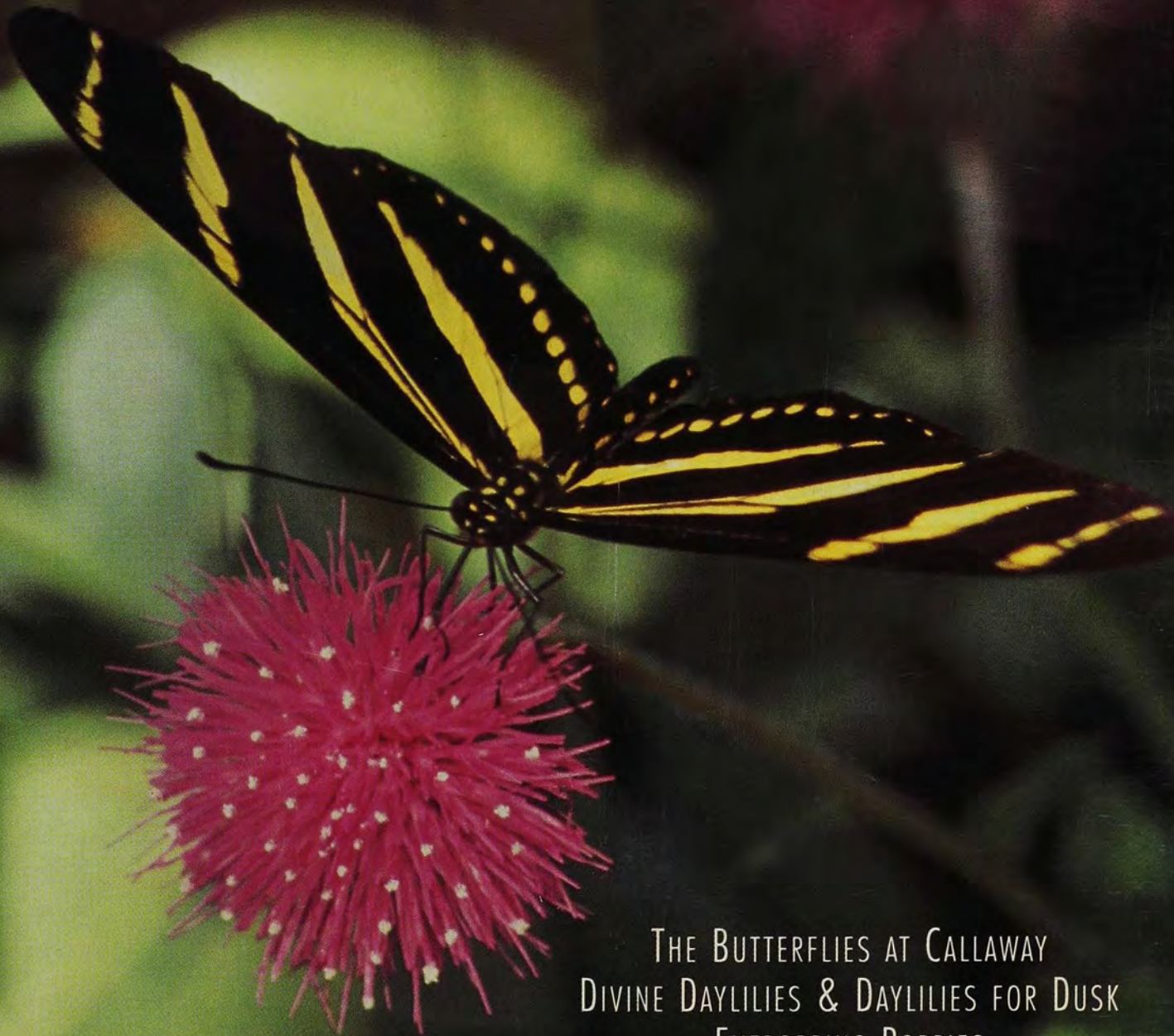


American Horticulturist

June 1992

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American Horticulturist

Volume 71, Number 6

June 1992

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JUNE'S COVER

Photographed by K. Mark Cowick

The zebra longwing (*Heliconius charitonius*) alights on a Texas thistle (*Cirsium texanum*) at the Zilker Butterfly Garden and Trail at the Texas Botanical Garden Society in Austin. Dr. Larry Gilbert, who helped design the butterfly garden there, has found that this butterfly has the unique ability to absorb protein, making it longer lived than most butterflies. A tropical butterfly whose larval food plant is *Passiflora caerulea*, it can survive freezing nights as long as day temperatures are warm enough to thaw it out. In most of the United States, it needs the protection of an indoor butterfly garden, such as the Day Butterfly Conservatory at Callaway Gardens in Pine Mountain, Georgia. Read more about these two butterfly gardens beginning on page 20.

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

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COMMENTARY

This month an unprecedented gathering of world leaders takes place in Rio de Janeiro. The agenda of Earth Summit, a United Nations-sponsored conference on the environment, will focus on two concepts: that humanity has an incalculable impact on the natural environment and that our species must take responsibility for that impact.

We at the AHS applaud Maurice Strong, secretary-general of the U.N. Conference on Environment and Development, for having the vision and ability to gather representatives of seventy governments and more than 1,000 nongovernmental organizations for this event. AHS will be represented by one of our newer members, Rory O'Connor, a television production executive and journalist, who will report to us on developments related to horticulture.



Another important event opened in April for a six-month run in Columbus, Ohio. AmeriFlora '92, this nation's first attempt at an international horticultural exposition, is a courageous act that deserves the support of our members.

Such "garden expositions" originated in Europe following World War II with a dual purpose: to create beautiful and useful public parks in areas destroyed by war, and to celebrate the richness of their region's horticultural activities. Thus the earliest garden expositions took place in Holland, Belgium, Germany, and France, and the concept spread to other countries in Europe. Today they are primarily celebrations of the beauty and usefulness of ornamental horticulture.

Why haven't Americans done this sort of thing before? Sure, we gather in convention centers and put on spring flower shows—valiant efforts of regional societies that are generally well-attended. But we have nothing in America to rival the European shows.

This is due in part to our not having a unified horticultural community. A single horticultural display simply could not represent all of North American horticulture. Imagine someone announcing an exposition of European gardening and horticulture. Which one? British, Dutch, French?

The organizers of AmeriFlora '92 did a wise thing. They chose to promote, generically, the value of gardening and the beauty of plants and flowers. There are educational demonstrations, fun events for kids, and a great abundance of attractive, colorful displays.

While it may not reach the level of sophistication and refinement of the European expositions, it is an excellent start. Just as we are a young country, we are to a great extent a nation of "beginning" gardeners. So the generic, educational, "entry-level" approach that comprises much of AmeriFlora '92 is appropriate. Let us hope that more gardeners result from the tremendous effort the Columbus community has made.

We encourage all of our members to go, not only to see what does well in the southeastern Great Lakes subregion, but also to witness a first attempt at a world-class horticultural exposition. Other groups across the country should consider the possibility of undertaking similar projects in their communities.

George C. Ball Jr., AHS President



LETTERS

Plants in Education

No wonder four-year-old Charles had so much trouble when told that plants "needed food to survive," as related in the article "Wiggly Creatures and Amazing Mazes" by Brian Holley (April). Plants do not need food to survive, and to tell children so misleads them. Growing plants in solution culture hydroponics is an easy way to show children that plants only require air, light, water, and the proper minerals. Two-liter plastic soda bottles or 35-millimeter plastic film canisters make excellent hydroponic systems for school use.

The April "Commentary" about using plants in science education adds another voice to what might become a renaissance for plant use in education. Four recent curricula funded by the National Science Foundation center on gardening or plants; they are Wisconsin Fast Plants, GrowLab, LifeLab, and Project LEAP (LEarning About Plants). There have also been numerous recent publications about the use of plants in education.

David R. Hershey
University of Maryland
College Park, Maryland

Brian Holley responds:

I certainly agree that hydroponics can be a very effective way of teaching basic plant physiology in a classroom setting. I use hydroponics with older students at the Royal Botanical Gardens' Teaching Garden to demonstrate the ways in which various nutrients affect plant growth. However, in this instance, I was talking about a very different age group. And most of the plants that children come in contact with, whether they are in a forest, a garden, or at home, will be growing in soil or a similar medium. As a result, when working with children in a gardening program, I feel it is quite important that they understand the role of soil and of techniques such as composting for improving the soil.

When I'm working with preschoolers, one of the goals is to sensitize them to the needs of plants as fellow organisms. In the particular program referred to in the article, each child adopts a house plant and is responsible

for its care. I admit that we do attribute an animal characteristic to plants when we talk about feeding them and it may not be scientifically correct, but it does reinforce our goal. I am much more careful about my tendency to anthropomorphize since my experience with Charles.

I too find the recent interest in plant studies by educators a very exciting prospect. No other medium offers as many opportunities for intellectual and affective development, as well as the development of practical skills.



L. ALBEE / COURTESY OF LONGWOOD GARDENS

Correction: A photograph that accompanied "Wiggly Creatures and Amazing Mazes" in April was misidentified. The maze garden photo by Allan Rokach was taken at the New York Botanical Garden. The real Longwood Gardens maze appears above.

VICTORY GARDEN MEMORIES

For an upcoming article, *American Horticulturist* would like to hear from members who grew or helped grow victory gardens during World War II. Of course, you were mere babes then. But perhaps family stories or journals have kept this experience alive. Tell us briefly what your parents grew, whether the children helped, whether it was delightful or drudgery, and how that has affected your gardening today.

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OFFSHOOTS



Horticultural Discrimination

By Elisabeth Sheldon

When I began flower gardening in earnest and met other people devoted to that pursuit, I thought I had moved into a somewhat rarefied atmosphere. I felt that somehow my fellow gardeners and I, through our constant association with flowering plants, had undergone a kind of mysterious purification process that freed us from many human frailties—at least in our dealings with one another. I thought we would all be happy guileless gardeners together—children of paradise, in a way. However, I'm now aware of strong evidence that we have brought one unworthy element to our horticultural heaven from the world outside, and that is snobbery.

This snobbery has two aspects. The first is the simple manifestation of the old human failing of wanting to have something one's friends and neighbors don't have (yet). It makes the gardener cherish his *Corydalis cashmeriana* for the cupidity it arouses in his chums, his *Androsace* for the anguish of longing he reads in visitors' eyes, and his *Arisaema candidissimum*

more for the fact that hardly anyone else has it than for the fact that it is strikingly beautiful. On this subject I found an amusing paragraph in the memoirs of the English novelist E. F. Benson, which follows an affectionate description of a garden he has made:

There was nothing of the slightest interest or rarity, for this garden was not intended to be one where the owner, with difficulty deciphering a metal label, solemnly introduces the visitor to a minute mouse-colored blossom and tells him that never before has this species flowered in Sussex . . . How I long, on such occasions, to stamp on the mouse, passionately exclaiming, 'And it shan't go on flowering in Sussex now . . .'

Benson's strong reaction notwithstanding, this way of measuring the worth of any object, animate or inanimate, is regrettable but still comparatively innocent.

It is the second aspect of horticultural snobbery I find more disturbing—that of those who concentrate on one whole group of plants and look down on all others. I don't mean enthusiasts of a particular genus—say those who adore *Iris*, *Primula*, or *Rosa*—who love these plants especially but appreciate and grow many others. I



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FOR MORE INFORMATION

Our Alexandria, Virginia, Annual Meeting will provide encouragement and inspiration for both inexperienced gardeners and seasoned professional horticulturists. Look for a registration form and more information on the Annual Meeting program in the *American Horticulturist* News Edition.

PHOTO BY ANN MCDOWELL

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mean those who embrace one group and discount all the rest. Reginald Farrer, who encountered this attitude in his time as well, wrote in *In a Yorkshire Garden*:

It is the specialist in gardening that I dread—not the specialist in himself . . . but the spirit of narrow exclusiveness that specialism seems liable to breed.

Oddly enough, he had just been speaking of people in Cornwall who concentrated on growing gorgeous rhododendrons and scorned his beloved small plants from the high mountains. Nowadays that situation has been almost completely reversed, with many sophisticated gardeners sneering at rhododendrons (and other plants that produce big explosions of color) and worshipping only alpinists. In fact, it is among these alpine enthusiasts that the biggest plants snobs seem to be found today. Many of them value a plant only if it is very small, very rare, and very difficult to grow. They scorn large, lusty perennials and remain unmoved even at the sight of smallish rock plants if they are the sort that are at all amenable. If a plant can be grown by a novice, no matter how pretty it may be, it is beneath their notice.

It is easy to understand a gardener's going overboard for alpinists, even to the point of spending a lifetime hauling rock,

constructing screes and moraines, devising crevices made of just the right rock, placed at just the right angle to suit his *Lewisia*, *Saxifraga*, and/or other highland princesses. I've even heard of a passionate alpinist who puts all his pots of a particularly exigent subject into the refrigerator every night and takes them out in the morning.

Alpinists are truly lovely plants, restrained and elegant, and certainly provide a challenge to those who need one, especially if they are trying to grow them at low elevations in the United States. The fanciest of these plants are also hard to find and expensive when found. Dedicated rock gardeners join alpine societies and raise as many as they can from their seed exchanges. This is all innocent and commendable activity—even I try doggedly to raise alpinists. Even I, as I criticize, am leaving my writing pad to go peer, now and then, at seed flats that I hope are hatching *Erodium*, rock yarrows (*Achillea* spp.), and *Androsace* that might miraculously resign themselves to living in my stone wall. I yearn to have alpinists as well as easy rock plants from below the tree line.

Nevertheless, rock gardeners and other specialists should keep in mind that Farrer may have had something when he said:

This cult of the separate rarity is the destruction of true gardening . . . the true gardener despises nothing . . . You may ignore, you may leave out, but you must never despise . . .

While it was Farrer who introduced the fine art of rock gardening to Great Britain, it is Louise Beebe Wilder who is given the credit for bringing it to America. Like Farrer she adored alpinists but regretted the attitude that was quickly assumed by some who became experts in the field. She wrote in defense of easy saxatile plants that "seldom receive sufficient credit . . . they ask so little—which, instead of arousing our gratitude seems to engender a faint contempt."

Shouldn't we listen carefully to these two superb gardeners? Shouldn't we enjoy plants for their own sakes rather than for their social positions? Shouldn't we note the beauties of an ordinary clump of sundrops as well as those of *Daphne*, value the contribution of a mass of stout *Delphinium* as well as that of a two-inch *Penstemon acaulis*, of *Aquilegia chrysantha* as well as *A. jonesii*? And when a rock plant, such as an *Aubrieta* or *Campanula elatines* var. *garganica*, is pretty and easy to grow, we certainly should not scorn it but rather be grateful to it for giving so much to our gardens in exchange for so little effort on our part.

Elisabeth Sheldon is a frequent contributor to American Horticulturist.



