

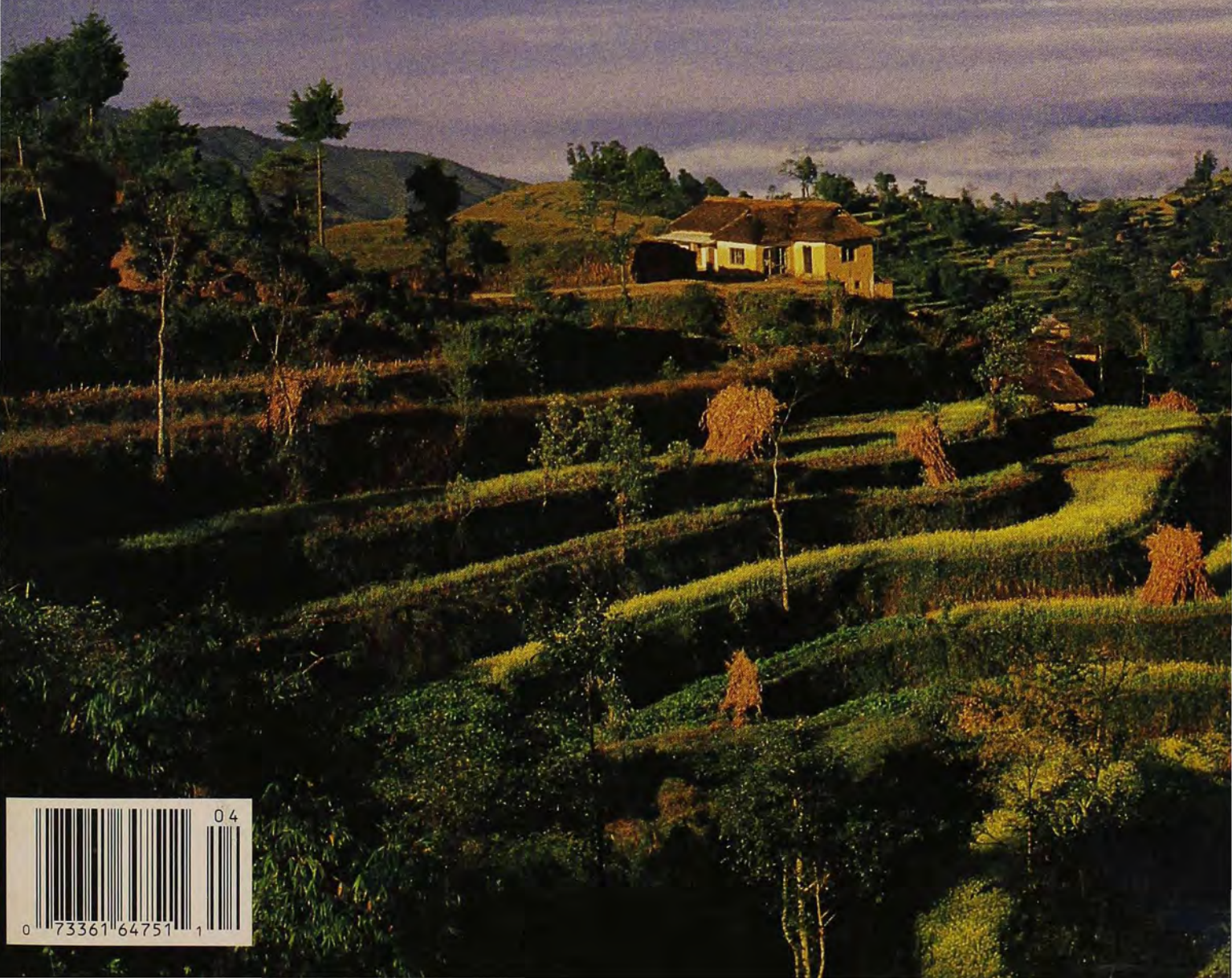
American Horticulturist

April 1991

A Publication of the American Horticultural Society

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American Horticulturist

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APRIL'S COVER

Photographed by Carlos R. Lola

Nepal is a country of magnificent mountains, terraced fields, and plants that botanists have risked their lives for. Beginning on page 10, plant breeder Simon Crawford recounts his trek along paths braved by Joseph Dalton Hooker some 150 years ago. Above, north of Kathmandu near the Langtang Valley in the Himalayas, rice is being harvested in the fall.

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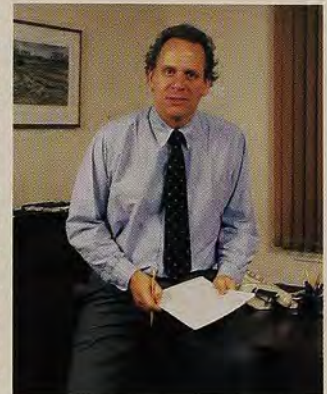
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Mr. Frank L. Robinson



COMMENTARY

Raising public awareness of plants as the sustainers of all life on earth is critical to our planet's future. The educational programs and publications of the American Horticultural Society are making vital contributions toward strengthening the field of horticulture, raising the awareness of many Americans about the impact of the field on our daily lives, from food to aesthetics, from medicine to the environment. In the future, I envision a Society that becomes increasingly vocal in its advocacy of horticulture as a base for conservation and the preservation of earth's biodiversity.



For this to occur, the Society must continue to grow and expand its services, to increase membership, and to identify and attract broad sources of revenue. Increased revenue for operating support is our lifeblood. Thus the success of the 1990-91 Annual Appeal is a matter of great importance to the future of our Society, and that success depends on the participation of all AHS members.

As you know, in these uncertain times nonprofits are challenged daily with increasing costs—among them, higher postal rates for our publications. Our Board of Directors is exploring every possible avenue to open new, effective means to meet our increasing budgetary needs.

We are seeking pro bono services for many of our ongoing functions and new activities. We are opening dialogues with foundations and corporations whose leaders know little about the Society, working to raise their awareness of the long-term benefits of gardening and horticulture to the social and environmental health of future generations, and of our need for funding support to carry out our mission.

Last October, to help ensure the continuation of the Society's services at this critical time, the Board members challenged themselves to raise funds for operating support. To date they have brought in \$40,000.

We are doing our part to guarantee that the American Horticultural Society, which has been promoting horticulture since 1922, will continue its respected work for at least another seventy years. But we need your help. We are open to your suggestions of persons or organizations to contact for funding, and we especially need your contribution to the 1990-91 Annual Appeal.

Every gift counts. AHS currently has 22,000 members. If each of us gave just \$15, we would surpass our goal of \$250,000 to meet our budgetary needs. It's an enormous task to find the sources necessary to fund the Society, and to extend and expand its benefits and services.

Won't you join in our efforts to safeguard the Society's future? The American Horticultural Society is a proud tradition. Please share in it by supporting our campaign today. On page 41 you will find more information on the Annual Appeal. Your gift today will shape a more effective Society tomorrow, and that's our gift to future generations.

*George C. Ball Jr.
AHS President*



STUDY TOURS

TRAVEL/STUDY TRIPS FOR THE AHS GARDENER

APRIL 21-28, 1991 GARDENS OF THE MISSISSIPPI

Experience the grandeur of the Mississippi from New Orleans to Memphis on board the *Mississippi Queen*. Ports of call along the river include Houmas House, Saint Francisville, Natchez, Vicksburg, and Greenville. Experience true Southern hospitality as AHS members and friends along the river open their homes and gardens for this horticultural adventure.

MAY 12-23, 1991 ENGLISH COUNTRYSIDE GARDENS AND THE CHELSEA FLOWER SHOW

AHS members will have the unique opportunity to meet horticultural author Rosemary Verey and visit her home and garden—Barnsley House—during this visit to the rolling hills of the Cotswolds and Kent. Participants will visit the gardens of Hidcote Manor, Sudeley Castle, Oxford, Denmans near Arundel, Nymans Gardens, Wakehurst Place, Great Dixter, Sissinghurst Place, and Isabella Plantation before transferring to London to enjoy the Chelsea Flower Show. Guest lecturer for this program is David Wilson, popular panelist on the BBC's series, "Gardener's Corner." The tour will be led by Elvin McDonald, lecturer and author and Secretary of the AHS Board of Directors.

JUNE 10-20, 1991 AND JUNE 23-JULY 3, 1991 GARDENS OF THE SOUTHWEST: COLORADO ROCKIES AND CANYONLANDS

Explore the diverse contrasts of plants from the alpine meadows of the Colorado Rockies to the desert plains of the Southwest. Explore unique, out-of-the-way parks like Arches National Park, the Goosenecks of the San Juan River, and Canyon de Chelly National Monument. See firsthand the varied uses of native plants as AHS members and friends open their gardens and homes for our special visit.

OCTOBER 2-20, 1991 GARDENS OF ASIA

Join AHS Executive Director Frank Robinson on a program that encompasses the eastern world of Thailand, China, and Japan. Highlighted are excursions to the ruined city of Ayutthaya; hillside villages near Chiang Mai; a jungle safari on elephant-back to the village of Karen near Mae Hong Son; Beijing and the forbidden city; Xi'An and the tomb of Emperor Qin Shi Huangdi with its army of terra cotta figures; Shanghai's Yu Garden and Museum of Art and History; the beautiful gardens of Suzhou; Kyoto's holy Saiboji Moss Temple, Nijo Castle, and Ryoanji Rock Garden; and Nikko's botanical gardens. And by special invitation, we shall visit the Imperial Palace Gardens as well as the Jindaiji Botanical Gardens in Tokyo.

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

Daitokuji Temple in Kyoto. Participants in an October tour of Asia will visit several Kyoto gardens.

PHOTO COURTESY OF THE JAPAN NATIONAL TOURIST ORGANIZATION

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LETTERS

Too Much Credit

Thanks to you and to Tovah Martin for doing the article about me in the December issue. I have heard from many about it, and I suppose this is one of the rewards for having worked in such an exciting field for so long.

However, since I am a stickler about credits, I must point out that while I have been consulting at Monticello since 1978, I can take no credit for the work attributed to me in the picture caption concerning the vineyard. And my work on the garden terrace was as part of a team, led by William Bieswanger, the architectural historian there, of which I was the landscape architect. Also I was given credit for having consulted at Colonial Williamsburg which I never have.

Your inset about Bacon's Castle was very nice and added to the article. It would have been even nicer had it acknowledged the sponsorship of this very expensive project by the Garden Club of Virginia, which has restored over fifty gardens in that state over the years. Sponsors today are hard to come by and they should be recognized at every turn.

I have subscribed to *American Horticulturist* for many years and always look forward to its arrival in our home.

Rudy J. Favretti
Storrs, Connecticut

Although we did not mention the Garden Club of Virginia in the sidebar about Bacon's Castle, we did give them well-deserved credit for support of the \$250,000 project in the main story, on page 30.

The Road to Hana

A friend recently gave me a copy of your December issue. Of special interest was the article "Gardening Challenges: Hawaii—Land of Endless Summer," which, as a frequent visitor to the islands I especially enjoyed.

While visiting the island of Maui recently, I took the trip (always spectacular) to

Hana. On the way I stopped at a beautiful private residence that had been planted with gingers, heliconias, bromeliads, bananas, and many more tropical plants.

The property is not open to the public, but, although your article says Hawaiians are reluctant to share their gardens with tourists, the owners graciously showed me around.

Should any of your readers be on the road to Hana they should be sure to check out the Kailua Maui Gardens.

J. Reed
Santa Barbara, California



Fearfully Fun

Peter Loewer's "Demon Seeds & Roots of Evil" (December) was refreshing, thought-provoking, well-written, and especially good reading for mystery and science fiction fans.

I wanted to say an immediate "thank you" for giving your readers something different with this "horrorculture" article. I was transported back to the years of hiding science fiction magazines under the mattress (nice girls didn't read such things), a period of Gothic novels in which handsome, money-grubbing lovers eyed the leaves of the oleander tree as the naive heiress spoke of papa's will, and English

murder mysteries with little old ladies chopping poison mushrooms so the squire wouldn't have time to change his plans to finance a new roof on the church.

Another way of thinking and learning about plants. Thanks.

*A. Carman Clark
Union, Maine*

Rappaccini's Eden

Peter Loewer's "Demon Seeds & Roots of Evil" was good entertainment, missing only a genuflection to Nathaniel Hawthorne's *Rappaccini's Daughter* as the American progenitor of the genre.

Dr. Rappaccini cultivates an "Eden of poisonous flowers," made up not only of naturally toxic species, but of "the monstrous offspring of man's depraved fancy, flowing with only an evil mockery of beauty." (Surely Katharine White recalled this description when she berated modern hybridizers in her *New Yorker* articles.)

While early gardeners' poison gardens were more medicinal than murderous, Rappaccini is the scientist gone wrong, committed to the mind at the expense of the soul. It's the stuff of twentieth-century science fiction and B movies.

*Karan Davis Cutler
Essex Junction, Vermont*

Alaska Handbook

I so enjoyed Lenore Hedla's article "Keeping Your Cool in Alaska" (February)!

I have called several local book stores to try to find and order Ms. Hedla's book, *The Alaska Gardener's Handbook*, mentioned at the end of the article. They can find absolutely no record of it in their computer listings which, they tell me, are based or connected to the Library of Congress.

Help! My son is moving to Palmer, Alaska, in May and I would like very much to get this book for him to start using as he plants his garden. Please let me know how I can obtain a copy!

*Susanne S. Kemper
Kansas City, Missouri*

The *Alaska Gardener's Handbook* can be ordered from High North Press, 6440 West Dimond Boulevard, Anchorage, AK 99502 for \$9.95.

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GARDENING

by Hazel Weihe

Drought Insurance

Droughts...severe winds...not enough rainfall...what's a plant to do?

Our pets found spots in the shade during last summer's heat. Plants can't lie in the shade unless they're planted there and they can't go in for a cool shower unless you give it to them with a hose. But you can help them get through a long hot summer by using an anti-transpirant called Wilt-Pruf.

