Six years ago, the propagation area of the Botanical Garden was a jumble of special collections and sale plants, with incomplete or no records for the many plants propagated. Thousands of seeds passed through this nursery, but virtually nothing had been written down about how they had been treated. The main office kept careful records of collection data, but little was known about propagation. The mysteries of green thumb magic were a well-kept secret.

Most species in the U.C. Garden are unknown in cultivation, so success in propagating them is a matter of intuition and intelligent guesswork. There is a high attrition rate: many seeds simply don’t germinate, many do not survive the tender seedling stage, and once planted out, some do not make it through our summers or occasional heavy frosts.

The propagation area is one of the main hubs of the Garden, with seeds and people moving in and out constantly. Six years ago, John Domzalski took on the task of setting the place in order and establishing some guidelines for tracking seedlings. The propagation work now makes sense, both in the card file and the greenhouses. And as the Garden has grown and expanded, this has become essential.

Journey of a Seed

So what exactly happens behind the scenes in the propagation area? From seed to sprout and planting out, what is the journey of one of the thousands of seeds and cuttings that come through the Garden? To tell this story, we begin with the Index Seminum and the insatiably curious gardeners.

Almost all of the seeds for the Garden come either through private collectors’ lists or from the seed lists of various Botanical Gardens. The Index Seminum (“seed list”) represents a remarkable international cooperative convention between gardens through which a wide diversity of seed is available free of charge to participating gardens and arboretas. Most gardens publish a list of seeds and distribute an annual or biennial seed list. Many seeds are collected from the gardens and lack data, are incorrectly identified, or are hybrids, making them less than prime candidates for our collections.

The U.C. Garden list focuses on California native plants; ours is unusual in that with rare exceptions, the seed is collected in the wild. Over 400 seed lists pass through the main office, where assistant curator Holly Forbes processes orders from the gardeners. At our garden, the gardeners have considerable responsibility in choosing plants for their sections, so they are most often the ones choosing new plants to grow. They consider bed design, educational value, and quality of collection data in making their choices.

Once the seed packets arrive from Yugoslavia, U.S.S.R., Missouri, or Boston, the paper trails begin. Some material comes in the form of cuttings or bulbs. Holly enters the preliminary data in the computer, giving each species an accession number, i.e. the number that
eventually appears on the plant label (for example, 68.115). The seeds or cuttings move on to John, who fills out one propagation file card per species and prepares labels for a number of propagation pots. Every treatment and trial run is recorded on the file card for future reference.

Green Thumb Intelligence

The fine art of propagation is having some idea of the range of techniques available for imitating a seed's natural conditions for germination and then making an intelligent guess as to what will work best for each species. Species from cold winter climates or high alpine areas generally receive stratification or refrigeration (called stratification because of the earlier practice of storing the seed in between layers of sand). Species with hard seed coats require some form of scarification, or breaking of the seed coat to allow water to penetrate. Hot water is good for melting the coat of many legumes; sulfuric acid is necessary to etch through the thick seed coats of manzanitas.

Choice of soil or potting mix is a critical part of the process. John generally uses a mix of sand and peat, with variations on that theme for bulbs, palms, ericaceous plants, and others. There is a big peak of seed sowing in the spring when the seeds come in, followed by another flurry of sowing in the summer to prepare material for fall biology classes on campus. Throughout the year, recordkeeping alone takes almost a quarter of John's time.

Potted seeds and seedlings are kept in the first greenhouse, where watering conditions are controlled by a computerized mist system. Some tables received five seconds of spray every five minutes, others ten seconds every ten minutes. The first propagation greenhouse now has new rollaway tables that conserve space use, and a number of them are equipped with heating cables under the gravel surface. All seed pots stay in this greenhouse until the seeds sprout or for one year, whichever comes first. Dormancy periods can vary, and John is reluctant to give up too quickly on unusual species.

Once established, the seedlings are moved into the second greenhouse to mature under protected conditions. Here there is a set of grow-lights which can be used to imitate different day lengths. When too many seedlings need to be moved into this greenhouse, the more mature plants move out to the shade or lath house for hardening off. Here they face the dangers of marauding birds and occasional infestations of aphids or white flies. Rabbits and raccoons are kept out by a wire barrier at the bottom of the wall, so by and large, plants remain fairly nibbled. The lath house is divided by geographic area, and gardeners frequently check in to see if anything in their area is ready for planting out. Each change of location is marked in the computer database, so curators and gardeners know where to find each species. This makes it possible to use potted plants for display, classes, and research material as needed.

The Thread of Existence

Over the last few years there have been a few challenges to keep John on his toes. For example, through the Garden's work with the Center for Plant Conservation, he grows cuttings from the one remaining plant of Presidio Manzanita (Arctostaphylos hookeri ssp. ravenii). The goal is to establish the plant sufficiently to introduce some genetic diversity through seed production. He also is watching a number of cuttings from Magnolia sharpii, an endangered species planted in the Mesoamerican area.

The record system is now operating effectively, permitting the garden to take on these types of conservation challenges. The greenhouses are connected by roof and wall cover; the outside area is organized, and sale plants are separated out to minimize confusion. With the continued growth and expansion of the Garden, the propagation area will never be a slow place. Perhaps one of the best uses of John's green thumb and of amateur propagators as well will be on behalf of species whose genetic links to this world are tenuous and threatened by the pace of change.

—Stephanie Kaza

The Friends of the Botanical Garden will offer a series of four propagation workshops this summer and fall. See Calendar of Events for details.
Centennial Birthday Celebration

Despite the drizzle, the Garden drew over 800 people to its One Hundredth birthday party. (photo by Gladys Eaton)

T

hanks to a large force of enthusiastic volunteers and staff, the Centennial Birthday/Earth Day party on April 22 was a success. The garden was a showcase of color in spite of occasional drizzling rain, and everyone appeared to have a great time.

