New Woody Asians

In 1843 Robert Fortune set out from Scotland to China in one of the earliest European efforts to procure seed of exotic species for cultivation. *Rhododendron fortunei* was the first rhododendron to be introduced from China to the British Isles. Seven years later the Royal Botanic Garden, Edinburgh, sponsored its first collecting expedition to foreign lands. One hundred forty years later, in 1990, this same institution sent an expedition to Yunnan Province to collect seeds of many Chinese plants.

The new Quarryhill Botanical Garden in Sonoma County has also recently funded collecting trips; it will very shortly be one of the West Coast’s premier collectors of Asian plants. Both the Royal and Quarryhill have shared part of their new collections with the UC Botanical Garden.

The effort required to explore unknown territory, to acquire and establish plants back in the west is in many ways not too different from Robert Fortune’s times. Collectors are still susceptible to the political nuances of foreign countries, their diseases, landslides and floods, and the sheer distances to be covered can be exhausting. Many people and organizations from different countries become entangled in the knotty logistics necessary to move equipment, collectors, drivers and translators to remote areas. The difficulty is compounded by the fact that generally the areas that need botanizing are off the beaten track, if indeed there is a track!

Our garden’s recent Asian accessions result from a collaborative process that begins long before the plant is placed in the garden. We have been remarkably fortunate to have been the recipients of the fruits of several recent expeditions. I hope that the generosity of the sponsors and collectors can be repaid by success in growing and flowering the plants.

Azaleas and other Rhododendrons

The Quarryhill Botanical Garden, in conjunction with Kew Gardens, sponsored two trips to Japan, to Hokkaido in the north, through the temperate regions of Honshu to the southerly islands of Shikoku and Kyushu and even Yakushima. These recent trips yielded seed of several azaleas now beginning to make their way in the garden. This is particularly timely because the Asian section at UCDBG has long been bereft of wild-collected plants in the azalea group of rhododendrons (Ericaceae or Heath Family).

Below the *Styrax* and *Cryptomeria* trees in the lower part of the Asian section are new plantings of *Rhododendron tashiroi* (from Yakushima), *R. macrosepalum*, *R. indicum* (actually divisions of an old garden plant from Joseph Rock’s collection), and an as of yet unidentified species which seems to be in the Reticulatum group. *Rhododendron macrosepalum* and *R. indicum* belong to the Section Tsutsusi (the old Azalea Series, Subseries...
A new young specimen of *Acer capillipes* showing the attractive leaf shape (photo by Elaine Sedlack)

Obtusum) as do two previously planted accessions, *R. kanehirae* and *R. oldhamii*) from Taiwan. There is also a new planting of *Rhododendron rubropilosum* from Taiwan in this area (in the same botanical section). This was collected by the Taiwan Forest Resource Institute.

An interesting new species to our garden is *Rhododendron tashiroi*. This species straddles two sections, Tsusiopsis and Brachycalyx. The southern Japanese name for this plant is “Cherry Azalea”. The flowers vary from almost white through pale pink to deeper shades found at lower elevations. It will be interesting to see what color ours will be. They were collected from mixed *Tsuga* and *Chamaecyparis* forest, but as they sometimes occur as epiphytes on *Cryptomeria* trunks, they were planted beneath the *Cryptomeria* in bed 246.

Near the lower falls of the Japanese pool are more plants of *Rhododendron macrosepalum*. This is the species from which the odd selection that is called “Linearifolium” was developed, with its extremely narrow leaves and petals. The UCBG plant will have the more typical funnel-shaped flowers of rosy lavender. From the same region of Honshu, *Pieris japonica* was found and is interplanted with the azaleas. The *Pieris* is also in the Ericaceae (Heath Family), as are *Vaccinium* and the familiar genus *Arctostaphylos* (manzanita). The small urn-shaped flowers display more clearly the relationship of these genera than is apparent in the genus *Rhododendron*, with usually larger funnel-shaped flowers.

Around the Japanese pool and in bed 226 under the *Paulownia* tree is a continuation of new plantings: *Rhododendron wayrichii*, *R. reticulatum* and *R. albrechtii* are Japanese species in Section Brachycalyx (the old Schlippenbachii Subseries).

**Snake-bark Maples**

Japanese maples are commonly associated with the species *Acer palmatum*. However, this is also a large genus in Asia; there are some interesting alliances between other maples from Japan and ones whose range extends from Korea, through China and the Himalayas. Garden visitors are perhaps familiar with *Acer davidii* in bed 232 which glows with rich yellow fall foliage to rival a Gingko. This species belongs to a group known as the “snake-bark maples” due to a striking pattern of vertical green striping on the trunk. In bed 170A is the Japanese counterpart to this Chinese species, *Acer crataegifolium*.

*Moso Bamboo* (*Phyllostachys pubescens*), a nonwoody grass collected by the American Bamboo Society in Guangxi Province and donated to the Garden. (photo by Elaine Sedlack)
This shrubby maple won't get nearly as large as *Acer davidii* and can take more sun. Another plant in this group, found in Sichuan and Yunnan, is now represented in bed 235. *Acer laxiflorum* reveals its adaptation to a monsoon climate in the long drip-tip of the leaf. And lastly is a new young tree into bed 228 (above pool). *Acer capillipes* is a strong-growing maple from Japan which can reach 75' and has, in addition to the striped bark feature, handsome cordate, long-acuminate leaves which change from bright-red in the spring to rich green and then again to red and yellow shades in the fall.