Think of the plant as inhaling and exhaling. When a plant inhales, it takes water in through its roots. When it exhales, it gives off moisture through its leaves. There are tiny pores in the leaves that give off this moisture. If the supply of water to the roots is too low, leaves become limp because they continue to emit moisture. In the process, leaves curl, become brown and desiccated. This is because they're giving off more moisture than the plant is absorbing.

What an anti-transpirant does is hold a balance between water taken in and moisture given off. Wilt-Pruf can sometimes make the difference between saving a growing tree or shrub and losing it.

An anti-transpirant is especially helpful when transplanting a small tree or shrub. No matter how careful a person is, the plant's root system is disturbed and some roots are lost. Wilt-Pruf has helped my transplants retain additional moisture after transplanting. Transplants need to be watered heavily to get them over the shock of having been dug. My plants have indicated by their behavior (they haven't died!) that Wilt-Pruf has been a definite help to them in surviving their trauma.

Wilt-Pruf is a clear organic liquid that in no way inhibits growth or harms a plant. Available at nurseries, garden centers and hardware stores.

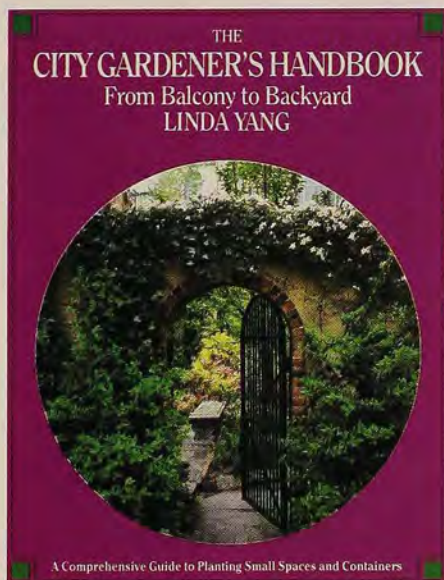
Hazel Weihe of Somers, New York, is an award-winning writer whose garden column is syndicated by *The North County News*.



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BOOK REVIEWS



The City Gardener's Handbook: From Balcony to Backyard

Linda Yang. Random House, Inc., New York, 1990. 316 pages. Color photographs, black-and-white drawings. Publisher's price, hardcover: \$26.95. AHS member price: \$22.50.

This very satisfying book tackles city gardening with common sense, a real gardener's passion for soil, and an inquiring turn of mind not afraid to wander in a good cause. A sequel to *New York Times* veteran columnist Linda Yang's *Terrace Gardener's Handbook*, it is both a primer for beginners and an evocative browser's book for sophisticates. The writing is personal and fun.

How do you transform small, ugly corners of a city, up in the sky or down in its sooty, hard-packed dirt, into beautiful gardens? Usually by making them look like fragments of larger landscapes or woodlands. The 150 color photographs show it is being done everywhere—East Coast, West Coast, a scrap of front yard in the author's native Brooklyn, a windy Chicago terrace, barren rooftops under the harsh skies of Manhattan, Paris, London.

Interesting "before" and "after" photo-

graphs show how some of the illusions are created. My favorite transformation involves an old soot-blackened brick wall separating narrow terraces. The homely opening in the wall becomes a vine-topped arch through which a diagonal path meanders. Bordering the path are young paper bark birches, white azaleas, andromedas, crabapples, Japanese maples, ivies. On the other side the path curves away to the right and disappears, off to infinity.

Equally dear and less costly is the tea garden trick for apartment dwellers. A six-foot balcony is transformed by a small-scale table and two chairs, house plants in matched pots, flowering baskets, and a small weeping cherry in a big rustic tub.

Other photographs show elements that screen out towering neighbors, buffer winds in high places, and hide sooty masonry: trellises, lattices, arbors, linear fences, 'Skyrocket' juniper, false cypress, clematis, ivies.

Bonus: first-rate planting plans by Sharon Bradley Papp accompany some of the gardens photographed. They are nicely tuned to Stephen K-M. Tim's elegant botanical drawings.

How to make these gardens happen and keep them up is the substance of thirteen thoughtful chapters. Chapter 4 is a whole dictionary of plants for the city. Most paragraphs have marginal heads so you can go back and find a given topic.

"The Secret Is in the Soil" describes soils that offset air pollution, what to compost, why and how to keep the plants clean, and which pests are the good guys. (This is an environmentally-hip author.) We learn why soil for sky-high gardens must be different and water management, too, from drains and puddles to droughts and vacations. How not to have the downstairs lawyer on the phone discussing falling plaster is useful information.

The chapter on containers is, fortunately, superb, since containers are where many city gardens are planted. I especially value the generous sprinkling of charts and tables indicating which plants can share moisture levels and pH, will glow in

autumn, bloom early, tolerate wind, screen and hedge, welcome espaliering, and more.

And when that perfect little instant garden—which a city garden tends to be—immediately outgrows its original scale? It takes an entire chapter to sort the challenges of root pruning from those of limbing up. This is a chapter gardeners who have achieved (almost) all will come back to. Pruning is easy but never simple.

This is not one of those shallow, instant-gratification pieces to swallow at one go, but rather, the kind you take to bed with you and savor, year after year after year.

—Jacqueline Heriteau

Jacqueline Heriteau, author of *The National Arboretum Book of Outstanding Garden Plants*, currently gardens in a town house in Washington, D.C.

Book Order Form

- City Gardener's Handbook: From Balcony to Backyard by Linda Yang \$22.50
RAN
- The Gardens of Europe edited by Penelope Hobhouse and Patrick Taylor \$29.75
RAN297

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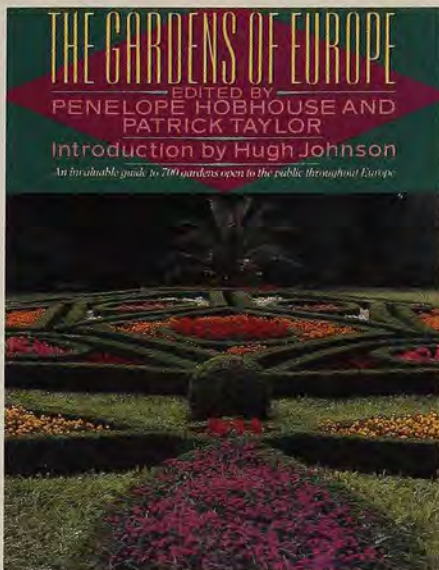
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The Gardens of Europe

Edited by Penelope Hobhouse and Patrick Taylor. Introduction by Hugh Johnson. Random House, New York, 1990. 320 pages. Color and black-and-white illustrations, photographs, and maps. Publisher's price, hardcover: \$35.00. AHS member price: \$29.75.

Of all the continents, Europe offers the greatest profusion of gardens. The authors of this beautiful book have selected 700 of them—enough for most of us to see in our lifetimes—and have given us a sense of their diversity and excitement.

The garden descriptions are organized by regions: southern, northern, central Europe, and—lumped together—the Balkans, eastern Europe, and European Russia. For each country there is a small map showing locations of gardens described, a brief outline of its gardening history, and, most important, a description of its climate. Climate, after all, is the key.

Because of its mild climate, England has the most gardens, with the greatest range of plants. Although the authors do not say so, it also has the greatest number of introduced plants and has had, at least in modern times, the greatest influence on gardening. Sissinghurst, with its rich variety of plants grown within a severe linear design, is rightly called “the most famous and influential of English twentieth-century gardens.” This and other favorites of the authors are indicated with a star. For each garden there is a concise description, preceded by information about its location, ownership, open hours, and whether there is an admission fee.

While I was naturally interested to read about gardens I had seen, I was also fascinated by reading about all those I have

missed. The book is accurately called by the publisher “an invaluable guide.” It is certainly a book I will take on my next trip to Europe.

The reader is apt to wish for more color plates in any garden book. To have added them would have added greatly to this book's now extremely reasonable cost, however.

The authors say nothing about national character as it is reflected in gardening, except to note details such as the French use of mosaiculture (or carpeting), and the fact that gardens in Spain and Portugal, with their Roman, Islamic, French, and English influences, are interesting but sadly neglected. Yet that character certainly exists. Anyone sitting on a bench in the Parc Monceau would know he was in France.

My other small quibble with this otherwise splendid book is the excessive use of “qv,” indicating that the spelling of a proper name has been verified. In so sophisticated a work, this seems out of place. Most of us do know how to spell Versailles.

—Adelaide C. Rackemann

Adelaide C. Rackemann is a Baltimore freelancer and gardener who serves as librarian for the Cylburn Arboretum and with her husband, Frank, edits its newsletter.

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Himalayan Journal

UPDATED



The peaks and plants of eastern Nepal have changed little since British plant hunter Joseph Dalton Hooker eloquently recorded them a century and a half ago.

The following excerpts are from Joseph Dalton Hooker's Himalayan Journals, Notes of a Naturalist, first published in 1855. We have retained the original spellings.

COLLECTING

The top of the pass was broad, grassy, and bushy, with dwarf Bamboo, Rose, and Berberry in great abundance, covered with moss and lichens: it had been raining hard all the morning, and the vegetation was coated with ice; a dense fog obscured everything, and a violent south-east wind blew over the pass in my teeth. I collected some very curious and beautiful mosses, putting these frozen treasures into my box, in the form of exquisitely beautiful glass ornaments, or mosses frosted with silver.

LEECHES

The road zigzags extraordinarily in and out of the innumerable lateral ravines, each with its water-course, dense jungle, and legion of leeches; the bite of these blood-suckers gives no pain, but is followed by considerable effusion of blood. They puncture through thick worsted stockings, and even

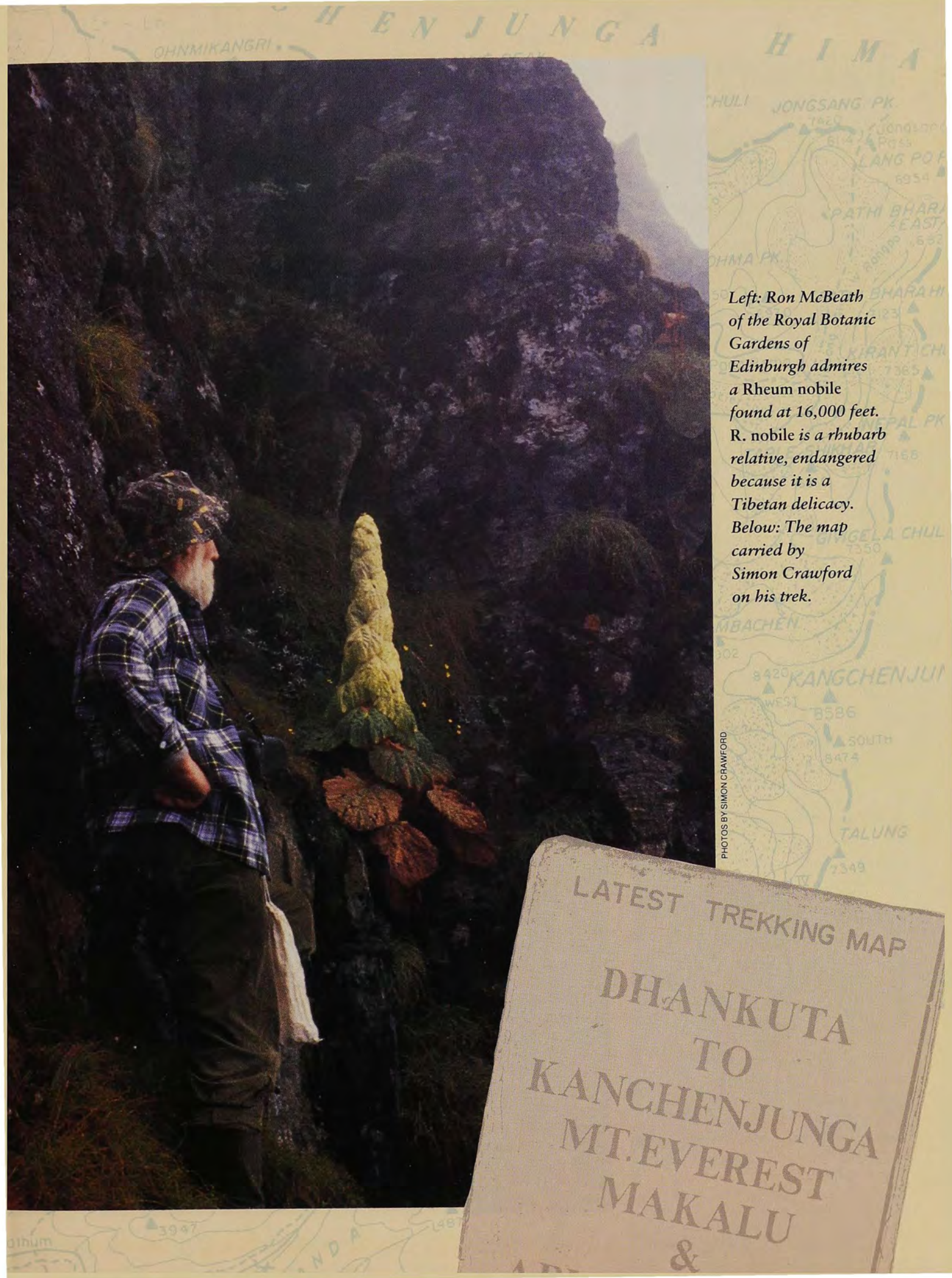
B Y S I M O N C R A W F O R D

IN THE LATE SUMMER OF 1989, MY ROLE AS A PLANT BREEDER FOR A major American seed company led to my being chosen to join six botanists from the Royal Botanic Gardens of Edinburgh, Scotland, and Kew, England, on a five-week trek to the lower slopes of Kanchenjunga, the third highest mountain in the world. The botanists—five men and one woman—had widely varying interests, including bryophytes, sedges, alpines, and of course, the many species of rhododendron and impatiens that are common to this area of eastern Nepal.

Such expeditions are frequently organized by botanical gardens around the world to collect plant material for dried herbarium specimens that can help clarify relationships within the plant kingdom. Just as important is the collection of living plants and seeds to grow for conservation and research. The study of living plants not only yields information of horticultural and botanical importance but may lead to the development of new drugs. For instance, a new drug for the treatment of leukemia has been isolated from *Catharanthus* species. My own goal was to collect seed of *Impatiens* species to develop new types for introduction into ornamental horticulture.

