with the multitudinous questions that kept occurring to him, he returned again and again to his books. Always an early riser, he sneaked in his botanical reading beginning at the crack of dawn. Then it was out to the garden to make on-the-spot observations of how plants grow. He noted on June 13 that for the past three days he had forgone his usual walk taken for exercise to devote more time to his garden. He was already planning for the preservation of seeds for planting in fall and the following spring. In short, John Quincy Adams was hooked.

He spent two months in Quincy that summer, arriving on August 4. One of the hottest spells in memory descended, leaving him unable even to write. His brief vacation was interrupted by the usual round of callers, but by the twelfth he was solidly back on track with regard to gardening. He had four small wooden tubs made for seedlings and immediately planted five tamarind stones and eight pear seeds in one and five tamarind and six pear seeds in a second. This was to be an experiment to see whether stones and seeds from grafted or budded trees would germinate.



COURTESY OF WOODROW WILSON HOUSE / NTHP—WASHINGTON D.C.

Woodrow Wilson and his second wife, Edith Bolling Wilson, pose in the East Garden, which was planned by Ellen Wilson, the President's first wife. Ellen Wilson was also responsible for the Rose Garden.



COURTESY OF THE WHITE HOUSE

Over the years, U.S. presidents have planted thirty-four commemorative trees on the White House grounds. John Quincy Adams planted an American elm seedling during his tenure in office. The giant elm, shown here in 1984, had to be removed in December 1991; until then it was the oldest tree on the grounds. Right: Boxwoods and tulips grace the White House gardens today.

His literary sources did not provide an answer.

He was also gratified that at the nursery he had established at his summer home—the original family homestead, which he had bought from his parents in 1803—more “shag-bark walnuts” had come up, making twelve to have done so. He also noted horse chestnuts and oaks that had germinated but mourned to his diary:

In this branch of natural history my experiments have commenced so late in life, and are yet so little governed by a system pointing directly to useful ends, that they may perhaps end in mere trifles; but that is not my intention. On the 8th of October, 1804, I planted perhaps forty walnuts in this garden, several of which came up the ensuing summer. One of them was transplanted to the garden of the house where my father was born, and lives, but is not yet in bearing; one only remains on the spot where the nut was planted, and, at the age of twenty-one years, last autumn bore perhaps two hundred nuts. Most of these I planted here and twelve at Washington, and there are now thirteen of them here and twelve at Washington growing. But last year was my first experiment of planting acorns, and that has been partially successful here, and totally failed at Washington. Colonel Perkins told me yesterday that he thought our pasture white oak, well salted, as good for ship-building as the best live-oak. This is encouragement for me to persevere in my experiments, which I would leave as at once a charge and an inheritance to my children.

In Washington during that 1827 fall he planted numerous oaks of several species, hickories, walnuts, chestnuts, persimmons, tulip poplars, and limes as a border around his garden and hoped they would outlast many presidents. He feared they might be uprooted, but the thought did not deter him.

In early May the following spring, among frequent references to the results of his planting endeavors, he found eighty-two trees growing along the north border, three along the west, with none along the south or east. A sharp frost and a later hailstorm had caused damage if not death to these and fruit trees occupying the garden. Later that month he wrote to his son

Charles about nuts he had planted:

They are now coming up, and within the last fortnight upwards of two hundred trees have shown themselves above the surface. I expect with another month to witness the birth of near two hundred more. I shall see little of these myself, but in leaving an infant forest under the eyes of my Successors, I intend it as a memento for them which I hope they will have the means of cherishing.

By summer he had become reconciled to botanical death. He could now afford to be philosophical, for he had more than 700 saplings of some 20 varieties growing at the White House. They were a very necessary tonic to the political disappointment he was experiencing. The trees would be his legacy to the nation he had served all his adult life, and he took pride in that. He could also relish the fact he had contributed at least one positive bit of knowledge by his experiments: Self-seeded plants thrive more vigorously than those planted by man. He noted sadly, though, "The plants which I most cherish are the most apt to disappoint me and die." Mr. Adams

had come of age as a gardener.

It is a testimony to his belief in the importance of the presidential office, even though it had not dealt kindly with him personally, that he persevered to such an extent, given the response of most of his countrymen to his efforts. A great part of the problem lay not necessarily with his ideas but with his inability to communicate them. The highlight of his political courting, in fact, revolved around a tree. Trees were something he knew very well how to deal with. The occasion was the Independence Day celebration of 1828, at which he was to break ground for the Chesapeake and Ohio Canal. His spade at once struck a large submerged tree trunk. He tried several more times without success to come up with a shovelful of earth at the designated spot, whereupon, throwing off his coat, he finally succeeded at the task. The 2,000 spectators roared their approval. Even Adams understood that this small unplanned act was worth all the speeches he had ever made in order to obtain the support of all his constituents.

He was not so lucky after he left office. Adherents of Andrew Jackson were determined to exterminate all vestiges of

Adams's presence, or so it seemed to the latter, for they trampled the White House nurseries, gardens, even the trees he had planted for posterity. He was similarly thwarted in the end with his other great botanical endeavor of providing the American Navy with an assured supply of live oak for ship construction.

He was more fortunate with his gardens in Quincy; there he suffered only the usual defeats common to all who toil in the ground. Small though they were, they kept him happily occupied as he advanced in years. Every time he looked at the "shell-bark walnut" in his garden and the Mazzard cherry north of his house, both of which he had planted in 1804, he was reminded of how much he had learned about plants. At age 66 he was still "plucking up weeds—a never ceasing occupation" that he probably pursued until his death at age 81. He died on the floor of the House of Representatives in 1848.

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WILLIAM CLARK / COURTESY OF THE NATIONAL PARK SERVICE, U.S. DEPARTMENT OF THE INTERIOR

The Many-Hued Lupines

Their history is almost as colorful as their flowers.