Other trees of several families have newly planted progeny in the garden. The Asian section finally has wild-collected *Prunus* from Taiwan and Korea, and three species of *Sorbus* from China (all in the Rosaceae). There are two new genera in the Betulaceae (*Corylus* and *Carpinus*), and there is a rare representative of the Rubiaceae from western China, *Emmenopterys henryi*. The cherry trees are especially exciting introductions. They come to us courtesy of the National Arboretum in Washington, D.C. via U.C. Davis, where they fulfilled their mandatory three-year quarantine to insure against viral infection. One new taxon, *Prunus cerasoides* var. *campanulata*, is the eastern representative of what was previously our only *Prunus* species (*Prunus cerasoides* from Nepal) in the Asian collection. The variety *campanulata* is called the "Taiwan Cherry" and is frequently cultivated in Japan. It blooms early and has long-pedicelled, deep rose flowers with or before the leaves. This last winter had been so mild that by January it still hadn't dropped its leaves and it will be interesting to see in succeeding years whether the genetic memory of this plant is stronger than our relatively mild seasons here in the Bay Area. Our *Prunus cerasoides* from Bhutan is also evergreen except in very cold winters. The other two new species, *Prunus takesimensis* and *P. takasagomontana* are from Korea and Taiwan, respectively. *Prunus takesimensis* was collected at only 100 m. elevation on Ullung Island, Korea. It will have white flowers and is planted in bed 245A behind the *Rhododendron griffithianum*, where its pale fall foliage will light up an otherwise dark location. *Prunus takasagomontana* is a mouthful; it barely fits on a large format label. Already this tree is exhibiting the burnished copper bark for which the genus is known. Also white-flowered and behaving here as an evergreen, it is described as having glossy black fruit. It is very rare in the wild, being endemic to the mountains in Ilan, Taiwan, but it is now receiving visitors below the *Paulownia tomentosa* in bed 226.

The *Corylus tibetica* (now planted in bed 248) was actually collected in Sichuan. This member of the Betulaceae has edible fruit (a kind of hazel nut) and will at least provide the garden's squirrel population with a new source of fodder. The fruit are borne several to a

cluster, enveloped by a spiny involucre, or whorl of bracts, which in the case of this species is especially bristly. In fact, a closely related species is named *Corylus ferox*, meaning fierce. You are advised to keep your shoes on when approaching this tree although it is presently under 2' tall.

A long sought-after birch tree, *Betula jacquemontii*, will give the garden a fairly complete geographic display of this genus. Its chalk-white bark distinguishes it from the other predominantly Himalayan birch, *Betula utilis*.
De-Accessioning Trees

Since the beginning of time, trees have held aesthetic and emotional value, as well as spiritual symbolism for people. Herbert E. Schroeder has found in his studies on the psychological value of trees that through natural selection, humans may have evolved an innate attraction to trees, as a refuge, harkening back to some of our most primal survival instincts. So when the garden management considers the removal of a tree from the Garden, they take into account the attachments that many people have for individual trees. “As trees get older, they’re just like humans, they start to fall apart,” says California Area horticulturist Kurt Zadnik, who has many times been delegated to remove large trees from the Garden. “The two most common reasons to remove trees are (1) that they pose a safety hazard by dropping limbs (senescence), or (2) that they are diseased and pose a health risk to other plants.”

Several factors can contribute to senescence in the Garden. Trees in cultivation tend to receive more water than they would in the wild. For some species, this steady allowance of water causes trees to grow at astounding rates, that may result in dangerous top-heavy structures. Some, like redwoods, can over-extend themselves in the process of competing for light. They grow tall so fast that the thick lower branches don’t have enough light on which to live.

Other species (mostly natives, in the Garden) are slowly drowning in the extra water they receive in the Garden. Zadnik cites the large native oak on Strawberry Creek along the new trail in the native area.

“It’s been dying off for years because it gets too much water. It gets water from the creek and extra water twice a week because the more temperate collections around it must be maintained. The Botanical Garden is, by its nature, a collection of plants that have very different cultural needs.”

Zadnik’s comments get to the heart of the matter. For someone who has grown to love a particular sprawling oak in the Garden, it is downright painful to watch it deteriorate. But as the gardener points out, he must always consider the cultural conditions for surrounding plants, and trees always influence options for planting new herbaceous accessions in the area.

It is interesting to note that there are actually more “volunteer” trees in the Garden than trees that have been planted intentionally. Most of the volunteers are oaks and bays, that, due partially to fire suppression, grow very quickly in the canyon. These hills were once subject to natural, periodic fires.

The beauty of Strawberry Canyon as a whole is testimony to the hardiness and good fortune of these trees, as well as those intentionally planted in the Canyon in the thirties. The Garden, however, is ideally a place where plants are selected and carefully cultivated for their botanical, cultural and aesthetic value. And the desire among Garden personnel is to have a mixed-age population of trees, so that the landscape is always evolving.