The clouds held off just long enough for guest speakers Warren Roberts and Assemblyman Tom Bates to commend the garden on reaching its important centennial milestone. Assemblyman Bates presented a joint resolution from the state legislature, recognizing the relationship between the garden's outstanding collection of plants and the role it plays in educating the public about the value of environmental protection. Dr. Robert Ornduff read a letter of congratulations from Governor Deukmejian, and Robert Riddell hosted the ceremony on behalf of the Friends. Each one spoke optimistically of the challenges facing the garden as it looks to its second hundred years.

Following the speakers, almost 250 people shared birthday cake and conversation on the lawn. Spirited young visitors had their faces painted in the Asian section, and were then entertained with stories on the Oak Knoll and Mather Grove. In between stories, guests enjoyed swing music and a special performance by campus madrigals. The idea was to encourage people to venture into every section and discover the Garden’s diverse collections. Many guests took the opportunity to sample the self-guided audio tape tour, which made its successful debut at the party.

Good parties are only possible through efforts and enthusiasm from dedicated volunteers and staff. Linda Cook designed an enchanting brochure for the event, and Nancy Swearengen mobilized the team of volunteers. Jim Van Sicklen, Kurt Zadnik, and David Gartland handled traffic and parking with ease. It is probably the most critical job (certainly the most grueling) during major public events in the Garden, and their experience was much appreciated.

In the spirit of Earth Day, Elly Bade compiled a conservation-oriented book display and posted a sampling of entries from the Children’s Art Contest. The Propagators set up shop to help out with questions and sales in the Visitor Center. The Docents led tours through the Garden and monitored Rainforest Rap, which brought folks of all ages into the Meeting Room to learn about tropical ecosystems and conservation issues. Gladys Eaton and Janice Vargo greeted people from a membership table at the gate and, as a result, we have a number of new Friends. We even had volunteer help from six Chevron employees who supported the event by inflating balloons, passing out free California native seeds, and selling T-shirts!

Such an enjoyable public event was an encouraging start for a new era of public awareness, and for the Botanical Garden’s continuing role of leadership in understanding the natural environment. Thanks to all involved!

—Bobbie Ohs
Tracking the Crow Tobacco Ceremony

When Peter Nabokov arrived at the Botanical Garden, tobacco seeds in hand, he had no idea if they would germinate. These were sacred seeds, key to the Crow Indian Tobacco Society ceremony. And they were possibly 50 or 60 years old. They had been kept in Crow medicine bundles since the time of cultural suppression in the 1920s. Nabokov wanted to know what this plant looked like, *Nicotiana multivalvis* — the “national” plant of the Crow Indians.

Nabokov, a consultant and lecturer in Native American studies, had been drawn to the Tobacco Society ceremony while teaching at the University of Montana in Missoula. The only previous academic description of the ceremony described it as an unimpressive conglomerate of elements from other Crow rituals. Through field work, interviews with Crow Indians, and ethnohistory archive work, Nabokov learned all he could about the Tobacco Society ceremony. He determined that not only was its adoption portion still alive, but further, he postulated that it was the key ritual for this culture.

The Sacred Power

As the story goes, a powerful leader of the precursor culture of the Crow, the Hidatsa, had a medicine vision. In his vision, he “saw” a specific tobacco plant, *Nicotiana multivalvis*, as his medicine. In Native American tradition under these visionary conditions, it is said that the plant adopts the person who “saw” it. The plant becomes a supernatural parent. The leader headed westward with a group of his people on a vision quest and established what became known as the Crow Indian tribe. It was understood that the success of the people depended on the success of the plant.

Because the plant was considered sacred, there was a tribal injunction against its consumption. The Crow smoked tobacco, but not this species. Instead they smoked the non-sacred species, *N. quadrivalvis*. The sacred *N. multivalvis* was reserved for the important Tobacco Society planting and adoption ceremonies. These were the only times when the Mountain Crow and the River Crow people would leave their separate parts of Montana to come together to plant tobacco.

Today, the adoption ceremony is infrequently performed as it requires a year of preparation and $2000 or more of goods for exchange. It is initiated by a couple of members of the Society choosing to formally adopt another couple into the Society. As a rite of initiation, the ceremony reenacts the planting of the sacred tobacco. Through it, the members of the Society retell the story of their culture and how it came to be.

Botanical Clues

Nabokov came to the Garden in 1988 as a graduate student in Anthropology working under Dr. William Simmons, then department chair. He brought the seeds to John Domzalski, Garden propagator, so he could see for himself the difference between the sacred and non-sacred tobaccos. To his disappointment, propagation of the old medicine bundle seed was not successful after all. The seed most likely had been kept under poor conditions and had a short viability period. However, Nabokov was able to obtain some seed from an overseas source, and this proved more successful. The differences between the two species were subtle — primarily the valves of the seedpods and the size of the two plants.

In his research, Nabokov found that successful regeneration of seed was originally necessary for successful regeneration of Crow culture through the Tobacco Society ceremony. During the time of general cultural suppression, the United States government banned the ceremony. For over 30 years the ceremony was performed only intermittently. When many Crow Indians acculturated by adopting Christian faiths, they were urged to
Tobacco Society Adoption Procession, 1900. (Photo by Rinehardt)

Now the ceremony is carried out without the ritual planting, but Nabokov suggests that it is still vital in preserving Crow culture. It is the sacred tobacco vision that led the Crows to Big Horn Valley. And here in one of the most abundant Indian reservations on the continent, the tribe has flourished. Can the ceremony be sustained over time without the sacred seed? Or can the sacred tobacco be propagated to generate enough seed to renew the Crow’s sacred relationship to the land?