BY ERROL CRAIG SULL

As a garden hybrid, this plant's history would seem to begin with a twentieth century British railway employee, yet it is known to have been cultivated several thousand years ago. It has been a symbol for Roman royalty and for one American state but was for a time banned in parts of England.

The lupine genus (*Lupinus* spp.) contains over 200 species. With their palmate leaves and pea-shaped flowers that ripen into conspicuous pods, lupines are among the easiest wildflowers to recognize. They are also some of the most colorful, blooming in showy spikes of red, blue, white, purple, orange, pink, yellow, and bicolors. The lupine has a colorful history too, but not an entirely happy one. In fact, the genus name has its roots in *lupe*, the Greek word for "grief." The Roman poet Virgil called the plant "*tristis lupinus*"



ROBERT E. LYONS: PHOTONATS



*Though the genus *Lupinus* contains over 200 species, few wild lupines have found favor with gardeners. Most cultivars are descendents of Russell hybrids, shown here, which were developed by amateur breeder George Russell.*

("the sad lupine"), allegedly referring to the bitterness of the seeds, which, unless boiled several times, will draw the face of anyone who eats them into a grimace of despair. The Latin word *lupus* means wolf, and its similarity to *lupinus* gave the plant an undeserved reputation for devouring nutrients from the soil. Because it is a legume, the opposite is true.

Possibly because it emerges with the late spring or early summer showers, the Romans described it as a plant that "stretched upward to the gods and brought the rains." Its purple flowers gained it special status in Rome, since the use of that color was a dignity reserved to the highest officials.

The Romans boiled the flowers with talc to make a face cleanser and grew some annual lupines as food, fodder, and as a green manure. In the third century B.C., the painter Protogenus supposedly lived for seven years on lupines and water, a diet recommended for stimulating the imagination. Perhaps there was some truth in that assertion, since his best-known painting was a lifelike picture of a mad dog.

In the seventeenth century, botanist John Parkinson proclaimed that lupine seeds, besides being "anciently cherished for food," could also be used to "scour and cleanse the skin from spots, morpew [ulcerous lesions], blew marks, and other discolourings thereof." Eighteenth-century ladies, according to the Rev. William Hanbury, made an ointment from lupine seeds "to smooth the face, soften the features, and make the charms they possess a little powerful."

Powerful aptly describes the effect of lupines. As the experience of Protogenus suggests, parts of them—primarily the seeds and long taproots—are toxic, and their consumption has occasionally ended in death. According to a legend said to date from the era of the Salem witch trials in New England, an Alice Graybeal decided that lupine seeds would make an interesting addition to her pie dough, so she crushed some and mixed them into her flour. The results sickened or killed some fellow townspeople; Graybeal was accused of being a witch and lupine seeds came to be called the "grains of the devil's hand." Their toxic qualities made lupines the *Cannabis sativa* of nineteenth-century England. In several shires, those caught growing them were fined and sometimes had their gardens seized.

Lupines are native to both North and South America, and to the Mediterranean

basin. In the United States, the most fertile ground for the genus is the West Coast. In California, for instance, you will find the succulent or hollow-stemmed arroyo lupine, *Lupinus succulentus*. Reaching two feet or more, this annual's deep purple-blue or sometimes white flowers are a feature of grassy flats and low elevation slopes. The diminutive *L. nanus*, which reaches only about fifteen inches, grows farther up slope than the arroyo lupine. Commonly known as the sky lupine, this annual produces fragrant, blue flower spikes with a white or yellowish spot on the petal at the tip of the spire (the "standard petal"). Occasionally, it can be found in white- and pink-flowering forms as well. Even higher, and smaller, is the alpine perennial *L. lyallii*, which, at only four inches, is one of the shortest species in the genus. Its dark blue flowers can be seen on summits and ridges from California to Washington.

Other West Coast species are so large you might not even recognize them as lupines. *L. arboreus*, for instance, reaches heights of eight feet or more. A native of the California coast, this lupine produces ten-inch-long, sweet-scented racemes that are usually sulfur yellow, but sometimes lilac or blue. Its flowers have earned it the name "yellow tree lupine" but because it is the best-known of the larger forms, it is often just called the "tree lupine."

Several other West Coast species are also big enough to merit that name. *L. chamissonis* can grow to six feet and produces blue or lavender flowers. At about five feet, *L. longifolius* blooms from deep blue to nearly white. Its standard petals have a whitish or rose purple spot. Of similar height is *L. albifrons*. Its petals are blue or purplish with white to yellow centers. Among the most ornamental of the tree lupines is *L. polyphyllus*. It also reaches five feet, and produces two-foot-long racemes of dense, blue to reddish flowers.

Further south, the arid lands of central Texas are home to the genus's most famous annual, the Texas bluebonnet. The common name is used for two very similar species, *L. texensis* and *L. subcarnosus*. The former grows to about a foot and has deep blue flowers with a white spot that changes to magenta during the season. Its flowers are not inflated, unlike those of most lupines. *L. subcarnosus*, the state flower of Texas, differs from its cousin mainly by having inflated and lighter blue flowers. Although bluebonnet seeds are readily available throughout the United

States and Canada, the appeal of these species seems to be mainly as a curiosity, rather than as a serious addition to the garden. Outside the hot, dry landscape of Texas they do not fare well.

Travel to Mexico and the Hartweg lupine, *L. hartwegii*, will greet you. Growing to three feet, this lupine has unusually hairy leaves and blooms as late as early autumn. Its racemes of blue flowers are topped by pinkish standard petals.