Garden policy directs horticulturists to remove plants that are more than six feet tall only after that permanent removal is considered from the curatorial, educational, administrative and aesthetic points of view. Though there have been suspicions spurred by the deep emotional attachments people have for the trees, the Garden is not staffed by chainsaw-happy madmen. If a tree is finally designated for removal, that removal has been weighed against many factors, including room for new trees in the Garden.

The curatorial staff, in conjunction with the appropriate horticulturist, selects new trees appropriate for the habitat represented in each bed. These are long-term considerations. Trees need constant care so that they don’t infringe on other plants in the bed, and it is inevitable that some saplings will need to be thinned in order to provide the best care for all of the plants.

“We always plant more than one specimen of accessioned trees, in the hope that one individual will survive and dominate,” explains Martin Grantham, horticulturist for the Mesoamerican area. “And we’re always fine-tuning.”

— by Bobbi Ohs
**BOOK REVIEWS**

**Seeds of Change, a Quincentennial Celebration**

In recognition of the Columbus Quincentenary this year, the Smithsonian has prepared an exhibition and book describing the world-shattering exchanges brought about by his voyages of discovery. The exhibit and this book, *Seeds of Change*, have adopted the title of an earlier book by Henry Hobhouse that describes the impact of five plants (maize, tobacco, quinine, tea and sugar) on world events. Hobhouse is one of the contributors to the new book *Seeds of Change* in which the “seeds” represent the plants, animals and diseases exchanged between the Old and the New Worlds during the past 500 years, permanently altering the lives of mankind.

**Impact of Columbian Exchange**

Five prime examples were chosen, because of the human dimensions of the story, to represent this Columbian exchange. They are:

1. **sugar** from the Old World, which led to the transformation of New World ecosystems and the enslavement of Africans;
2. **maize**, which led to an increase in African populations, bringing about a supply of manpower for American plantations;
3. **the potato** from the New World, which became the basic food for many people throughout the world and provided food for the population increase fueling the industrial revolution;
4. **disease**, such as measles and smallpox, which decimated the people of the New World; and
5. **the horse**, a gift from the Old World to the New, which then became an important part of subsequent native American culture.

**Reevaluation**

In recent years there has been a reexamination and evaluation of the historic changes occurring in the world since Columbus set foot in the Americas. In this book, fourteen essays by experts examine the European conquest of the New World, going on to then describe the effects of this conquest on both worlds. The flood of Old World animals (pigs, goats, sheep, cows) and plants (grasses, cereals, pears, apples) into the New permanently changed New World ecosystems, while New World food plants were taken to many regions of the world where they have, in most cases, improved human nutrition. Massive changes in world populations have occurred as a result of these exchanges.

Research is now showing us the successful farming methods of the Aztecs and Incas, and we are beginning to examine their early foods (quinoa, amaranth, etc.), long suppressed by the conquest. Today we must confront the problems arising from the long ongoing decline of New World ecosystems while we try to learn about them, appreciate them and preserve the parts of them that remain. This Quincentenary examination is a good way to begin to do that.

—Elly Bade
Question: What happens every two years, requires hundreds of hours of staff and volunteer time, and causes people to climb up trees?

Answer: The Botanical Garden’s Biennial Seed Exchange.

Every two years the Botanical Garden staff and volunteers undertake a major effort that shares a bit of California with other Gardens and institutions worldwide. For the 1991-92 Botanical Garden Seed Exchange, we’re sending catalogues to nearly 600 gardens worldwide offering over 200 different taxa from all over California. These institutions will use the seeds for research, display and educational purposes. This international seed exchange is the primary source of new materials for gardens like ours, allowing us to share the richness of our flora with those who may never see it in the wild. In return for our efforts, hundreds of institutions send their lists and supply seeds to us free of charge. On average, each year between a third and a half of all new materials in our Garden come to us through this exchange system.

The work behind the seed exchange is truly impressive. Beginning last summer and fall, Roger Raiche, Kurt Zadnik and Holly Forbes of the Garden’s horticultural and curatorial staff obtained collecting permits and began scouting up and down the state for desirable populations of plants during the flowering season. On subsequent trips, they collected over 200 different species of seeds from wild populations with each item accompanied by thorough documentation including habitat description, exact locality, date of collection, collector’s name and collection number. En route they endured long days, mediocre restaurant food, and tortuously winding, carsick-causing roads. They even perfected the hazardous art of tree climbing to collect cones from Foxtail Pine, Mountain Hemlock, White and Red Fir, and other coniferous species.

Back at the Garden, volunteers meticulously cleaned seeds by hand and machine before packaging them into thousands of envelopes for eventual shipping. Getting the seed separated can be an arduous task — for some species, it even meant “barbecuing” cones on a small Weber grill to get them to release their seeds! Special thanks go to volunteers Francine Henderson, Elizabeth Hunt, Leonard Maudens, Nathan Shoehalter, and Margriet Hecht for their many hours of seed cleaning, sorting and packaging. Once the catalog is mailed out, we’ll prepare for the onslaught of mail requests for seeds (the 1989-90 Seed List resulted in requests for over 5100 packets). Margriet Hecht will once again be the primary volunteer responsible for packing and distributing seeds as the mail order requests arrive.