The Kanchenjunga area is very rich in impatiens, with novel flower colors and flower forms. Rarely visited by westerners, the region remains much the same as when Joseph Dalton Hooker made his expedition to eastern Nepal and Sikkim in 1848. Hooker collected a wide range of plants, primarily for the Royal Botanic Gardens in Kew, but is best known for his rhododendrons; he described twenty-eight new species after his 1848-49 expedition. Indeed, many of the paths we walked followed Hooker's route and many of the problems we faced with leeches, slippery paths, and wet weather mirrored his expedition 140 years before. We chose to make the expedition in September because the monsoon season would be nearing its end, many plants would still be in bloom, and there should be some ripening seeds to collect.

Our 350-mile trek was organized by a specialist Sherpa company in Kathmandu. The Sherpa, a Tibetan people now living in northern Nepal, are renowned for their skill as guides in the Himalayas. They are also exceptionally kind, resourceful, and always in good spirits on a trek, as well as able business administrators. We would be led by a



Left: Ron McBeath of the Royal Botanic Gardens of Edinburgh admires a *Rheum nobile* found at 16,000 feet. *R. nobile* is a rhubarb relative, endangered because it is a Tibetan delicacy. Below: The map carried by Simon Crawford on his trek.

PHOTOS BY SIMON CRAWFORD

LATEST TREKKING MAP
DHANKUTA
TO
KANCHENJUNGA
MT. EVEREST
MAKALU
&



Joseph Dalton Hooker in his study.

trousers, and, when full, roll in the form of a little soft ball into the bottom of the shoe, where their presence is hardly felt in walking.

BRIDGES

I crossed the Mewa, an affluent from the north, by another excellent suspension bridge. In these bridges, the principal chains are clamped to rocks on either shore, and the suspended loops occur at intervals of eight to ten feet; the single sal-plank laid on these loops swings terrifically, and the handrails not being four feet high, the sense of insecurity is very great.

KAMBACHEN

At the bottom of the valley we crossed the river—which was a furious torrent, about twelve yards wide—to the village of Kambachen, on a flat terrace, a few feet above the stream. There were about a dozen houses of wood, plastered with mud, scattered over a grassy plain of a few acres, fenced in, as were also a few fields, with stone dykes ... of all the mountain gorges I have ever visited this is by far the wildest, grandest, and most gloomy; and that man should hibernate here is indeed extraordinary, for there is no route up the valley, and all the communication with Lelyp, two marches down the river, is cut off

“Sirdar” or chief guide, Chuldim Temba Sherpa. At the age of thirty, he had logged about eight years of trekking experience, much of it with botanists.

As foreigners entering a remote region normally off-limits to tourists, we were joined by a liaison officer from the Nepalese government. At some locations, we would be at least two weeks’ walk from medical help. Thus we were also accompanied by a doctor from England, but as we would see, our isolation would still make us very vulnerable.

After three days’ preparation in the incredible medieval city of Kathmandu, we boarded an ancient bus along with all our baggage, five Sherpa guides, and about thirty porters to travel 250 miles to Hille in east Nepal. We were delayed by numerous tire punctures, gear problems, and a temperamental fuel pump as we negotiated the winding, precipitous, single-track road from Kathmandu south to the hot plain area of the Terai. Here the road turns east and runs close to the Indian border then turns north over the Ganges and continues on to Dharran, where it climbs again into the mountains.

The delays meant spending an unscheduled night in the town of Dhankuta, and in the morning we found our baggage in a smaller bus, better able to negotiate the bends in the road. After thirty hours we arrived at Hille, where it was a great joy to see my first impatiens of the trek—the small-flowered, yellow *Impatiens racemose*—growing on the thatched roof of a house.

The Sherpas organized our first camp; from here the walking would begin. It was necessary to hire more porters, so the expedition began with around sixty people. During the next few days we walked uphill, over some high passes, and then down into the Tamur Valley. The terrain in this area is quite thickly wooded with oak and rhododendrons, and the climbs were steep and slow along slippery mud paths, emerging only occasionally onto open grazed or cultivated land.

On our first morning’s walk, from our altitude of 7,000 feet we could gaze across the clouds at the snowy peaks of Chamlang and Makalu and—usually no more than fifty yards from the main path—at many impatiens. I was especially excited to see the small-flowered *I. gammei* and the yellow *I. stanantha*, which has an upward pointing spur, and it was a simple matter to collect their ripe fruit in cloth bags to be cleaned when we next stopped. We continued into the rhododendron forest, seeing many epiphytes, orchids, and ferns.

During these initial days the weather remained damp with regular showers and an occasional downpour. Leeches started to annoy us, but only in small numbers. Neither of these irritants spoiled our enjoyment of the wonderful plants. As we negotiated a narrow path we spotted the beautiful *Codonopsis dicentrifolia* (a relative of the *Campanula*) with pale blue, bell-like flowers. Masses of the white *Selinum tenuifolium* with its attractive lacy umbels made a natural picture with the bright golden yellow flowers of *Senecio diversifolius*.

Each day of the journey through the rich forest was punctuated by three excellent meals from our Sherpa cooks. The food, a mixture of Nepalese and Tibetan, was mostly vegetarian because of the difficulty in obtaining meat. After dinner each evening we pressed herbarium specimens, cleaned seed, and simply enjoyed each other’s company.

Cleaning impatiens seed is quite simple; the seed is separated from the fruit by hand and dropped into dry paper envelopes. But cleaning the seed of other genera can be more difficult. Berries, for instance, must first be squashed. Drying herbarium specimens in these humid conditions was especially difficult. When circumstances allowed, plant material sandwiched between blotting paper was dried overnight in presses over a small paraffin heater. But the large number of collections and the constant damp left us with a surplus of undried specimens that had to be carried for many days before they could be dealt with. Once dried, specimens were packed tightly in polyethylene bags.

Our last camp on the high ridge of the Buje Danda left us somewhat unprepared for the 7,000-foot, one-day descent into the Tamur Valley and the town of Dobhan. This fourth day of our trek was gruelingly hot, and we suffered from a general lack of fitness as we stumbled down the hillside. We dropped out of the forest through some badly burnt areas, into the more cultivated land at a lower altitude. The cause of the fire was not readily apparent, but as we approached more “civilized” areas, there was a pronounced increase in damage to the forest caused by the collection of firewood. Growing next to this path we found the very rare *Impatiens insigna*, a species with pink to purple flowers and a well-developed spur similar to the Himalayan balsam, and some large colonies of



Left: One of many suspension bridges crossed by the trekking party.
Top: Their campsite at Yamphudin.
Above: Saxifraga diversifolia and a Cyananthus.



In "The Botanist in Sikkim," a painting by William Taylor, Hooker is seated and his Sirdar, kneeling, takes a *Dendrobium nobile* from a vasculum full of plants.

during the winter, when the houses are buried in snow, and drifts fifteen feet deep are said to be common.

YALUNG DESCENT

The descent from the Yalloon ridge of the Khabili feeders of the Tamur was very steep, and in some places almost precipitous, first through dense woods of silver fir, with *Rhododendron Falconeri* and *Hodgsoni*, then through *Abies Brunonian*, with yew (now covered with red berries) to the region of *Magnolia* and *Rhododendron barbatum* and *arboreum*... A heavy mist clung to the rank luxuriant foliage, tantalising from its obscuring all the view. After so many days of bright sunshine and dry weather, I found this quiet, damp, foggy atmosphere to have a most depressing effect...

ALPINES

The plants gathered near the top of the pass were species of *Compositae*, grass, and *Arenaria*; the most curious was the *Saussurea gossypina*, which forms great clubs of the softest white wool, six inches to a foot high, its flowers and leaves seemingly clothed with the warmest fur that nature can devise.

Reprints of Himalayan Journals by Joseph Dalton Hooker are available from American Botanist, Bookseller, 1103 W. Truitt Avenue, Chillicothe, Illinois, 61523, (309) 274-5254.

the blue *Torenia asiatica*, a genus in which my company has an extensive breeding program.

We welcomed a wash in the tumultuous Tamur River, which runs through a narrow valley with steep sides rising to two or three hundred feet. The slopes are terraced whenever possible for rice cultivation and many of the paddies are very small, perhaps only ten yards by five yards. The intricate network of terraces is amazing, with the levels arranged so water can drain through small channels in trickling rivulets.

On the fifth day, which would again turn hot and sticky, we walked up the Tamur Valley, wading thigh-deep across some streams. Along the sandy banks of the river we saw a tall, large-flowered *Exacum*—a member of the *Gentiana* family—that all agreed would have made a very fine cut flower. (*E. affine*, a small, well-branched species, has been sold for many years as a pot plant in the United States and northern Europe.) In many places the path along the side of the valley was severely altered by landslides and we found ourselves ascending hundreds of feet only to descend by the same distance to avoid one of them. Some of the paths were precipitously narrow with almost sheer drops; this was somewhat disconcerting when crossing areas where the soil was still unstable. Further on we found the handsome *Impatiens florifera*, whose flower varies from a pinkish purple to a rich reddish purple.

On our sixth day we stopped in the Tamur Valley to dry herbarium material and to rest. The porters, too, were having a difficult time. We were exhausted from merely walking; they had to carry an additional fifty or sixty pounds on their backs.

The rain continued off and on as we squelched our way towards the junction of the Ghunsa Khola with the Tamur. We passed over a number of precarious suspension bridges, one of which the local residents, always short of wood, had tried to repair by placing stones over the rotten planks.

The walk up the Ghunsa Khola started in misty rain. Tormenting leeches increased into plague proportions on the ninth day as we neared the settlement of Amjilassa. Out of Amjilassa, however, the leeches became fewer and we saw some new *Impatiens* species including *I. thompsonii* and the enormous *I. sulcata*, which was over six feet tall. Also of interest were some beautiful *Allium wallichii*, a *Notholirion* with pale purplish flowers, and the late-flowering purplish blue *Primula capitata*.

Two days later we reached the small town of Ghunsa where the local police were surprised to see us, as we had entered a restricted trekking area. Fortunately our liaison officer Dr. Mahendra Subedi was able to resolve the problem, which apparently stemmed from poor communication between Kathmandu and Ghunsa. We had climbed to a height of about 11,000 feet and had seen our first Himalayan poppy, the yellow *Meconopsis paniculata*. We were at last approaching the alpine regions and encountering problems associated with hiking at over 12,000 feet. Breathing was becoming more difficult and we had to gulp huge volumes of air every few steps.

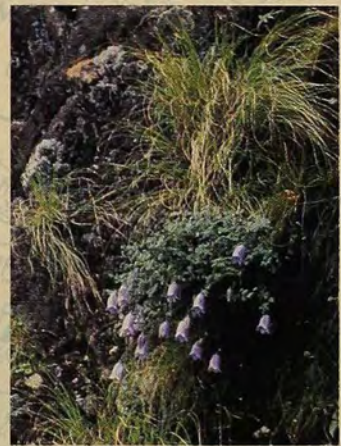
The banks of the Ghunsa Khola are wooded with the noble *Larix griffithii*, the east Himalayan larch, a small pyramidal tree with beautiful pale green foliage. Its range is limited to this area, and the few remaining stands are under government protection. The sides of the valley can be very steep and small streams topple in cataracts from the high cliffs.

Climbing toward the beautiful little village of Kambachen at 13,500 feet, we were delighted to see our first *Gentiana*, the bicolor *G. depressa* and the exquisite *G. ornata*. After traversing a large but ostensibly safe scree, we were greeted with masses of *Cyananthus*, *Gentiana*, *Pedicularis*, and *Parnassia*, and were treated to the unusual sight of tiny *Rhododendron lepidotum* flowering in September. This little rhododendron is used in a number of breeding programs to produce dwarf cultivars for the garden.

The following day, two weeks into the trek, we made the final ascent to our highest campsite at Lhonak, about 15,000 feet. The walk took us past the massive moraines of the Ramtang and Kanchenjunga glaciers, both of which are so majestic as to defy description. Beautiful alpine plants were everywhere: the spiny, vivid blue *Meconopsis horridula*, *M. discigera*, and some wonderful brown and yellow *Saxifraga diversifolia*.

After two nights at Lhonak we had to return to Ghunsa via Kambachen, where many of us took the opportunity to wash in a clear mountain stream. Apparently the locals do not bathe and they must have thought it strange to see us half naked in the ice cold water.

Seventeen days after starting from Hille we arrived in Ghunsa to learn that one of the nine porters who had been sent ahead with supplies had died, *Continued on page 40*



Left: A Tibetan woman among the porters at Ghunsa, where one of them died during the trek.

Top: An orchid, Spathoglottis ixioindex, found on the Buje Danda ridge at 8,000 feet.

Above: Codonopsis dicentrifolia, a Campanula relative.





THE MORAGNE *Plumerias*

Forty years ago, a dedicated amateur made the first controlled crosses of these fragrant tropicals.

BY RICHARD A. CRILEY AND JIM LITTLE

Plumerias, which are native to the semideciduous forests of southern Mexico and south into Panama, were described as early as 1522 in the *Badianus Manuscripts* by Francisco de Mendoza, a Spanish priest who was one of the first explorers of the region. According to this collection of Aztec lore, the Indians used the plants for medicinal purposes that ranged from poultices to emetics. Soon the hardy shrub with beautiful fragrant flowers was a favorite of the Spanish, who planted it around their churches, monasteries, and cemeteries, and took it with them as they explored the world.

The plumeria has also acquired religious significance in India, where it is known as the temple tree or pagoda tree. There, Buddhists and Moslems regard the tree as a symbol of immortality because of its capacity to produce flowers from stems severed from the parent tree. Hindus use the flower as a votive offering to the gods.

The flower's botanical name honors the seventeenth-century French botanist, Charles Plumier. Some horticultural historians say that the common name, frangipani, was derived from the French word, *frangipanier*, meaning coagulated milk, which its sticky white latex resembles. Others believe it honors a twelfth-century Italian who compounded a perfume similar to that of these tropical flowers that were discovered some four centuries later.