The Far North has its native lupines too. *L. nootkatensis* grows to three feet and produces bluish purple to white or yellow racemes. It ranges from the Aleutian Islands south to coastal Washington. It also occurs on the East Coast as an exotic, from Newfoundland to New England. Of sim-



A native of the California coast, the yellow tree lupine, top, is the best-known of the larger lupines. Among the other West Coast species is the arroyo lupine, above. Another California native, this species grows further inland and has hollow or succulent stems. The insects visiting the Russell hybrid, opposite, will not labor in vain: lupine cultivars are fertile although they don't breed true.

ilar appearance but only fifteen inches tall is *L. arcticus*. It has much the same range except that in the north, it grows as far inland as the Yukon. *L. latifolius* can be found from Alaska to the Sierra Nevadas of California. This species prefers alpine or subalpine habitats and varies considerably in form. Several varieties have been recognized, ranging in size from four feet (*L. latifolius* var. *latifolius*) to only ten inches (*L. latifolius* var. *subalpinus*). The flowers are mainly blue and purple but will sometimes be yellow, pink, or red.

One of the most common eastern lupines is *L. perennis*. Called the sundial, Quaker bonnets, or just the wild lupine, it ranges along the entire Eastern seaboard. Growing to two feet, its blue or sometimes pink

or white flowers are a feature of late spring in much of the East and Midwest.

Across the Atlantic, some lupines native to southern Europe, such as the yellow *L. luteus* and the blue *L. hirsutus*, are grown for both ornamental and agricultural purposes. Like other legumes, lupines add nitrogen to the soil, so they are sometimes grown to be plowed under as a green manure. And over the past few decades, researchers have developed less toxic cultivars of some agricultural lupines, so that they can be used as a fodder for livestock.

Given the number of lupine species and their diversity, it's surprising that so few of them have found a place in our gardens. Of course, some species are cultivated—the

Texas bluebonnet, for instance, or *L. perennis* or even California's tree lupines *L. arboreus* and *L. polyphyllus*. Both of the latter have several cultivars to their credit. But wild lupines can be very demanding about their growing conditions, and although they are beautiful in the wild, they frequently look rather unkempt and ragged in captivity.

The genus owes most of its ornamental success not to any single species, but to the hybrids produced by an English railway worker named George Russell. Russell got interested in lupines in 1911, the year that George V was crowned. Already 64 years old, he spent the next quarter-century collecting lupines and coaxing better flowers from them. In 1937, the year that George VI ascended the throne, the results of Russell's efforts were exhibited publicly for the first time.

The Russell hybrids were a sensational advance, but their origins are obscure. Russell's breeding technique apparently consisted of collecting every lupine species he possibly could, growing them all together, and eliminating any resulting hybrid that didn't please him. (Lupines hybridize readily and while the results of these crosses do not breed true, they are usually fertile.) It took some fifteen years of sifting these random crosses before Russell began to get results. But while Russell's patience with the plants themselves was next to infinite, he seems to have had very little use for records. It is impossible to trace his crosses—he apparently didn't even bother to record which species he had collected. So it's not surprising that speculation on the origin of the Russell hybrids began as soon as they were introduced. One visitor to the 1937 exhibition is reported to have detected half a dozen species in their make-up.

It's generally agreed that the two most important forebears of the Russell hybrids are the tree lupines, *L. arboreus* and *L. polyphyllus*. The former had been discovered on the California coast by Captain George Vancouver's expedition in 1792, and was naturalized to many parts of the English coast shortly thereafter. *L. polyphyllus* was found in British Columbia by the famous botanical collector David Douglas and brought to England in 1826. Other species that may have contributed their genes include the Mexican *L. hartwegii*, which Russell may have obtained from Germany, and the northern *L. nootkatensis*, which had been introduced into parts



MICHAEL S. THOMPSON

GROWING LUPINES

COURTESY OF G. S. GRIMES SEED COMPANY



"Popsicle" is one of the most popular lupine cultivars.

Lupines have developed a reputation for being finicky. It's not completely undeserved. Some species do require fairly specific growing conditions. Mature plants, in particular, are difficult to transplant, and the seeds need some help getting started.

The seed is surrounded by a hard casing that makes the absorption of water extremely difficult. Dropping lupine seeds into the soil as one would a marigold or zinnia will result in an extremely low germination percentage.

The usual treatments for hard seed coats—scarification and soaking—have their drawbacks. Nicking each seed's outer shell is time consuming, and in nicking the shell, it is quite possible to nick the seed itself. In soaking the seed, it is difficult to control water intake, and many of the seeds may get waterlogged and rot.

After I tried and only partly succeeded with both of these approaches, I searched for a method that would allow intake of water but at a slower pace. The method I use now gives me almost 100 percent germination.

Using a cocktail ice cube tray—one with the tiny cube squares—I drop a lupine seed into each opening. Next, I fill the tray with water, then freeze the seeds. After two days, I push the frozen cubes into individual pots or large trays to a depth of about a quarter inch in a good quality germination mix, cover the container with clear cellophane wrap so that it is airtight, and set it out of direct light. This allows the moisture to be absorbed into the hard-coated seed's casing at a slow and steady rate; the two days seems to give them an appropriate amount of moisture. In addition to giving me a higher germination rate, freezing the seeds seems to help them germinate faster—usually within five to seven days compared to the usual ten to twenty-one with other methods. Higher temperatures will not accelerate germination as they do with some seeds, and may actually prevent sprouting.

An inexpensive and rewarding way to grow lupines from seed is to collect the seeds from your own plants. Yet many gardeners remove the pods too quickly, usually in deadheading to make their gardens look neater, and end up with immature seeds that will not sprout.

Wait until the pods have begun to turn dark, then remove the entire stalk. Hang this upside down in a dry location, such as a garage, and then in fall or early winter open the pods and take out the seeds. As with all seeds, it is best to store them in a cool location such as a refrigerator or cellar.

It's after the seeds have sprouted that lupines can get a bit tricky. They have long taproots—mature plants' tap roots can reach down almost six feet—and these need special attention to their nutritional intake as well as plenty of room to grow

downward. (This, by the way, is why it is so difficult to transplant adult lupines: cut a taproot and it's like cutting a human's jugular vein.)