Considering the costs of collecting trips, the value of staff and volunteer time, and the expenses associated with printing, packaging materials, and postage, the biennial seed exchange is an expensive undertaking. This year, generous donations from The Happy Valley Gardening Club and other Friends helped to partially defray the costs of producing our list. Despite the expense of conducting the seed exchange, we at the Garden consider it both an investment and a service. We not only share our flora with others, we also benefit from their seed collections, saving us the major expense of overseas collecting expeditions.

Both the garden and its visitors benefit from the seed exchange in many ways. Our diverse collections are renewed and expanded with plantings from the world over. And now, even the backyard gardener can share in our bounty. Recently, staff horticulturists Peter Klement and Martin Grantham teamed up with volunteer Francine Henderson to harvest and clean seeds collected from plants in the Botanical Garden. This past January we began selling these garden-collected seeds through our Visitor Center. Now everyone has a chance to benefit indirectly from our international seed exchanges. Next time you visit the Garden, stop by the display and see the great selection of unusual species available for sale. Who knows, you might find the perfect addition for your own home garden!

—Margaret Race
**PROGRAM HIGHLIGHTS**

**Off and running**

In what may be aptly described as the busiest early Spring season ever, the UC Botanical Garden has managed to run its “Rainforest Rap” program weekly from January through March, put on 140 school tours, stage two major lab courses from campus, Plant Taxonomy and Introduction to Biology and attract capacity crowds for its twelve public programs, between January and April.

Especially popular were the lectures on English-style gardens, and on Natural Pest Control, and the workshops on Propagation, Fire-Retardant Planting, Soil Development, Waterwise Plant Selection and Irrigation Techniques. The Amber and Rhododendrons programs were also very well-received.

The Garden’s new adult courses in Plant Identification and Beginning Birding filled shortly after they were advertised, and waiting lists burgeoned. Our three fund-raising events attracted huge numbers of interested patrons: BUG DAYS! drew record crowds over Leap Year weekend; Birdwalk and Breakfast filled almost overnight; and enrollments for the Peninsula Gardens Tour rapidly spilled over to a waiting list! Gate receipts from all programs go directly toward program enhancement.

Successful programs are the direct outcome of at least three happy developments: (1) excellent instruction; (2) strong volunteer logistical support; and (3) conscientious publicity and marketing efforts. The people in the Education office and on the Program committee wish to express our gratitude to all of the wonderful instructors, volunteers and publicists who participated in these events.

**A New Docent Class**

On March 9 the newest docent trainees were inducted into the ranks of the Docent Program of the UC Botanical Garden, having duly attended weekly classes that began in August 1991 and led up to a written and a practical final examination. All passed with flying colors, and their addition now swells the ranks to a total of seventy active docents. Among the new docents are two former teachers, a librarian, a medical doctor (retired), several home gardeners, a postdoctoral fellow of the University and two horticulturists. Welcome aboard!

**Coming Events...**

It’s always exhilarating to hear someone talk about her passion in life, and you will have an opportunity to do just that when Robin Parer gives her talk on Geraniums in late April. Robin is the Bay Area geranium expert; she owns a nursery that specializes in the family (Geraniaceae), and plans to show you many photographic slides of the most likely geraniums for planting in the Bay Area.

The optimal time to come to the Garden to do some watercolors is in early May. Why not join our watercolor class for a few weekday mornings during our lushest season? Judith Corning is an experienced art instructor who knows the best spots in the Garden and when the light is just right. Or perhaps you have heard of Sonoma’s Robert Kourik (and his wonderful speaking style), and would like to find out more about growing lavenders, both native and exotic. He will be talking about lavenders in mid-June.

Travis Columbus, of the University’s Integrative Biology department, will conduct his excellent Grasses Workshop for the third time, on May 13th. If you have put off learning the native (and some exotic) grasses, but really want to know this beautiful and important group, here is what may be your last chance (Travis will be leaving the campus in the fall.)

June is Herb Month at the Garden: the Tour of the Month will focus on the several herb gardens; there will be another fine talk by Dr. Barbara Wilt, on the Medicinal Uses of Chinese Herbs, and Jerry Parsons and Diane Kothe will conduct an herb propagation workshop.

The Botanical Garden’s very popular day camp, Green Stuff, will operate again this summer. Children enroll for a week and have a great time learning about plants, bugs and ecology. More than a few parents (and kids!) from former Green Stuff classes (or from BUG DAYS!) have also inquired about after-school activities for children; we are currently exploring the possibility, and hope to have full details in the Summer Newsletter.

—Carol Baird
GARDEN SPOTLIGHT

The Succulent Strategy

Among the most popular attractions at the Garden, the succulent plants, with their myriad forms and adaptations, rarely fail to capture the attention and comments of visitors. Some people find the cacti, with their long, gleaming spines and satiny flowers, especially appealing; some appreciate the geometric patterns created by the leaf arrangements of the other succulents. The plants possess such visual charm that we might even fantasize that they assumed their forms just for our benefit. This, of course, is not the case. Instead, they have pursued a higher priority: survival!