Because *Plumeria* flowers and leaves come in so many forms, taxonomists once held that there could be forty-five or more species. Of course, these variations are not enough to justify naming a separate species. The

'Jean Moragne Jr.'

PHOTOS BY RICHARD A. CRILEY



Top, from left to right: Blooms of the Moragne hybrid parents, 'Scott Pratt' and 'Daisy Wilcox', and the plant now registered as 'Grove Farm'. Center: 'Cindy Moragne'. Right: 'Jean Moragne Sr.'



"lumpers" of the taxonomic trade—as well as *Hortus Third*—now say there are perhaps only seven or eight species, and that most of those in the popular books on tropical flowers are really only variations of *Plumeria rubra*. "Splitters" among taxonomists still dissect out some other species, as do floras of Mexico and other Central American countries.

The first plumeria was introduced into Hawaii in 1860. It was a yellow brought in by Wilhelm Hillebrand, a German physician and botanist who lived in Hawaii from 1851 to 1871. The first red is thought to have arrived from Mexico around the turn of the century, either via a Mrs. Paul Neumann, wife of a consul stationed in Honolulu, or a Mr. Gifford, landscaper for the Royal Hawaiian Hotel. The white 'Singapore' plumeria was brought to Hawaii in 1931 by Harold Lyon, director of a sugar cane research station, from a large collection established in 1913 at the Singapore Botanical Gardens.

Since then, natural hybridization has given rise to many variations in form and scent, making them popular among collectors, who in 1979 established their own admiration society for this plant, the Plumeria Society of America.

But as late as 1950, there were no records of any controlled crosses between plumerias. In that year, William M. Moragne Sr. became manager of Grove Farm Plantation on Kauai, which specialized in sugar cane, pineapple, and cattle. Moragne (pronounced "Mor-AY-nee"), who was born in Hilo, Hawaii, in 1905 and graduated from the University of Hawaii with a major in civil engineering and sugar technology, was an avid lover of plants and had always wanted to experiment with cross-pollinating plumerias. But because there were no books to tell him how to proceed, he had to learn on his own.

The plumeria's pistil—the stigma, style, and ovary that are the female reproductive parts—is located at the bottom of a very deep trumpet, and efforts to tear away the petals to reach the pistil produced a torrent of sticky white latex. So Moragne snipped off the petals at the tube and allowed them to "bleed" to get rid of the latex. The pollen of the mother flower was carefully scraped away before introducing the pollen of the male parent. But after three years of effort, he failed to produce a single seed pod.

Then in 1953, reflecting on the fact that the flowers were deep throated, Moragne realized that they would have to be pol-

linated naturally by little bugs crawling down into the throat and climbing around the pistil. In doing so, they would leave some pollen grains under the pistil, as well as on top. Perhaps, he reasoned, he should also place pollen under the pistil. He carefully transferred pollen to the sides and base of the pistils of four blossoms through an incision cut into the side of the flower tubes. His pollinations were carried out in the morning on newly opened flowers. After the pollen was transferred, he covered the pollinated area with plastic tape to prevent uncontrolled pollen from being carried in by insects.

Several weeks later, he realized that seed pods were beginning to swell the base of the flowers he had cross-pollinated. From those seeds he obtained 283 seedlings. The thirty-five he kept produced small trees with large, brilliant, fragrant blossoms, some of which bloom for six to eight months. Moragne at first numbered the seedlings as they came into bloom—some took five years to bloom, others as long as eighteen—but then began to select the largest flowers among the more brightly colored ones to name for the women of his family.

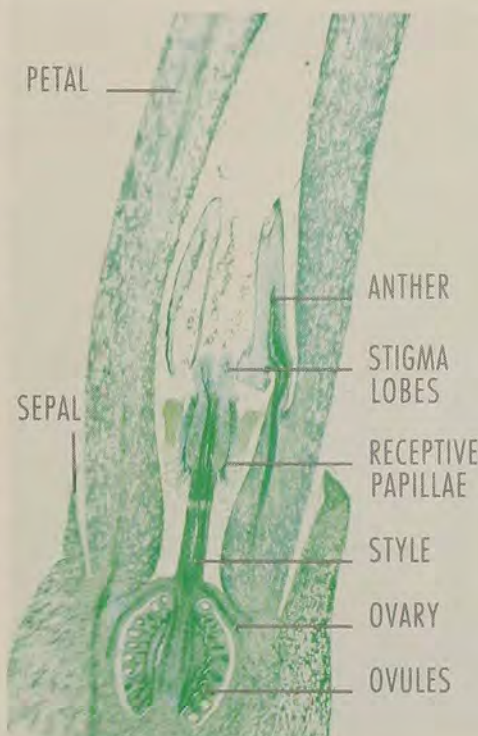
Only three of his eleven named hybrids—'Jean Moragne Jr.', named for a daughter-in-law, and 'Edi Cooke' and 'Julie Cooke', named for two of his granddaughters—have been registered with the Plumeria Society of America, which came into existence just four years before his death in 1983. In the 1980s, a renewed interest in plumeria led to great demand for cuttings of his hybrids at botanical garden plant sales. But as with many vegetatively propagated plants, cuttings had found their way into many gardens in Hawaii and abroad, sometimes with a name change along the way.

Now, more than forty years after he developed his series of hybrids, there is confusion about the parentage of these historic crosses. According to the *Register of Plumeria Culture*, the male parent is 'Scott Pratt' and the female parent is called 'Daisy Wilcox'. But in a 1974 newspaper article, Moragne was quoted as saying his hybrids were a cross between 'Grove Farm' and an otherwise unknown 'Koloa Red'. In trying to update the *Register* for the society in 1988, John P. Oliver asked for help in finding out which was right.

Although Moragne reportedly kept records relating to his breeding breakthrough, none can be located today. The



COURTESY OF MARY MORAGNE COOKE



Above: William M. Moragne Sr. Left: A cross section of a plumeria flower shows the location of its stigma, style, and ovary at the bottom of a deep trumpet, a position which makes the plant a challenging one to cross-pollinate.

S. LEKAWATANA

PLUMERIA CULTURE

While the Moragne hybrids are limited in availability outside of Hawaii, seeds and cuttings of many other plumerias can be obtained through various mail-order catalogs and botanical gardens. Visitors to Hawaii often carry home cuttings of plumeria to remind them of their tropical vacations. The University of Hawaii receives many inquiries about caring for these plants when they are taken to more northern climes.

It is important to remember that wild plumerias were found in hot, dry areas, often in poor soil, and on rocky limestone cliffs. While they respond readily to water and fertilizer, an overabundance of either tends to cause leggy growth with few flower clusters. Another problem with overwatering is loss of roots due to lack of air in the growing medium. For container culture, a well-drained medium is very important, and water should be applied only when the soil seems dry.

Plumeria growers in Hawaii often feed them year-round with a 10-30-10 fertilizer, believing that the extra phosphorus helps promote flower productivity. Recent research by horticulturists at the university has suggested that there is some validity to this practice, as trees fed with higher analysis phosphorus fertilizer had more growing points and slightly more flower clusters than trees given 10-10-10 or 10-20-10 fertilizer. Their rates of feeding were from one to four pounds of fertilizer per tree per year, based on tree size, and four applications (roughly a quarter pound of fertilizer per inch of trunk diameter up to four inches, spread under the drip line).

In northern areas with short growing seasons, the most important feedings will be the early and late ones. The spring feeding will help to develop the flower clusters and vegetative growth, while the late summer feeding, which should be low in nitrogen, will aid in setting the flower buds for the next year. Both organic and inorganic fertilizers are satisfactory.

In their native habitat, plumerias probably shed their leaves during a long dry spell, releafing when there is sufficient water. Regular and frequent deep irrigations promote long shoots. Thus, container culture is a balancing act between the grower's goal of a perfect leafy, floriferous plant and the plumeria's tendency to keep growing or to shed leaves and go dormant.

For good flowering, light and temperature are probably more important than water. The trees flourish in full sunlight, and set few buds when shaded by taller trees or buildings. Very little growth or flowering occurs once the temperatures drop into the sixties and lower. Leaf retention, on the other hand, is more a matter of day length than temperature; growth decreases, too, as the days become shorter.

Plumeria fanciers in cold climates simply allow their plants to defoliate and go dormant in the fall. Then they bring them indoors, either bare-rooted or still in pots, and store them in a protected place—a garage, basement, or attic—where they won't freeze. In March or April, they repot them if needed and once the danger of frost is past, they set the plants out to enjoy an early bloom. Growth and flowering are rapid with the return of temperatures to the seventies and eighties in spring and summer. They will grow and flower happily throughout the warm summer and fall months.

Those who want to attempt William Moragne's method of cross-fertilizing plumeria (see main story) will know within a month if they have a "take"; swellings should appear in two lobes at the base of the flower. The seed pods require six to nine months to mature, and eleven months to split open naturally.

Good seed is plump and firm when squeezed lightly. Each has a little papery wing that enables seed dispersal by wind. If dried slightly and stored in dry conditions, they may remain viable up to a year, but it is best to sow them immediately for a high germination percentage.

Seeds should be sown shallowly or stuck into the medium with the wing protruding. They should germinate in two to three weeks. Seedlings can be transplanted as soon as their stems have thickened and true leaves appear. Plumeria fanciers have observed flowering within a year, but more often it takes two to five years. For the last of his hybrid seedlings to bloom, William Moragne waited eighteen years.

answers had to be found by talking to his daughters, Mary Moragne Cooke, Sally Moragne Mist, and Katie Moragne Bartness, and a long-time plantsman on Kauai, Howard Yamamoto.

Among the plumerias in Moragne's garden near Lihue, Kauai, was the cutting of a chance seedling originally collected from Lawaii Kai on the southern side of Kauai by plumeria enthusiast Alexander McBryde. The cutting was planted there when the plantation was still being managed by a couple named Ralph and Daisy Wilcox. Daisy Wilcox demurred at the suggestion that the flower be named for her, and Moragne—whether bowing to her wishes or simply because he preferred place names, called it 'Grove Farm'. Nevertheless, the name 'Daisy Wilcox' stuck among plumeria growers on the island, and 'Daisy Wilcox' it became officially when plumerias began to be registered many years later. 'Daisy Wilcox', a large, white-flowered plumeria with a pink stripe on the underside of the petals, bears little resemblance to a plumeria now registered as 'Grove Farm', a grainy pink one also found on Kauai. The large flower and tree size of most of the named selections, coupled with a letter written by Moragne in 1973, leave no doubt that the 'Grove Farm' plant he used was the large-flowered one.

Records relating to the male parent are even more conflicting. The only place the name 'Kohala Red' appears is in the 1974 newspaper interview. It may have been a reporting or typographical error; no one knows. In a 1975 account, Mary Moragne Cooke related that 'Grove Farm' was crossed with 'Kohala Red'; more recently, she discovered a slide dated 1955 that identifies the hybrid her father named after her as a cross of 'Kohala' on 'Grove Farm'.

There is little question that 'Kohala Red' is a synonym for a dark red plumeria eventually registered as 'Scott Pratt'. Pratt was the farm manager of the Kohala Sugar Plantations on the island of Hawaii. Once again, Moragne preferred the place name.

Cuttings from the series provided by Moragne to University of Hawaii plumeria breeder Ted Chinn in 1967 carried the notation in the accession book: 'Kohala' on 'Grove Farm' or 'Scott Pratt' on 'Daisy Wilcox'. Both are right, given the synonymous names for the red and the confusion over the large white. But due to the registration of plumeria names and descriptions with the Plumeria Society of America, 'Scott Pratt' must be listed as the

male parent and 'Daisy Wilcox' as the female parent for the Moragne series. (This is an unrecorded marriage in the history of Hawaii's long-time or *kama'aina* families, which may well support Moragne's preference for place names.)

None of the surviving selections have the small flowers or dark red color of 'Scott Pratt'. The strong yellows in some of them are not seen in either of the parents, but this isn't surprising given that Moragne selected for large size and colorful petals.

More than twenty years after the crosses were made, recollections are also vague about how many flowers Moragne actually attempted to pollinate. It is well documented that he harvested seed from the pods of four flowers and from them produced 283 seedlings, naming his favorites for his wife, "Jean Sr."; daughters Mary, Sally, and Katie; daughter-in-law "Jean Jr."; and granddaughters Cindy, Kimi, Julie, Edi, Cathy, and Kelly.

He planted fifteen around his home, and set out nine other hybrids and the rest of his breeding collection along the Nawiliwili highway that once led into Grove Farm, near the present-day Ulu Ko subdivision. The plants are not identified—Moragne removed the tags before planting them—but are still much admired, so much that many cuttings have been poached over the years.

When asked why he had not continued his pollination work, Moragne responded that with 400 potted orchids and a gardenful of heliconias and gingers, he didn't have time or space for another 283 plumerias. He had selected the best and that was enough.

Today, a few of the best of the Moragne hybrids are used for leis or worn pinned in the hair or wired as nosegays. From their 'Daisy Wilcox' parentage, some—primarily the numbered ones—inherited a rangy growth habit, but others are more compact and suited to landscape use.

Moragne gave cuttings to Foster Garden, the University of Hawaii, and the Pacific Tropical Botanical Garden. Shortly before his death, he gave cuttings to Jim Little, a photographer and university instructor and amateur botanist whom he also taught how to hand-pollinate plumerias. Little and a few other plumeria hobbyists have kept Moragne's legacy alive.

His hybrids represent a rare ability to choose only the best from a seedling population. It has been a long time since those initial, individual plants were chosen,



Left: 'Kimi Moragne'. Below: 'Sally Moragne'.



and their distribution has been limited by the isolation of the source and the lack of awareness among individual nurserymen of the uniqueness of these plants. It is time that these brilliantly colored, fragrant trees receive the recognition they deserve through more widespread propagation and use in tropical and protected, subtropical landscapes.

Dr. Richard A. Criley is professor of horticulture at the University of Hawaii at Manoa. His work on plumerias has been supported in part by the Plumeria Society of America. Jim Little is an instructor of photography at Leeward Community College and runs a small nursery near Haleiwa on Oahu.