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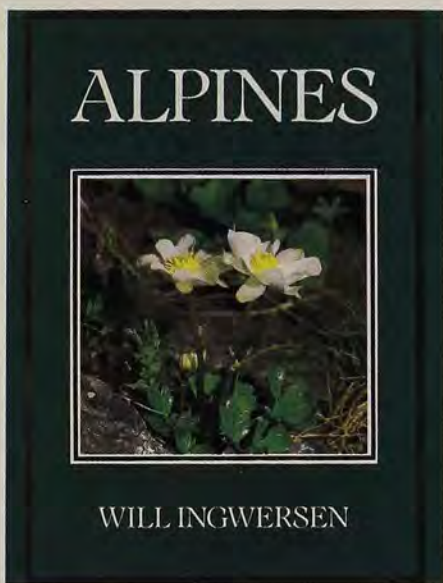
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BOOK REVIEWS



Alpines

Will Ingwersen. Sagapress, Inc./Timber Press, Inc., Portland, Oregon, 1991. 292 pages. 7¾" × 10½". Color photographs. Publisher's price, hardcover: \$65. AHS member price: \$55.

The late Will Ingwersen was probably one of the ten best nurserymen in the United Kingdom. He specialized in alpine plants at his nursery southeast of London. I visited there a few years back and wandered around in wonder at the variety and beauty of the well-grown plants. An elderly man who was hovering around came up to me and started to talk about plants. This was Ingwersen himself, connoisseur of plants and extensive traveler like his nurseryman-plantsman father. Typically, he showed us some of his best and rarest specimens, not as a sales pitch, but because he needed to share his obsession.

His previously written *Manual of Alpine Plants* has been useful and popular. Now we have his last words on alpinism in a book edited and arranged by his colleague in the Alpine Garden Society, Richard Bird. This is a less encyclopedic but a more personal and more casually organized work. It is also a handsome book with color photo-

graphs on almost every one of the 273 pages of text. These are often on the same page as the plant under discussion, but not always, and you don't know whether a plant will be illustrated without referring to the index. Some of the plants are magnified specimens beautifully photographed, while others are indifferent examples.

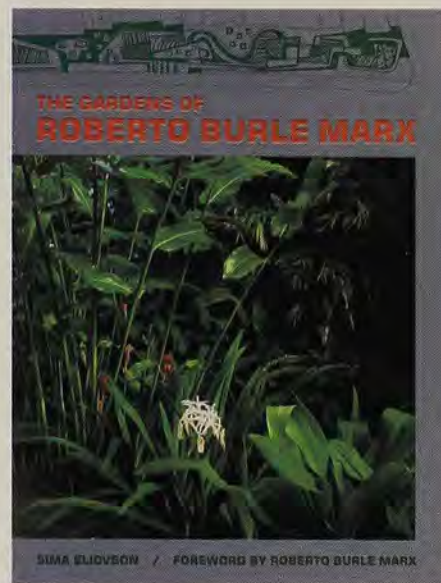
The text is reminiscent of a stroll through Ingwersen's nursery with him at your side giving short descriptions, snippets of history, lots of praise (he only shows you plants he likes), and occasional cultural hints; the feeling of affection for plants comes through strongly. This is a book to browse through, recognizing familiar plants, looking for new ones, and aching to extend the list to include one's own favorites. Alpine plants form a category without fixed boundaries and in this collection you can find plants that come not only from above the tree line, but also from forests, deserts, and the seashore, along with garden hybrids and selections. Lovers of these beautiful plants are often specialists but not usually purists, so alpine gardeners tend to make room for any desirable plant that seems to fit in their gardens.

But Will Ingwersen's nursery is not your own garden, so some of the plants may not be hardy in New England or growable in Arizona. Many of the hybrids and good forms are not available in the United States, so you have to understand phrases like "in general cultivation" or "in catalogs" to mean something else. There is still pleasure in reading about the unattainable.

He grumbles a good deal about botanical name changing and repeats author Reginald Farrer's ridiculous use of the word "race" for "genus," but his tone is genial and plant-friendly. He leaves you feeling that a life close to plants is well spent.

—Geoffrey B. Charlesworth

Geoffrey B. Charlesworth is the author of *The Opinionated Gardener* and has held various offices in the American Rock Garden Society.



The Gardens of Roberto Burle Marx

Sima Eliovson. Sagapress, Inc./Timber Press, Inc., Portland, Oregon, 1991. 237 pages. 8¾" × 11¼". Color photographs, black-and-white illustrations. Publisher's price, hardcover: \$45. AHS member price: \$38.

Brazil's unique cultural composition, a mixture of races and diverse indigenous and European influences, has produced an artistic dynamic of extraordinary excitement, energy, imagination, and high technology. A fine example is Roberto Burle Marx, internationally known landscape architect and painter, designer, botanist, passionate gardener, and collector. He has worked with great talents—Le Corbusier, Oscar Niemeyer, and Lucia Costa, his teacher and greatest influence. He has traveled the world for seeds and plants for both himself and for botanical gardens. He has designed, among heaven knows what else, tablecloths, tiles, wall and floor murals, and mosaics.

The late Sima Eliovson first met Marx in 1973, visited him often, and wrote this excellent biography of the man and his accomplishments, because she believed his work has been the "greatest single influence on gardens since the development

NEW BOOKS FROM AHS

NORTH AMERICAN HORTICULTURE

The Second Edition of *North American Horticulture: A Reference Guide*, edited by Thomas M. Barrett, is now available from the AHS Book Program.

Compiled by AHS, the completely revised and expanded *North American Horticulture: A Reference Guide* is the most comprehensive directory of U.S. and Canadian horticultural organizations and programs. Major new sections in this edition include native plant societies and botanical clubs; state, provincial, and local horticultural organizations; horticultural therapy; and historical horticulture. Thousands of organizations and programs are arranged in twenty-eight categories, including: conservation organizations; international registration authorities; national governmental programs; horticulture education programs; botanical gardens, arboreta, conservatories, and other public gardens; plant societies; and community gardens.

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The volume is available to AHS members for just \$78.50 postpaid.

THE AMERICAN HORTICULTURAL SOCIETY FLOWER FINDER

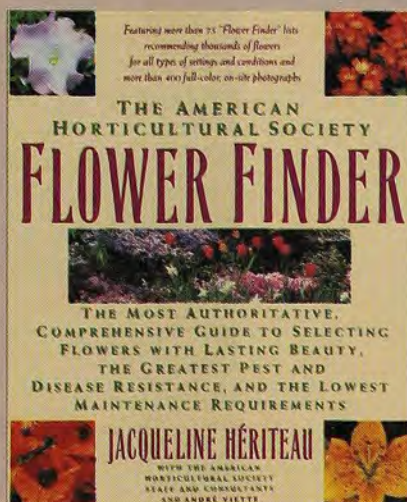
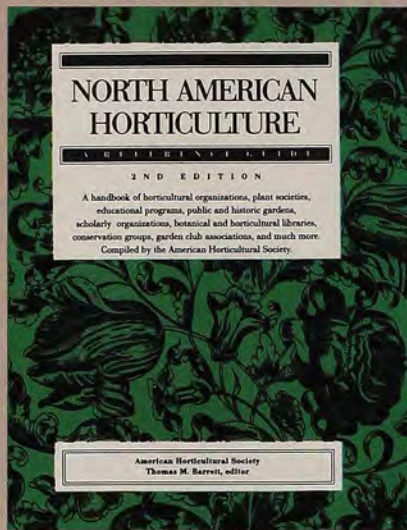
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of the English garden in the eighteenth century," which liberated garden design from the formal French and Italian Renaissance gardens. Marx has moved freely in all traditions, taking whatever he needed to expand into still another dimension—his own—in which he creates masterpieces on the ground. "I paint my gardens," he once said, and so he does, with a brilliant palette.

Marx achieves his effects in large part because of his impressive knowledge of how plants live together in their habitats. He then plants them accordingly in his designs. He is selective, preferring to use many plants of only one species, and he controls his design to complement and not overpower the architecture. It must be said that these are all high-maintenance gardens for individuals, businesses, or governments with full purses, but there is much for the amateur to study and try.

Look, for example, at how he can "paint" a scene with banks of just two or three colors of coleus and grass cut in a mosaic pattern; what he can do with falling water, walls, and levels; boulders and river rocks; assertive geometric shapes in a "natural" landscape; and sculptural plants like *Vriesea imperialis* used with vines and tropical vegetation.

Roberto Burle Marx trusts his work will show what "gardens ought to be—spaces in which people (can) . . . renew their faith and belief in finding a better way of living." They do.

—Faith Jackson

Faith Jackson is a former book editor of the Miami Herald.

The Golden Age of American Gardens

Mac Griswold and Eleanor Weller. Harry N. Abrams, Inc., New York, 1991. 408 pages. 9½" × 10". Color and black-and-white photographs. Publisher's price, hardcover: \$75. AHS member price: \$64.

The Golden Age of American Gardens is a big, beautiful, expensive book about big, beautiful, expensive gardens—all belonging to America's rich and very rich of fifty to 100 years ago. Superb as a coffee table ornament, it is a work of serious scholarship as well.

The book got its start in the 1970s with the rediscovery of a remarkable collection of "magic lantern" slides commissioned by the Garden Club of America (GCA) early in this century. Through GCA efforts, these 1,400 hand-colored, glass-plate images have become the nucleus of the Smithsonian Institution's new pictorial Archives of American Gardens.

Supplemented by over 200 other photographs (most in black and white), the heart

of this book comprises 100 of these dreamy, softly tinted images. More would have been even better. All 1,400 are listed, at least, in an appendix.

But this is not really a picture book. Most of its 408 pages are crowded with a text dense with facts. Eleanor Weller is chairman of the Archives of American Gardens; Mac Griswold is a New York writer with a special interest in garden history. Drawing on a wide array of primary sources, they spent five years working on this book, accumulating in the process fifteen file drawers of correspondence and documentation.

Intelligently winnowed, the results are still monumental. Over 500 gardens are profiled, set into social and cultural context, their owners and designers illumined by anecdotes, and the whole leavened by an almost chatty style and a good helping of wit. Though at times the wealth of detail overwhelms both the big picture and the gardens themselves, it would be ungrateful to criticize Griswold and Weller for giving us too much of a good thing.

With an encyclopedic range, evocative photographs, and a sense of humor, this book will satisfy and inspire many gardeners and preservationists. —Scott G. Kunst

Scott G. Kunst is a landscape historian in Ann Arbor, Michigan.

The Book of Primroses

Barbara Shaw. Timber Press, Inc., Portland, Oregon, 1991. 96 pages. 11" x 9 3/4". Color illustrations. Publisher's price, hardcover: \$35. AHS member price: \$30.

Here is a book about one of my favorite subjects charmingly written by a knowledgeable and talented author. One look inside and you will be captivated by sixty-four reproductions of excellent botanical watercolors.

This is not a book about the wide ranging genus *Primula*. Rather it is about named varieties of garden primroses that have been around for a long time. Starting with the foundation plants—wild primrose, cowslip, oxlip, a colored primrose from Eastern Europe, and *P. juliae*—the illustrations lead through sports and hybrids, doubles, jack-in-the-green and hose-in-hose, on into the miniature world of *P. juliae* hybrids.

The text explains the history and qualities of the plants in an easy conversational style. The chapter on growing primroses is loaded with special little tricks that can make you a highly successful grower. Primrose aficionados will enjoy the way the author delicately sidesteps the question of the origins of the Garryard varieties.

The author is the keeper of the National Collection of Primroses in the North of England (Yorkshire) and is just about the only primrose expert who is also a much honored botanical artist. And yes, there is a chapter on botanical painting.

Reviewers do look for mistakes, and since there is no such thing as a perfect book, turn to page 72. The captions for numbers one and three are switched.

The illustrations must be viewed in natural light in order to get the best rendition of color and in bright light in order to best see the fine detail. A first impression concerning the color has never quite left me: about a dozen of the reproductions seem to be stuck on the color mulberry.

Botanical illustrations need to preserve the delicate tones of the originals. I found myself wishing the color had been printed by the firm that is used by *American Horticulturist* instead of a firm in far-off Singapore. Then I saw the illustrations with the author's article in another magazine. The book is much, much better.

I put the author at the top of my list of people with whom I would most like to spend a spring day and maybe sip a little cowslip wine. On second thought, one day would not be nearly enough. —Cyrus Happy

Cyrus Happy is president of the American Primrose Society.

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Night & Daylilies

*After-five gardeners
can choose
varieties that open as the day
draws to a close.*

B Y P E T E R L O E W E R

When we moved to our first country house in the late 1960s, among the few plants left in a garden ignored for about fifty years were two big clumps of the lemon lily (*Hemerocallis lilioasphodelus*) and hundreds of the common orange daylily (*H. fulva* 'Europa').

For a number of years gardening took a back seat to restoring the house to a semblance of habitability, so we were glad to have the daylilies. They required no work at all, blooming without fail every summer.

As our garden grew, our collection of perennials went beyond those ordinary varieties found at local garden centers, largely as a result of my entering the wonderful world of mail-order nurseries and growing a number of plants from seed.

The first of our seedling daylilies was *H.*

citrina, ordered in 1984. Known in the 1930s as the citron daylily, it has arching leaves up to forty inches long that are rippled along the edges and attractive in their own right. They are dark green and in autumn turn to a golden yellow and finally to a bright yellow brown. But most importantly, the narrow flowers open in late afternoon and stay open all night, finally starting to decay about noon of the next day (earlier if the day is excessively warm). The three lemon yellow sepals have streaks of green on their backs. Each tip is stained with a blot of purplish brown, easily noted when the flowers are in bud. The petals are a clear and pale lemon yellow and the blossoms are sweetly fragrant at night. I have a friend who planted a whole row of them beneath his bedroom window so that on warm summer nights, the light perfume is wafted in upon the evening air.

And the plants bloom for a long time. A

healthy stem (or more properly, a scape) will often reach three to four feet and bear up to fifty buds with two or three opening each evening.

Yet while descriptions of this plant admit that it's attractive, most write it off for having an undesirable night-blooming habit and narrow flowers. One team of contemporary writers criticizes the foliage as well, for tending to die too early in the fall (undoubtedly a fault if your garden is devoted to only one species, but I find the fall color very attractive, especially with grasses and other perennials).

The citron daylily originally came from north central China's Shensi province. In 1890 a Catholic missionary, Guiseppe Giraldi, sent a plant to Antonio Biondi in Italy. Professor E. Baroni of the Museum of Botany at Florence saw Biondi's plant and in a description published in 1897, gave it its botanical name.

COURTESY OF DAYLILY DISCOUNTERS





The hybridizing began immediately, with everyone hoping that by mixing the genes of the citron daylily with other species and clones, they would eventually produce a flower that would be open for longer than twenty-four hours.

In 1903 two Naples nurserymen, Karl Ludwig Sprenger and his nephew Willy Müller, released 'Baroni', a plant similar to *H. citrina* but with fuller flowers. That same year, 'Mülleri' was released by a Charles Sprenger—who turned out to be the same Sprenger with an Anglicized first name—and, of course, his nephew Willy. He said it was the best of the hybrids between *H. thunbergii* and *H. citrina*. The flowers were described as being very large with a sweet scent. Unfortunately it opened about 4 o'clock in the afternoon and was gone before noon the next day.