Yet virtually all lupine plants grown and sold today are in containers that are not deep enough, causing the roots to form the spirals that spell "potbound," sometimes traveling out the top of the soil after losing the battle to find more southern space. This not only results in plants that are weak but may shorten a lifespan already genetically programmed to be brief; plants usually begin to fade in flower quality and production after three to five years.

You can improve on this. Once your lupine seeds have at least two of their distinct, palmate leaves, transplant them into a pot that you've made by putting two paper cups together. Note: Don't be ruthless about thinning seedlings. The best flower colors often appear on the spindliest, slowest seedlings. Poke drainage holes through the bottom of one cup, cut out the bottom of the other, which will become the top of your "pot," and tape the two together at what would normally be their rims.

Planting your lupine seedlings in this homemade container will accomplish three things. First, it gives taproots more room to grow down and consequently, to become stronger. The bulge in the middle of the pot also allows more room for secondary root growth and for water and nutrients, encouraging a stocky, strong base for the plant near its stem. Finally, when transplanting the seedlings into your garden, you are much less likely to damage the taproot—simply peel away the paper "pot" and plant the root ball.

Lupines can also be propagated from cuttings. In fall, the cuttings should be taken with a heel and inserted into a cold frame in a sunny location.

Most lupines do best in a moderately acid soil (a pH of 5.7 to 6.3); the Texas bluebonnet prefers a sweeter soil (7 to 7.5). Because they are legumes, they create their own nitrogen and thus need a low-nitrogen, high-phosphorus fertilizer. They generally prefer a well-drained, sandy soil, require average to moist water conditions, and do best in full sun or partial shade. With the exception of gardens in the South, lupine seedlings can be transplanted throughout the growing season, not only in spring or fall. Be sure to mulch the bottoms, as the "feet" enjoy a cool, moist soil.

Even after your lupines are well established in a suitable spot, you will need to keep an eye out for problems. Their nervous temperament seems to make lupines susceptible to several diseases and insect pests, so you should be prepared to respond quickly. The most frequent pests are green aphids or lupine aphids, the latter of which can seriously deform the racemes. Among the most common diseases are powdery mildew and crown rot. There's no special cure for mildew in lupines; the best defense against crown rot is to avoid crowding the plants.

Because it's difficult to transplant mature plants, decide up front where you intend to have your lupines for their life span. Unless you are collecting seeds, you should deadhead the spikes as soon as the flowers are spent to ensure a strong plant for the next season and possibly produce a second blooming. Don't be disappointed if your young lupines don't flower the first or even second year. Their beauty and grace are definitely worth the wait.

—Errol Craig Sull

of Scotland by the early nineteenth century.

Whatever their origin, the Russell hybrids have proven an indispensable source of breeding material. Russell's flowers are behind most lupine cultivars on the market today, though these modern varieties don't greatly resemble the original Russells. The trend in modern breeding, observes Bill Watson, vice president of G. S. Grimes Seed in Smethport, Pennsylvania, is toward plants that are more compact than the three-foot-high Russells. Modern cultivars also usually have shorter spikes with more

flowers. 'Gallery Hybrids', 'Popsicle', and 'Minarette'—all available in mixed colors—are examples of current developments. Also popular are 'The Chantelaine', which blooms in pink and white, and 'The Governor', whose flowers are blue and white.

But if the genus's ornamental value is now proven, it still has yet to be fully realized. Growers find that even the modern hybrids present some serious problems. In the first place, the hybrids themselves aren't stable. Kevin Milaeger, co-owner of

Milaeger's Gardens in Racine, Wisconsin, says he doesn't even like to use the term "hybrid" to describe lupine cultivars, because of the range of variation that is usually present in them. He thinks "strain" would be a better word, but even that may not do the lupine justice. Because lupines interbreed, a bed of cultivars will eventually tend toward only one or two colors, usually red or blue. There is no remedy short of replacing the plants.

Lupine cultivars are also inclined to suffer from the heat of the American summer. Such a weakness may seem odd for a genus that is so well stocked with species native to the Americas. But according to Watson, most of the new cultivars are being bred in England and Japan, so perhaps it's not surprising that the results aren't entirely suited to the American garden. A partly shaded location, where soil temperatures are likely to be somewhat lower, will help keep lupines from fainting. But of course the real solution would be the development of cultivars better suited to American conditions. That would only be giving the lupine its due: A genus that adorns so many of this continent's wild places deserves extensive use in our gardens too.

Errol Craig Sull, a free-lance writer and Master Gardener, would like to form a lupine society. Contact him at 370 Franklin Street, Buffalo, NY 14202.

SOURCES

High Altitude Gardens, P.O. Box 4619, Ketchum, ID 83340, (208) 726-3221. Catalog free. Seeds of some wild species.

Las Pilitas Nursery, Las Pilitas Road, Santa Margarita, CA 93453, (805) 438-5992. Catalog \$4. Mostly plants of species.

Milaeger's Gardens, 4838 Douglas Avenue, Racine, WI 53402-2498, (414) 639-2371. Catalog \$1. Plants of cultivars and of *Lupinus perennis*.

Theodore Payne Foundation for Wild Flowers and Native Plants, Inc., 10459 Tuxford Street, Sun Valley, CA 91352, (818) 768-1802. Catalog free. Seeds of a wide variety of species native to California.

Thompson & Morgan, P.O. Box 1308, Jackson, NJ 08527, (908) 363-2225. Catalog free. Seeds of cultivars and of some species.

White Flower Farm, Litchfield, Connecticut 06759-0050, (203) 496-9600. Catalog free. Plants of cultivars.



COURTESY OF MILAEGERS GARDENS

Modern cultivars, like these 'Minarette' hybrids, usually produce shorter, denser racemes than the original Russells.