SOURCES & RESOURCES

Jim Little Nursery, 59-657 Alapio Road, Haleiwa, HI 96712.

The Plumeria People, 1846 Eagle Falls, Houston, TX 77077.

The Plumeria Society of America, P.O. Box 22791, Houston, TX 77227-2791, (713) 780-8326.

The Exotic Plumeria (Frangipani), by E. H. Thornton and S. H. Thornton, 1985. Available through Plumeria Specialties, P.O. Box 431132, Houston, TX 77243. \$12 plus \$1 handling.

The Handbook on Plumeria Culture, by R. Eggenberger and M. H. Eggenberger, 1988. Available through the Plumeria People (see above).

THE EAGLE THE DOVE

*The columbine's
ethereal grace
makes it seem more
bird than flower.*

BY ELISABETH SHELDON

When I was about ten years old I wanted a gift to take to a teacher I loved. My mother generously ravaged her garden of several dozen long-stemmed, long-spurred columbines in shades of sky blue, mauve, pale pink, light yellow, and white. As she lifted them to lay them in the box she said: “Look at them—they’re more beautiful than orchids!” So for the first time, I really looked at them. She was right. Above their scalloped, slightly gray green foliage, they hung like butterflies, like dragonflies, hummingbirds. They

‘McKana’ hybrid columbines.





Top: The widely available 'McKana' hybrids appear in a wide range of pastel shades.

Bottom: Aquilegia chrysantha, a native of New Mexico and Arizona, is hardy to Zone 2.

Opposite: A. flabellata has blue gray fan-shaped leaves and chunky blossoms.

flew, they floated. They were delicate, almost ethereal, with their translucent petals, their long slender spurs, their pale lovely colors, their fragility. They seemed to be barely attached to their stems, barely earthbound. No wonder they were named "aquilegia" for the eagle and "columbine" for the dove.

No doubt my mother's columbines were 'Mrs. Scott-Elliott' hybrids, which as I recall, came only in pastel colors. That strain seems to have been replaced by 'McKana' hybrids and new ones of more intense color: 'Red Star', in bright red and white; 'Spring Song' ("extra large flowers . . . in bold colors"); and 'Music', of medium height and striking combinations of color. Of the newer hybrids I have had only the widely available 'McKana' in my garden—bicolors they are, in many combinations, and very beautiful, especially one that joins a deep plum color with smoky lavender.

Aquilegia is of the buttercup family, Ranunculaceae. There are about seventy species, most of them from mountainous regions in the Northern Hemisphere. For years I have had groups of *A. chrysantha*, a three- to four-foot native of New Mexico and Arizona. One expert gardener calls it gawky and says it should be grown among shrubs, but Graham Stuart Thomas and I think it elegant. It's pale yellow and not only a long bloomer (through all of May and June until the heat of July knocks it out) but also long lived, for a columbine. I must have had the same plants for six or eight years.

I wish the Colorado columbine, *A. caerulea*, were half so sturdy. I nourish myself with its beauty while it lasts; a summer or two of its creamy white petals and gray lavender blue sepals is all I get, then I must start again. No doubt it misses the cool, dry mountain air. Both *A. chrysantha* and *A. caerulea* have been used to breed many of the tall columbine hybrids.

Another yellow native that has contributed to the modern hybrids is *A. longissima*, a three-foot plant from Texas and Mexico. Its spurs are from three and a half to six inches long, making it attractive to breeders. I've been wondering whether the big yellow *Aquilegia* sold, both as seeds and plants, under the ill-chosen name of 'Maxi-Star' is not a cultivar but really *A. longissima*? I cannot now find the old catalog in which I read that 'Maxi-Star' is a native of Texas. It's a splendid subject, flashier than the yellow *A. chrysantha*, but

neither so long-blooming nor so long-lived.

Hybridizers also have used *A. formosa*, which is from the Northwest. Its petals are yellow and its spurs and sepals coral to bright red. It must be somewhat similar to *A. canadensis*, the wild columbine we're familiar with in the Northeast, except that ours is smaller and daintier, with more slender blossoms. *A. canadensis* loves rocks, often hanging from cliffs in the gorges hereabouts, but I have a friend with a paved court into which this plant has moved and seeded itself in all the available interstices. It's a pretty sight in spring, and later too, as the foliage remains dark and thrifty-looking all summer, unlike that of the big border columbines.

A. 'Snow Queen' vies with *A. chrysantha* in both length of blooming time and in longevity. I no longer have it in my border but I did for many years and vow to start it again. It's tall and pure white with medium long spurs, obviously developed in Germany since its alternate name is 'Schneeköningen'. I've also grown 'Mrs. Nicholls', a clear, deep blue strain, no doubt derived from *A. caerulea*. It seems to have disappeared from seed lists along with 'Mrs. Scott-Elliott'.

The British are very sentimental about what they call granny's bonnets, *A. vulgaris*, a vigorous three-foot native of the Welsh valleys and most of continental Europe. The purple or pink flowers on this species look dumpy compared with the ones I've been describing, being wide of girth and short of spur. Nevertheless, since some have come up in my woods garden I, like the British, have found it hard to pull them out; there's something appealing about them. If I don't harden my heart, they'll crowd out plants that I like better, since they're determined self-seeders. There's one *A. vulgaris* I'd like to get hold of—*A. vulgaris* var. *nivea*, which is also sometimes called 'Munstead White'. It's said, in a race of glaucous-foliaged plants, to have the grayest leaves of all, with pale stems and buds and pure white flowers. Of course, I think if Gertrude Jekyll liked it I would like it. (But it's not necessarily so; I dislike her beloved yuccas, for example, except in a semitropical setting).

Long ago *A. vulgaris* was crossed with *A. alpina*, a ten-inch blue or blue and white plant from Switzerland, producing the 'Hensol Harebell', another cottage garden favorite. This one is usually deep Wedgwood blue, but sometimes blue and white and even plum, pink, lilac, or white, on



account of its granny's bonnet blood. It has handsome dark foliage and seeds itself about generously, filling in bare spots, especially those that are rocky.

Among the new columbine hybrids are some that perhaps weren't worth the effort. I haven't seen the ten-inch 'Biedermeyer' dwarfs in bloom but some discerning critics have called them ungraceful and stumpy. Certainly, from the pictures, the new fifteen-inch 'Fairylend' deserves Thomas's comment that they're an "abomination." He says they have lost all beauty of floral shape. I've been fretting about *A. 'Nora Barlow'* since I first saw it advertised; the flowers have been doubled to the point where they look nothing like *Aquilegia* but something like thistles or *Astrantia*. If they were *Astrantia* I might like them. My antipathy is partly outrage that anyone would commit such violence on a flower with such a uniquely lovely form.

Some of the *Aquilegia* species are natural dwarfs much cherished by rock gardeners. Most of them actually seem to be more yearned over than cherished, as they are extremely difficult to console when deprived of their perches on screes, crags, or stone deposits near icy streams. Many a rock gardener has nearly broken his or her heart trying to compensate a tiny individual from the American West, called *A. jonesii*, for such a lack. It is described, almost tearfully, in rock garden books, as having a one- to three-inch spread of downy silver foliage and one small, rich deep blue flower on each two-inch stem—when it has flowers.

Lincoln Foster, long-time president of the American Rock Garden Society, says that not only do most alpine columbines take two years to germinate, but, when raised in a rock garden, they either "grow fat and wheezy, short-lived and pale, or they intermarry with the undistinguished to gain longevity and awkwardness." Furthermore, it's difficult to find seed that is really that of the alpine offered, unless it was gathered in the wild, the persistent sin of columbines being their willingness, even eagerness, to breed with any other columbine of whatever species happens to be growing nearby.

Some of the alpine species are less demanding than others and are certainly worth a try. From the Altai Mountains in central Asia there is eight- to ten-inch *A. glandulosa*, which, if pleased with a sunny, sheltered, humusy spot, will celebrate with large bright oxford blue and white flowers.

MICHAEL S. THOMPSON



Above: The European *A. alpina* has short curved spurs.

Right: The British are fond of *A. vulgaris*, or granny's bonnets.



There's a white variety of this, *A. glandulosa* var. *jucunda*, which *Hortus Third* calls simply *A. jucunda* and which the *Royal Horticultural Society Dictionary of Gardening* says is almost sure to come true from seed.

There are two from the Rocky Mountains in Utah, *A. saximontana* and *A. scopulorum*. *A. saximontana* is a little gem with gray, twice-divided leaves, crinkly, bluish foliage, and pale blue and white nodding flowers on four-inch stems. It wants coarse limestone soil in sun or light shade. The Pennsylvania nurseryman Walter Kolaga said—somewhat bitterly—in his 1966 *All About Rock Gardens and Plants* that it's not easy to grow but easier than *A. jonesii*. *A. scopulorum* has three-lobed glaucous leaves growing in tufts and carries pale blue flowers with long slender spurs. It wants coarse limestone, like *A.*

saximontana, but full sun.

It is apparently not impossible to harbor the ten-inch *A. alpina*, which is also blue and white but has short curved spurs. There's a slightly larger cultivar of this, *A. alpina* 'Superba'. One from France and Italy, called *A. bertolonii*, is about a foot tall when flowering, its two-inch rich purple, short-spurred blossoms rising over a tuft of grayish foliage. Kolaga cheerfully calls this one "a dandy."

I once bought seed for *A. pyrenaica* but am not sure that's what I received, for it wasn't particularly pretty and Foster says that in its true form it is one of the most beautiful columbines, with deep blue, short-spurred flowers on six-inch stems above dark green foliage.

Lots of us raise the Japanese *A. flabellata* of the thick, creamy blue gray fan-shaped



leaves. Its chunky blossoms have purple-blue sepals and spurs and white petals, the colors and shapes combining perfectly. For a while *A. flabellata* 'Nana Alba' grew here. It's a shorter one with lovely, pure icy white flowers. *A. flabellata* var. *pumila* is the same as one sometimes listed as *A. akitensis*, a six-inch version of the ten-inch *A. flabellata*.

I grow a Chinese plant with the amusing name of *Semiaquilegia ecalcarata*, which I now find goes around sometimes as plain *A. ecalcarata*. It's a dear thing with miniature brownish purple or wine dregs-colored, spurless columbine flowers above lacy darkish columbine foliage. Mine are usually eight to ten inches or less but the books say they can attain twelve inches. I haven't yet tried another murky one, the twelve-inch *A. viridiflora*, which has green

and brown flowers.

Considering columbines as a whole, you might ask yourself if they are worth growing. Their shortcomings are many. They interbreed, they are subject to crown rot, and are quite short-lived. The border varieties care nothing for their appearance after they've finished their show for the year and allow all their outer leaves to turn yellow. Unless steps are taken to prevent it, their green leaves are defaced by leaf-miners and, in my garden the last few years, they've become the favorite food of armies of small green sawfly worms (*Pristiphora aquilegiae*) that cleverly creep under the leaves where they can't be seen and chew them to the bone overnight. (I am told *Bacillus thuringiensis* will take care of them, but when I remember to sprinkle granules of a systemic insecticide-fertilizer

around them every few weeks I have no trouble with either miners or worms.) Columbines don't like to be moved, can't be divided nor reproduced readily from cuttings, and, while they come up enthusiastically from seed they have sown themselves, they take the devil's own time to germinate from seed planted in a flat, even when it is done properly, just pressing the seed into the surface and not covering it.

As to virtues—ah well, the virtues far outweigh all the faults. Yes, they are short-lived, but better a short life and a good one than a long dull haul. Better a brief dancing columbine than a permanent stodgy pulmonaria, say, or an old faithful but boring hosta. As to their interbreeding, it should be possible to keep separate species far apart, if one's garden is large enough.

To nonpurists like myself, their proclivity for promiscuity has an advantage I appreciate—producing surprises every spring in the form of color combinations I've never seen before. I had a group of the red and yellow *A. canadensis* in my woods garden, far enough away, I thought, from a few 'McKana' hybrids introduced later. But no—they all mingled merrily, probably adding a few genes from some dark blue *A. vulgaris* in another corner, until now there is a columbine festival every spring at that end of the garden. Columbines in pink and white, blue and white, dark solid red, pale yellow and blue, wonderful peach colors and apricot, even a semidouble pure blue. All of this with no trouble on my part. Could one ask for anything more?

Elisabeth Sheldon is the author of A Proper Garden.

SOURCES & RESOURCES

Elisabeth Sheldon advises against buying columbine plants by mail-order, since they hate being moved and, because of their fragile nature, tend to arrive somewhat mutilated. For seed, try the following catalogs and seed exchanges:

American Rock Garden Society, 15 Fairmead Road, Darien, CT 06820.

Hardy Plant Society, The Manor House, Walton-in-Gordano, Clevedon, Avon, England BS21-7AN.

Park Seed Company, Cokesbury Road, Greenwood, SC 29647-0001.

Royal Horticultural Society, 80 Vincent Square, London, England SW1P 2PE.

Thompson & Morgan, P.O. Box 1308, Jackson, NJ 08527.

It is an indelible quirk of human nature to desire what we can't have. Why else would prohibitions against coveting figure so prominently in the Ten Commandments? Azalea lovers in cold climates seem especially prone to lust for the unattainable. They desire azaleas' showy flowers, but are thwarted by winters that blast the buds or even kill plants altogether.

The longing for winter-hardy azaleas isn't new. Efforts to hybridize attractive, cold-tolerant azaleas began in the 1920s with the pioneering work of the late Joseph Gable. He was followed by other hybridizers, now also deceased, whose names are legendary among azalea breeders and collectors: United States Department of Agriculture (USDA) horticulturist Ben Morrison, who developed Glenn Dale hybrids (named for the Maryland home of the department's Plant Introduction Station); Robert Gartrell, who created Robin Hill and Gartrell hybrids; Edmund Mezitt of Weston Nurseries in Massachusetts; Geneva, Ohio's, Peter Girard Sr.; Orlando Pride of Buller, Pennsylvania; and Tony Shammarello of Euclid, Ohio.

Thanks to these and other breeders, hundreds of evergreen azaleas are available for gardeners as far north as USDA Zone 6b. Azaleaphiles into Zone 4 can grow any number of deciduous hybrids.