'Fulcitrina' resulted from a cross between *H. fulva* 'Maculata' and *H. citrina*

in the early 1900s. It too was nocturnal with narrow-petaled flowers and was written off as "dull and worthless."

'Golconda' appeared in 1924, the result of a hybrid between a forgotten clone and *H. citrina*. The flowers were large and light cadmium in color, but because they were night-blooming, this hybrid was abandoned by the Farr Nursery Company.

'Thelma Perry' was listed in 1925 by Amos Perry as a hybrid between *H. thunbergii* and *H. citrina*. This plant was described as having "erect foliage, tall well-branched spikes . . . each with fifteen to twenty flowers, blooming from July to September." Alas, it too was nocturnal.

Another cross between *H. citrina* and *H. thunbergii*, 'Citronella', was released in 1926. Although it had excellent foliage and pale yellow flowers fuller than either parent, this night-bloomer was discontinued in the trade.

Long-blooming little 'Stella de Oro', which has been called America's most popular daylily, is a winner in the evening too.

In 1928 Bay Street Nurseries distributed 'Lemona', a night-blooming plant that reached five feet and produced numerous pale lemon yellow flowers almost five inches across. It was gone by 11 o'clock on warm, sunny mornings.

'Golden West', a hybrid between *H. citrina* and *H. aurantiaca*, was introduced by H. P. Sass in 1932. *H. aurantiaca* appeared in Kew Gardens in 1890 and was assumed to have arrived from Japan at an earlier date.

A survey of American Hemerocallis Society members failed to locate a source of any of these citron daylily hybrids, either from nurseries or a private collection. Obviously the idea of enjoying daylilies in the

THE ALL-AMERICA DAYLILY SELECTION COUNCIL

Craftspeople, says Angelo Cerchione, get juried before they can present their products in prestigious shows. "But everyone is allowed to register daylilies with judging taking place over a long period of time. Almost 40,000 have been registered, but no performance verification has ever been done. Some of the very large nurseries have internal systems to ferret out unworthy plants, but that's not common."

Cerchione, of Deep Gap, North Carolina, is executive director of a three-year-old group, the All-America Daylily Selection Council, which incorporated last year. Its members include growers from New England to California, Florida to Pennsylvania and Missouri. Cerchione started developing a performance evaluation system five or six years ago, just out of curiosity. He knew that all of the 13,000 cultivars on the market could not be equally excellent.

"If the only criteria you have is a pretty face, daylilies are terrific. But if you begin to try to find a balanced performer— attractive foliage, plants that will not bleach in the sun, plants without a terrible spent bloom habit, and plants that hold their flowers above the foliage—the attrition rate gets to be enormous. By using questionnaires and through talking to commercial people, we eventually developed a set of fifty criteria."

The group evaluates daylilies at three levels. At Tier One, Cerchione and his staff visit gardens and nurseries and rate every flower they see on general criteria such as overall beauty and foliage type. If a daylily gets a passing grade on this initial test, the information is added to a computer file and the plant is promoted to Tier Two and brought to Cerchione's gardens in North Carolina. There it is tested further to see if it is worthy of moving up to Tier Three. If it is, plants are shipped to sixteen test stations across the country. Then all year long, data comes back monthly and is added into a computer database. As a result of following this procedure for two years, the computer is jammed with information. "We have 108 codes, so we can include such information as whether it's a double that tends to go single," says Cerchione.

One member of the council is Darrel Apps, a hybridizer and owner of Woodside Garden in Chadds Ford, Pennsylvania. He believes that most new hybrids are of good quality but that too many older cultivars have been allowed to stay on the market.

"The older varieties had thin petals instead of fat petals. They didn't have good foliage, and their bloom times were very short," says Apps. The modern daylily, in comparison, "is a totally new plant."

There are some 600 breeders in the country, turning out as many as 1,000 new hybrids a year. "We should be thankful for all these breeders," says Apps. "Our palette is getting very rich." Yet given this rapid growth in the number of available cultivars, perhaps it's not surprising that some growers are skeptical about their quality. The English had landscape authorities like William Robinson to set standards for gardens and plants, says Apps, but in the United States, there are few experts to say sweepingly, "This is the way it should be." Hence the need for groups like the All-America Daylily Selection Council.

Cerchione agrees that most of the inferior daylilies are older ones. "Right now," says Cerchione, "if you buy daylilies, chances are the plants are from cultivars fifteen to twenty years old and they were probably not the best daylilies at that time.

But so many of the really good daylilies are in such short supply that unless a nursery takes plants to a tissue culture lab, there just won't be enough exceptional stock."

Cerchione says the council's goal is to evaluate all of the 13,000 available cultivars, both new and old. Of the older ones, he observes: "You don't throw away good genetic material and you don't throw away beauty. You wouldn't throw away a Picasso just because he's out of fashion. You want to save anything that can offer one good characteristic, like diamond dusting or creping. And you want some data for comparison, so if someone orders 'Aztec Gold', the grower can suggest a better gold."

Among its all-America selections, the council will try to include daylilies with different uses. Highway departments may want cultivars that withstand salt and spread to six feet in diameter, so they have to dig fewer planting holes. Landscape daylilies may bloom for 100 days but have rather ordinary flowers. Front door specimens have shapes or coloring that make them stunning on close inspection but may stop blooming after a month and a half.

Says Cerchione of the council: "We see ourselves as a service to the public and also to people who are interested in daylilies whether commercial or amateur gardeners. We don't sell daylilies. While most of the members are growers, their business activities take place outside the organization. What we're trying to do is to go through all of the daylilies now in circulation."

In Tier One they have been through about 6,000 of the 13,000 existing cultivars. There are between 500 and 600 in Tier Two and about 200 in Tier Three. "When we get to that top one percent that a commercial enterprise could invest in or an amateur could put in his or her garden because it's been known to do well in their weather zone, we'll be dealing with some pretty terrific daylilies."

For example, while the average daylily has good foliage for eight to ten weeks, the best will be attractive for eighteen weeks. The average daylily increases by two, but some of the better varieties will produce ten divisions. The average daylily produces twenty-one days of bloom, but the days of bloom vary considerably around the country—in California some plants produce for 300 days—so the council has developed a figure called the average daylily bloom intensity (ADBI).

The ADBI tells how many blooms per day a plant is providing over its entire period of bloom. The average is a bloom every other day per scape. Some cultivars will average 2.7 blossoms in the first year and in their second or third year, will go as high as eight or twelve. Next year, the council will have found sufficient cultivars lacking in poor features and well above average in performance to announce its first All-America Daylilies.

When the consumer's guide that the council is preparing is published, daylily selection will be a whole new ballgame. As the newer cultivars enter the market, they can be paired with performance data just like automobiles or electronic appliances, and gardeners can have a very clear choice as to which is a good daylily and which is a loser.

—Peter Loewer

For more information on the All-America Daylily Selection Council, write Route 1, Box 625, Deep Gap, NC 28618 or call (704) 264-7839.

evening has been unpopular over the past eight decades, suffered bad press, or perhaps was looked upon as being *déclassé*.

In the 1930s, A. N. Steward introduced a second nocturnal daylily, *H. altissima*, found in the Kiangsu and Anhwei provinces of China. My efforts to find seeds paid off six years ago when Major Howell's international seed exchange came to the rescue. Planted out in May, they produced flowering plants the following year.

Botanical descriptions of *H. altissima* call for leaves to four feet long and fragrant flowers that begin to open after 3 p.m., are fully open by 9 p.m., and call it quits around 8 o'clock the next morning. The scapes are supposed to be four to six feet tall, hence the species name.

But my scapes were over seven feet tall, and the orange brown flowers, while fragrant, opened in the very early morning, stayed open all day, and gave up the ghost at dusk.

Darrel Apps, who ran the Department of Education at Longwood Gardens for seventeen years and has more than forty cultivars to his credit, told me I no doubt had an impure strain of seed. "Even though yours came from a botanical garden, in the intervening years some hybridization occurred among the plants that produced your seed," he explained. "While fragrance is there, along with increased height, the nocturnal habit is gone."

Today *H. altissima* is being used to create a whole new breed of taller daylilies with night-blooming genes.

There are literally hundreds of nocturnal and extended-bloom daylilies available. However, most catalogs and nurseries neglect to pass the information along, believing that gardeners are uninterested in the garden after the cocktail hour rolls around. For example, in his 1989 book *Hemerocallis, the Daylily*, author R. W. Munson Jr. never even mentions the nocturnal aspects of daylilies except to describe *H. citrina* and *H. altissima*.

Enter R. Donald Spencer, who has developed a nocturnal and late-closing rating system for daylilies.

"Daylilies have widely different behavior," said Spencer, "especially with respect to the time of day their flowers open and how long it takes for their flowers to unfurl after the process has begun. Why, with some cultivars, the petals start to separate a full day before the flower actually opens, although with most cultivars the opening process takes only a few hours. Northern growers, such as a friend of mine

COURTESY OF THE ALL-AMERICA DAYLILY SELECTION COUNCIL



DARREL APPS



DARREL APPS



Top: 'Yearning Love'; Center: 'Gentle Shepherd'; Bottom: 'Lusty Lealand'.

in Montana, have to be very choosy about which cultivars they acquire because they get many cool nights in the summer, and after such a night, many diurnal daylilies never fully open. These are the daylilies that in warmer climates would normally start opening around sunrise and be fully open by noon. When nights are cool, only the nocturnal or partially nocturnal daylilies can be relied upon to open fully in the morning."

Spencer and a number of friends have formed a round robin and report daylily habits as observed in their gardens around the country.

Because plants don't use time pieces, but function on solar time, these observations must be made in solar time. In solar time, noon occurs not when the clock proclaims it but when the sun crosses the observer's meridian—that spot directly overhead where the sun appears to be the highest in the sky. What we call standard time is solar time at the center of each time zone. At the western border of any time zone, it will be thirty minutes later, and at the eastern border, thirty minutes earlier. And solar time is measured on the twenty-four-hour clock, so 2 p.m. is really 14:00 hours and 7 p.m. is 19:00 hours.

Spencer's classification system for nocturnal/diurnal daylilies has five categories:

Noc 0: The new flower is open at least 80 percent between 12:00 and 16:00 solar time and remains fresh all night.

Noc 1: The new flower is at least 80 percent open between 16:00 and 22:00 solar time.

Noc 2: The bud is less than 80 percent open at 22:00 solar time but at least 80 percent open by 06:00.

SOURCES

American Daylily and Perennials, P.O. Box 210, Grain Valley, MO 64029, (816) 224-2852. Catalog \$3 (deductible).

Caprice Farm Nursery, 1524 S.W. Pleasant Hill Road, Sherwood, OR 97140, (503) 625-7241. Catalog \$2 (deductible).

Daylily Discounters, Route 2, Box 24, Alachua, FL 32615, (800) 329-5459. Catalog \$3 (includes \$5 coupon).

Greenwood Daylily Gardens, 5595 East 7th Street #490, Long Beach, CA 90804, (310) 494-8944. Catalog \$5 (deductible, includes poster).

Meadowlake Gardens, Route 4, Box 709, Walterboro, SC 29488, (803) 844-2545. Catalog \$2 (deductible).

Oakes Daylilies, 8204 Monday Road, Corryton, TN 37721, (615) 687-3770. Catalog \$2 (deductible).

Woodside Garden, 824 Williams Lane, Chadds Ford, PA 19317. Catalog \$2.

NOCTURNAL DAYLILY CULTIVARS

The following descriptions of nocturnal daylily cultivars include the noc number according to Donald Spencer's system if possible; if not, the notation is "noc." Because many of these flowers are difficult to find, information such as bloom time is missing for some.

'After the Fall'. Noc; two-and-a-half-inch flowers of tangerine and copper blend with a yellow halo; plants are twenty inches high and bloom very early in the season.

'Agape Love'. Noc 2; seven-inch ivory flowers washed with pink; fifteen-inch high plants bloom midseason.

'American Bicentennial'. Noc; six-inch, fragrant flowers of dusty rose with green throats; plants bloom midseason on twenty-eight-inch scapes.

'Best of Friends'. Noc 2; six-and-a-half-inch, deep pink flowers with a green throat; plants bloom early to midseason on nineteen-inch scapes.

'Bitsy'. Noc 1 (except after a very cold night); two-inch, fragrant yellow flowers on twenty-inch scapes above six-inch grassy foliage; plants bloom continually.

'Butterpat'. Noc 1-2; two-and-a-half-inch, fragrant, creamy yellow blossoms on twenty-six-inch scapes; plants bloom midseason.

'Eenie Weenie'. Noc; one-and-a-half-inch, fragrant blooms of light yellow on twelve-inch scapes last well into the night.

'Erin Prairie'. Noc 2; golden yellow flowers with a grass green throat.

'Evening Bell'. Noc 2; seven-inch flowers of light yellow with a green throat on twenty-two-inch scapes; blooms early to midseason.

'Gentle Shepherd'. Noc 2; near-white flowers with a yellow-green throat.

'Green Ice'. Noc; seven-inch, fragrant flowers of pale yellow with a green throat on thirty-six-inch scapes; plants bloom mid- to late season.

'Guardian Angel'. Noc 1-2; four-inch, almost white flowers with a green throat on twenty-six-inch scapes; plants bloom early to midseason.

'Ida Miles'. Noc; fragrant, pale ivory yellow blossoms on thirty-inch scapes last until after midnight; plants bloom midseason.

'Lemon Mint'. Noc 2; lemon yellow flowers on numerous scapes.

'Lily Fields'. Noc 1 (but doesn't open fully after cold nights); light gold flowers with a green throat turn orange as the flower ages.

'Lime Painted Lady'. Noc; greenish yellow flowers lightly dusted with glitter.

'Lullaby Baby'. Noc 2 (3 when nighttime temperatures are in the 40s); light pink flowers with green throat.

'Lusty Lealand'. Noc. Six-inch, fire engine red flowers with a gold throat on twenty-eight-inch scapes; plants bloom midseason and rebloom.

'Margaret Guillory'. Noc; six-inch, fragrant flowers of two-tone rose with a green throat on twenty-one-inch scapes; plants bloom early in the season and repeat bloom.

'Master Blend'. Noc; huge seven-and-a-half-inch, fragrant flowers of rose pink with a green throat on twenty-five-inch scapes; plants bloom midseason.

'May May'. Noc 2 (even after 45-degree nights); creamy flowers with a chartreuse throat.

'My Belle'. Noc 2; flesh pink flowers with a green throat.

'Puddin'. Noc; two-and-a-half-inch, fragrant, lemon yellow flowers on twenty-inch scapes open until midnight; plants bloom midseason.

'Red Bantam'. Noc; two-inch flowers of bright red with a tangerine throat on eighteen-inch scapes; plants bloom early midseason.

'Silver Circus'. Noc; seven-inch, fragrant flowers of bright yellow suffused with pink, ruffled edges, and a green throat on thirty-inch scapes; plants bloom early to midseason.

'Stella de Oro'. Noc 1; three-inch fragrant golden yellow flowers on twelve-inch scapes stay open until at least 8 p.m. throughout the season; does not do well in the deep South.