Nabokov’s research gives a glimpse of a native American way of life, one that includes the role of sacred plants as well as sacred animals. He is one of a number of insightful researchers drawing on botanical knowledge to piece together cultural stories. It is possible that important societal functions can be restored by restoring seed sources of sacred plants. Perhaps as botanical gardens come to serve as resource centers for ecological restoration, they will come to be of use for cultural restoration as well.

— Stephanie Kaza, based on an interview with Peter Nabokov

FROM THE DIRECTOR

This spring I was fortunate to be able to make frequent visits to the Garden, sometimes showing visitors around, sometimes on garden business, and sometimes on my own. If you visited during the spring, you will agree that the Garden put on one of its finest shows ever. The Rhododendron Dell was ablaze with color, luminescent even during the frequent gloomy Berkeley spring days. The penstemons in the renovated Alpine Fell-field told us, with flowers, how much they are enjoying their new home.

The Vernal Pool looked like the real thing, with meadow-foam, goldfields, and tarweeds forming their usual “bathtub” rings around the pool’s slopes and sky-blue downingias flowering last in the pool bed. I missed the tadpoles that wriggled around in the pool for the past several years. But perhaps it is just as well they were missing, since the pool usually dried long before the tadpoles transformed into terrestrial froglets and the “crop” was lost.

I took particular delight in seeing two species of Puya flower for the first time. Puya chilensis produced chartreuse flowers and P. berteroniana, teal-colored flowers and contrasting orange anthers. The flowers of both species are borne in branched inflorescences that looked like sky rockets frozen in motion. I collected the seed that gave rise to these plants in Chile in February, 1983, from somewhat wizened parents that had flowered months previously. A little over seven years later, the next generation produced a marvellous display of flowers many thousands of miles away from home. These Puyas are not so spectacular as the infamous Puya raimondii that flowered here a few years ago. The press got ahold of that event, and we were overwhelmed with visitors who came only to view that spectacle and, having seen it, went back to their cars and drove home. Puya chilensis and P. berteroniana are more modest cousins, and we didn’t call the press this time.

However, we have had quite generous media publicity for the Garden’s Centennial Year, and this has generated quite an increase in visitation rates. If you want to visit when the Garden is not crowded, come early on weekday or weekend mornings, or after 5pm on summer Wednesdays. Bring a picnic dinner to share with Steller’s Jays who will insist on joining your party.

— Robert Ornduff

Puya raimondii
(Drawing by Judith Finn)
When prospective garden visitors ask what is the best time of year to visit, the usual answer is spring, when the Asian, California, and African Hill areas are at their showiest. One of the garden's best kept secrets, however, is the North American area across the road from the Western Herb Garden. Derelict for years, this small hillside area has literally blossomed under the guidance of gardener Roger Raiche. Plants in this area hail from eastern North America for the most part, with some specimens from as far west as Kansas and Alberta. Known mostly for its brilliant display late in the year, this area also puts on a show in spring and summer. At this time an enormous mass of creeping Moss-Pink (*Phlox subulata*) covers several square feet of hillside, complemented by other spring beauties such as white and blue species of *Viola*, and the brilliant orange flowers of Puccoon (*Lithospermum caroliniense*) that enlivens the remnant prairies of the midwest.

The red- and yellow-flowered columbine *Aquilegia canadensis*, resembling our own *A. formosa*, is followed by the yellow *A. chrysantha*. There are spring-flowering shrubs such as the low, wide, deciduous Beach Plum (*Prunus maritima*), whose slim branches burst alive with masses of tiny white flowers, and the eastern Spice Bush (*Calycanthus floridus*). In my mind this species has a substantial edge as an ornamental over our own *C. occidentalis*, which has larger but fewer flowers and somewhat coarse leaves.

Cacti and other plants normally considered characteristic of arid habitats also thrive on this well-watered hillside. There are yuccas from Kansas and New Jersey and an *Opuntia* from Kansas. One early inhabitant of this hillside, planted before the character of the collection had been defined, is a magnificent specimen of California's endemic Santa Lucia Fir (*Abies bracteata*), too large to move and too handsome to cut down.

**A Tapestry of Composites**

The plants that provide the colorful summer and early fall displays are largely members of the Compositae, or sunflower family. These are mostly yellow-flowered, but subtleties of hue, texture, and height lead to greater visual complexities than a mere mass of yellow. Some eastern North American genera also occur in the west, such as *Aster*, *Helenium*, *Erigeron*, and the goldenrods, *Solidago*. I find it interesting that British horticulturists have made so much of our natives. There are several handsome named forms of North American goldenrods available in British nurseries, whereas at home these plants are scarcely noticed. Less familiar eastern composites are *Rudbeckia*, *Silphium*, and the tall, purple-flowered Joe-Pye Weed (*Eupatorium maculatum*).

Other typical eastern plants in the hillside collection include the stately deciduous Royal Fern (*Osmunda regalis*), the shrubby *Potentilla fruticosa* (available commercially in several color forms and habits), and the summer-flowering *Rhododendron bakeri* with its orange-red flowers. Our two species of cranberry (*Vaccinium oxyccocum* and *V. macrocarpon*) which are both inhabitants of cold bogs in nature, grow happily as dense ground covers on the Garden's well-drained slope. We also have a fledgling Pawpaw (*Asimina triloba*), one of the few temperate representatives of a mostly tropical family, the Custard-Apple family (Annonaceae) and an American Persimmon (*Diospyros virginiana*). I have never tasted the melting flesh of a Pawpaw, but I can vouch for the excellence of our native eastern persimmon once its small orange fruits have been robbed of their astringency by heavy frost.
Climate Change Affects Forests

One interesting feature of the flora of North America is that it has assumed its present distribution fairly recently, at least geologically speaking. About 15-20 million years ago, in Tertiary times, much of northern North America was forested with a rich mixture of hardwoods and conifers. We know that many genera of hardwood trees now unknown in the west except as planted ornamentals once grew here naturally. In addition, Coast Redwood fossils from Alaska, Greenland, Europe, and Asia indicate that this narrowly restricted western species once occurred elsewhere not only on this continent, but in the Old World as well.