But what about the unfortunates beyond these areas who crave this subgenus of *Rhododendron*? Hope is not lost, for hybridizers are still trying to push the boundaries of azalea territory northward.

The breeding program that has introduced some of the hardest new deciduous azaleas, the Northern Lights hybrids, is run by the University of Minnesota. The earliest releases were controlled F₁ hybrids; that is, the seed-grown offspring of deliberately crossed parents. The mature plants are about seven feet tall, with fragrant flowers of different shades of pink. However, the inherent genetic variability of F₁s causes minor differences in plant form, size, and flower color.

These early crosses are still available through nurseries, but they have been joined by cloned cultivars—sexually propagated plants that are consistent in color and form. 'Pink Lights', 'Rosy Lights', 'White Lights', and salmon-colored 'Spicy Lights' grow to about seven feet high. Purple 'Orchid Lights' and mildew-resistant 'Golden Lights' remain a

The Quest for COLD-HARDIER AZALEAS

Breeders have developed evergreen azaleas that can withstand temperatures of at least 15 below and deciduous shrubs hardy to minus 35.

How low can they go?

B Y E R I N H Y N E S

compact four feet.

'White Lights', 'Spicy Lights', and 'Golden Lights' are bud hardy to about 30 to 35 degrees below zero when dormant, suitable for northern Zone 4 and southern Zone 3. The dormant buds of the others, including the F₁s, can take the 45 below of southern Zone 2.

A new Northern Lights hybrid is due on the market in about two years. As yet unnamed, the introduction has bright yellow upper petals and creamy lower petals, giving a pale yellow effect overall.

A new group of hardy evergreen azaleas was developed by the late Dr. Henry Schroeder (pronounced Shrayder), an amateur hybridizer in southern Indiana. Schroeder died before his hybrids reached the market, but his sons Stephen and David selected and registered the thirty-eight hardest cultivars and sell them through their

nursery, Holly Hills.

Bud hardiness is listed at 15 below zero, although Stephen Schroeder reports that his mature plants flowered after last winter's 20 below. Most plants are compact, reaching about five feet high in as many years, although some are smaller. Flower colors include white, orange, pink, red, scarlet, and lavender. Two noteworthy cultivars are 'Carrie Amanda', an early bloomer with picotee flowers—white with a rosy outer margin—and 'Doctor Henry Schroeder', with large pink-trussed flowers. 'Doctor Henry Schroeder' is unusually evergreen; the leaves don't take on the purple tinge that many do in winter, and are less likely to drop off by winter's end.

At Weston Nurseries in Hopkinton, Massachusetts, Wayne and Roger Mezitt continue the work of their father, Edmund, who is famous for the 'P.J.M.' rhodo-

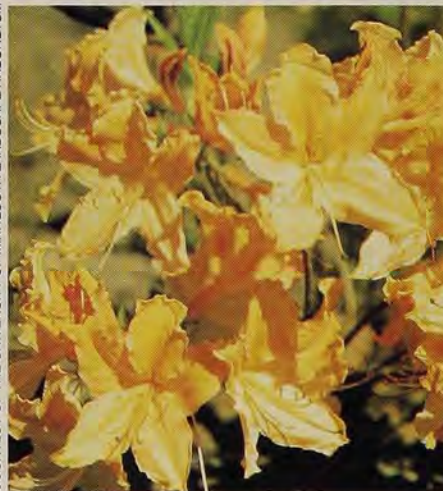


Dr. Henry Schroeder began the azalea breeding that is being continued by sons Stephen and David.

COURTESY OF HOLLY HILLS NURSERY



Above: 'Carlson's
Coral Flameboyant',
which is hardy
to 20 below.
Right: 'Golden Lights'
will withstand
30 to 35 below.
Both are deciduous.



dendron. Wayne Mezitt and head propagator Christopher Rogers make about twenty-five or fifty crosses on azaleas each year. Their 1990 catalog lists the new 'Bixby', a low-growing evergreen azalea with dark red flowers that Rogers says is hardy in Zone 5. 'Bixby' blooms in May and has dark green leaves that turn red in the fall. The Weston catalog also lists older evergreen hybrids for Zone 5: 'Texas Pink', dark rose red 'Vyking', wine red 'Majesty', 'Pink Clusters', 'Pink Discovery', and purple 'Royal Pillow'.

Among Weston's hardiest deciduous azaleas is 'Lemon Drop', which flowers in mid-July with lemon-scented pale yellow blooms. It can take the cold of Zone 3 and is reputed to tolerate summer heat as well.

In Geneva, Ohio, on Lake Erie, Peter Girard Jr., and his daughter, Roberta Forinash, carry on the work of Peter Girard Sr., which began in the 1940s and created a group of hybrids known for their consistent performance. Girard says that most of his nursery's deciduous azaleas are

hardy to at least 30 below, putting them on the border of Zones 3 and 4. "We're coming out with a lot of double, fragrant, sterile azaleas in yellow, pink, red, and two-tone, such as pink and white," Girard says. "Fireflash' will be out next year. It's orange-red, with a yellow throat; it's fiery looking—and one of the few single-flowered new introductions." Girard also plans to introduce new evergreen azaleas that are hardy to at least 10 below.

Azalea fans partial to native plants can turn to Transplant Nursery in Lavonia, Georgia, where Mary Beasley and her family select and hybridize North American deciduous azaleas hardy to Zone 5 and even Zone 4. The torrid Georgia summers prevent the Beasleys from joining their northern counterparts in working with the hardiest North American azalea, *Rhododendron canadense*. It's hardy to Zone 3 but can't handle heat.

Not all hybridizers in search of cold-hardiness are nursery professionals. As Fred Galle writes in his authoritative work,

Azaleas: "Many nurserymen cannot devote time and valuable land to the long-term investment required in breeding and evaluating new cultivars . . . Consequently, dedicated amateur azalea enthusiasts are assuming a larger role in hybridizing."

That role is one requiring great dedication. Azalea hybridizers may grow and observe hundreds of azalea species and cultivars over several years before choosing parents that might give them the hardiness and other traits they want. After crossing the parents, they must wait two or three years for the offspring to flower so they can judge their ornamental qualities in bloom. But to evaluate hardiness, five or six years is the minimum time needed; ten years is more common. In *Azaleas*, Galle recommends taking twenty or thirty years to evaluate a plant, "so that you get enough variation within the weather cycles to get the extremes."

But while amateur hybridizers can advance azalea breeding, the trend toward what some refer to as "back-yard hybridizing" creates a problem for gardeners who yearn to plant cold-hardy azaleas in their yards: How do we get our hands on their new shrubs? "Very few of those plants will be introduced into commerce; certainly not through the wholesalers and probably not even through the specialty nurseries like ours," says Bob Carlson of Carlson's Gardens in South Salem, New York. "They get named, registered, and that's the last that's ever heard of them except for being distributed to a few friends."

Consider the case of 'Pots Silver Pink', alias 'Pots Double Silver Pink', alias 'Pots Pink', with "Potts" as a variation on the spelling of Pots. Thirty years ago, hybridizer Weldon Delp took cuttings of a plant his friend Julian Pots had bred. "It was the most hardy evergreen azalea for that area, sixteen miles north of Pittsburgh," recalls Delp. He gave 'Pots Silver Pink' to, among others, Malcolm Clark.

"It is my belief—that's belief, not knowledge—that 'Pots Silver Pink' is the hardiest evergreen azalea," says Clark, a nurseryman and azalea breeder. "It's hardy to about thirty-five below." Want one for your North Dakota home? Clark sells some from his Chandler Gardens nursery in Southern Pines, North Carolina, which isn't set up for mail order. No one else seems to carry it.

To make the problem worse, even plants from some famous hybridizers can be hard to find. "Some worthwhile older cultivars



have gone out of circulation,” laments August Kehr, a retired USDA geneticist who now breeds double-flowered azaleas in Hendersonville, North Carolina. “Joe Gable and Orlando Pride were the best breeders for hardiness, but their cultivars aren’t readily available.”

Perhaps outstanding cold-hardy hybrids have trouble making it to the retail level because nursery growers have so many ho-hum introductions to sort through. Galle lists about 6,000 cultivars in *Azaleas*; it’s hard to believe all of them are remarkable. “People fall in love with their hybrids and introduce stuff that shouldn’t be introduced,” says Harry Weiskittel of Marshy Point Nursery, a major wholesale grower in Chase, Maryland. “We’re getting too much repetition, rather than ones that are unique.”

Clark of Chandler Gardens concurs. “We have these back-yard breeders who look at their hybrids and say ‘Gee, that’s nice!’—and it is, but we’ve got a ton of other plants that look just like it.” Clark, like many hybridizers, grows a few thousand of other breeders’ cultivars to compare to his new progeny. “If I didn’t have them, I wouldn’t know what to throw away,” he explains. In *Azaleas*, Galle urges hybridizers to be more critical of their creations, naming and registering only those different

from and superior to most other azaleas.

Then there’s the slippery issue of cold hardiness itself. First, although the USDA has neatly divided North America into the hardiness zones shamelessly cited throughout this article, in truth countless microzones exist within each major zone. As Transplant Nursery’s catalog notes, “Many factors such as altitude, degree of exposure to wind, proximity to bodies of water, snow cover, soil types, and the like can create variations of as much as two zones in winter hardiness.”

How can one say a plant (or its buds, depending on which rating is given) is hardy to a certain temperature when so many variables affect hardiness? A plant’s ability to tolerate cold depends not only on its genetic makeup, but also its age, with mature plants being hardier; how well it hardened off before the cold hit—a wet or unusually warm fall, late fertilizing, or early freeze can mean disaster; whether it’s out in the open or protected; whether it’s mulched or covered with snow; and other factors.

“Those that go dormant early are better,” says Weiskittel. “And they need to stay dormant. They can be delicate if they break dormancy early. A plant may be hardy in January but not in April.” Carlson stresses the importance of acclimation. Each of the

Edmund Mezitt of Weston Nurseries and his original ‘P.J.M.’ rhododendron. Sons Wayne and Roger took over his breeding work.

1,800 varieties that he carries winter outdoors, in containers, rather than in the polyhouses common in many nurseries.

A new wrinkle in the controversy about hardiness ratings is lab testing, in which dormant buds are chilled in freeze chambers. The rating is the temperature at which half the buds sustain tissue damage.

Not all hybridizers have faith in the method. Says Weiskittel: “The only real way to know is to grow it in your area for several years.” Carlson adds: “It bothers me as a marketer to see them listed as hardy when the rating really means half the buds will be gone at that temperature. Maybe half the buds is fine. But frankly, if I lost half the buds, I wouldn’t consider it hardy.”

But Weston Nurseries’ Wayne Mezitt and propagator Chris Rogers find the lab results usually agree with their field observations. “The lab tests give us an idea about a plant’s hardiness that we can’t get around here,” Rogers says. Retired USDA geneticist Kehr agrees. “I find nothing wrong with lab testing; it’s more precise than in the field.”

BREEDING FOR COLD TOLERANCE AND MORE

For woody landscape plants, it's a jungle out there. As if it weren't hard enough to endure natural assaults such as temperature extremes, drought, and pest infestations, plants are often expected to survive human-made hazards like pollution, road-salt spray, and soil compaction.

The Center for Development of Hardy Landscape Plants was established a year ago with the goal of developing shrubs and trees that can take the multiple assaults that nature and neglect too often dish out.

Harold Pellett, the University of Minnesota professor of ornamentals breeding and culture who is coordinator of the center, observes that concerns about global warming and its impact on the environment have led to nationwide efforts, notably the American Forestry Association's Global ReLeaf, to plant trees in urban areas to alleviate the greenhouse effect. "Unfortunately," says Pellett, "many trees and shrubs that are planted in landscapes die or perform poorly because they are not sufficiently tolerant to the stresses that they encounter."

The goals of the center are to link institutions and researchers throughout North America so that they can coordinate activities and share knowledge, and to raise funds for expanding existing research projects and establishing new ones.

The center now has almost fifty member institutions—botanical gardens, arboreta, agricultural research stations, and universities. By setting up cooperative research, center members hope to develop plants that are hardy over broader geographical areas than is now the case. For example, second generation interspecific hybrids of *Sorbus* and *Aronia* species from the Minnesota programs will be field planted in various locations in the Great Plains to see if plants already determined to be attractive and cold hardy are also more drought and heat tolerant than currently available mountain ash trees.

However, Pellett observes, a mild or moderate climate is usually best for the first step of the hybridization process, in which a cold-hardy plant may be crossed with a less hardy one having superior aesthetic qualities. The first generation crosses are usually intermediate in hardiness; cold tolerance equal to or greater than the original parent will probably not appear until subsequent generations. This is another reason that new plants must be evaluated in multiple sites.

Pellett notes that many of the participating institutions have individual plants worthy of evaluation for introduction into the trade as cultivars, but they may lack the staff or land to conduct an ongoing breeding program. Center funds may allow them to hire additional researchers.

The center plans to support both applied research—not only breeding and evaluation but exploration for and preservation of germplasm—and basic research into what genetic and physiological traits make plants hardy, and ways to screen plants for those characteristics.

Other trees that are being evaluated are *Cedrus libani* from the Purdue University campus, and interspecific hybrids between *Acer truncatum* and *A. platanoides* and between *A. saccharum* and *A. saccharum* subsp. *grandidentatum* from the Morton Arboretum, some of whose progeny are expected to show greater cold tolerance than Norway maple and greater tolerance to heat and drought than sugar maple.

Other seedlings from the Minnesota program—deciduous azaleas selected for tolerance to different climates and honeysuckle resistant to witches broom aphid—are also being distributed. Minnesota is also working with Oregon State University to cross viburnums, *Aesculus*, and intergeneric crosses of Pomoideae, a subfamily of the rose family.

Researchers from the Agriculture Canada Research Station at Morden, Manitoba, asked other center members for assistance in evaluating four new, winter-hardy roses developed there and said to be disease resistant and hardy to Zone 3, and in one case, 2b.

The center needs volunteers throughout North America to collect seeds of targeted species of woody native plants. To volunteer, send a tax-deductible donation, or obtain more information, contact Harold Pellett, Center for Development of Hardy Landscape Plants, P.O. Box 39, Chanhassen, MN 55317, (612) 443-2460.