'Treasured Bouquet'. Noc; five-and-a-half-inch lavender rose flowers with a green throat on twenty-eight-inch scapes stay open for twenty-four hours; plants bloom early to midseason with a late summer repeat.

'Witches Dance'. Noc; six-and-a-half-inch flowers are dark red with a green throat on thirty-inch scapes; plants bloom early to midseason.

'Yearning Love'. Noc; five-and-a-half-inch ivory flowers overlaid with pink, and pink veins and rippling edges of ivory. Plants with thirty-inch scapes bloom late into the evening beginning midseason and have some repeat bloom.

'Zarahelma'. Noc; five-inch, fragrant, pink lavender flowers have a magenta halo and veining and a green throat. Twenty-inch scapes flower late into the evening; plants bloom midseason.

Noc 3: The bud is more than 20 percent but less than 80 percent open at 06:00 solar time.

Noc 4: The bud is less than 20 percent open at 06:00 and the flower does not stay open all night.

The first three categories define nocturnal daylilies while the plants in the Noc 3 and 4 categories are diurnal, since their flowers don't open until after daybreak.

So far I have obtained a half dozen nocturnal cultivars, and my wife and I plan to create an entire bed of *H. citrina* and favorite shrubs along a garden path.

Just about dusk on many summer evenings, I walk into our formal garden where the majority of the night-blooming daylilies are planted. Here they flower against the dark green backdrop of a rhododendron hedge, with ferns and a star magnolia (*Magnolia stellata*) to the right and our viburnum tree (*Viburnum macrocephalum*) to the left. I have set flagstones underneath the magnolia and moth orchids and cymbidiums spend their summers there. All the night-flowering plants from the greenhouse hang on various branches of the viburnum.

The large, ivory yellow blossoms of *Hemerocallis* 'Ida Miles' are next to the pinks of 'Erin Hanley', both fronted by a large patch of 'Stella de Oro', its golden yellow trumpets gleaming in the fading light of day. And mixed with the scents of a host of tropical plants are the fragrances of the daylilies, drifting on a slight breeze coming up from the lake below—light and sweet on the evening air.

This article is excerpted from Peter Loewer's The Evening Garden, which will be published by McMillan this fall.

Daylilies of His Field

From Brother Charles Reckamp come ruffled pastels that some might call divine.

BY TOM CAHILL

In 1971 a little crippled plant growing in a nursery field in Techny, Illinois, caught the keen eye of Brother Charles Reckamp. He had been growing and hybridizing daylilies for almost thirty years, but this was the first he had seen with ruffled edges. "It seemed stunted, almost as though someone had stepped on it," Brother Charles recalls, "although

when we let it grow back the next year, it was fine." It would eventually be named 'Amen', and it was only the first of a heavenly series.

"I took its pollen and used it very generously throughout the garden," he says. "From then on, every generation of our daylilies has had more and better ruffling."

Today, these ruffled edges on pastel-colored blossoms are his trademark. Generations of painstaking selection have produced flowers that are full and

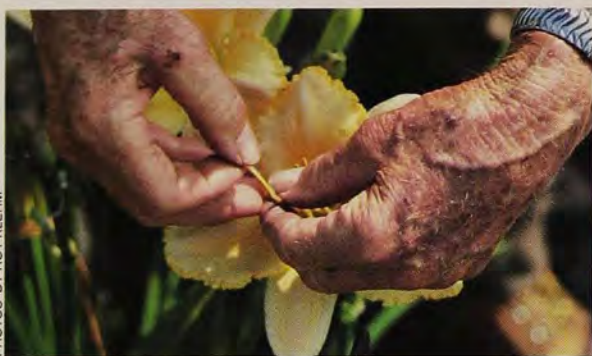
rounded. Their deep-textured broad petals are fanned by prominent, firm sepals.

In 1983 a local magazine, *Northshore Annual*, reported that Brother Charles had "close to 140 named daylily varieties registered with the American Hemerocallis Society, and is known the world over among connoisseurs of this particular flower." Nine years later, at age 86, Brother Charles says he has lost count of his named cultivars. But he maintains his quiet passion for hybridizing, seeking patiently to produce a more perfect,



COURTESY OF ROY KLEHM

Now 86, Brother Charles Reckamp keeps putting in long days at the work he loves.



Top: Applying pollen to a daylily stigma. Above: Says Brother Charles: "A lot of people have never seen some of the modern hybrids growing." Right: 'Heavenly Companion'. Opposite: 'Little Flock'.

even more delightful daylily.

His views on the characteristics of a good daylily are quite definite. He considers the daylily market flooded with plants of inferior quality. He is not impressed by many of those appearing in catalogs. He considers hybridizing a nice hobby but definitely not an immediate money-spinner.

Daylilies (*Hemerocallis* spp.) originated in China, Japan, and Siberia, and have since naturalized in many countries, including the United States. Their common name is derived from the blossoms' resemblance to that of the lily, and the fact that the flowers last just a day after they open. However, they are unrelated to real lilies; they grow not from bulbs but from sinewy roots.

The most common species, *H. fulva*, is a sturdy, plain flower with a stark orange color. But if the species is a bit earthy in the

opinion of many, Brother Charles's cultivars and their names are out of this world. Some of the names reflect the wonders of Earth—'Dawn Ballet', 'Sunshine', 'Little Rainbow'—but others are more heavenbound—'Hosanna', 'Commandment', 'Heavenly Treasure'. Most are in the cream-yellow-pink range and vary in their markings, size, or shape. 'Heavenly Grace' is ivory pink tinged with tangerine. 'Heavenly Treasure' has a yellow edge and green throat. Some, like 'Ascending Hymn', are fragrant. 'Exaltation' is particularly tall at three feet; 'Hosanna' has recurved orange sepals. Brother Charles particularly likes to see a tinge of lavender or pink on the petals and promises the release soon of several with rounded petals that are rose-colored at the tips.

For him, the creation of new daylily cultivars has been a unique way to pro-

claim the glory of his own Creator. In 1927 he joined the Society of the Divine Word, which conducts educational and missionary work in poor countries and low-income districts in the United States, to spread the seed of the Gospel as a missionary brother. Instead, for sixty-five years he has lived and worked in Techny, spreading the word through his flowers.

Born in Ethlyn, a town about fifty miles northwest of St. Louis, Missouri, he was one of twenty-two children. Rising at dawn to work on his family's 200-acre farm toughened him to hard physical labor at an early age. "There was no machinery then," he says saltily. "Horses and mules only."

It was fortunate that he liked farm work. His arrival in Techny coincided with the establishment of a nursery to benefit the seminary by Father Peter Oswald, a biology

professor who had studied botany with Benedictine monks in the Swiss Alps.

"When I came to Techny I had no background in horticulture," Brother Charles says. "Just had a country school, eighth-grade education."

But Father Peter noticed him, as Brother Charles would notice the unformed daylily some forty years later, among other classmates that he invited to his room for informal botany classes. That was the foundation for Brother Charles's work with plants.

"He taught us how plants grow, how the cells divide, how some grow from seed, and how some grow from division." With that very basic botany, he plunged into private study, relying primarily on nursery catalogs and encyclopedias. "If I saw a plant that I didn't know about listed in a catalog, I'd look it up in the encyclopedia and try to find out if it could be grown in this area, what its attraction was, whether it was the bloom or its shape, or something else."

He remembers two seminarians from those early days who seemed to know every plant from Lake Michigan to the Des Plaines River west of Chicago. He claims that they could identify every plant except the grasses—every tree, shrub, or flower that they came upon.

"They would take me on walks around the grounds and point out the different plants and some of their different characteristics. That helped me a great deal to appreciate the plants that had always been around me."

Brother Charles began breeding daylilies in the 1940s, although he could not spend much time at it for many years because of the pressure of having to make money at the society's nursery. He did not become a fulltime breeder until 1975, when the nursery was closed. "I was getting older, and it was too difficult for my superiors to find help for me," he says.

His first breeding efforts, interestingly, were not with *Hemerocallis* but with the German iris. Irises, along with gladioli and peonies, were among the flowers that the seminary nursery grew for cutting. Talented horticulturist friends taught him how to make iris crosses and to propagate them from seed.

However, irises must be pollinated when they bloom in spring. "The iris bloomed when we were the busiest in the nursery," Brother Charles recounts, "and we didn't have the time to make crosses. A customer would stand there in line and want to be



waited on. I couldn't afford to go out into the nursery and hybridize irises."

Daylilies, on the other hand, are one of the easiest plants to hybridize, not only because the reproductive parts are large and accessible, but because the anthers can be removed before the buds open and pollen from those that bloom early can be dried and stored to cross with late-season bloomers. For Brother Charles they offered an additional advantage, because they bloomed later in the summer when the nursery was no longer busy with customers. So Brother Charles refocused his attention on daylilies, again on the advice of friends.

One of these friends was Dr. Robert Griesbach, a professor of botany at DePaul University. Another was Orville Fay, a commercial grower in the Chicago suburb of

Northbrook who was the first in that region to produce a tetraploid daylily. These plants have twice the usual number of chromosomes, and a heavier substance that enables them to withstand the elements.

Fay sold Brother Charles one of these early tetraploid plants for \$200 to help him get started with stock. It was money well spent.

"Now all the daylilies we breed are tetraploid," says Brother Charles. "Double the number of chromosomes and you have so many more possibilities for stronger and heavier petals."

A number of his cultivars, including one of his latest introductions, 'Techny Perfume Delight', are a testament to the potential of *Hemerocallis* for fragrance. "Most daylily varieties have little if any fragrance," Brother Charles says. "Those with *Hemerocallis* Continued on page 42

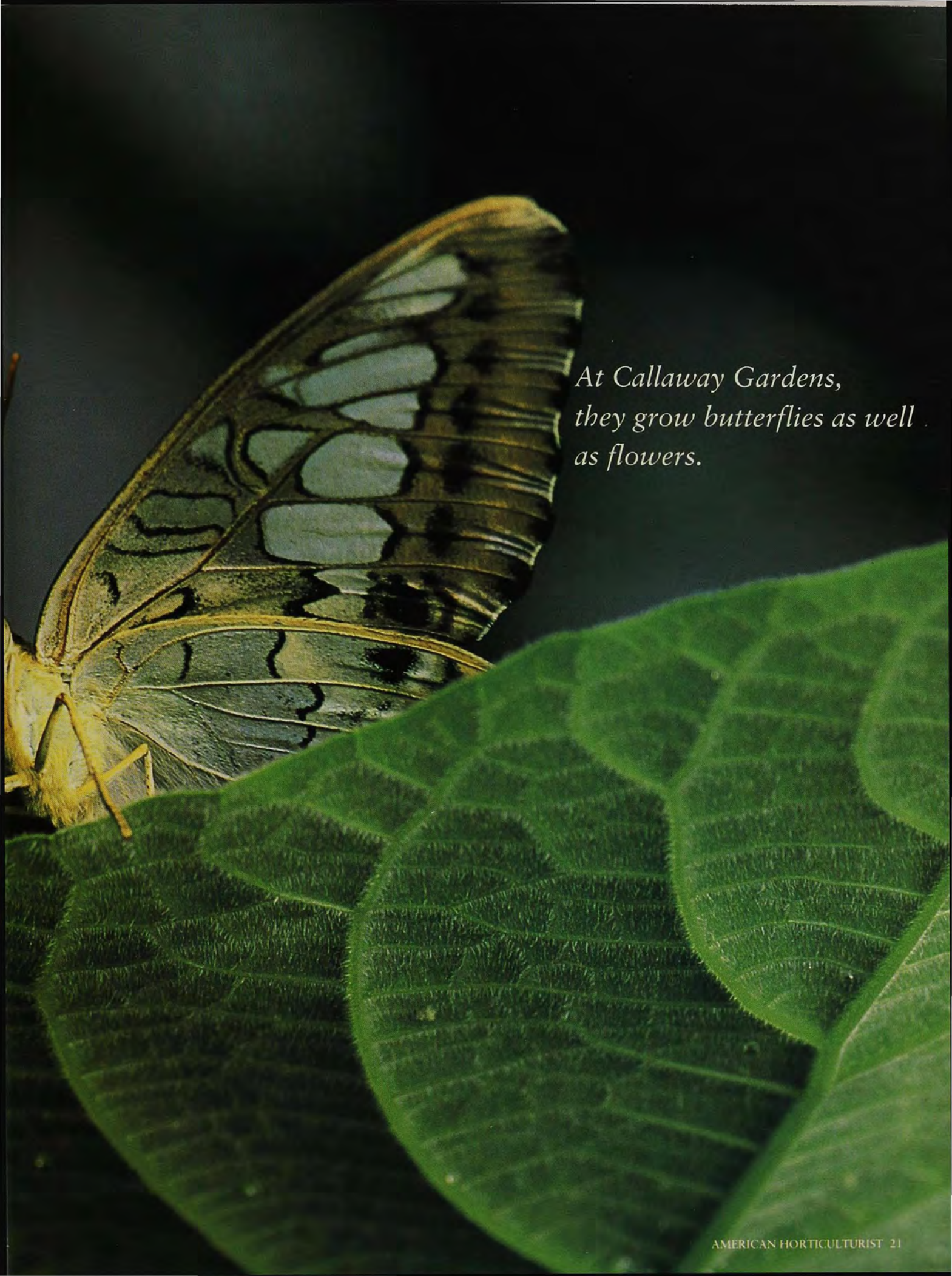
A House Full of Wings

BY MEG WILLIAMSON

Magical may be the best word to describe the butterfly conservatory at Callaway Gardens in Pine Mountain, Georgia. Visitors of all ages are enchanted by the experience of walking through a blizzard of bright wings, where at any moment an owl butterfly may perch on their shirtsleeves. If they are patient, they may see a Malaysian lacewing emerge

*The clipper (*Parthenos sylvia*), above, is native to southeast Asia. Photo by Rob and Melissa Simpson.*





*At Callaway Gardens,
they grow butterflies as well
as flowers.*



from a chrysalis. Encompassing 8,000 square feet, it is the largest free-flight, glass enclosed butterfly conservatory in North America.

During my first visit to the Cecil B. Day Butterfly Center, I too was captivated by those beautiful creatures that seemed to float effortlessly among the bright flowering plants. But then the sensibilities of a horticulturist began to gnaw at me. I wondered how they did it—not only where they got the butterflies and how they kept them happy and healthy, but how they kept plant pests at bay without harming the butterflies and how they kept the butterfly's less appealing life form, the caterpillar, from devouring all the plants.

Education is one of the center's primary missions, and center manager Frank Elia was happy to solve some of these mysteries.

Elia, a lepidopterist—an entomologist

who specializes in butterflies—explained that butterfly larvae feed only on certain host plants and that these are often different from the nectar plants that attract the adults. Female butterflies know instinctively which plants these are, and if they aren't present, they won't lay eggs. So to avoid having ragged plants spoiling the beauty of the conservatory, larval host plants were not included among the permanent plantings.