As the climate changed toward the end of the Tertiary, there was a substantial sorting out of the trees on this continent. In the west, overall annual rainfall decreased markedly, and the summers became warmer and drier. In response to the degradation of the western climate, many hardwood trees disappeared from this area. But on the eastern seaboard, rainfall totals remained high with ample rain in the summer months, so these species were able to survive there and continue to co-exist with a few conifer species.

Conifers were able to persist in the drier west because most can tolerate moderate drought and are capable of storing water in their wood. During the mild, wet winters when leafless hardwoods photosynthesize scarcely at all, the mostly evergreen conifers continue to produce sugars, proving to be competitively superior under these conditions to the disappearing hardwoods.

Though the explanation for this sorting out may be a matter of speculation, the fossil record leaves no doubt that a few million years ago our western forests contained hornbeams, persimmons, beeches, hollies, sweet gum, sassafras, elms, and other groups of trees. These species are now restricted on this continent to the deciduous forests of the east and a few occurrences in the summer rainfall areas of central and southern Mexico.

Cross-Country Connections

Thus it is no great surprise to learn that some of our western natives have close relatives in the east. These groups appear to have persisted on both edges of the continent, but have been separated long enough that in each area, different though closely related species occur. For example, there are only two torreys in North America: Torreya californica, a tree of widespread distribution in California, and T. taxifolia, from along the bluffs of the Appalachian Coast in northern Florida. The Florida disease-ridden population seems doomed to extinction, but fortunately the Garden's T. taxifolia is disease-free and prospering.

The eastern Rhododendron catawbiense bears a striking resemblance to the western R. macrophyllum, common in northern Coast Redwood forests and up into the Pacific Northwest. The eastern Christmas Fern, Polystichum acrostichoides, is puny compared with its grand western cousin P. munitum, the Western Sword Fern. The eastern redbud, Cercis canadensis, bears a striking resemblance to the western redbud, C. occidentalis. Lizard Tail (Saururus cernuus), normally found in standing water in eastern marshes, grows happily on a sloping hillside. It and our own western Yerba Mansa, Anemopsis californica, are the only North American representatives of their family.

A number of young eastern deciduous hardwood trees dot the hillside, and as they grow, the visual impact of this small landscape will change as well. But even as it changes, the area will continue to offer visitors horticultural delights that provide a welcome show of color when much of the rest of the botanical garden appears to be taking a breather.

—Robert Ornduff
The efforts of all these volunteers has produced substantial income for the Garden — $1900 from docent tours, $15,000 from Visitor Center sales, and $34,000 from plant sales, as well as the generous gifts made possible by Friends' efforts. Board President Robert Riddell and Garden Director Robert Ornduff offered their deep thanks and appreciation for the hard work and dedication of so many volunteers.

Volunteers who have made this year's activities possible are:

### DOCENTS
- Donna Andrews
- Carol Bocigalupi
- Elly Bade
- Doris Beatty
- Norma Berger
- Anne Boardman
- Marge Brostrom
- Joey Clark
- Suzanne Clausen
- Addie Collins
- Ed Dankworth
- Kitty Dankworth
- Ramona Davis
- Scott deMille
- Barbara Donald
- Edna Ellern
- Chris Elms
- Perry French
- Iris Gaddis
- Mitchell Harvey
- Francine Henderson
- Ruth Hendrix
- Myra Holstein
- Susan Kahn
- Peggy Klenz
- Diane Kothe
- Marilyn LaBrash
- Jo Larson
- Bob Lichtenstein
- Britt Loften
- Nancy Markell
- Joan Minton
- Margaret Mitchell
- Paul Mucci
- Peggy Newell
- Jane Orsini
- Esther Osvald
- Liz Ozselcuk
- Andre Pancheco
- Lois Paul
- Mary Pierpont
- Chris Pires
- Annette Poley
- Jean Portello
- Susan Rhoade
- Sarah Ripley
- Thelma Russell
- Pete Shell
- Nat Shoehalter
- Hal Simkover
- Leonard Skinner
- Tomiye Sumner
- Mark Sutton
- Nancy Swearengen
- Katie Szaky
- Leland Unsell
- Jim Van Sicklen
- Janice Vargo
- Jackie Vittori
- Brenda Wong
- Jacqueline Woodfill
- Betty Wren
- Florence Yaffe

### PROPAGATORS
- Bill Brobisky
- Pan Canales
- Addie Collins
- Barney Dietz
- Edna Ellern
- Dick Emory
- June Falkner
- Iris Gaddis
- Kate Heckman
- Jim Jones
- Jo Larson
- Lizzie Lee
- Jim Lewis
- Joan Mirov
- Chuck Page
- Dorothy Pitelka
- Jean Portello
- Mary Schrader
- Sarah Wikander
- Myrtle Wolf
- Jacqueline Woodfill

### VISITOR CENTER
- Antonio Albuquerque
- Patricia Allison
- Elly Bade
- Cheryl Blomquist
- La Nelle Clack
- Betty Coggins
- Jeanne Dunn
- Beth Fernandez
- David Gardland
- Evelyn Givant
- Mitch Harvey
- Jerry Hashimoto
- Francine Henderson
- Elizabeth Hunt
- Liz Jewell
- Evelina Just
- Susan Kahn
- Jean Kastien
- Dorothy King
- Peggy Klenz
- Nancy Markell
- Barb Martien
- Isabel McKay
- Peggy Newell
- Jean Nunnally
- Kay Riddell
- Daphne Robinson
- Jim Van Sicklen
- Nancy Swearengen
- Joan Szaboky
- Leland Unsell
- Michael West
- Nancy Wilson

### CURATORIAL, CLERICAL, EDUCATION, AND GARDEN HELPERS
- Grace Abiko
- Richard Anderson
- Linda Cook
- Jack Darnell
- Ramona Davis
- Gladys Eaton
- Janet Edwards
- June Falkner
- Noraen Ford
- Evelyn Givant
- Peggy Grier
- Margriet Hecht
- Diane Kothe
- Leonard Maudens
- Linda Price
- Mary Ricksen
- Myrtle Wolf

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Kudos to the coordinators for the first children's art contest: (left to right) CNR staff Margaret Race, Marietta Ison, Susan Bushnell, Laura Gregory, Alan Werner, Uki Mathias, docents Elly Bade and Florence Yaffe.