Given the limitations of cold-hardiness ratings, what's the next step in the quest for cold-hardy azaleas?

For consumers, it's education. Too many of us are attracted to the dazzling display of azaleas in bloom at Dizzy Don's Discount Palace, then wonder why our bargains don't survive the winter. It's worth the effort to find out which plants are hardy before we buy by calling the county extension agent, looking it up in Galle's book, or perusing the catalog of a grower who specializes in azaleas. Appropriate cultural practices will help encourage hardiness—selecting the planting site carefully, not fertilizing in the fall, and waiting until plants are dormant before mulching.

For hybridizers, a much needed step is exploration. "There are untapped resources in the gene pool," Galle says, noting that the evergreen Japanese species *R. kaempferi*, or torch azalea, commonly used to breed for cold hardiness was collected in southern Japan. "There's been very little collecting in the northern islands of Japan to get gene pools of some of these more cold-hardy forms. That's something that needs to be done if we're going to do further breeding."

John Creech, a retired USDA plant explorer who introduced many species from Japan and China, agrees with Galle. "No major breeders are working with the northern forms," he says. "Most are selecting for variation within what we already have."

Even with an expanded gene pool, further breeding faces some discouraging obstacles. The limited funds available for agricultural research go primarily to food crops; there's little money left for something that makes the yard look nice. In the last few years, breeding programs at the University of Connecticut, North Carolina State University, and the Vineland Research Station in Ontario have been phased out.

Nor does azalea breeding seem to attract as many aficionados as it used to. "We're a dying breed," observes Weldon Delp. "Young breeders can't go into it because of the expense involved. If a hybridizer doesn't have a love for the work and financial support, it's impossible to do."

Jeremy Wells of Wells Nursery in Penrose, North Carolina, who propagates the Windsor hybrids his father James popularized, observes: "Breeding requires a special sense of patience and aptitude. It takes decades. It takes a special personality. My generation doesn't have the time, the

patience, or the aptitude.”

Discouraging, but not hopeless. Some young hybridizers are carrying on—Steve Schroeder of Holly Hills, Jeff Beasley of Transplant Nursery, Christopher Rogers of Weston Nurseries, Harry Weiskittel of Marshy Point Nursery, and Roberta Forinash, of Girard’s Nursery, are breeders in their 30s and 40s.

But perhaps azalea breeding is, as Kehr says, “the kind of a hobby a young person’s not interested in. It’s more enticing as you get older.” In that case, there’s a lot of hope; when the legions of baby boomers reach retirement age, we may see an unprecedented upsurge in azalea hybridizing. Then the newcomers will discover, as has breeder Pete Vines of Vines Horticultural Gardens in Springfield, Virginia, the reason to devote a few decades to the project. “I do it because I want to do something better,” Vines explains. “And it’s exciting in the spring to see 4,000 plants bloom that no one on Earth has ever seen before.”

Erin Hynes is a free-lance writer who recently put cold hardiness worries behind her by moving from Indiana to Austin, Texas.

SOURCES & RESOURCES

Azaleas. Revised and enlarged edition. Fred C. Galle. Timber Press, Portland, Oregon, 1987. 519 pages. AHS member price, hardcover: \$55.25. Order code: TIM033.

Azalea Society of America, P.O. Box 6244, Silver Spring, MD 20906.

Carlson’s Gardens, Box 305, South Salem, NY 10590, (914) 765-5958. Carlson’s hybrids, Gable, Glenn Dale, Robin Hill, Northern Lights, others. Catalog \$2 deductible.

Girard’s Nursery, Box 428, Geneva, OH 44041, (216) 466-2881.

Holly Hills Nursery, 1216 Hillsdale Road, Evansville, IN 47711, (812) 867-3367. Schroeder, Northern Lights, others.

Transplant Nursery, Parkertown Road, Lavonia, GA 30553, (404) 356-8947. Native azaleas, Kehr, Northern Lights, others. Catalog \$2 deductible.

Vines Horticultural Gardens, 8110 Edinburgh, Springfield, VA 22153. Catalog and growing guide \$4.

Weston Nurseries, P.O. Box 186, Hopkinton, MA 01748, (508) 435-3414. Weston hybrids, Robin Hill, Abbott, others. Noted for carrying unusual hybrids.

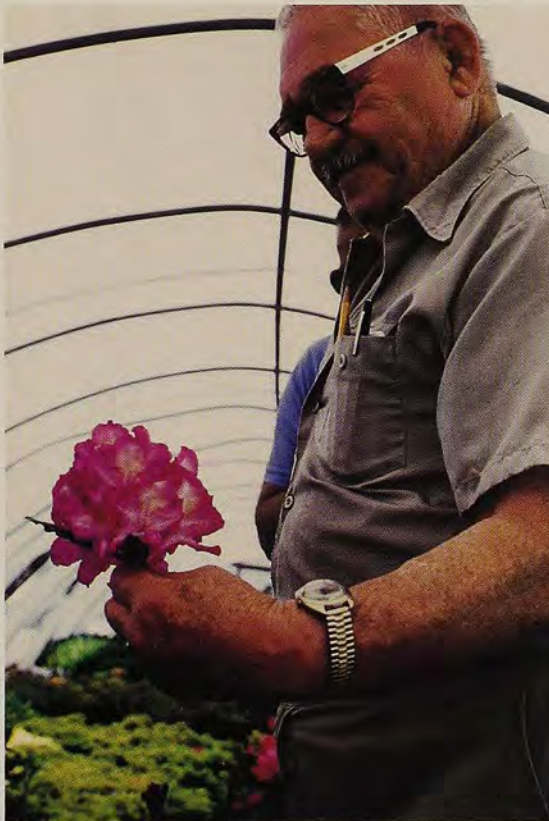
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Above: ‘Carrie Amanda’ is a hardy cultivar from Holly Hills.

Left: ‘White Lights’ is one of a half dozen hardy cultivars from the University of Minnesota.

Below left: Peter Girard Sr. began breeding reliable hardy azaleas in the 1940s. His son, Peter Girard Jr., and granddaughter, Roberta Forinash, carry on his efforts.

HANASHOBU
the
Romantic
Japanese
Iris

The history of Iris ensata is replete with samurai and feudal lords, but Americans have given it a new place in the sun.

BY CLARENCE MAHAN

THE MODERN JAPANESE IRIS comes close to being the perfect garden perennial. If minimal needs are met—sun, acid soil, and water during the growing season—even the least experienced gardeners can amaze friends and neighbors with gorgeous flowers the size of dinner plates. A single specimen can provide an entryway with a hint of the orient.

JOHN COBLE



*'Freckled Geisha' won
the top award of the
Society for Japanese
Iris in 1987.*



Top: 'Dancing Waves' is one of the finest creations of breeder Arlie Payne.
Bottom: Japanese irises are an excellent choice alongside a stream.

Massed in a bed by themselves near a stream or pond, or along some gravel arranged to give the illusion of a stream, they create a landscape evoking the most fabulous gardens of Japan. This wonderful perennial also fits into a mixed border with ease, providing both beautiful flowers and majestic foliage that stays attractive until late autumn.

The forerunner of our modern Japanese iris is a single species, *Iris ensata*, which is native to China, Korea, and Japan. Although various forms of this species were grown and appreciated in these countries for hundreds of years, it was not until the

first half of the nineteenth century that the Japanese iris as we think of it today was developed.

One needs to know a little about the structure of an iris flower to readily appreciate the history of its development. The basic form of the species flower encompasses six segments. The three lower petals, which typically hang down and are botanically the sepals, are called falls. The three upper segments, which in the species are pointed upward and are the true petals, are called standards. We call the species type the "three-fall" or single form. As the Japanese iris developed, varieties evolved in which

the standards enlarged and acted as falls. These have been called the "six-fall" or double form. Subsequently, other forms have evolved with additional petals, so today we have "nine-fall" forms, and even some cultivars with more than nine falls.

It is popularly believed that the Japanese iris, or *hanashobu*, is the flower associated with the iris festival (*Ayame no Sekku*), one of the five major festivals of ancient Japan, celebrated as early as the seventh century A.D. But that distinction belongs to a plant that is not even an iris, *Acorus calamus* var. *angustifolius*, a form of the sweet flag that has a rather undistinguished flower but wonderfully perfumed leaves similar in appearance to iris foliage. For many centuries this plant, known as *shobu* or *ayame*, was used to decorate the eaves of houses on the fifth day of the fifth month. Today the Japanese iris is sometimes used in the same way.

The history of *Iris ensata* cultivation dates back only to the late eighteenth and early nineteenth century, when three distinct forms had their beginnings.

In the early eighteenth century there were a number of large plant nurseries in Horikiri, on the Sumida River six miles from the center of Tokyo, providing cut flowers to the Shogun's capital, then known as Edo. As individual growers introduced wonderfully improved varieties of *I. ensata*, with large flowers and multiple petals, several of these nurseries began to specialize in *hanashobu*. The type grown here came to be known as Edo irises.

Much of the outstanding stock grown by the Horikiri nurseries came from Matsudaira Shoo, who lived from 1773 to 1856 and is considered the individual most responsible for creating the modern form of the Japanese iris. Carrying on the work of his father, who collected many different colored forms of the wild iris, Matsudaira Shoo is credited with creating more than 100 new outstanding varieties. He particularly prized the three-fall form in which wide falls overlapped. He also appreciated the six-fall type as long as they had good substance, but Matsudaira Shoo could not tolerate thin, drooping petals. A few of his original cultivars are still grown in Japan today and at least one, 'Renjo no Tama' (Lilac Jewel), is available from some specialist iris nurseries in the United States.

Around 1800 in Ise, a district not far from Kyoto where Japan's most ancient and sacred Shinto shrines are found, Yoshii Sadagoro began growing and selecting a different strain of Japanese iris. To him and

others who followed him in developing the Ise type of iris, the only acceptable form was that of the classic species, with three delicate drooping falls and slender and graceful leaves. This type of iris was usually grown in pots and brought indoors when in bloom.

A third type of Japanese iris was developed in southern Japan in the area once called Higo and now known as the Kumamoto prefecture. In 1852, a samurai by the name of Junnosuke Yoshida brought sixty-four varieties of Edo irises to Higo, which at that time was ruled by the feudal lord Hosokawa Narimori. Lord Hosokawa encouraged his small groups of retainers to grow these irises and to develop new cultivars. These Kumamoto irises were grown in pots, and each group competed with the others to obtain bigger, more spectacular blooms. They valued the six-fall type most highly.

The Kumamoto samurai rules forbade them to share their irises with anyone outside their group. It was not until after 1914 that Kumamoto irises, or Higo irises as they are called in the West, became available for export. While Europeans and Americans had been importing Japanese irises since the middle of the nineteenth century, they were mostly of the Edo or Ise type until the 1920s.

Most varieties of Japanese irises being hybridized in the United States and Japan today are "mixed" sorts, with parentage including Edo, Kumamoto, and some Ise strains. However, those interested in growing historic irises can obtain some of the original types from growers in the United States.

Very few old Ise irises are available here, but a nice example is 'Sakura no Miya' (Cherry Blossoms at Miya), a large, soft-toned lilac pink. Classic Edo irises include 'Warai Hotei' (Laughing God), a double with purple veins and dark purple center on a light background; 'Kurokumo' (Dark Clouds), a double of dark purple coloring; and 'Yuhi' (Evening Sun), a lovely ruffled double white, edged in pale pink. Three very old Kumamoto varieties are 'Aki no Nishiki' (Autumn Brocade), a single purple with white veins and crests; 'Maiko no Hama' (Dancing Girl on the Beach), a double white edged in violet; and 'Suiten Isshoku' (Color of Water and Heaven), a huge single of navy blue.

Whereas these old varieties have a special charm, many of the American originations on the market today are far superior in substance, form, and color. This is one



MARYL LEVINE

An unnamed seedling in a Virginia garden. Each year Americans are introducing new Japanese irises of potential "star" quality.

area where Americans have taken a Japanese product and bettered it.

W. Arlie Payne, a landscape architect who lived in Terre Haute, Indiana, is the real "father" of Japanese iris development in the United States. Beginning in the late 1920s, Payne used a very small stock of mostly Edo varieties to hybridize more than 100,000 seedlings, of which more than 150 were registered with the American Iris Society and introduced into commerce. These American originations were great improvements on his original stock, and especially well-adapted to American growing conditions.

When his iris 'The Great Mogul' was introduced in Japan, it created an instant sensation, and he received many honors from the Japan Iris Society. The American Iris Society honored Payne's work by naming the highest award a Japanese iris can attain the "Payne Award." Only one Japanese iris is awarded this prize each year. Payne was a founder of the Society for Japanese Irises, a section of the American Iris Society.

One of the first Americans to work with the Kumamoto or Higo strain of Japanese irises was Walter Marx of Boring, Oregon, who called the irises he hybridized and



'The Great Mogul' is an American introduction that created an instant sensation in Japan.

introduced "Marhigos," a term formed by combining the first three letters of his name with "higo." Some of his best known cultivars are 'Peacock's Dance', 'Frosted Pyramid', 'Gay Gallant', 'Frisled Enchantment', 'Snowy Hills', 'World's Delight', and 'Blue Pompom'.

Another American pioneer in the world of Japanese irises was C. A. Swearengen, a friend and neighbor of Payne. The first president of the Society for Japanese Irises, serving in that office from 1964 to 1966, Swearengen introduced twenty cultivars, including 'Le Cordon Bleu' and 'Dame Violet'.

Fred Maddocks of Fair Oaks, California, also hybridized some exceptional cultivars that retain a deserved popularity. Two of them, 'Leave Me Sighing' and 'Hue and Cry', won the Payne Award.

Arthur Hazzard is responsible for Kalamazoo, Michigan, being one of the centers of Japanese iris culture. Last October 6 the Norfolk Botanical Gardens in Norfolk, Virginia, dedicated its Arthur H. Hazzard Memorial Garden, which will eventually have all the Japanese iris cultivars created by this remarkable man who did not start working with these plants until he was in his 70s. Hazzard introduced scores of new cultivars, many of which have the word "prairie" in their names,

among them 'Prairie Bluemoon', 'Prairie Velvet', 'Prairie Noble', and 'Prairie Valor'.