The Cacti

Over the last few million years, cacti (family Cactaceae) have adopted a variety of methods to deal with the gradual drying of the Earth's climate. Some, such as the Lemon Vine, *Pereskia aculeata*, have adapted minimally, retaining large leaves and developing slightly succulent stems capable of photosynthesis. Others from more water-stressed climates, such as the Golden Barrel, *Echinocactus grusonii*, have gone to extremes in order to minimize their surface area while at the same time maximizing their water-holding ability by assuming the shape of a ball (and a very large ball at that!). Many other essential adaptations to survive drought conditions have coincidentally made these plants (family Cactaceae) beautiful to our eyes. Let's take a closer look at this succulent strategy for survival.

Spination and Surface

Perhaps the most intriguing feature possessed by cacti is their wide range of armature. Most cacti are heavily spined in order to protect the hard-earned water they store in their stems. Familiar examples are the various Barrel Cacti, both *Ferocactus* and *Echinocactus*; the Hedgehog Cacti, *Echinocereus*; and the Prickly Pears, *Opuntia*. There are, however, many exceptions to the rule that cactus plants always are spiny. For example, the Saguaro, *Carnegiea gigantea*, of the American Southwest, is extremely spiny as a juvenile plant, but upon reaching a height of over five feet becomes essentially spineless. Its juvenile spination is necessary to discourage predators, especially rodents, from eating the young plants. When the plant matures, however, it grows out of reach to predators, and no longer requires heavy spination. And some cacti have completely lost their spines, notably *Lophophora williamsii*, the Peyote cactus, which has evolved unpalatable alkaloids within its tissue to discourage predation.

Besides the waxy cuticle that all cacti have, which helps them conserve water, many plants "coat" themselves with reflective materials, most notably a waxy bloom that reflects sunlight and heat. (Botanically, a bloom is defined as a white, waxy coating on leaves, stems, or some fruits, such as plums or grapes.) This bloom gives the stems of many columnar cacti the blue coloration that cactus fanciers find so desirable. One cactus, *Lemaireocereus beneckei*, is so covered with wax that mature plants are almost solid white! Besides wax, other globular cacti, most notably members of the genus *Astrophytum*, produce white scales that can completely cover the plant body. Some people even mistake these scales for pests, such as scale or mealy bug, but no matter how much the plant is treated, these "scales" just don't go away!

The Other Succulents

Although the Cactus family is the best known of the various groups of succulent plants, few people realize that the evolution of succulence has cropped up in many other diverse plant families. The Desert House collection at UCBG contains succulent members of over 40 different families from around the world, ranging from the Sunflower family, Compositae (Asteraceae) to the Milkweed family, Asclepiadaceae. Many of these unrelated plants show adaptations similar to those found in the Cactaceae. Some succulents, however, have gone
beyond these adaptations and added a few of their own.

**Leaf Arrangement**

Many succulents have adapted to drought by using the same methods as members of the cactus family, namely spination, thickening of the epidermis, and reflective coatings and hairs. Succulents have also minimized surface area while maximizing water storage to a higher level.

Succulent plants from many different families such as the Lily family, Liliaceae, and the Century Plant family, Agavaceae, have assumed a "rosette" shape that superficially resembles an artichoke. The leaves of rosette shaped plants radiate from a short central stem and are arranged in a series of spirals, with each successive layer slightly overlapping the last. In some cases the layers are tightly compressed against each other, further reducing the exposed surface area. Some members of the Stonecrop family, Crassulaceae, have taken the rosette to an extreme, such as *Crassula columnaris*, a succulent from the Karroo Desert of South Africa. Even more extreme is *Crassula pyrimidalis* from the same area, which has thin, wafer-like leaves stacked so tightly on top of each other that they form a solid, hard stem that resembles a miniature pyramid.

Probably the most extreme adaptation in succulent plants has taken place in some members of the Carpetweed family, Aizoaceae. These succulents, most notably in the genera *Lithops* and *Conophytum*, have adapted to severe drought by reducing their leaves down to a single annual pair, often camouflaging themselves to resemble the rocks among which they grow. Their mimicry is so complete that they have been able to fool the grazing animals that have made Africa famous. During their resting stage, these plants superficially wither, and their leaf surfaces dry to a thin papery layer. At this time, they appear to be completely lifeless. The plants, thank goodness, know better, and are actually forming a new set of leaves inside the old ones. In order to conserve every last molecule of water, they completely absorb the old leaves. Then, in the spring, the new set of leaves bursts through and sheds the old "skin."

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**Night Moves (CAM)**

In order to further conserve water, succulents differ fundamentally from non-succulents in the way they "breathe." All green plants survive through a process called photosynthesis, in which they combine water, carbon dioxide (CO₂) and salts in solution in the presence of light and chlorophyll to create food for growth. In non-succulent plants, this takes place in the green surface tissues of the leaves during daylight hours, when CO₂ enters the leaf through "windows" in the leaf surface called stomata. When stomata open, they not only allow air to enter, but precious water to escape through evaporation. Most non-succulents can afford this loss, while succulents cannot.