The Dawn Redwood

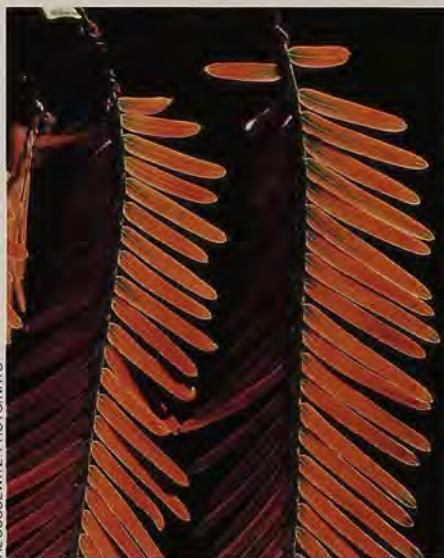
East and west cooperated to save this living fossil from extinction.

The discovery of the dawn redwood (*Metasequoia glyptostroboides*) in China half a century ago generated great excitement among scientists. By extraordinary coincidence the tree had been described from fossil evidence that same year but was believed to be extinct.

With a 100 million-year history that extends into the Cretaceous period of the Mesozoic era, *Metasequoia* dates to the age when dinosaurs were becoming extinct and flowering plants were appearing. By the time botanists had discovered dawn redwood, this lone survivor of a genus that had once been distributed throughout most of the Northern Hemisphere existed only in China, where it was near extinction. Although its long-term survival in its natural habitat is not assured, dawn redwood now appears to be thriving in cultivation in the United States and elsewhere.

For several years before World War II, Japanese paleobotanist Shigeru Miki had been searching for fossils of woody plants in Japan's Cenozoic clay deposits. He collected fossil female cones somewhat similar to redwoods (*Sequoia* spp.) but with stalks and opposite cone scales and found vegetative shoots resembling bald cypresses (*Taxodium* spp.) but with leaves that were opposite rather than alternate. In 1940, when he discovered better-preserved fossils of this conifer in clay deposits at Osusawa and elsewhere in central Hondo, he was able to determine that the tree was different enough from the other two genera to assign it to a new genus, which he named by adding the Greek *meta*, meaning "akin to," to *Sequoia*. Remarkably, the fossils he had found were so well-preserved and complete that Miki's descriptions and drawings recorded most of the external traits that were later found in the living

BY SUSAN SAND



The feathery foliage of the dawn redwood, above, is bright green changing to russet in autumn. Its single straight trunk and pyramidal shape, right, make it a popular choice for the landscape.

species, *Metasequoia glyptostroboides*. When he published the new name in 1941, Miki believed that *Metasequoia* represented a genus that had been extinct for twenty million years.

During the winter of 1941 a Chinese forester, T. Kan, of the Department of Forestry of National Central University in Nanjing, was traveling near the village of Modaoqi in eastern Sichuan province in central China when he noticed three intriguing trees growing at the edge of rice paddies. But it would have been pointless to collect specimens, since it was winter and the trees were leafless. He did learn that the natives called the tree *shui-sa*, or

"water fir." A small shrine had been built beside the largest of the trees, for the local villagers considered it divine. They believed that its cone production indicated crop yields and that the withering of a twig or branch predicted someone's death.

The next year, Kan asked a local school principal, Long-xin Yang, to collect specimens for him. They were gathered but not identified. In 1944 Yang asked Z. Wang of the Central Bureau of Forest Research to stop at Modaoqi to investigate the unusual trees. Wang gathered both cones and branchlets, thinking the trees were Chinese swamp cypress (*Glyptostrobus lineatus* or *G. pensilis*), a deciduous conifer of south China. Eventually Wang's specimens reached Professor W. J. Zheng of the Department of Forestry at the National Central University. The herbarium material was incomplete and Zheng could not be sure of the tree's identity, so he sent his graduate student, Ji-ru Xue, on two collecting trips to Modaoqi, in February and May of 1946. Xue's journey required a two-day trip by steamboat and a seventy-two-mile hike on narrow mountain trails. His diligent efforts provided numerous complete specimens, and Zheng became convinced that the trees of Modaoqi represented a new genus. He sent some of Xue's samples to Dr. Xian-su Hu, director of the Fan Memorial Institute of Biology in Beijing. Hu had read Miki's paper on the fossil metasequoia and realized that the specimens from the live trees belonged to this very genus. In 1946 he published a paper announcing its discovery; two years later Zheng joined him in describing it fully and giving it a specific epithet in honor of its resemblance to the Chinese swamp cypress, *Glyptostrobus*, which Wang had noted. He later referred to this discovery of the living metasequoia as the most remark-



able botanical find of the century.

Miki's fossil discovery was also significant, for it solved a long-standing paleobotanical puzzle. For almost a century, paleobotanists had occasionally noted fossil features that suggested a new genus but continued to assign specimens to either *Sequoia* or *Taxodium*. Incorrectly named, they had been used to construct theories about migration, ecology, and evolution of Tertiary vegetation of the Northern Hemisphere. When paleontologist Ralph W. Chaney of the University of California-Berkeley reexamined the fossil evidence, he concluded that the dominant conifer of arctic forest communities in the Tertiary

period, 63 million to two million years ago, had been the deciduous *Metasequoia* rather than the evergreen *Sequoia*.

Today's wide distribution of this tree, so near extinction when it was discovered, can be attributed largely to the efforts of Dr. Elmer Drew Merrill, then director of Harvard University's Arnold Arboretum. When Merrill received some of Xue's herbarium specimens from Zheng in 1946, he realized the significance of the discovery. Working with Hu and Zheng, he arranged for the arboretum to fund a seed-collecting expedition for late summer and fall of 1947. Zheng's collectors visited Modaoqi and beyond and discovered about 1,000

trees in the neighboring twenty-five-mile-long Shuishaba Valley to the south, in western Hupei province. During this three-month expedition, they collected a little more than two pounds of seed. In January and March of 1948, Merrill received shipments of seed from Zheng, who also sent seeds to Copenhagen and Amsterdam, and arboretum staff immediately distributed more than 600 packets to arboreta, botanical gardens, and interested individuals throughout the world.