Garden Volunteers — the Key to Success!

On Tuesday, June 19th, the Friends held the Third Annual Volunteer Appreciation Party to honor the important role of volunteers in the Garden. This year's report on volunteer contributions was an impressive array of statistics. Nancy Swearengen, Volunteer Coordinator reported on the extensive volunteer efforts that keep the Garden running.

In 1989-90, 40 weekday docents hosted 208 tours, contributing 1362 tour hours. They served 2000 adults, 900 college students, and 3000 children on 133 tours. Twelve weekend docents put in 900 hours for a total volunteer effort of 2262 hours, an increase of 66% over last year. In the Visitor Center, 30 volunteers kept the Garden's main link to the public open seven hours a day throughout the year, contributing 2500 hours. Training and administrative support for the Visitor Center, including book buying, stocking, accounting, and cleaning, added another 750 hours for a total of 3300 hours, the equivalent of 19 person-months.

The 20 volunteer propagators who grow plants for three plant sales each year, worked an average of two days per week, spending 750 hours each potting and repotting their thousands of young seedlings. This totals to an astounding 16,000 hours, or 17 person-months. Curatorial and clerical volunteers put in many hours to help with computer input (20 hours), seed cleaning (200 hours), seed exchange (130 hours), poster contest (100 hours), other clerical (240 hours), and plant sales (600 hours). The 18 volunteer board members each spent at least 10 hours per month in meetings, phone calls, and behind-the-scenes work. The grand total of all these volunteer hours for 1988-89 rounds out to approximately 25,500 hours or the equivalent of 13 full-time employees!
Fall Plant Sale

Saturday, September 23, 10am to 3pm

The Fall Plant Sale features a wide variety of plants, many of which are best planted out in the fall before the rainy season. Species listed below are a sample of what will be available. To encourage the greening of the campus, students with identification will receive a 10% discount on all sales.

A special feature of this sale are a collection of species roses. These wild roses are found throughout the northern hemisphere from the Arctic as far south as South India and Thailand, but are unknown in the Southern hemisphere. They usually grow in somewhat disturbed habitats on the banks of streams, on cliffs, and on hillsides where forest has been cleared. Species roses tend to be vigorous and disease resistant, making them good choices for naturalizing.

**Vines:** Bonarea, Chorizema cordatum, Clematis, Clinatus puniceus, Dipogon lignosus, Discorea, Hardenbergia, Hibbertia, Jasminum, Kennedia, Lapageria rosea, Lophospermum, Mandevilla, Passiflora, Solanum, Thunbergia

**California Natives:** Arctostaphyllos, Brodiaea, Camassia leichtlinii, Delphinium, Heuchera, Iris, Romneya coulteri, Smilacina, Vaccinium hexandra, Zauschneria, ferns and annuals.

**Perennials:** Over 110 species and cultivars including Achillea, Aconitum, Adenophora, Agapanthus inapertus, Anemone, Aster, Calceolaria aff. hypericinca, Campanula, Digitalis, Echinacea, Eryngium, Filipendula ulmaria 'Aurea', Hemerocallis, Incarvillea, Iris (bearded and non-bearded), Kniphofia, Liatris elegans, Lilies, Potentilla, Salvia, Sisyrinchium striatum 'Aunt May', Stokesia, Tricyrtis, Xeronema.

**Others:** Ferns and fern allies, rhododendrons, grasses and grass-like plants, bromeliads, terrestrial and epiphytic orchids, trees and shrubs, herbs, cacti and succulents, rock garden/alpines.

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**Plant Sale Success**

The Spring Plant Sale and Preview Party for members was a tremendous success if measured by the income generated for the Garden. The Preview raised over $10,000 and public sales the next day brought the total to $22,296.

This sale was the last of the plant sales for fiscal year 1989-90. Other sales were equally successful, with the Fall Sale raising $11,212 and the Holiday Sale in December grossing $4,725. The grand total for the year is $38,234 — a major contribution towards Garden programs and operations.

The Friends' Board would like to thank the 20 active, hardworking volunteer propagators who labor so diligently growing the healthy, attractive, and sometimes unusual plants. They also thank the volunteers who staff the sales, the Garden staff who are so helpful, and especially the members who are the source of much of our support. The Garden is a richer place for all of their efforts.

— Gladys Eaton

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**Roses**

- **Rosa bella** — Northwest China, upright shrub with single, bright pink flowers.
- **Rosa corymbifera** — Eastern Europe and Asia, creamy white flowers with hints of blush pink.
- **Rosa centifolia** — China, vigorous climbing plant with dense foliage and single to semi-double creamy white flowers.
- **Rosa chinensis** — China, vigorous climbing plant with single, light crimson flowers.
- **Rosa altaica** — China, dense, single white to blush-pink flowers followed by pendulous oval orange hips.
- **Rosa hybrida** — China, single to semi-double creamy white flowers.
- **Rosa koreana** — Korea, medium shrub with bluish-green foliage and deep pink flowers.
- **Rosa villosa** — Europe/Asia, medium shrub with single, clear pink flowers and large apple-shaped fruit.
- **Rosa wichuraiana** — China, almost evergreen species with dark green glossy foliage, good as a climber, single white flowers and small dark red hips.
GARDEN NOTES

A Rewarding Spring Season

Grant Successes: The Garden was awarded $75,000 from the Institute of Museum Services, a federal agency that offers general operating support to the nation’s museums. This will provide substantial assistance for operations, curation, and education projects. The Garden has recently purchased and installed computer equipment supported by the IMS 1989 Conservation Support grant for mapping specimen locations in the garden beds.