Succulents, however, cleverly open their stomata at night, when the temperature and evaporation are much lower, taking in CO₂ and combining it with other substances to produce organic acids. Early in the day the plant closes its stomata, minimizing water loss, and breaks down these organic acids into CO₂ and water, which are utilized photosynthetically to make food. This process is called **Crassulacean Acid Metabolism (CAM)** and is not confined to succulents, but is found in other drought tolerant plants as well.

The list of succulent adaptations necessary for survival is nearly as myriad as the forms of the plants themselves. If these plants intrigue you, try and spend some time among them in the Desert House display area, which is open daily from 9:00 AM to 3:00 PM. The plants want you to appreciate them!!

- Kurt Zadnik, with special thanks to Fred Dortort and Sean Hogan

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WHO'S WHO IN THE GARDEN

Jean Nunnally, with Nancy Swearengen: both volunteers have filled in for Visitor Center staffers on vacation (photo by Carol Baird)

The Visitor Center Volunteers

The University of California Botanical Garden's Visitor Center is a marvelous example of what volunteers can accomplish. Under the auspices of the early Docent organization, the original Visitor Center structure was designed by architect James Novosel, a docent, and built on the site of the current Tour Orientation Area in 1976. It housed a small collection of field guides, a few pretty cards and a selection of whimsical gift items. It was administered by paid Garden staff and manned by work-study students and occasional volunteers.

Business was slow and hours were irregular. The location was not ideal, so in 1986 the building was moved to its present location at the edge of the inner parking lot, and set off by a new wooden deck. Business did not improve markedly, and Garden management discovered that running it was costing precious funds from their meager University budget allotment. Enter the Friends of the Botanical Garden, who reasoned that the fifth largest public garden in the United States must have a visitor information center, at the very least, and wondered if it might not be staffed entirely by volunteers. This notion was accepted joyfully by Garden management, at least as an experiment, and no one has ever looked back.

The Friends Take Over

A committee composed initially of Friends Board members Peggy Newell, June Falkner, Jim van Sicklen and Nancy Swearengen set out to recruit volunteers, expand the book selection and diversify the gifts, while often working 3 or 4 shifts each week themselves.

In 1987, floor space was expanded, thanks to the generous gift of half a greenhouse from yet another Friend of the Garden, and in 1988, volunteer Walt Wagner constructed the bookcase on the west wall. Itching for another project, he built the plant sales deck between the Visitor Center and the Garden Office, allowing the volunteer Propagators to sell their wares year-round on an "as ready" basis, rather than relying solely on the two or three plants sales each year.
Meanwhile, the volunteer ranks grew. Elly Bade took over the Book Buyer position. Elly has a degree in Library Science, plus a second sense for which books will appeal to Garden visitors. She has lovingly increased the book inventory to more than 700 titles. Francine Henderson became the Gift Buyer; she excels at finding wonderful cards and delightfully different gift items that appeal to one-time buyers and regulars alike. Marge Brostrom has recently succeeded Mary Schroter and Lizzie Lee as Nursery Manager; she checks the Plant Deck to be sure it is suitably stocked and attractive, and coaxes volunteer propagators into offering their special treasures for sale. Jim van Sicklen toils away at writing checks, balancing bank statements, preparing monthly financial reports and threatening to retire. His complaints have subsided somewhat since Frances Hartwell joined the group to assist him.

A Diverse Crew

The volunteers who work in the Visitor Center are of all ages and bring various skills and insights to the operation. Isabel McKay and Kay Riddell have volunteered since before it became a wholly volunteer project. Elly Bade, Mitch Harvey, Leland Unsell, Susan Kahn, Peggy Klenz, Nancy Markell, Peggy Newell and Jim van Sicklen are also active docents. David Gartland worked as Garden Security Guard while he was a Cal undergraduate, and has stayed to help with an occasional weekend shift. Evelyn Givant and Jean Nunnally have substituted for nearly everyone, and worked every Plant Sale since they joined the staff in the '80s. Liz Hunt is a loyal substitute. Jerry Hashimoto and Tim Carson have given us whole days out of their busy schedules, quit as regular volunteers, and then continued to help out if needed. Joan Szabocky has been sharing her retailer's insights for a couple of years, while Pam Dahlen's eye for organization and efficiency has also made its mark. Gloria Conway, Carol Beckmann and Karen Pettit bring their reliability and good humor. Pat Day, Jenna Donatelli, Kristina Serrano, Linda Simons and Julie Waldman are new Visitor Center staffers, all working weekend shifts and are absolutely indispensable to the level of service the Visitor Center seeks to provide.

These fine and knowledgeable people are more than happy to answer questions from Garden visitors, or to refer them to specialists. That in itself is an important reason for their presence. But also, thanks to the imaginative and dedicated merchandising that goes on, the Visitor Center has been able to provide visitors, gardeners and researchers with the materials they need, and to donate the $60,000 required for landscaping the new parking lot. Kudos to all!