Hazzard's single white iris 'Numazu' and single blue-violet 'Virginia B.' are two of his loveliest creations. 'Virginia B.' was named in honor of Virginia Burton of Lad-

son, South Carolina, one of the United States's most diligent promoters of Japanese irises. Burton served as president of the society from 1982 to 1985.

In 1989 the world of Japanese irises lost one of its really great hybridizers, Jonnye Rich of Roseville, California. Rich's 'Star at Midnight' won the Payne Award in 1969, and her 'Tuptim' won the award in 1978. Some of her other excellent creations include 'Frostbound', 'Center of Attention', and 'Sea of Amethyst'.

Each year the Society for Japanese Irises conducts a popularity poll in which members vote for their favorite irises. The results of the 1989 poll put a new tetraploid variety, hybridized by Dr. Currier McEwen of Harpswell, Maine, in first place. McEwen, former dean of medicine at New York University, was the first person to develop tetraploid cultivars of Japanese irises. His award-winning 'Japanese Pinwheel' is a large single type, so dark that it appears black. It has a small white rim around all its petals.

In the 1990 poll 'Oriental Eyes', winner of the Payne Award in 1988, beat out 'Japanese Pinwheel' and other contenders to take first place. This light violet iris shades to gray white at the edge and has a dramatic purple halo in its center, giving the appearance of the eye of a peacock

SOURCES & RESOURCES

The Society for Japanese Irises, 16815 Falls Road, Upperco, MD 21155.

The Japanese Iris by Dr. Currier McEwen. Available to AHS members for \$25.50. Order code: UPN005.

Aitkens Salmon Creek Garden, 608 N.W. 119th Street, Vancouver, WA 98685. Catalog \$1.

Caprice Farm Nursery, 15425 S.W. Pleasant Hill Road, Sherwood, OR 97140. Catalog \$1.

Ensata Gardens, 9823 East Michigan Avenue, Galesburg, MI 49053. Catalog \$2.

George C. Bush, 1739 Memory Lane Extended, York, PA 17402. Send stamp for list.

The Iris Pond, 7311 Churchill Road, McLean, VA 22101. Price list \$1.

Laurie's Garden, 41886 McKenzie Way, Springfield, OR 97478. Send first-class stamp for list.

Pope's Perennials, 39 Highland Avenue, Gorham, ME 04038.

feather. This iris was hybridized by Adolph Vogt of Louisville, Kentucky, a past president of the society.

Other cultivars at the top of recent polls: 'Dancing Waves'. One of Arlie Payne's finest creations, this large double, mulberry purple cultivar has a silver band around its falls. Blooming late in the season, which in the mid-Atlantic area includes the entire month of June and into July, 'Dancing Waves' won the Payne Award in 1968.

'Freckled Geisha'. Hybridized by Lorena Reid of Springfield, Oregon, this extremely feminine beauty won the Payne Award in 1987. It is a ruffled, white double with a hairline edge of deep maroon, delicately dotted with wine "freckles."

'Taga Sode'. The name of this iris means "geisha's sleeve." It is a large double, bright fuchsia with bold white veining. It was hybridized by the late Dr. Shuichi Hirao, whom many consider the greatest twentieth-century hybridizer of Japan. In his honor, the Society for Japanese Irises next year will introduce an iris named 'Shuichi Hirao', a magnificent single white variety that Dr. Hirao sent to the United States as a numbered, unnamed seedling before his death in 1989.

'Gay Gallant'. This is an older variety that remains extremely popular. The creation of Walter Marx, it is white with blue veins.

'Kalamazoo'. A single hybridized by Arthur Hazzard, this cultivar became an immediate winner at the time of its introduction by Ensata Gardens last year. It is positively huge, with overlapping petals of exquisite coloring. It is heavily veined and washed with blue-violet over white and ruffled like crepe paper.

'Caprician Butterfly'. A Marx variety of recent introduction, this double white is heavily marked with dark purple veins. It is large and ruffled.

'Crystal Halo'. Another Marx double, this iris is lavender with purple veins and a wide white rim, a sure point of drama in the garden.

'Iapetus'. Named for a Greek god who revolted against Zeus, this is a splendid, extremely ruffled double created by Sterling Innerst, one of America's foremost hybridizers. It has a light ground color that is heavily sanded and veined in blue and red-violet. It has a blue-violet halo.

'Lilac Peaks'. Created by Adolph Vogt, this exquisite double is white with violet veining.

'Continuing Pleasure'. Developed by Currier McEwen, this double-full blue-



MICHAEL S. THOMPSON

'Gay Gallant' is an older cultivar from Oregon breeder Walter Marx.

violet sometimes produces repeat bloom in areas like Maine, where summers are cool.

'The Great Mogul'. One of the greatest of Payne's creations, this velvety maroon single can grow up to ten inches or more in width.

'Wine Ruffles'. A beautiful wine-colored double variety of uniformly excellent form and texture. This outstanding cultivar was developed by Dr. William Ackerman of Ashton, Maryland, well-known for his work with camellias.

Although there are many outstanding Japanese iris cultivars from which American gardeners can choose, it is unfortunate

that one must be cautious when selecting sources from which to buy them. Some inferior and wrongly named cultivars have found their way into commerce, a problem that the Society for Japanese Irises is working to correct by bringing it to the attention of nursery owners. In addition, some suppliers carry only older varieties. The sources listed with this article offer a wide selection of outstanding, correctly named cultivars.

Clarence Mahan, who lives in McLean, Virginia, is the immediate past president of the Society for Japanese Irises.

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HIMALAYAN JOURNAL From page 15

apparently of pneumonia. Presumably, he had been ill when the trek began, and the miserable conditions had exacerbated his symptoms. We were shaken by this reminder of the tenuous hold we all have on life when traveling in a remote area. With death there is always protocol to follow: a funeral had to be arranged and police procedures followed before we could leave for Tseram.

Our spirits began to lift on our uphill trek through firs and *Rhododendrons*, including *R. hodgsonii*, *R. arboreum*, and *R. barbatum*. Once we were above the forest, alpines appeared again—*Primula primulina*, *Pedicularis megacarpa*, *Corydalis*, and some petiolar *Primula*. We camped just over the high pass of Tamo La.

On day twenty we arose to a beautiful clear morning. We had superb views of the towering pinnacle of Janu as we labored upwards over the high passes of Sinnion La and Mirgin La. Our efforts were rewarded on the way down when we passed a small, crystal clear lake near which we found *Gentiana elwesii* and a stunning blue aconite. In the late afternoon we arrived in Tseram in the Yalung valley.

After two nights in Tseram we had to move up the valley to a drier campsite at about 14,000 feet. We spent three days and nights here exploring and making day trips to higher altitudes. We found a fine example of *Rheum nobile*, a rhubarb relative in some danger of extinction because of its status as a Tibetan delicacy. Its yellowish white bracts made it easy to spot from some distance. But the Yalung valley is better known for its rhododendrons, which cover the slopes in profusion and make a tremendous sight in April and May.

Leaving the heights of the Yalung valley to walk downstream along the banks of the Simbua Khola, we started to find *Impatiens* again. The most exciting was *I. falcifer*, an attractive yellow species with red spots on the lower and upper petals—colors that it would be wonderful, although terrifically challenging, to transfer to *I. wallerana*.

The weather was still troubling us near the end of September. Our twenty-sixth day started fair but then rained steadily as we ascended through fir and hemlock forests where there were mosses and ferns in great number. Crossing over a high pass we made a treacherous descent, slipping and sliding down muddy paths recorded by Hooker. With the mud came the return of the leech as we camped in the misty gloom of the forest for the night.

The next day, on a tough walk over a high forested ridge, we saw countless *I. stenantha*, an open-faced flower with a red blotch in the throat and an upward pointing spur, but unfortunately none had set seed. Leeches were an annoyance but didn't approach the plague of Amjilassa eighteen days before. We walked downhill on a pleasant afternoon to enter the pretty little village of Yamphudin (Hooker's Yankutang) near the border with Sikkim.

There were some demands that Hooker's party did not have to face; we spent six nights in Yamphudin waiting for a Granada film crew from England to shoot some footage of the Kew botanists for a series about the Royal Botanic Gardens. We took advantage of the nearby clean river water for washing and explored the area for herbarium specimens and seeds. We found some colonies of the mauvish blue *I. decipiens* near the village but were again too early for seed. The arrival of the television crew on the twenty-ninth day of the trek brought news of home and a much appreciated letter from my wife.

On the thirty-third day we moved on, down the Omje Khola. We traversed many landslides and numerous suspension bridges as population and cultivation increased.

Our destination was the town of Taplejung where there was a small airstrip cut into the side of a mountain. The film crew and I hoped to catch a flight to Kathmandu, leaving the rest to continue the trek for another five days. The first plane on which we were booked could not land because of poor visibility and it was two days before we could fly out. As we did so we were treated to some of the most spectacular scenery in the world including glimpses of Everest and Annapurna.

I had made twenty-six collections of *Impatiens* seed from sixteen different species, some of which had not been introduced into cultivation, had collected four *Mecynopsis* species, and made about twenty other collections from species such as *Delphinium*, *Geranium*, *Aconitum*, and *Senecio*.

My fellow travelers had collected more than 2,000 herbarium specimens that had to be packed for shipment to England with duplicate specimens left for study by Nepalese scientists. A formidable "live plant" collection was taken back to the United Kingdom for further study. In many ways the work had only just begun.

Simon Crawford is a plant breeder for Pan-American Seed in West Chicago, Illinois.



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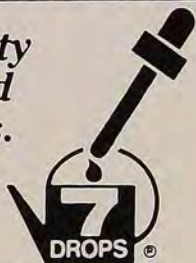
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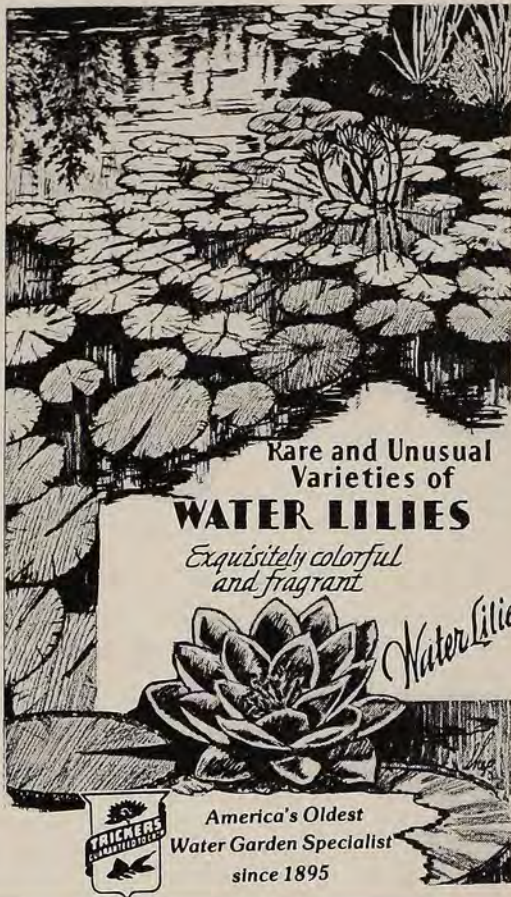
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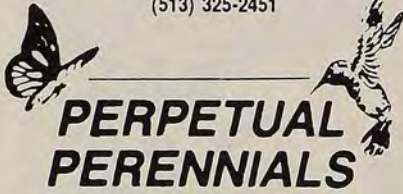
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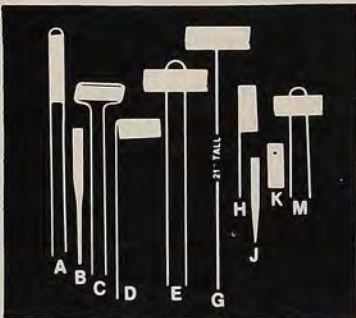
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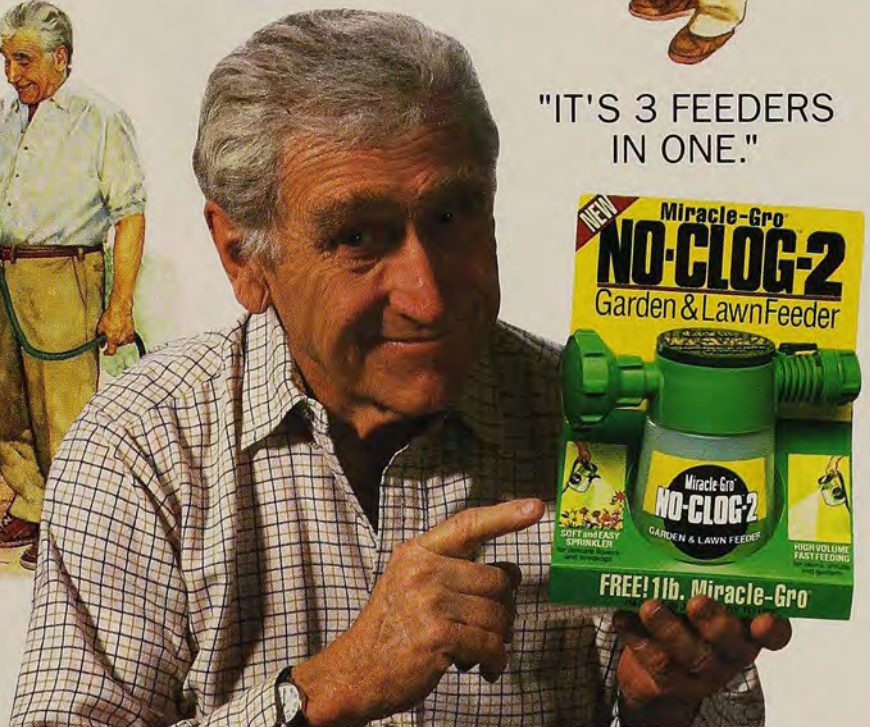
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