We also received $13,000 from the Elvenia J. Slosson Endowment Fund to fund a horticultural and educational exhibit design for the new Mesoamerican area. The Strawberry Creek Restoration Project will benefit from a $18,000 grant from the Department of Water Resources urban streams program. This grant will assist with erosion control, check dam replacement, and the use of California natives for bank stabilization. All of these grants were written by outgoing Curator Jim Affolter—a nice legacy for the Garden!

Education and Public Relations: Nine hundred Biology 1B students completed a second field trip with a focus on California ecology, pollination biology, and ethnobotany. In addition, the Garden’s docents led 77 tours for a total of 1785 people from mid-March to mid-June, the peak spring season of the year, including participants in the Garden Club of America’s Western regional meeting.

Two copies of the Bay Area Backroads video tape are now available through the Development office. This film is a good overview of Garden programs and can be shown for club events. The Garden also has a new slide program for its Speakers Service outreach, put together with Richard Anderson’s beautiful photographs.

Conservation: Assistant Curator Holly Forbes attended a California regional priorities task force meeting at Rancho Santa Ana Botanic Garden April 26-27. The Center for Plant Conservation meeting drew participating garden staff, state and federal agency botanists, and botanical experts who discussed protection priorities.

Children’s Poster Contest: Over 800 children from East Bay schools entered the Centennial contest with the theme: “Plants and Us: the Green Connection”. The artwork was a fabulously diverse collection of topics and media, ranging from rainforest preservation to the beauty of plants and their role in our ecosystem. A panel of 20 judges selected the 78 winners, and nearly 300 people attended the awards program on May 19th.

Grand Prize winners were: Stacey Dunker, Valley Christian School (grades 4-6), Michael Cheng, Christ the King School (grades 2-3), and Kate Berthko, Hillcrest School (grade K-1).

More Good-byes: Education Coordinator Stephanie Kaza will be leaving the Garden this summer after two and a half years serving the Education Program. She leaves to complete the last year of a Master of Divinity program at the Graduate Theological Union in preparation for a university teaching position in the field of Environmental Ethics. Stephanie’s commitment to conservation, education, and people-centered learning has set a valuable standard for future education activities at the Garden.
Margaret Race, Assistant Dean of Planning at the College of Natural Resources and liaison between the College and the Garden, will also be leaving this summer for the East Coast, where her husband has accepted a new position. Her assistance in the Garden’s transition from the College of Letters and Sciences has been invaluable, and her devoted efforts on behalf of the Children’s Poster Contest brought many new faces to the Garden. We wish both Margaret and Stephanie well in their new directions and work.

Art teachers and other community and campus volunteers judge over 800 poster entries for the children’s art contest.

Sister Garden: U.C. staff Jerry Parsons and Martin Grantham spent four weeks in May-June at the Wilson Botanical Garden in Costa Rica collecting seeds and cuttings for exchange. They offered horticultural assistance in redoing the orchid walk display and in developing a new Begonia display. The bromeliad display, self-guided palm tour and natural history tours designed by U.C. Berkeley summer session students in 1989 were completed this spring by interns from Longwood Botanical Garden. Two new ponds have been dug in the northwest corner of the cultivated grounds to attract water birds, and plantings have been initiated to attract seasonal as well as common resident butterflies.

— Stephanie Kaza

Volunteer Opportunities

The Garden is always looking for volunteers to help with its many activities. If you enjoy coming to the Garden, you might like to be part of these programs:

Docent Training — A new group of future docents will begin training in early September. Apply now for this outstanding chance to interact with all kinds of people of all ages and to develop your knowledge of the Garden and its collections.

Visitor Center — Visitor Center volunteers work as sales people and hosts half days once a week. If you like meeting people and are not intimidated by a cash register that does everything, this job is for you.

Plant Sales — We will need cashiers and security helpers for the Fall Plant Sale on September 23. Mark your calendar and plan to help!

For more information on these and other volunteer opportunities, please call Nancy Swearengen, Volunteer Coordinator, 642-3352, Mon-Wed-Fri mornings.

Errata: With apologies to Jim Jones, we offer the following correction to last issue’s article on orchid nomenclature. Single quotation marks are used only for cultivar epithets, not grex names. For example, Cymbidium San Francisco and its offspring ‘Angelica’, ‘Florence’.
New Members

The Friends of the Botanical Garden welcome the following new members:

Tim Aaronson
Fan Albantron
Roy & Judith Alper
Norma J. Ayres
Dr. Joseph Barbaccia
Ellen Barth
Judith S. Bowman
Gretchen Boyer
Robert Brentano
Steve Bridge
Gretchen Boyer
Ellen Barsh
Dr. Joseph Barbaccia
Norma J. Ayres
Fan Albritton
Roy & Judith Alper
Robert Brentano
Janice Brigg
Doris & John Brown
Gina Basciolato
Karen C. Bustillo
Mella A. Caisse
Dorothy J. Campbell
Ross Carlton
John Cherniak & Hatsue
Katsura
Vincent K. Chen