Instead, nonhost plants such as aroids, palms, and ferns provide a backdrop of greenery. Flowering plants from Central and South America, Malaysia, and Taiwan offer a source of nectar for the 1,000 or so individual butterflies that inhabit the conservatory on any given day.

These plants include the showy, large-leaved *Clerodendrum speciosissimum*, which is a dominant shrub in the plantings.

Its large, bright, scarlet flower panicles are a favorite of butterflies and visitors alike. Star-cluster (*Pentas lanceolata*), with its dense terminal flower clusters, is another shrub that is often visited by the butterflies. The white form is used here, but it also flowers in magenta, pink, and lilac. Spicy jatropha (*Jatropha integerrima*) is a small tree found in the plantings. Its blood red inflorescences also attract much attention. Throughout the conservatory are hanging baskets of *Lantana camara*, which has flat multicolored flower heads containing florets of yellow, orange, and in some cases, pink. Butterflies commonly seen visiting these flowers are the zebra longwing (*Heliconius charitonius*), the Malaysian lacewing (*Cethosia hypsea*), and *Danaus chrysippus*, a monarch relative.

Altogether, some fifty species of tropical butterflies flourish in this ideal environment, where the humidity is kept between 60 and 80 percent, and the temperature is maintained at or near 78 degrees. A brick walk descends into the octagonal conservatory, curves around through the lower levels and eventually ascends back up the other side. Near the entrance, a multitiered waterfall cascades from a large, rounded basin into several smaller ones. On the other side of the building, another waterfall drops twelve feet into a large, shallow pool where mandarin ducks paddle. These water features not only help create a serene atmosphere but also help to maintain the appropriate humidity and temperature. This miniature ecosystem is also home to hummingbirds, ground pheasants, and bleeding-heart doves.

There is also a one-and-a-half-acre outdoor butterfly garden where no humidity controls are needed. Here the challenge, since there are no walls, is keeping the butterflies around for visitors to enjoy. A brick path encircles the entire site, while another curves around the center buildings—an entry building and the conservatory itself. Viewed from the air, these paths form the wings of a butterfly. Interspersed along the paths are flower beds containing perennials such as butterfly bush (*Buddleia davidii*), butterfly weed (*Asclepias tuberosa*), *Coreopsis* spp., *Verbena* spp., and Joe-Pye weed (*Eupatorium purpureum*). Annuals such as lantana, star-cluster, zinnia, cosmos, and marigold are massed around the perennials, creating a visually stunning display, but more importantly, helping to attract some seventy species of butterflies native to the area.



Opposite: The postman butterfly (*Heliconius melpomene*) is native to Central and South America. Above: Malaysian lacewings dry after emerging from their chrysalises. Far left: The owl butterfly feeds on ripe bananas left on dishes in the conservatory. Left: Frank Elia and Mary McPherson watch the caterpillar of a mormon butterfly (*Papilio polytes*). Below: Hanging baskets of *Lantana camara* are found throughout the conservatory.

During the summer months, visitors are likely to see the Eastern tiger swallowtail (*Papilio glaucus*), the mascot of the Day Butterfly Center, visiting the flowers. Others commonly sighted include the cloudless sulphur (*Phoebia sennae*), the buckeye (*Junonia coenia*), and the painted lady (*Vanessa cardui*). The monarch (*Danaus plexippus*) is often seen in the fall. Its larvae feed on the various milkweeds (*Asclepias* spp.) planted there, while larvae of other species feed on the abundant native vegetation in naturalized areas throughout Callaway Gardens.

Because there are no larval plants indoors in the conservatory, and thus no eggs from which new generations can hatch, its residents must be continuously replenished from butterfly farms. While some butterflies live only three days, and others survive to become comparatively ancient at



BUTTERFLIES IN TEXAS

BY K. MARK COWICK

Although Callaway's Day Butterfly Center is the largest indoor butterfly garden in the country, there are many other indoor and outdoor butterfly gardens to visit.

One of these is the Zilker Butterfly Garden and Trail at the Texas Botanical Garden Society in Austin, Texas, which was created in the spring of 1990.

With its long growing season and warm weather, central Texas is a great place to see butterflies. The Xerces Society, a nonprofit group dedicated to educating the public about butterflies and other invertebrates, estimates that almost half the butterfly species in the United States visit Texas at some time during the year, and Austin is full of them from early spring until the middle of November. This includes migrants from Central America as well as resident butterflies.

As its name indicates, the Zilker garden and trail has two aspects. The garden is a large open space surrounding a gazebo and an esplanade full of flowering plants—a favorite haunt for visitors, with color and life that seem to bring out the artist in everyone. Painting and drawing classes are held here and it is rare to visit and not see someone sitting in the shade of a live oak with a sketch pad or easel.

The butterfly trail begins on the garden's northwest corner. It wanders through a canopy of oaks, mountain laurel, and beebrush (*Aloysia gratissima*), and is punctuated by open areas planted with flowers. These include the scrub plant (*Bouvardia ternifolia*), a drought-tolerant plant found in western Texas's Guadalupe Mountains that seems to be struggling in the state's recent heavy rains. Although wasps, which are valuable for controlling predators, thoroughly enjoy it, butterflies seem to like it less than some of the others here, such as purple coneflower (*Echinacea purpurea*) and *Lantana* species.

On the trail you are more likely to find a number of the shy insects, like the pearly eye butterfly or the clear winged sphinx moth, that normally inhabit woodland areas. This space mimics the natural habitat of many species, and while it is not as showy as the rest of the garden, it offers many surprises for the watchful visitor. If you are patient and watch closely, you will see a thread-waist wasp digging in the sand that lines the trail, its cobalt blue body flashing brilliantly against the sun as it works away. Or looking carefully, you will recognize an orange and black harlequin bug lying camouflaged in the blooms of a butterfly bush.

Native plants make up the majority of the garden's beds. Perennials like lantanas (*Lantana horrida*), salvias (including *Salvia azurea*, *S. coccinea*, *S. farinacea*, and *S. greggii*), and yarrow (*Achillea millefolium*) serve as nectar sources, while spicebush (*Lindera benzoin*), passionflower (*Passiflora incarnata*), and asters (*Aster ericoides*, *A. subulatus*, and *A. texanus*) provide food for larvae. The result is a low water-use garden alive with color.

The garden and trail were designed to provide hands-on education to visitors of all ages. While visiting groups range

from preschool classes to retirement home residents, there is a special emphasis on learning opportunities for children. "One of the main ideas we help kids understand is the interconnection between themselves and nature. Not only in the gardens, but in their own yards and in their whole town," explains Peggy Winkler. "We ask them, 'What was here before your house or your yard? It was wild. So what animals were living here?' Then we talk about the wildlife that still lives with us and explain how things like insects can be very important."

The Texas Botanical Garden Society's Docent Program provides free guides for elementary classes and the garden has hosted thousands of children from schools throughout central Texas. Winkler and co-teacher Susan Overbey know how to get the children involved and enjoying their visit. For example, to explain pollination, they choose some students to be flowers. The "flowers" stand up and put their hands in the air, announcing, "These are my stamens." Then the other children, equipped with hand puppets of butterflies or bees, buzz by the "flowers" and tickle them while everyone screams, "Get the nectar, get the nectar!" It's guaranteed to have children and their escorts squealing with laughter.

Winkler and Overbey have been helping schools throughout central Texas create their own butterfly areas. Fifth and sixth graders at St. Andrew's Episcopal School in Austin designed a migratory songbird and butterfly garden and working with students from lower grades, installed it on the school grounds. Students there plan to build butterfly gardens for St. Andrew's Retirement Center and for El Buen Samaritano, a community outreach program. Girl Scouts at Bryker Woods and Casis elementary schools and students at Parkside Community School have also planted butterfly areas. The Austin Area Garden Council plans to introduce butterfly gardening into the landscapes of city recreation centers and those of schools in low-income neighborhoods.

The garden society has an arrangement with the Travis County sheriff's department that allows it to maintain its grounds at little cost to the taxpayer. Since the Zilker garden opened, it has been groomed with the help of community service crews—usually first-time offenders who must provide community service hours to fulfill the terms of their probation. Under the guidance of garden society volunteers, they begin their work at 7 a.m. sharp every Saturday. Last season the crews helped expand the butterfly trail and make more areas wheelchair accessible.

The Zilker garden also serves as a showplace for environmentally sound techniques that work in urban and suburban landscapes. Using native plants, avoiding broad-spectrum pesticides, encouraging natural predators like wasps to control plant pests, and replacing some turf areas with ground covers are practices that have all been effective here. Consequently, many local landscapers and homeowners have started using these ideas in their gardens—a big plus for butterflies and humans as well.

K. Mark Cowick is a free-lance writer and gardener living in Austin, Texas.



Buckeye butterflies appear in Austin in autumn, on their way to their winter home in Mexico. Here one alights on white boneset (Eupatorium havense).

six months, the average lifespan is only two weeks. Elia and his staff could raise many of the species that fly in the center, but it is a very labor-intensive process, and they find it more economical to import them from the farms, many of which are in Asia. Elia feels that dealing with these foreign suppliers helps the economies in those countries and also promotes conservation of forest resources. Rather than cutting down forests to cultivate short-lived crop land, these farmers plant larval host plants in the forests and thus establish long-term business ventures. Although this entails shipping the insects out of their native lands, many others escape collection to reproduce and maintain the local populations.

The butterflies are shipped in the chrysalis stage since they are most likely to survive the trip at that time. Durable though the chrysalises might be, many look like fragile works of art. Some are an iridescent green. Others appear to be tinged with gold leaf, while yet others are smooth, egg-shaped, and pearly white.

When Elia's assistant, Mary McPherson, receives a shipment of chrysalises, she uses their silky attachment strings to hang them from a styrofoam sheet fitted over a terrarium. Moist paper toweling lines the bottom of the terrarium to increase the humidity. The chrysalises remain in this enclosure until metamorphosis occurs.

After the butterflies emerge and their wings have dried sufficiently, McPherson gently picks them up, puts them in a covered, insulated box, and takes them to the conservatory. She then puts them in inconspicuous places on screens along the glass walls where they warm their wings in the sunlight in preparation for flight.

Some species that aren't commercially available are raised in the insectary's greenhouses. Within each of the two greenhouses are two rearing cages measuring sixteen feet square and eight feet tall and containing both nectar and larval host plants in large pots. An automatic mist system maintains the humidity at an optimum level.

Twelve to thirteen females and five to seven males of the same species are released into each cage, where they mate and lay eggs. Like the imported species, they are released into the conservatory after undergoing metamorphosis. One species that is raised in this way is the owl butterfly (*Caligo* spp.). Its enormous furry brown larvae feed on banana plants in the

OTHER NORTH AMERICAN BUTTERFLY GARDENS

Bayou Bend Garden, 1 Westcott Street, Houston, TX 77219, (713) 529-8773.

Butterfly World, 3600 West Sample Road, Coconut Creek, FL 33073, (305) 977-4400.

Butterfly World, 4 Port Alberni Highway, Coombs, BC V0R 1M0 Canada, (604) 248-7026.

Butterfly World, Marine World Africa, U.S.A., Marine World Parkway, Vallejo, CA 94589, (707) 643-6722.

Calgary Zoo, Botanical Garden, and Prehistoric Park, P.O. Box 3036, Station "B", Calgary, AB T2M 4R8 Canada, (403) 232-9342. Location: Memorial Drive at 12 Street East, St. George's Island.

Insect World, Cincinnati Zoo and Botanical Garden, 3400 Vine Street,

Cincinnati, OH 45220, (513) 281-4701.

Kanapaha Botanical Garden, North Florida Botanical Society, 4625 S.W. 63rd Boulevard, Gainesville, FL 32608, (904) 372-4981.

National Zoological Park, Smithsonian Institution, 3001 Connecticut Avenue N.W., Washington, DC 20008, (202) 673-4670.

North Carolina State Museum of Natural Sciences, 102 North Salisbury Street, Raleigh, NC 27604, (919) 733-7450.

Papillion Park, 120 Tyngsboro Road, Westford, MA 01886, (508) 392-0955.

Ross Park Zoo, Southern Tier Zoological Society, 185 Park Avenue, Binghamton, NY 13903, (607) 724-5461.

insectary's greenhouse. This will be a life-long taste: the large brownish butterfly, whose wings bear conspicuous dark spots circled in white, is often seen in the conservatory feeding on ripe bananas left for it on shallow dishes. Another species that feeds on ripe fruit from these dishes is the dead leaf butterfly (*Kallima paralekta*), a master of disguise with wings that look just like a dead leaf when it comes to rest and folds them together.

When asked about the center's pest control strategy, Elia rubbed the fingers of one hand together and replied, "The 'pest control' wears blue shirts and they do a lot of this." He was wearing a blue shirt, as were other staff members. Ah yes, mechanical control! It can be quite effective. In addition to squashing pests between their fingers, the staff uses biological controls with a high degree of success. They periodically release a predatory beetle called the mealybug destroyer (*Cryptolaemus montrouzieri*), and predatory mites are introduced to prey upon pest mites.

Given the numerous lantanas and other whitefly favorites growing in the conservatory, it is surprising that whiteflies are not a serious problem. A wasp, *Encarsia formosa*, which parasitizes whitefly larvae, is used to control that pest in the insectary's greenhouse, and could be released in the conservatory if the population were to increase, Elia observed. Another pest-control measure has been to remove plants that prove excessively prone to insect pests and replace them with more tolerant species. As a last resort, short-residual controls such as

soaps and oils are applied in spot treatments. This integrated pest management system seems to work quite well; there is little evidence of insect pests or damage caused by them.

Although most visitors never learn all of these behind-the-scenes tricks, they are educated by informative signs found throughout the conservatory. For instance, a potted citrus provides an example of a larval host plant. A sign beside it explains that once swallowtail butterflies lay their eggs on it, it is taken back to the insectary where the caterpillars hatch, grow, and develop into butterflies.

The 7,000-square-foot entry building contains artwork depicting butterflies, host plants, and birds in various media. There is also a theater, where an engaging film explains the biology of butterflies. Near the exit from the conservatory there is a display case containing chrysalises, where visitors gather in the hope of seeing a butterfly emerge.

There are numerous other educational opportunities. Question-and-answer sessions are held at the center on weekends, and pamphlets on butterfly watching are also available. During the growing season, butterfly gardening demonstrations take place at Callaway's vegetable garden. In addition to the broad spectrum of horticultural classes, Callaway's education department offers in-depth courses on butterfly gardening, integrated pest management, and creating back yard wildlife habitats. The quarterly newsletter also features articles relating to nature, gardening, and conservation.

The butterfly center, which opened in 1988, was the brainchild of Deen Day Smith, widow of Cecil B. Day, the founder of Days Inns of America. The Days were nature lovers who often visited Callaway Gardens to relax and unwind. For several years after Cecil died at the age of 44, Deen Day continued to operate the Days Inns and became a powerful businesswoman and a major corporate philanthropist. In 1986, after visiting butterfly houses in Britain, she became determined to establish a major butterfly center in the United States.