Eventually about 1,500 trees were found, but they were rapidly being destroyed by locals who were using them for firewood and for finishing the interiors of their homes. Chaney, during a hurried trip to observe the living tree in Modaoqi in March 1948, under the auspices of the Save-the-Redwood League, called on the American ambassador and other officials to launch an effort to conserve dawn redwoods. A conservation committee was established with representatives from both government and academic institutions, including Chaney as a foreign member.

Chaney was accompanied on his expedition by Milton Silverman, science editor of the *San Francisco Chronicle*. Chaney coined the name dawn redwood when they were discussing the upcoming journey. "I suggested the name 'Dawn Redwood' to the editor," Chaney later related, "when he complained that *Metasequoia glyptostroboides* would not go over in a news account." Actually, Chaney felt that Chinese redwood was a more appropriate name and he seldom used the term "dawn redwood" in print.

Chaney and Silverman were the first westerners to see dawn redwoods growing in their natural habitat. One more American expedition was made before the bamboo curtain fell in 1949. During the summer of 1948, J. Linsley Gressitt of the California Academy of Sciences headed the California Academy-Lignan University Dawn Redwood Expedition to the metasequoia area to study the flora and fauna of the region. He noted many familiar-looking trees in the valley, including beeches, willows, poplars, oaks, maples, chestnuts, and sassafras, and later wrote that an American or European viewing only the trees might think himself near home.

The area was not visited by foreigners again for thirty-two years. Scientists with the Sino-American Botanical Expedition to western Hupei Province in 1980, in which five American scientists participated,



MICHAEL S. THOMPSON

Solitary cones remain on the tree throughout the winter, then fall to the ground.

found that the enormous dawn redwood at Modaoqi, then estimated to be about 450 years old, was still standing. But the shrine built in its honor was gone, as were the two smaller trees that had been near it.

Many other metasequoias had been planted along the road through the village. In the metasequoia valley south of Modaoqi, the local Bureau of Forestry had counted 5,420 trees with a diameter of at least eight inches. Yet although 1,700 to 1,800 of these metasequoias were seed-producing trees, expedition members saw no seedlings in the valley. In 1948, seedlings had been found in the dense growth around mature trees; now, that vegetation had been cleared. The government had forbid cutting the trees but had not protected their habitat so that they might reproduce.

In the paddies along the river floodplain, more than 200 metasequoia trunks, many over six-and-a-half feet in diameter, testified to their former range. Local residents had been using the tree for as long as three centuries. Metasequoia boards were used to construct some of the older homes in the valley, believed to be 200 to 300 years old. The valley, enclosed by mountains and offering no easy river access, was the last in the area to be settled, which probably helped the dawn redwood survive into the twentieth century. Even so, it now existed mainly at the end of ravines descending to the valley floor and along rocky stream banks. Locals had also planted some near their homes or along the rice fields and streams, by making cuttings or digging saplings. They believed heavy cone production on upper branches predicted a good rice harvest, while profuse cones on lower branches foretold the yield of hill crops such as corn and herbs.

The range of survivors was originally thought to encompass about 320 square miles; Gressitt's maps showed the area about one-third larger. Nevertheless, it was such a limited area that several earlier plant explorers of the region failed to discover the tree. French missionary Armand David collected plants in central China in 1869, and almost twenty years later, Irishman Augustine Henry explored the mountainous, forested region of the Hupei-Sichuan border, discovering hundreds of new plants. Ernest Henry Wilson of England, who made four trips to China between 1899 and 1910 and introduced more than 1,000 plants to the western world, had explored both western Hupei province and eastern Sichuan province without spotting

metasequoia.

This remote region had such a mild and wet climate that scientists doubted that dawn redwood would survive in the United States north of Georgia. Annual rainfall was forty-eight inches with little snow, and the average low temperature was not much below freezing, similar to Georgia's coastal plain. However, because dawn redwood seed was so widely distributed—and its performance so carefully observed under various conditions—studies soon indicated that the tree was much hardier than anticipated. Early reports documented its success on the Pacific Coast and in eastern North America and Europe. It grows best where ample moisture is available year round and in USDA hardiness zones 5 to 8.

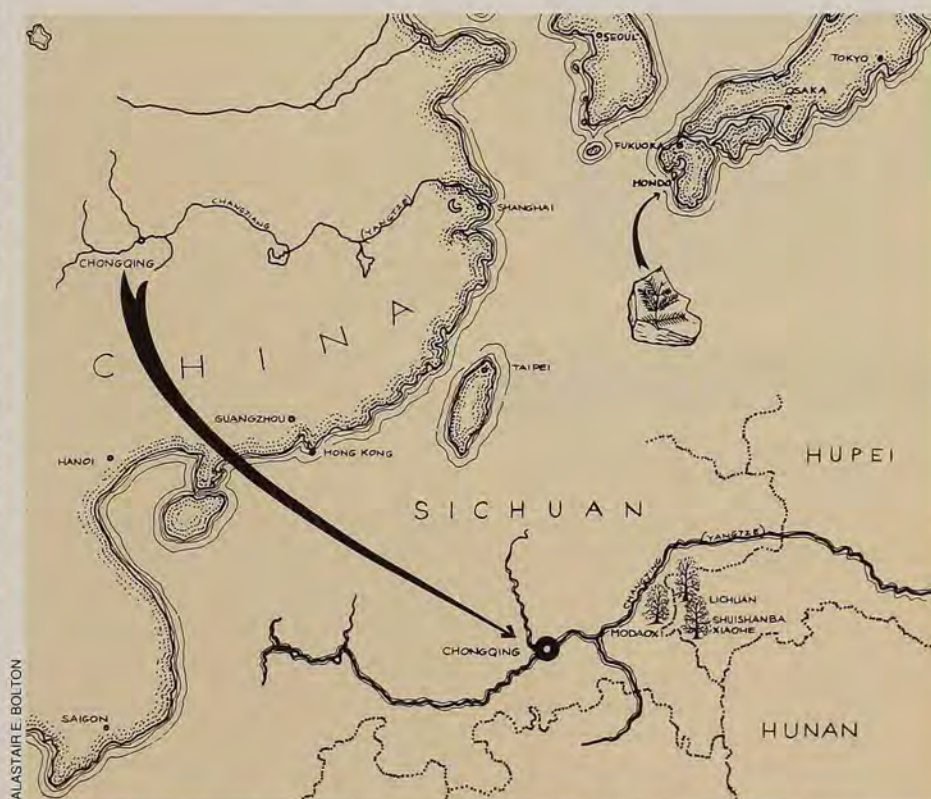
Another surprising discovery was its rapid growth rate, possibly the fastest among conifers. Near Philadelphia, plants grown outdoors from seed reached almost six feet in eighteen months with stem diameters of an inch and a half two inches above ground. Twenty years after seed had been distributed, some trees were sixty feet tall; at thirty-two years, some specimens approached or exceeded 100 feet.