Moe Clark
Priscilla Collins
Jim Cole
Colette
Neil & Judy Collier
Tim R. Cooke
B. Lee Cox
Barbara Cox
Thomas Batcheller Cox
Robert Cumman
 Lorren Cross
Patricia Curran
Kim Cypther
Tom Daigle & Joan Zoloth
Barbara D’Annao
Chuck Darrah & Janice Kovach
Robert Derige
Barbara Deutsch
Hazel & Henry Diccon
Debora Driggers Dillen
Charles Dithrich & Andrea Walt
Dr. Robert A. Doyle
Joanne Dunn
Janet Finch
Russell Eber
Harrick J. Eave
Janet C. Everett
Harvey Feld
Cindy Felton & Jerry Prierson
Mr. & Mrs. James A. Field
Brian Flannery
Katharina & Donald Foley
Kate Frankel
Jane & William Fraser
Lauren Galaty & David Gowen
Mrs. Peter K. Gallagher
Doris Garrick
Sherry L. Goe
Peter Goldberg
Mary Gordon
Frances H. Grafe
Walter Grewe
Sorrelle Green
Ann Gregory
Pamela Grove & Jerry Nelson
Heather D. Huffard
Ann Huxman
Charles A. Harless
Gene Hassan
Amanda Hawley
Sady & Amy Haskins
Marilyn Hestor
Sean A. Higgins
Wanda Hill
Don & Helen Holm
Lisa Homesley
Bob Horneback
Linda B. Ingham
Helen M. Johnson
Stephanie Johnston
Anne Jolley
Justice & Mrs. Marcus Kaufman
Margaret Kavanagh
Mary Kaye
Patrick C. Kennedy
Shawn Kim
Patricia Kirkbridge
Ebbu Kranup
Elizabeth Knoebel
R.E. Laidford
Caroleen LaCasse
Linda Larson
Shirley Larson
Rosemary Leen
Rickey Lewis

Chris Lewis
Melanie F. Lewis
Robert M. Lloyd
Eugene & Joanne Loop
Astrid Lorie
Scott A. Lucas
Steve Lustig
Mr. & Mrs. Henry May
Kathleen D. Mauer
Tim McDermott
Collie McRory
Linda Cohen McSwain
Bryan Merritt
Barbara Morgan
Jennie Munro
Native Sons Wholesale Nursery
Manyia Nelsen
Nancy Newman
Eugenia V. Novakos
Helen Noorthoek
Sally Parker
Lana R. Paulin
Mrs. Peter Pederson
Jacqueline Peresca
Catherine Peterson
Dr. Glen N. Peterson
Kate Peyer
Cecilia M. Placek
Natalie M. Post
Heather A. Price
Sandra Price
Silly Randel
Eleanor Rasmussen
Laurie Reid
Elaine Richards & Andy Bode
Steve Rieser
James T. Ringgold & Karen E. Ivy
Barbara Robinson
Nancy D. Robinson
Tom & Betty Roland
Carole & David Reddy
Laura Schiff
Tom Schuessler
Robert Schwab
Bert Schwarziald
Roy Sebastian
Ruth A. Shaw
Jean & Stanley Saddie
Jacob Sigg
Loona Soares
Sonoma Horticultural Nursery
Ann Sorensen
William Spading
Robert Standle
Elen Stumque
Barbara Swenson
George A. Tucker
Chris Vincon
Jackie Vogt
Sharon Wood
Bill Winer
Ingrid Werner
Donald Whorton
Maggi Fry Williams
Cato I. Wilson
Andrew Wood
In Memoriam

The Friends offer appreciation and thanks for gifts from these donors in memory of:

Henry Evans, honorary trustee, from Dr. Baki Kasapligil
Haruko Obata, for the Japanese Stroll Garden, from Lloyd & Cynthia Malmstrom, Golden Calkins Torgesen, Kosaku Ishihara

And for donations given in honor of:

June Falkner, from Shirley Craig
Elizabeth Hammond, from John & Josephine Shuman
Harland Hand, from The Garden Guild, Happy Valley Garden Club, and Linda B. Ingham
Jacqueline Woodfill, from Charles Harless, and Marlene Jani & Bing Jap

Grateful Thanks

The Friends wish to thank these donors who have made a substantial gift over and above membership:

Janet Alderton Kosaku Ishihara
P.K. Anderson Tonne Jones
Professor Alan Bearden Justice & Mrs. Marcus Kaufman
Jerome Carlin Lizzie & Dick Lee
Mr. & Mrs. Hugh Carpenter Lloyd & Cynthia Malmstrom
Dr. John Carr Mrs. Phillip McCombs
Dr. & Mrs. Estol Carte Robert & Beverly Middlekauff
Judy & Mike Cirolo Mrs. K. Ralph Morris
Michael Concannon Letea H. Nelson
Ramona David Kevin Nieman
Ken & Paul Doty Orinda Garden Club
Gladys Eaton Mary & John Ricksen
Jane & William Frazer Wayne Roderick
Wallace Gorell Jon & Jo Shuman
Happy Valley Garden Club Golden Calkins Torgesen
Charles A. Harless Ruth Towsend
Elizabeth Helmholz Leland Unsell
Eleanor & Jack Higson
Linda B. Ingham

Friends' Annual Meeting & Picnic

On Sunday at noon, October 14th, the Friends will hold their Annual Meeting and Picnic in the Garden. The day has been named Myrtle Wolf Day in honor of a long-time supporter of the Garden. Myrtle Wolf, a docent long before the Garden had a docent program, led groups of youngsters on garden tours for many years starting in the sixties.

A student of Lincoln Constance (Emeritus Professor of Botany at U.C. Berkeley) Mrs. Wolf co-authored a book with Herbert Mason called Botany in Berkeley. It has long been used in Berkeley schools and is still in use in San Jose schools. Myrtle Wolf has been instrumental in securing funding and support for development of several areas of the garden and is an active Volunteer Propagator.

Myrtle Wolf's friends are invited to join the Friends at the Annual Meeting on October 14 at noon for a celebration, picnic and short business meeting.