Callaway Gardens, a 14,000-acre nature preserve, horticultural showplace, educational facility, and recreational resort, seemed to be the perfect location for such a center, so she presented the idea to G. Harold Northrop, Callaway's president and chief executive officer. Skeptical at first, he was also inspired after touring those same butterfly houses overseas, where he was particularly impressed by the rapt attention of child visitors. Several members of the Callaway board were encouraged to make the same trip and returned as converts. Deen Day Smith donated the lead gift to establish the Cecil B. Day Butterfly Center in memory of her late husband.

William Barrick, vice president and director of the gardens, was named project director. To plan the buildings and develop the four-and-a-half-acre site he chose Henri Hova, who designed the Jimmy Carter Presidential Center in Atlanta, and Robert Marvin, a national award-winning landscape architect headquartered in Walterboro, South Carolina. Elia, who had been working at the Cincinnati Zoo, was hired in the early stages to advise the design team so that the conservatory would provide butterflies with the optimal environmental conditions.

A portion of the Callaway Gardens mission statement says that the organization seeks to "promote a better understanding of all the living world." It seems to be fulfilled through the educational efforts of the Day Butterfly Center and the exhilarating experience of visiting the conservatory and its grounds. It is a miniature living world where the interrelationships between flora and fauna are demonstrated in a beautiful and magical way.

Meg Williamson is a free-lance writer and staff horticulturist for the Botanical Garden of Georgia.

The Empress Tree

Paulownia tomentosa has been both vilified and venerated.



AL BUSSEWITZ/PHOTONATS

The empress tree's large lavender blossoms are downgraded by some because they appear in spring before leaves emerge to provide a background.

BY SUSAN SAND

The Chinese native empress tree (*Paulownia tomentosa*) has an ancient history full of twists and turns and ironies. Considered a weed by many, it has also been a target of thieves and a lucrative United States export to Japan. While lacking the delicate refinement of other Chinese ornamentals such as the dove tree, the empress tree is nevertheless valued by many for its spring blossoms and high-quality, lightweight wood.

The genus *Paulownia* was mentioned in Chinese literature as early as the third century B.C., when it became known by its traditional name of "tung." "Yung-tung-mu," meaning "glorious paulownia wood," appeared in a list of useful woody plants in an encyclopedia of cultural and natural topics. Centuries later, more complete information on the tree's culture was published in a 1049 treatise by Ch'en Chu. At that time, paulownia wood was used in Buddhist monasteries to make dishes and utensils and for coffins, ridgepoles, beams, and pillars of houses. It was later recommended for medicinal use, and even today all parts of the tree are important in the folk medicine of rural China for conditions that range from graying hair to bruises, fever and delirium, and liver ailments.

P. tomentosa is the species most commonly cultivated in China and Japan. While the empress tree is native to western and central China, Japan imported both the tree (which they call "kiri") and its associated customs long ago. One such custom was the father's planting of an empress tree upon the birth of a daughter and harvesting it to make a bridal chest

when she reached marriageable age. The wood was fire-resistant and chests made of paulownia protected the kimonos stored in them, even when the owners' straw houses were destroyed by fire. The chests became increasingly elaborate and important to the marriage ritual and are still a major impetus for Japanese purchase of paulownia timber.

Japan was the source of the paulownia that arrived in Europe about 1830, collected and shipped by Philip Franz von Siebold, a German doctor who worked for the Dutch East India Company. Siebold and another German physician, J. G. Zuccarini, gave the tree its generic name, writing in an 1835 monograph that they had named it for Princess Anna Pavlovna, wife of Prince Willem of the Netherlands, daughter of Russian Tsar Paul I, and granddaughter of Catherine the Great. Most of paulownia's common names derive from this association.

After its introduction, use of the empress tree spread in Europe, and sometime around 1845 it was introduced to the United States, possibly by seed used to produce nursery plants. Most widely planted in the South, it quickly became naturalized, establishing itself from southern New York to Florida to Texas. Fast growing and adapted to many soils, this prolific seed producer proved to be virtually pest and disease free. Thus by 1919 it was described in *American Forests* as a "fugitive tree" that had successfully "sown much more of its own seed than man." It sprouted in barnyards and pastures, along roadsides, and in vacant urban lots. Indeed, paulownia has been found to produce up to 2,000 seeds per capsule, with one tree capable of producing twenty million seeds.

This "weed," however, was destined for royal status in the United States. By 1973, a witches-broom blight in Japan had diminished the supply of superior paulownia wood. The Japanese needed sources in addition to their own plantings and imports from China. That spring, a logging exporter named Milton Carr was driving a Japanese customer through West Virginia when the man suddenly asked Carr to stop. The guest jumped out of the car and ran back to examine a tree with pale violet flowers. Japanese buyers had been unaware that paulownia grew in the United States; suddenly there was a market for these wild trees. During the spring blooming period, small scattered stands—sometimes just one or two trees—were located by helicopter and landowners were

approached for negotiations. Unaware of the empress tree's worth, they were happy to be paid for trees they considered a nuisance; some Washington, D.C.-area owners were even giving them away.

The paulownia export business was highly profitable for the first few years: in 1978, six suppliers grossed more than \$8 million. However, the empress tree's fortunes took another turn in the spring of 1979 when an enormous stand was found in western Tennessee near the Mississippi River. A massive rush followed, and when exports doubled in volume, oversupply caused the market to collapse. After a few years, Japanese buyers did return, but only for the finest quality timber.

In the meantime, all the publicity about the value of paulownia had led to a rash of tree stealing. In the Baltimore area, trees were cut from school grounds, parks, and private property, then whisked to the docks where they were quickly sold and loaded on ships. Thieves were once caught in Rock Creek Park in Washington, D.C., when a ranger who lived nearby heard a chain saw operating late at night.

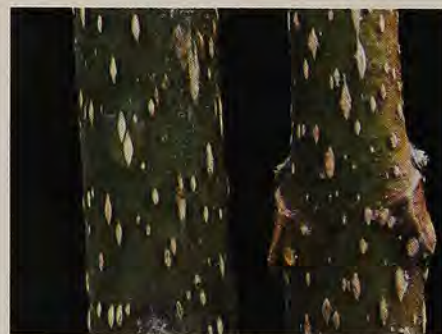
Empress trees' sudden increase in value prompted not only thievery, but also a keen interest in commercial cultivation. Very little was known about their culture, however, even though they had been introduced some 130 years earlier. As a result, several research programs were initiated to determine the most productive methods of growing paulownia commercially.

Dr. John F. Kundt, a retired extension forestry specialist for the University of Maryland who has researched the production of plantation-grown trees, says that paulownia is the most valuable single tree we have in the United States. John Michel, consultant forester from Elkton, Maryland, reports that wild trees currently sell for \$1 to \$5 per board foot, with a high quality tree bringing up to \$1,500. The Japanese look for narrow, evenly spaced growth rings—preferably five per inch—and wheat- or beige-colored wood rather than white. One half of 1 percent of empress tree wood exported by the United States fits this category, and it is used in Japan for making harps (kotos). Furniture, jewelry boxes, and sandals are also manufactured from paulownia. Since the wood weighs only fourteen to nineteen pounds per cubic foot, poorer grades make excellent crating material for air freight.

When viewed as an ornamental rather than a timber tree, paulownia engenders



PHOTOS BY AL BUSSEWITZ/PHOTOINATS



Top: Flower buds, which form the summer before blooming, provide winter interest but are often killed by northern winters. Above: The Japanese have valued fire-resistant paulownia wood for making bridal chests.

enthusiastic admiration from some and lukewarm support from others. Donald Wyman, in his *Trees for American Gardens*, has termed it "striking," praising its appearance in flower and noting the advantage of its heavy shade. While Wyman and Michael Dirr, author of *Manual of Woody Landscape Plants*, both consider it coarse in texture, some gardeners admire the tropical appearance of its foliage. Its production of large lavender blossoms on a virtually leafless tree in early spring has been considered both a spectacular sight and a failure, since there is no foliar back-drop for the flowers.

Most of paulownia's features are actually more curious than they are beautiful, but the tree's flowers are indeed lovely. Two-inch-long vanilla-scented blossoms develop on eight- to twelve-inch upright terminal panicles. The tubular, pale violet flowers, dividing into five unequal, rounded lobes, are similar to foxglove in form, not surprisingly, since both are in the figwort



The one-to-two-inch long seed capsules clatter in the winter, giving paulownia the common name of rattlebox.

family, Scrophulariaceae. The heart-shaped opposite leaves, occasionally three or five lobed, are usually five to ten inches wide and long. However, when the trees are young, they grow as much as ten feet in one season and can produce leaves thirty inches wide. As they mature, the trees develop a dense rounded crown, and occasionally reach a height of sixty feet, although thirty to forty feet is more typical.

In autumn, woody capsules form, but the paulownia leaves remain green. On the morning after the first killing freeze, they begin to shed, often denuding the tree within a day. Only the capsules and brown pubescent buds for next spring's flowers remain. Because the buds are vulnerable to temperatures below zero, they often do not survive for spring bloom in northern areas. USDA Hardiness Zones 7 to 10 are the most favorable for the empress tree.

The one- to two-inch long, egg-shaped, pointed seed capsules, although considered unattractive by some, add another interest-

ing winter feature: when the wind blows, they rattle, giving paulownia the common name of rattlebox. These tough, persistent capsules, coupled with terminal branch dieback of up to four feet in northern areas, give empress tree a reputation for messiness, since fruit, twigs, and leaves create litter on the ground.

Adding paulownia to carefully manicured yards does require some seasonal cleanup work. However, while enthusiasm for the bold, ten-inch leaves may vary, the flowers are truly beautiful and unusual; a background of conifers creates a pleasing contrast with their pale violet blossoms. Once the leaves develop, they cast a dense shade, creating a welcome retreat from summer heat. Owners of new homes on treeless lots may also appreciate empress tree's rapid growth, and children are fascinated by the "Jack and the Beanstalk" appearance and growth rate of the young trees.

Although it will grow in poor soils and is even being used for surface mine reclama-

tion, paulownia prefers a moist and deep well-drained soil in a location providing full sun or partial shade and protection from wind. Balled and burlapped trees should be transplanted in early spring.

There are several interesting cultivars of paulownia. 'Coreana' is a 1925 Korean selection from the wild with heart-shaped to egg-shaped leaves, which are yellowish and covered with dense, short, matted hairs underneath. Its violet flowers have yellow-speckled throats, while those of the species are typically yellow striped. 'Lilacina' is a 1908 Paul Guillaume Farges introduction from western China bearing pale lilac flowers. Michael Marcotrigiano's 'Somaclonal Snowstorm' has irregularly variegated leaves of creamy white, yellow-green, and green. It originally developed from callus tissue of a hypocotyl (the part of the axis of a seedling plant that is below the cotyledons) explant in tissue culture. Dirr has noted that the leaves of the 'Somaclonal Snowstorm' specimen in the Georgia Botanical Garden reverted to green and that careful pruning is required to maintain the variegation.

Interest in the empress tree has not flagged for more than two millennia. Because of its rapid growth rate and ability to sprout and survive on barren, disturbed soil, paulownia also has potential for global reforestation, a mission pursued by Dr. Peter R. Beckjord, a former University of Maryland professor. So this remarkably versatile tree, long appreciated by the Japanese and Chinese and increasingly important in the United States, may someday be well known to even more people around the globe.

Susan Sand is a horticulture and biology instructor at Damascus High School in Damascus, Maryland. This is the fourth in a series of tree histories by Sand.

SOURCES & RESOURCES

The National Paulownia Center publishes the *Kiri Newsletter* and a paulownia information packet and sells seeds. For information send a self-addressed stamped envelope to Dr. Peter R. Beckjord, 4303 Kenny Street, Beltsville, MD 20705.

Carroll Gardens, P.O. Box 310, Westminster, MD 21158. Catalog \$2.

Forestfarm, 990 Tetherhasl, Williams, OR 97544. Catalog \$2.

Greer Gardens, 1280 Goodpasture Island Road, Eugene, OR 97401. Catalog \$3.





Oz-some



POPPIES

Iceland and Shirley and Welsh, oh my!

B Y M O L L Y D E A N

MY ADMIRATION OF THE POPPY BEGAN years ago in England when I saw fields of corn poppies blanketing the countryside in early summer. I was captivated by their brilliant red and the seeming paradox of such a bold color in such a fragile flower. As I learned more about the poppy family, I became amazed at its diversity.

All of us have heard of the opium poppy, but how many are familiar with the majestic Himalayan poppy, which has flowers of an intense, glistening blue? Many of us have planted Shirley poppies (the descendants of the corn poppy), but how many gardeners have sown the seeds of the cultivar 'Mother of Pearl', also known as 'Fairy Wings', which is equally easy to grow? These fragile flowers are aptly named: their petals are softly iridescent

LEFT PHOTO BY PETER H. MARGOSIAN; PHOTOGRAPHS ABOVE FROM THE ARCHIVES OF GENE ANDREWSKI

It was doubtless the opium poppy that put Dorothy to sleep. Its relatives, like the leafless-stemmed Iceland poppy, will wake up any garden.



MICHAELS THOMPSON

shades of the palest grays, peaches, lilacs, roses, and blues.

Papaver, the genus name of most plants popularly known as poppies, means milk and alludes to their milky sap. The sap found in the large seed head of the peony-flowered or opium poppy is the source of opium.

The poppy has been cultivated since ancient times and has served not only as a religious symbol, associated with fertility and prosperity, but also as a food source. Both an oil extracted from opium poppy seeds and the remaining oleaginous cake were consumed by people in the Ganges Valley of India and other opium areas. Today the oil is used for food processing, and the poppy oil cake for cattle feed. The seeds are used as flavoring on breads or in cakes.

The mythic origin of the poppy associates it with sleep. It is said that the poppy was made by Somnus, the god of sleep, so that Ceres, goddess of agriculture, could find the rest that had long eluded her and thus would restore long-neglected crops. This association is made, of course, because of the narcotic qualities of the opium poppy. It finds its way to the twentieth century in popular stories such as "The Wizard of Oz," in which the Wicked Witch of the West creates the magical field of poppies to bring about Dorothy's enchanted sleep.

The poppy is used as a symbol for love in the first "revolutionary" ballet performed in the Soviet Union. This work, composed by Reingold Gliere, was originally called "The Red Poppy," but was later renamed "The Red Flower." It tells the story of the love between a Chinese dancer and a Soviet sea captain. When he is fired upon by her manager during an uprising of the Chinese people, the dancer shields him with her body and dies, clasping a red poppy in her hands.

In this ballet the red poppy is also associated with death in battle. Poppies are often a metaphor for slain soldiers. A poem, "In Flanders Fields," written in 1918 by Col. John McCrae, linked the red poppy and the blood of fallen heroes and inspired the American Legion Auxiliary tradition of distributing paper poppies prior to Memorial Day and Veterans Day.

All poppies, from the everyday to the exotic, are loved for the graceful simplicity of their blossoms and the silky, crepe-paper texture of their petals. This holds true even in the boldest and most dramatic poppy of all, the oriental (*P. orientale*). Its blooming

period is brief, but its flowers are often enormous, up to ten inches across and flamboyantly ruffled. Yet even these giants possess an elusive air of delicacy.