Many other features have made dawn redwood popular as a landscape plant. It

develops a single straight trunk with a shapely pyramidal form and feathery bright green foliage that changes to brown or russet before both leaves and branchlets fall in autumn. The flat, linear, half-inch leaves, up to an inch and a half long on younger trees, are opposite each other on opposite branchlets. Solitary, pendant cones that grow to an inch around turn to brown and stay on the tree through winter. The base of the tapering trunk becomes buttressed and fluted and the reddish brown bark grays with age and exfoliates in narrow strips.

This lovely tree is readily available from nurseries and transplants easily. It prefers moist, well-drained, slightly acid soil and a location in full sun. Low sites make it susceptible to frost damage because the tree has a long growing season: It initiates new growth in early spring and foliage does not mature until mid- to late fall. The foliage is also susceptible to damage by Japanese beetles, and the U.S. National Arboretum in Washington, D.C., has lost several trees to a fungal disease called *Dothiorella* canker. In general, however, metasequoia has been relatively free of insect or disease problems.

Because it can reach 70 to 120 feet at



In 1941 three dawn redwoods were seen near Modaoqi in eastern Sichuan province. Fossils of the tree were found in Japan a year earlier.



CLASSIFIEDS

maturity and spread to one-fourth its height, dawn redwood requires ample space. It is versatile and can be planted in groups or as a screen, and cities such as St. Louis, Missouri, and Maplewood, New Jersey, have used it as a street tree. But for it to develop its graceful, naturally symmetrical cone-shape, it should be planted as a specimen, away from buildings and preferably on an open lawn.

With the widespread planting of dawn redwood, *Metasequoia* has returned to North America after an absence estimated by Berkeley's Chaney at 15 million years. He believed that the tree moved south from the arctic forests as northern latitudes became drier and colder, eventually becoming the most abundant conifer in western North America, with a range extending throughout most of the Northern Hemisphere. But as summers became drier it retreated, until there was only the single species surviving in central China, where summers are wet. It has not only made a phenomenal comeback to this continent, but is widely grown in Asia, Europe, and some areas of the Southern Hemisphere as well. Dawn redwood's discovery in Modaoqi, Merrill's generous and prompt seed distribution, and the enthusiasm of scientists and gardeners around the world helped rescue it from the edge of extinction.

Susan Sand is a horticulture and biology instructor at Damascus High School in Damascus, Maryland. This is the fifth in a series of tree histories by Sand. Modern Chinese translations were provided by Gang Li, a native of China and a graduate student of taxonomy at the University of Maryland.

SOURCES

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

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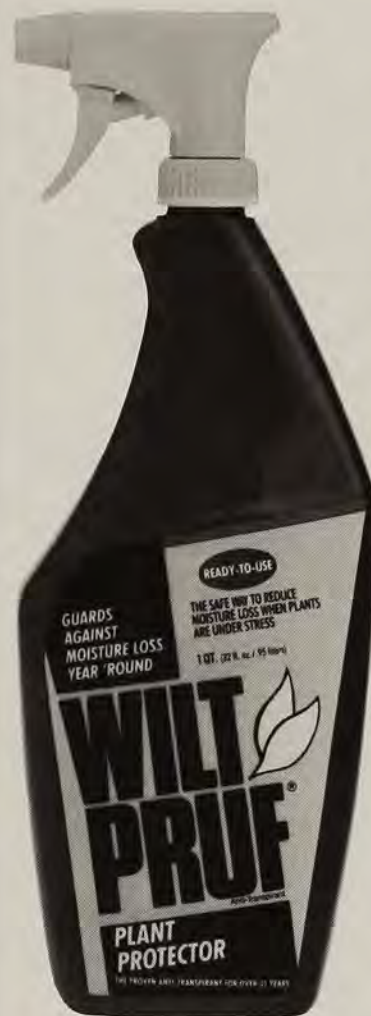
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Browallia bro-WAL-ee-uh
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B. tubiflorum B. too-bih-FLOR-um
Cannabis sativa KAN-uh-bis suh-TEE-vuh
Cinchona calisaya sin-KO-nuh kal-ih-SAY-uh
C. ledgerana C. lej-er-AY-nuh
Gladiolus glad-ee-OH-lus
Glyptostrobilus lineatus
glip-TOE-stroh-bus lin-ee-AY-tus
G. pensilis G. PEN-sih-lis
Hippeastrum hih-pee-ASS-trum
H. candidum H. KAN-dih-dum
Kitchingia kih-CHING-ee-uh
Impatiens sultanii im-PAY-shenz
sul-TAN-ee-eye
I. wallerana I. wal-er-AY-nuh
Labiatae lay-bee-AY-tee
Lavatera lah-vah-TEE-ruh
Lisianthus lih-zee-AN-thus
Lupinus albifrons loo-PIE-nus AL-bih-fronz
L. arboreus L. ar-BO-ree-us
L. arcticus L. ARK-tih-kus
L. chamissonis L. sham-ih-SO-nus
L. hartwegii L. hart-WEG-ee-eye
L. hirsutus L. her-SOO-tus
L. latifolius L. lat-ih-FOE-lee-us
L. latifolius var. *subalpinus* L.
lat-ih-FOE-lee-us var. sub-al-PIE-nus
L. longifolius L. lon-jih-FOE-lee-us
L. luteus L. LOO-tee-us
L. lyallii L. lie-ALL-ee-eye
L. nanus L. NAY-nus
L. nootkatensis L. newt-kah-TEN-sis