Membership

The Friends of the Botanical Garden offers public education programs and provides independent funding to support the many needs of the Garden. You can enjoy and support the Botanical Garden year-round by becoming a member of the Friends of the Botanical Garden.

Annual Membership benefits include:

• Newsletter
• Workshops, lectures, and tours
• Discount on Visitor Center purchases
• Discount on educational classes
• Admission to Spring Plant Sale Preview
• Volunteer opportunities

Friends of the Botanical Garden Membership Application

Yes, I would like to support the U.C. Berkeley Botanical Garden as a member:

☐ Student .................$7.50  ☐ Sponsor ...................$250
☐ Individual ...............$20  ☐ Patron .....................$500
☐ Family ..................$30  ☐ Benefactor ...............$1000
☐ Contributing ............$50  ☐ Friends' Circle ...........$5000
☐ Supporting ..............$100  ☐ New : Renewal

Name ____________________________

Address __________________________________________

City/State/Zip ____________________________

Telephone ____________________________

Contributions are tax deductible. Please make checks payable to Friends of the U.C. Botanical Garden and mail to: Friends of the Botanical Garden, U.C. Botanical Garden, Berkeley, CA 94720.

* Full-time students only
Calendar of Events

CENTENNIAL TOURS  Sats, JULY-AUGUST
Docent-led tours of the Garden's historical collections with stories of the past 100 years as a University and community resource. 1:30pm, Visitor Center.

GREEN STUFF DAY CAMP  JULY 16-AUG 17
Week-long programs for children with instructor Chris Pires on the wide world of plants, how people use plants, plant stories, art, and games. Sessions I & III for 8-11 years, 9am-3pm Mon-Fri; Sessions II & IV for 5-7 years, 9am-2pm. $90 per session. Call 642-3352 to register.

INTRO TO PLANT PROPAGATION  Sat, JULY 28
Learn propagation techniques for seeds and cuttings from Otto Quast of West Marin, a former UC graduate in ornamental horticulture. Includes a tour of the Garden's propagation area and greenhouses. Meeting Room, 1-4pm. Limit 20. $20 members, $30 non-members, includes materials.

PLANT DISEASE CLINIC  Sat, AUG 4
Bring your sick plants for free consultation with Master Gardeners and others on infection, disease and pest problems. 9am-12noon, Meeting Room.

PRUNING TREES AND SHRUBS  Sat, AUG 11
Ted Kipping, Tree Shaper, will show slides and discuss correct and incorrect pruning techniques. The group will spend time in the Garden to learn more about this fine art. Meeting Room, 1-4pm. $15 members, $25 non-members.

PLANT DISEASE CLINIC  Sat, SEPT 1
Bring your sick plants for free consultation with Master Gardeners and others on infection, disease and pest problems. 9am-12noon, Meeting Room.

STRAWBERRY CREEK SYMPOSIUM  Sat, SEPT 8
A day of talks, tours, and celebration of the natural history and restoration of Strawberry Creek, landmark of city and campus. Guest lectures and panel discussions, 9am-12noon, Meeting Room. Garden Creek tours 1-3pm. Free.

WATERCOLOR PAINTING  Sats, SEPT 15-Nov 3
Introduction to the basics of watercolor techniques, with Judith Corning, who will discuss materials, composition, color, and strokes during the eight class sessions. Beginners and all levels welcome. Meeting Room, 9:30am-12noon. $45 members, $55 non-members.

PROPAGATION & SEED TREATMENTS Sun, SEPT 16
Martin Grantham, U.C. Botanical Garden staff, will give an overview of propagation techniques with special focus on seed selection and treatment. Meeting Room, 1-4pm. Limit 20. $20 members, $30 non-members, includes materials.

FALL PLANT SALE  Sun, SEPT 23
Vines, perennials, trees, California natives, roses, ferns, and many other species. 10% discount for students with ID. 10am-3pm, at the Garden.

PLANT DISEASE CLINIC  Sat, OCT 6
Bring your sick plants for free consultation with Master Gardeners and others on infection, disease and pest problems. 9am-12noon, Meeting Room.

PROPAGATION OF NATIVES  Sun, OCT 7
Wayne Roderick, former Director of East Bay Regional Parks Botanic Garden, will demonstrate methods of making cuttings of native California plants. Meeting Room, 1-4pm. Limit 20. $20 members, $30 non-members, includes materials.

PHOTOGRAPHING TREES  Sat, OCT 13
A slide lecture on trees as seen through the eyes of master photographers, and afternoon workshop exploring compositional and expressive possibilities of trees in the Garden. Instructor Richard Anderson, Garden photographer, will share conventional and experimental techniques from his work with the ancient bristlecone pines. Limit 20. 10am-6pm, Meeting Room. Members $30, non-members, $40.

FRIENDS' ANNUAL MEETING & PICNIC  Sun, OCT 14
Members are invited to bring friends and family to picnic and take behind-the-scenes tours. Dessert will be provided. This day has been designated Myrtle Wolf Day. Noon, Garden lawn.

PROPAGATION BY CUTTINGS  Sat, OCT 27

CHINESE MEDICINAL HERBS  Sat, NOV 3
Principles of Chinese medicine including yin-yang and the five element theory. Herbalist and licensed acupuncturist Barbara Wilt will offer sample medicinal teas and simple remedies for everyday health ailments using commonly available herbs. Meeting Room, 1:30-4:30pm. $12 members, $15 non-members.

For further information on classes and events, call the Visitor Center, 642-3343. To register for classes, send checks to UC Botanical Garden. No refunds the week before the class date unless class is cancelled.

The Garden is open every day of the year except Christmas from 9:00am to 4:45pm, Wednesdays until 7pm. Free public tours led by docents are given on Saturdays and Sundays at 1:30pm. Admission to the Garden is free.

Plants are for sale at the Visitor Center all year * 642-3343