The oriental poppy, native mainly to valleys along the Iran-Afghanistan border, was discovered in 1702. It then found its way to France and the court of Louis XIV and by the early half of the seventeenth century had gained popularity in many European gardens.

Today it is often seen in traditional cottage gardens along with other perennials such as columbine, iris, peony, and phlox. Its natural flaming red-orange is not subtle; however, various other colors have been bred, such as pinks, crimsons, raspberries, salmons, and white. 'Springtime' is huge and snowy white with a ruffled pink border. 'Helen Elizabeth' is a pure but pale salmon pink.

Another striking characteristic of the oriental poppy is its dark, velvety center, sometimes surrounded by splotches of black. Although the petals appear fragile as paper, the gray green foliage is coarse and thistly. It dies away completely in July or August, after the flowers have bloomed. Therefore this poppy should be grown in conjunction with late blooming flowers such as baby's-breath that will fill in for it the rest of the summer.

Exotic as the oriental poppy might appear, its care is not difficult. Its most important requirements are plenty of sun and a well-drained soil of average fertility. Space the plants about a foot apart and give careful consideration to where you want them, as they are difficult to transplant once established. Provide good drainage; wet crowns during cold weather can be fatal. Winter mulch protects the plant from constant thawing and refreezing. In warm regions mulching in summer helps the plant retain moisture and stay cool. Oriental poppies prefer cool summers and are hardy in Zones 3 to 7.

Early last spring I massed Iceland poppies (*P. nudicaule*) instead of my usual pansies along a sunny bed bordered by large rocks. This poppy is less individually

Left: California poppies are a favorite in meadow gardens. Famous for their golden orange color, they can now be found in white, cream, pink, deep orange, and mauve. Right: Residents of the Pacific Northwest can try the stunning blue Himalayan poppy, which can grow five feet tall.



showy than the oriental, but possesses a pleasing grace of its own. One of its best qualities is the abundance of flowers it produces continuously during its blooming season, which in my northeast Georgia garden is April. In cooler regions it will bloom in early summer at about the same time as bearded irises.

The Iceland poppy is native to Arctic regions, in North America south to Colorado, and in Eurasia. Another poppy paradox is the image of this airy golden flower blooming on such rough, frigid terrains. It was first seen by explorers and came into cultivation in 1730.

The Iceland poppy is a fairly neat and uniform plant, its soft-looking foliage forming low clumps in the garden. Its specific epithet, *nudicaule*, refers to its characteristic leafless stem. This feature differentiates it (and the alpine poppy) from other members of the poppy genus. It is often labeled as a perennial at garden centers, but while it will survive as a short-lived perennial in northern climes, this cold-lover usually must be treated as an annual.

Most Iceland poppies are cream, rose, orange, or yellow, all with a warm, sun-kissed look. 'Garden Gnome' and the popular 'Wonderland' have flowers in all these colors and are low and compact, usually not taller than twelve inches. They can be used to good advantage at windy sites, since they don't need staking, or in rock gardens. 'Hybrid Matador', however, has vivid crimson flowers and often reaches a height of up to eighteen inches.

Another poppy of the north is the diminutive alpine poppy (*P. burseri*, sometimes sold as *P. alpinum*), which reaches only four to ten inches in height. This native of the Swiss Alps has grayish foliage that is low and mounded and delicate one-inch flowers of yellow, pink, or white. Often found in rock gardens or flecking gravel paths, it prefers poor soil with good drainage and will grow quickly from seed sown directly where it is to grow; the plant does not appreciate root disturbance. Sow the seeds in summer for bloom the following spring. This flower is hardy in Zones 4 to 7 and usually behaves as a short-lived perennial.

The opium or peony-flowered poppy (*P. somniferum*) is probably the best known of all poppies. It possesses a certain mystique, not only because of its illegal status in this country, but also because of its beauty. Its blossoms are big, up to five

inches across, and ruffled and frilled. It is found in shades of translucent pinks, whites, purples, and crimsons and has a large, elegant seed head, shaped like an urn. The flowers of this annual are offset by distinctive silver blue foliage.

It is difficult to accept the idea of such a beautiful flower on a crop plant; yet, it is grown as a crop, in many cases illegally. Workers routinely hack off hundreds of poppy heads in vast fields in the Middle East and southeast Asia to get to the young seed pods, which contain the sap used to make opium. It is equally difficult to reconcile the beauty of *P. somniferum* with its use as a source of the ill-famed narcotic, heroin, which is made from opium. It is also grown legally on farms in India to be used in medicines such as codeine and morphine. The abundant seeds, which have no narcotic properties, are those same seeds sprinkled on cakes and breads.

Mankind discovered the opium poppy at least six thousand years ago. We know that opium use began in the Middle East. Depictions of the opium poppy ornamented the walls of Egyptian temples, and opium was prescribed as a drug by Greek doctors before the time of Christ. In much more recent times, Thomas Jefferson grew white opium poppies for their striking visual impact in his garden at Monticello.

Other annual poppies, almost all of which are easy to grow from seed, are ideal for gardens with a naturalized look. Fragile in appearance, they are actually tough customers once established.

A poppy lover like myself thrills at the lists of available annual poppy seeds, most of which are descended from the corn or field poppy (*P. rhoeas*) seen all over Europe and Asia. Three of the best selections are 'Danebrog', 'Mother of Pearl', and the Shirley poppy. 'Danebrog', which is named for the flag of Denmark, is boldly red with a distinctive white cross. 'Mother of Pearl' has a unique, iridescent sheen to its petals and comes in soft, pastel shades.

The Shirley poppy, regarded by some authorities as a cultivar while classified by others as a strain, has become one of our best-loved garden flowers. In England toward the end of the last century the Reverend W. Wilks of the Shirley vicarage found a wild poppy, a comely freak of nature sporting a delicate white outline about the edges of its petals. Beginning with this flower, Wilks eventually developed a poppy with a color range from red to white, including pinks and peaches.

Many of these have "margined or suffused petals," as he described them. He changed the original black flower centers to yellow and then white. Most seed catalogs and sources in this country list Shirley poppies, all descendants of Reverend Wilks's first poppies, in forms such as 'Shirley Re-selected Double Mixed' or 'All Double Shirley'. In England, seed mixes closer to the original are available. Some examples are 'Reverend Wilks' Strain', which is described as the reselected form of the original, and 'Shirley Double Queen', the double form of the first.

The Shirley poppy and its relatives cast their seeds about the garden, assuring offspring for the next growing season. Even though they don't come up true to form, they produce very pretty and interesting blends of red, pink, white, and peach. Gardeners who have never sown these seeds are often daunted by their tiny size; however, if the seeds are mixed with twice their amount of fine sand, they will be easier to sow. The seeds can be planted in fall or early spring at the site where they are to grow. Unlike many other poppies, they may also be transplanted while small into individual containers. Successive plantings can provide flowers for a long period during the blooming season, usually May through July here in Georgia.

All of these members of the *Papaver* genus share the common characteristics of milky sap, showy flowers borne singly on erect stems, and capsules containing many small seeds. They are also generally native to the Old World, including Britain, Central and southern Europe, and temperate Asia.

The *Papaver* genus is encompassed by the large poppy family known as Papaveraceae. Some say the name is suggestive of the sound made when chewing poppy seeds. This family includes twenty-eight genera, with 450 species, mostly herbs, native to North temperate and tropical regions. Among its diverse members are the bleeding-heart, Dutchman's breeches, and bloodroot as well as non-*Papaver* plants commonly called "poppies": the beautiful white prickly poppy (*Argemone grandiflora*), native

Continued on page 43

Oriental poppies are loved for the silky, crepe-paper texture of their flowers, which can grow up to ten inches across. Often used in cottage gardens, they die away completely in late summer.



THE DESERT FARMERS OF THE SOUTHWEST

B Y B E T T Y F U S S E L L

*For centuries,
they have used song
to make the sand
sprout corn.*



about the same time that Christ was born in a desert across the sea, members of the Hohokam tribe were beginning to make their stretch of the Sonoran Desert bloom with corn, as they had done for three centuries already with squashes, limas, tepary beans, and tobacco. Although earlier desert cultures like the Mogollon had cultivated corn in the mountainous borderlands of southern Arizona and New Mexico, corn as a civilizer of the Southwest desert began with the Hohokam, whom their Pima descendants called the “Huhugam O’odham,” meaning “the vanished ones.” In the next thousand years, the Hohokam would develop the most diverse plantings of any tribe living in what is now the United States as well as one of the largest canal systems in North America.

The Hohokam were farmers despite sandstorms, flash floods, and temperatures that jumped, then as now, from 7 to 119 degrees.

Right: A farmer of the Ácoma Pueblo gathers corn stalks in 1945.

Excerpted with permission from The Story of Corn by Betty Fussell, to be published next month by Alfred A. Knopf, Inc.



Rainfall averaged less than ten inches a year. Fortunately, there was the floodplain of the Gila River, formed by the Salt and Verde rivers flowing toward the Colorado. With stone hoes these farmers began to dig pit houses and wide, shallow canals. If you visit Arizona's Park of the Four Waters today, you can see the remains of eighteen prehistoric irrigation canals running parallel to the modern canal that now waters downtown Phoenix. The city is built over the ruins of 1,750 miles of Hohokam canals. Along the Gila south of Phoenix, you can see the extensive ruins of Snaketown, where the Hohokam flourished until 1450, covering 240 acres with their dwellings and irrigated fields.

As Mesoamerican cultures bred new strains of corn resistant to drought and found new ways to irrigate it, a Reventador popcorn, a Chapalote flint, and the eight-rowed, sixty-day flour corn we call Maiz de Ocho reached Mexico's northern frontier. Along with adaptive corn breeds came Mesoamerica's planting sticks and, no less importantly, their planting songs. In their many different languages, all the Southwestern peoples knew the power of corn song.

"It is late July, the moon of rain," Ruth Underhill writes in 1938 in *Singing for Power: The Song Magic of the Papago Indians of Southern Arizona*. "Now planting can begin." Every man, she explains, placed his field at the mouth of a wash where, after a torrent, the earth would be soft enough to puncture with his digging stick. In each hole he dropped four kernels and, kneeling, spoke to the seed so there would be no misunderstanding. "Now I place you in the ground. You will grow tall. Then they shall eat, my children and my friends who come from afar." While the corn grew, night after night the farmer walked around his field, "singing up the corn."

Writes Underhill: "There is a song for corn as high as his knee, for corn waist high, and for corn with the tassel forming."

The corn comes up;

It comes up green;

Here upon our fields

White tassels unfold.

The corn comes up;

It comes up green;

Here upon our fields

Green leaves blow in the breeze. . . .

There is also a song for the blue evening when the corn tassels tremble, for the wind when the corn leaves shake, for the fear of

the corn when the striped woodpecker strikes at its heart, for the green time when the tassels wave for joy, and for the harvest time when the corn is embraced lovingly by the harvester's arms. "Sometimes," said Underhill, "all the men of a village meet together and sing all night, not only for the corn but also for the beans, the squash, and the wild things." Songs and prayers were an essential part of cultivating wild things and while no one has proved that loving a corn plant, as Henry Agard Wallace said, will improve it or its progeny, the sense that corn was sacred certainly did it no harm.

It was not lack of desert song but a disastrous series of droughts and floods that depopulated the Hohokam valleys a century before Europeans set foot in the Southwest. The first to do so were three Spanish slave-catchers and a Moorish slave named Estevan de Dorantes, who had been shipwrecked on the Gulf coast of Texas in 1535. Before they worked their way back to Mexico, the Spaniards were told by natives they encountered of a kingdom of rich cities to the north. A later foray headed by Dorantes and a Franciscan priest, Fray Marcos de Niza, got the slave killed for his trouble, but the priest's tales of imaginary gold were enough for Francisco Vasquez de Coronado and his troops to saddle their horses and set out for the "Seven Cities of Cibola." In 1540 they found instead the cornfields of the Zuni.

Z

uni Pueblo is on the New Mexico side of the Arizona border, due south of Gallup and north of Bat Cave. To reach it, you must first climb through rocky canyons and forests of piñon and juniper before hitting a barren plateau. Theirs is the only one of the eighty pueblos conquered by Coronado that has retained its ancestral land, which they call the Middle Ant Hill of the World. Few Zunis grow corn here today. Those that do—largely for ceremonial purposes—grow it as their ancestors did.

The corn of their ancestors impressed Pedro de Castaneda, who, when he returned to Mexico City in 1596, wrote about his trip with Coronado in *Relacion de la jornada de Cibola*. "The Indians plant in holes, and the corn does not grow tall, but each stalk bears three and four large and heavy ears with 800 grains each, a



T. HARMON PARKHURST / COURTESY OF THE MUSEUM OF NEW MEXICO

thing never seen in these regions. In one year they harvest enough for seven years."

A century ago the methods of Zuni corn farming impressed another observer, Frank Hamilton Cushing, who led a Smithsonian expedition to the Pueblo in 1879 and discovered there a handful of Presbyterian missionaries working hard to cultivate a tribe of 1,700 unsaved souls. Cushing was a remarkable translator of the distinctive Zuni language, but he took his enthusiasm for the Zuni culture to extremes unacceptable to his Washington bureau chiefs. The Easterner who came to observe aboriginal ways remained for four and a half years to become a Priest of the Bow and First War Chief, before his assimilation was cut short by his choking to death on a fishbone at age 43.

From Cushing we learn in precise detail how Zuni and other desert farmers made the sand sprout corn. When a young Zuni wished to mark land as his own, Cushing tells us, he looked for the mouth of an arroyo and carefully "lifted" the sand with his hoe. First he lifted little mounds of sand at intervals around his proposed field, then he built them into embankments called "sand strings." At each corner he placed a rock to establish his claim to this land for



his lifetime and, after his death, his clan's.

Before he could plant, the Zuni farmer, like the Hohokam, had to construct an irrigation system. Upstream of his chosen arroyo, he drove forked cedar branches in a line across the dry stream bed and built a dam with branches, rocks, and earth. Downstream, he built more barriers on either side. Finally, he looked for a ball of clay, which he buried at the side of the bed where he wanted rain freshets to flow, then banked earth over the clay to form a long embankment that angled into the arroyo. The buried ball of clay was important symbolically as well as practically, for it represented a wooden cylinder used in a Zuni game called "Ti'-kwa-we," or Race of the Kicked Stick. Here two opposing teams, running at full speed, competed over a twenty-five mile course by kicking ahead of them two small cylinders of wood. The clay ball provided a cylinder for the water gods, encouraging them to race with the kicked stick and to push their waters ahead of them with like force and speed.

This earthen banking created across the farmer's field a network of barriers that directed any freshets and caught any rain that fell. To encourage the rain, the farmer sought the corn priest of his clan to prepare

a plumed prayer stick and a cane of wild tobacco. The priest knelt in the new field facing east and implored the god priests of earth, sky, and cavern "not to withhold their mist-laden breaths, but to canopy the earth with cloud banners and let fly their shafts little and mighty of rain, to send forth the fiery spirits of lightning, to lift up the voice of thunder whose echoes shall step from mountain to mountain, bidding the mesas shake down streamlets." That the streamlets might become torrents and feed the earth-seeds, the priest "this day plants, standing in the trail of the waters, the smoke-cane, and prayer-plume."