Parking Fees: The new University parking lot is now completed. Officially designated as a "satellite lot" for Campus staff, it is also available for our Garden visitors at all hours. After much bargaining back and forth with the Parking Office on campus, a fee for visitors has been established, and is now in effect. The charge is fifty cents per half hour; computerized meters in the lot will issue tickets for the amount of time that you have selected with your coins (or bills). The University Hill Shuttle is also available, during the week from the Mining Circle on campus, for fifty cents each direction, or on weekends (as a test, through April), from the BART station, for one dollar round trip.

Lecturer from the Garden: Martin Grantham is a horticulturist with the Botanical Garden, who has extensive postbaccalaureate botanical training through the University. Both that background and his propagation experience at the Garden more than qualify him to teach his course, Advanced Plant Propagation, at Merritt College. The course covers the following, among other topics: ferns from spores; plant juvenility and other epigenetic states; nurse seedling grafting; fungal problems; hard-wood cuttings, and root cuttings. Martin is having a grand time as instructor, and is eagerly awaiting the time when the students turn in their independent projects.
Spring Plant Sale

Friday May 8  
Members’ Preview Party, 5pm-8pm  
Saturday, May 9  
Public Sale, 10am-3pm

The Spring Plant Sale sponsored by the Friends of the Botanical Garden will take place on Mother’s Day weekend, Friday-Saturday, May 10-11th. This sale is the most extensive of the year, offering a wide variety of California natives, roses, rhododendrons, houseplants, perennials, rock garden/almipes, ferns, grasses, orchids, and bromeliads. Please note that many plants will be available at the Visitor Center before the sale, especially those that flower early, so come by frequently and see what we have!


Herbs: culinary favorites: Annuals and Perennials- Basil, Chervil, Chives, Garlic, Marjoram, Oregano, Parsley, Rosemary, Tarragon, Thyme. Ornamentals: Carnation (Dianthus caryophyllus), Clary Sage (Salvia sclarea), Lady’s mantle (Alchemilla mollis), Lamb’s Ears (Stachys byzantina), Ornamental Oregano, Rose Campion (Lychnis coronaria), Sweet Woodruff (Galium odoratum), Lavenders, Teucrums, Artemisias, Lemon Verbena.

Orchids: Cattleya, Cymbidium, Paphiopedilum, and a variety of other genera including Dendrobium, Coelogyne, Oncidiun, and reedstem epidendrums.

Bromeliads: Aechmea, Billbergia, Vriesea, Puya, Cryptanthus, Guzmania, Tillandsia, and a special collection featuring Cryptanthus hybrids.


Palm: Primarily Rhapis.

Vines: Berberidopsis corallina, Clematis, Gelsemium sempervirens, Hydrangea anomala var. petiolaris, H. seemanii, Jasminum, Lapageria rosea, Lonicera, Parthenocissus, Philadelphus mexicanus, Stigmaphyllon, Vitis pentagona, and others.

Ferns: Adiantum spp., Anemia mexicana, Araistegia hymenophylloides, Asplenium several spp., Blechnum occidentale, Campylopus ornatus, Colysis tigris, Coniopteris japonica, Davallia trichomanes, Diplazium lanceum var. crenatum, Doodia media, Leptochilus decurrens, Pellaea falcatula, P. viridis, Platycerium several spp., Polypodium several spp., Pteris several spp., Quercifilix zeylanica, Selaginella kraussiana, S. pallescens, S. wildenovii.

Grasses: Ornamentals, natives, ground covers.

Fuchsias: Species from the University of California Botanical Garden.

Perennials: California natives: Over 50 form (as of February). More are germinating. Most are from the Garden’s Native Plant collection. Featuring: Achillea, Agave deserti, Asarum caudatum, Armeria, Dudleya hybrids, Eriogonum, four color forms of Eriogonum glaucus, Geranium spp., Heuchera spp., and hybrids, Iris, Lewisia, Mimulus, Penstemon (including rock garden forms), Phacelia, Rudbeckia californica var. glauca, Salvia, Sidalcea spp., Sedum, Sisyrinchium spp., Viola, and Zauchneria.


Trees and shrubs: Due to deer damage during the construction of the parking lot, the selection of trees is reduced, but there will be a larger selection in the Fall sale. Pseudopanax arboreus (large handsome evergreen shrub); Mexican Quercus (both larger and smaller trees); Hymenosporum flavum (Australian evergreen for sheltered position, with fragrant yellow flowers); Daphne odora 'Aureomarginata'; Cornus capitata, Araucaria bidwillii (large Australian tree); Kadota figs; Rubus phoenicosiarius (Wine berry).

House plants: Coffea, Philodendron, Episcia, Kohleria, Sansevieria, Ficus, miniature Begonia, Coleus, Alocasia, Colocasia and more.

ROSES

These varieties will be at the Spring Plant Sale or otherwise at the Visitor Center.