L. perennis L. per-EN-is
L. polyphyllus L. pah-lee-FIL-us
L. subcarnosus L. sub-kar-NO-sus
L. succulentus L. suk-yew-LEN-tus
L. texensis L. teks-EN-sis
Meconopsis betonicifolia me-koh-NOP-sis
bay-ton-ih-kih-FOE-lee-uh
Metasequoia glyptostroboides
met-ah-see-KWOI-yuh
glip-toh-stroh-BOY-deez
Nepeta NEP-eh-tuh
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low-BAY-tuh
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S. buchananii S. byew-can-NAN-ee-eye
S. clevelandii S. kleev-LAND-ee-eye
S. confertiflora S. kon-fair-tih-FLOR-uh
S. discolor S. DIS-kuh-ler
S. elegans S. EL-ih-ganz
S. greggii S. GREG-ee-eye
S. greggii var. *microphylla* S.
GREG-ee-eye var. my-kroh-FIL-uh
S. jurisicii S. jur-ih-SICK-ee-eye
S. officinalis S. oh-fis-ih-NAL-liss
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Indian Agricultural Institute in New Delhi, will travel with the group in India. Leading this tour for American Horticultural Society will be Helen Fulcher Walutes, acting executive director of AHS.

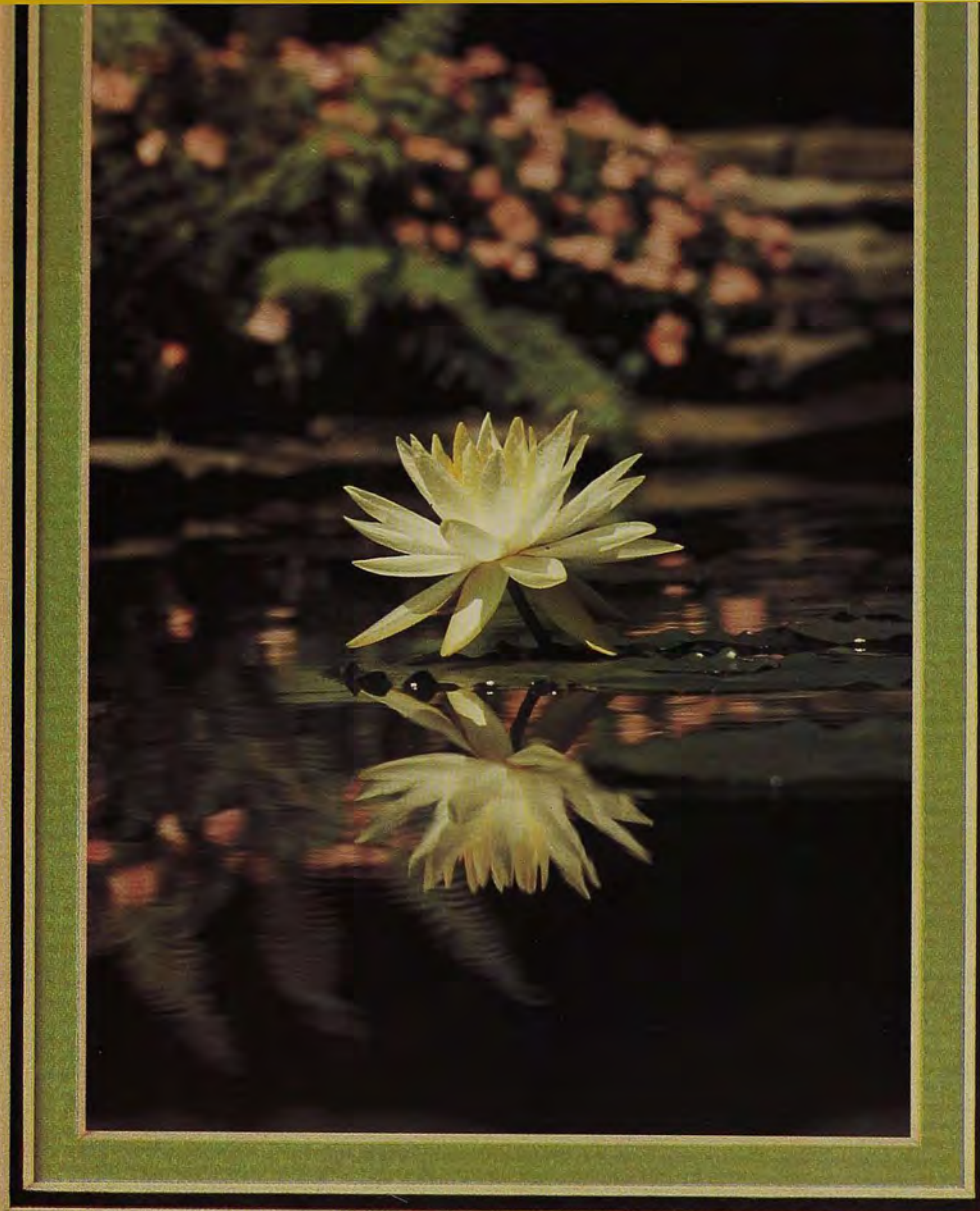
MARCH 16-29, 1993 NATURAL GARDENS OF PANAMA AND COSTA RICA

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

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