It would be a full year before the infrequent rain deposited sufficient loam. Then the Zuni would plant rows of sagebrush along the western boundaries of his field to catch the fine dust and sand blown during April, the month of the Crescent of the Greater Sand Storms. Usually there was but a single rainstorm in the spring and its waters, channeled by the embankments, helped redistribute and tamp down the soil until it was at last ready for the ceremonies of planting.

During the winter the seed had been blessed by the corn matron, who had sprinkled a tray of selected kernels with the

In a 1936 photo, women of the San Juan Pueblo shuck mountains of colorful corn during a husking bee, as their ancestors had done for centuries.

black powder of corn-soot (what we call corn-smut) and a mixture of yellow dye, yellow flowers, and corn pollen, so that the grains became bright yellow in token of their strength. She then stored them in a pouch made from the whole skin of a fawn.

At the first of May, when the farmer heard the Sun Priest call from the rooftops, he sharpened his planting stick of juniper. The base of his stick was forked with a stump that he could use as a brace for his foot. He brought with him to the fields a plumed prayer-stick and six corn kernels of different colors, which a corn-matron sprinkled with water to bless with "rain." When the farmer arrived at the field, he dug four holes equidistant from the center, each of them a cardinal point, and in each he planted a corn kernel of the right color—red for the south, white for the east, yellow for the north, blue for the west. He dug two more holes and planted a white kernel for the sky regions and a black kernel for the world below. In lines extend-

ing from each of the four directions, he planted rows of corn until all the kernels in his pouch were gone. He returned home to fast and pray for four days.



hen the farmer could plant all his corn. Taking a seed bag and a lunch of piki bread, a flat bread made of corn flour, the planter dug holes four to seven inches deep alongside last year's rows. (The country is so dry, Cushing explains, that seed had to be planted deep in the underlying loam for protection.) A boy followed him, dropping twelve to twenty kernels in each hole and covering them with sand. Where the broken stalks of last year's rows were thin, the planter reinforced them with twigs of greasewood or sagebrush to catch drifting soil blown by the wind.

Next the planters made a network of crow traps. They erected several cedar poles, topped them with prickly leaves, and strung between them ropes made from split yucca leaves. On these they hung rags or strips of hide, moss, old bones—anything that would sway in the wind. They also made small nooses, using a hair baited at each end with a corn kernel, contrived to choke two crows simultaneously. Boys fashioned scarecrows with faces of painted rawhide, eyes of cornhusk balls, teeth of cornstalk, hair of black horsetails, and lolling tongues of red leather. These were the “watchers of corn sprouts” and soon they were joined by crows that were caught and hung beak downward to warn their fellows away from the corn.

When the kernels had sprouted, it was “leaf-lifting” time. The farmers pulled up all but four or five of the best shoots sprouting from each planting hole and killed the white grubs near the roots. Then it was hoeing or staving time, when they dug out weeds with their ancient hardwood scythes or with the white man's hoe of hand-wrought iron. After the second or third hoeing of the summer, they hilled the corn with a pickaxe made from an elk's scapula or a broad stone and left the corn until harvest.

In autumn they picked all the corn that was still too green to show signs of ripening and carried it to a hill. Here they dug a deep, funnel-shaped hole, several feet in

diameter at the base, and on its windward side, a hole about two feet in diameter that opened into the interior of the pit. Through the hole in the top they threw dried grass, leaves, and wood, until the pit was full, then fired the pit so that it would burn all night. When the coals were glowing, they threw in green corn stalks and all the unhusked ears of corn, plugging the top and the draft hole with green stalks, then mounding earth over the whole. After a day and a night, the mound and stalk plug were removed and steam would shoot hundreds of feet in the air. By afternoon the mass had cooled and they could shovel out the corn and carry it into the village, where they husked the golden brown ears and braided them to hang from the rafters of their houses. This was their larder for the coming year.

While the remaining corn in the field ripened, the Zunis built little huts from which children and old men could keep watch against coyotes and burros as well as crows. Any burro so foolhardy as to venture into a cornfield after his first beating regretted it. Cushing recalls a burro nicknamed “short-horn” that had his ears shaved, his tail and tongue cut short, some teeth pulled and his left eye put out. “The Zunis, and probably most other Indians, are touchy on the subject of their bread-stuff,” he understates.

When frost turned stalks to gold and shucks to feathers, the corn was picked and carried into town for husking. Women formed the husking bees, shucking the cobs in great numbers, selecting ears to string on threads of yucca fiber and carrying baskets of cobs to the roof to dry next to heaps of chili peppers. Dried corn was stored in the corn room or granary of each house, where four sacred objects were kept in the center: a perfect ear of yellow corn, a bifurcated ear of white corn, a bunch of black corn-soot, and an ear blessed by a seed priest in the sacred Salt Lake, “Las Salinas.” The salt ear and the soot ear formed a couch for the “Father and Mother of corn crops”—the yellow and white ears, respectively—to rest upon. Each year the corn matron presented the first new corn to these corn parents in a ceremony called Meeting of the Children.

Today the Zuni and other Pueblos still keep their varied strains of colored corn pure by cultivating them in fields isolated from each other. They still keep back some seed, year after year, to maintain the bloodlines of their own pueblos. “We could buy other seed, and perhaps better, from white

The corn still “comes up green” in the fields of the Hopi and other Southwestern tribes today, although each year there are fewer planting the old way. Ancient strains are kept pure by cultivating them in fields isolated from each other.

people; or we could get seed from other pueblos; but the old men do not want to do that,” a native of San Ildefonso told a trio of ethnobotanists in 1916. “They want to keep the very corn of the pueblo, because the corn is the same as the people.”

They still plant their corn with planting sticks and tend it by singing. “A planting stick is special,” farmer George Blue-eyes told some Navajo students in 1979 at Point Community School in Chinle, Arizona. “You must finish your planting and put it away before the last quarter of the moon. You should sing after planting in the first four holes.”

Now there are more planting songs than corn fields. Three centuries after Spanish adventurers brought horses and swords to the Southwest, white American engineers brought dams and similar improvements. The Salt River Project effectively ended Pima farming in 1920 when it diverted water from Pima lands. The pattern is familiar. At that date there were still over 48,000 Native American farmers in the United States, half of whom owned the land they farmed. In 1982 the number had dropped to no more than 7,000. Each year there are fewer to say with George Blue-eyes that “planting the old way is still best.”

“Corn planted by tractor may take two weeks to come up,” he explained to *The Seedhead News*, the newsletter of Native Seeds/SEARCH program. “Mine might be up in four days. Wind can blow tractor-planted corn right out of the ground. Mine is strong. The plow rolls the ground over on itself across the whole field. Too much soil dries out. The stick digs just enough for each side. The ground underneath stays wet.” He might have added that the roar of a modern combine is nothing like a song. So how can it keep the corn from misunderstanding? How can it keep the tassels from trembling, the wind from its tender leaves, the woodpecker from its heart, until it is gobbled up by the ravening harvester?

Betty Fussell, who lives in New York City, is the author of four previous books and writes regularly for many magazines and journals.



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Reckamp Daylilies Continued from page 19



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'Heavenly Crown'.

citrina in their heritage tend to have an attractive, lemony fragrance."

The trademark characteristic of most Reckamp daylilies is their ruffled edges. "Other people have it, too," he notes, "but we were one of the first and some say we have the best ruffling of any of the growers."

Brother Charles does not make crosses between species nor has he had much luck with reds. He has never tried to develop a miniature. His objective has been wider, rounder petals and color combinations in which the cream is energized with a little pink or the pink is touched with yellow. There is enough genetic variation among the medium-height pastels to keep him challenged, he says. "I started with that line and I'm glad I stayed with it. When you jump around too much you get inferior offspring." Pastel colors show up well in the evening, when most people enjoy their gardens, and when darker colors begin to disappear. "And our blooms are just as fresh in the evening as when they first open," he says.

During his time at the community nursery, Brother Charles had built a reputation for raising high-quality plants. When the nursery closed, Roy Klehm, director of the well-established Klehm Nursery in South Barrington, Illinois, asked him to continue his breeding program with daylilies.

"He would take everything I produced," Brother Charles still marvels today. "I would need no catalog, do no bookkeeping, have no office. I would do the breeding, and he would pay me for my work."

Klehm Nursery takes Brother Charles's most promising efforts and plants them in

its own nursery fields for further evaluation and propagation for marketing. This association with a well-known nursery name gave his daylilies respect and good prices—to the benefit of the society and its work. In recent years, the most widely distributed plant catalogs in the country have begun to list some of the daylily cultivars cloned by Brother Charles.

Although daylilies are easy to grow ("Just put them in the ground and jump back," Brother Charles quips), hybridizing is not instantly gratifying work. "Anyone interested might be at it a long time before they could make a living out of it. But as a hobby, it's very nice," he says.

Surprisingly, he believes that the market is flooded with daylilies, many of which are "totally unacceptable and unnecessary."

This is not because daylilies are easy to hybridize so much as because older, vastly inferior varieties are still grown and marketed. The older cultivars bloomed briefly, usually midseason, and often hid their blooms in their foliage. The new hybrids are not only better in this respect, but hold up better to the elements and offer a vast variety of colors and sizes.

"There's a lack of education among gardeners," he says. "Take cars as an example. If you had never seen a modern car and someone was trying to sell you a 1938 Chevy, you might think it was the best available. A lot of people have never seen some of the modern hybrids growing."

Brother Charles sets high standards for himself, introducing only a few new plants annually. One of his introductions, 'Angel's Delight', adorned the cover of the *Wayside Gardens* catalog in the fall of 1981. His most recent honor was receiving the first presentation by the Chicago Botanical Garden of its Award of Linnaeus, which is bestowed on individuals for outstanding achievement in horticulture.

Unlike his daylilies, Brother Charles remains unruffled by his success. And unlike the blooms of his flowers, what he has achieved will last much longer than a day.

Tom Cahill is a priest with the Divine Word Missionaries in Maynooth, County Kildare, Ireland.

SOURCES

Klehm Nursery, Route 5, Box 197 Penny Road, South Barrington, IL 60010-9389. Catalog \$4, refundable on the first order.

Poppies Continued from page 34

to Mexico; the delicate wood or celandine poppy (*Chelidonium majus*), native to Europe and eastern North America; and the California poppy (*Eschscholzia californica*).

The California poppy is native to the West but is seen in meadow gardens all over the country. It is famous for its dainty, cuplike flowers and cheerful golden orange color. Its color range, however, has been greatly expanded by modern hybridizers to include pink, cream, white, deep orange, and mauve. There are also new double and semidouble cultivars. One exciting new California poppy, 'Thai Silk', has mostly semidouble flowers with a fluted form and a pleasing crinkly look to the petals, as well as bronze-tinged foliage.

The California poppy is a hardy annual whose tiny seeds may be sown in the fall, except in the extreme north, or as soon as the ground can be worked in the spring. It will thrive in dry, alkaline soils with good drainage; however, it is important to provide plenty of moisture after sowing to break seed dormancy.

Whether or not you can grow some of the more unusual poppies depends upon where you live. Those living in the Pacific Northwest can grow the Himalayan blue poppy (*Meconopsis baileyi*) and the Welsh poppy (*M. cambrica*). Both of these cold-hardy perennials demand cool, very moist conditions.

My own experience with the Himalayan poppy at this point is limited to a single, tiny sprout that germinated from one of my seeds. I tend it with loving care. The odds for its survival are not great, considering my Southeast location. This is a rare flower, more often seen in stunning photos than in real gardens. Most gardeners are intrigued by a challenge, however, and the lure of those glistening sky blue flowers with golden anthers is undeniable. The Himalayan poppy must be grown from seed and needs three seasons to become established. Picking off buds or new blooms before the third year prevents the plant from going to seed and thus helps it reach optimum growth and hardiness. It grows to two to five feet.

The Welsh poppy, which comes from Europe, reaches a height of about twelve to eighteen inches and produces yellow or orange flowers; some cultivars are heavily petalled doubles. Good drainage is vital for both the Welsh and Himalayan poppies. They prefer acid soil with plenty of peat

moss and leaf mold, and should be grown in filtered light rather than direct sun.

The California tree poppy (*Romneya coulteri*), native to Southwestern canyons, enjoys bright sun and dry, infertile soils. When grown from seed it will take several years to flower, but it is well worth the effort. This four- to eight-foot perennial produces three- to six-inch, clear white flowers with yellow centers. Its petals have a texture often described as crumpled silk. This plant should be kept well to itself, as its roots quickly spread out, encroaching on the territory of neighboring plants.

When I lived in England, I used to bring in armloads of red field poppies to brighten the house. Most poppies make good cut flowers, the cultivated forms being more long-lived than my beloved wild ones. Because most members of the poppy genus ooze a substance that clogs their stems, it's a good idea to sear the stem for an instant over a lighted match and then immediately set the flower in warm water. Only the California poppy lasts well indoors without this treatment, although it closes its petals after dark. Many people also use the dried seed heads of certain poppies in flower arrangements. One cultivar that is particularly good for this is the annual *Papaver somniferum* 'Hens & Chickens'.

Outdoors, as well, these individually beautiful flowers have many uses. Poppies can be incorporated in traditional perennial borders, cutting gardens, rock gardens, or the happy hodgepodge of a cottage garden. It is hard to visualize, in fact, a type of garden where some form of poppy would not be at home.

Molly Dean is a free-lance writer who lives in Clayton, Georgia.

SOURCES

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

J. L. Hudson, Seedsman, P.O. Box 1058, Redwood City, CA 94064. Catalog \$1.

Garden Place, 6780 Heisley Road, P.O. Box 388, Mentor, OH 44060, (216) 255-3705. Catalog \$1.

George W. Park Seed Company, Inc., Cokesbury Road, Greenwood, SC 29647, (800) 845-3369. Catalog free.

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August 1: "American Plants for American Gardeners"

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August 15: "New Variations of Old Landscape Plants"

J. C. Raulston, director of the North Carolina State University Arboretum, Raleigh, North Carolina

August 22: "Native Wildflowers: Habitat Gardening for the Future"

David K. Northington, executive director of the National Wildflower Research Center, Austin, Texas

August 29: "Bulbs as Companion Plants"

Brent Heath, owner of the Daffodil Mart, Gloucester, Virginia

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Let Lilypons and TetraPond help you to get started today by ordering one of our durable TetraPond 32 mil, flexible, 2 ply PVC pool liners. So easy to install and maintain you will ask yourself why you waited so long to begin this adventure. Call toll free to nearest location. Please have credit card information handy.

Choose from the seven sizes listed (sizes are approximate) for depth 18" to 24" in your own design.

Lilypons catalogue subscription (<i>Free with liner order</i>)	\$ 5	13' x 20' liner makes 9' x 16' pool	\$ 229
8' x 12' liner makes 4' x 8' pool	99	16' x 23' liner makes 12' x 19' pool	299
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