'Baltimore Belle': Pale pink rambler (1843)
'D'Aguusseau': Deep rose-colored Gallica (1823)
'de la Griffieriaie': Rose-colored multiflora hybrid (1846)
'Dortmund': Red modern shrub (1855)
'Félicité et Perpète': White rambler (1827)
'Jacques Cartier': Pale pink Portland (1868)
'James Mitchell': Lavender-pink moss (1861)
'Jeanne d'Arc': White Alba (1818)
'Königin von Dänemark': Pink Alba (1826)

'Lavender Lassie': Lavender-pink hybrid musk (1959)
'Mme. Louis Lévêque': Pale pink moss (1898)
'Mme. Plantier': White Alba (1835)
'Marie Louise': Pink damask (1813)
'May Queen': Pale pink rambler (1898)
'Mountbatten': Yellow modern shrub (1982)
'Penelope': Cream hybrid musk (1924)
'Phyllis Bide': Multicolored rambler (1923)
'Schneezwerg': White hybrid Rugosa (1912)
'Thérèse Bugnet': Pink hybrid Rugosa (1950)
**New Members**

Mrs. Charles B. Ames, Jr.
Linda Arthur
Perry Y. Asher
Linda A. Aurichio
and R. Ellen Pearce
Patricia A. Baccetti
Mr. & Mrs. Richard B. Bahme

Drs. Gordon & Emily Benner
Mr. & Mrs. Richard B. Bahme
Patricia A. Bacchetti
Perry Y. Asher
Linda Arthur
Mrs. Charles B. Ames, Jr.

Bahme and R. Ellen Pearce

**CONTRIBUTIONS**

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**In Memory**

Lillian Bender, from her sister, Florence C. Holmes
May Bliss, from Wayne Roderick
David Coronado, from his parents, Manuel & Martha Coronado
Paul Flehr, the father of Mary Schroter, from Kate & Harry Heckman

Julie E. Oakley, from Mrs. Elizabeth R. Carter
Myrta Beecher Phillips, from Marlene & Duke Leffler
John Platz, from Marlene & Duke Leffler

Patsy Sheaff, from Joanne & Ronald Richards
Charlotte White, from Joanne & Ronald Richards
A study table has been donated in memory of Victoria Wearne Nelson from Jerry, Alexandra, and Leif Nelson.

**Gifts In Kind**

Allen’s Press Clipping Bureau
Dr. Carol Baird
Dr. William Clemens
Helene Conant

James H. Jones
Susan Kahn
Moriga Garden Center
Ellsworth Young
Life Members and Honorary Trustee

At the January meeting of the Friends Board, Dr. Robert Ornduff was named as an Honorary Trustee. Dr. Ornduff was Director of the Garden for 18 years, until he retired from the Directorship in 1991. Bob continues as Curator of the 12345.*Collection.

Lifetime membership was voted to James and Irma Uren and to Gladys Eaton. The Urens generosity to Garden and Friends projects was noted. A gift from the Urens’ funded the first Children’s Art Contest during the Centennial, as well as a second contest to be held this spring.

Gladys Eaton has been Vice President of the Friends since 1984 and has chaired several committees including Major Gifts, Membership, and Plant Sale. Her work on the Centennial Committee contributed significantly to the success of the year-long celebration of the Garden’s hundredth birthday. Her careful attention to the needs of the Garden has been appreciated on Public Relations, Budget, Nominating, and Index of Policy committees. As a member of the Steering Committee of the Garden’s Self Assessment Process, she was instrumental in its success.

Both Eaton and the Urens have contributed to the planned renovation of the Garden’s Meeting Room.

Special Thanks

Susan & Michael Addison
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Mai K. Arbegast
Elly & Bill Bade
Berkeley Horticultural Nursery
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Helene M. Conant

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Katharine & Revett Wallace
Tom & Phoebe Watts
Jane & Nelson Weller
Harry Wellman

* Matching Corporate Gifts

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.

Membership benefits include:

• Newsletter
• Workshops, lectures, and tours
• Discount on Visitor Center purchases
• Discount on educational classes
• Early admission to Spring Plant Sale
• Discount subscription on American Horticulturist magazine
• 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* $10 ☐ Sponsor $250
☐ Individual $25 ☐ Patron $500
☐ Family $50 ☐ Benefactor $1000
☐ Contributing $50
☐ 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 only.
Calendar of Events

APRIL

CALIFORNIA NATIVES Sats, Suns APRIL
Tour of the Month will emphasize the California section. Tours are free: meet your Docent at the Visitor Center at 1:30 pm.

WILDFLOWER IDENTIFICATION CLASS Thurs eves, APR 9-JUNE 4
Dr. Glenn Keator, well-known botanist and educator, and author of the new book Complete Garden Guide to the Native Perennials of California, will present an evening course on identification of wildflowers in the major plant families of California. Meeting Room, 7-9:30 pm. Cost for the series is $50 members, $75 non-members, or $10 per workshop. Enrollment is limited. FILLED.

BIRDWALK AND BREAKFAST Sat am, APRIL 11
Professor Robert Middlekauff will lead a birdwalk through the Garden to observe resident and migrant birds, breakfast afterwards. Congregate at the Meeting Room, 7:15-10am. Members $20, non-members $25. FILLED.

A TOUR OF GRAND PENINSULA GARDENS Thurs, APRIL 16
Tour of Filoli, Gamble Gardens and two private gardens, one by Thomas Church, one by Mai Arbegast. The tour will depart from the Botanical Garden at 8 am and return at 4 pm. Enrollment is limited. $50 members, $75 non-members. FILLED.

20 SUCCESSFUL GERANIUMS FOR YOUR GARDEN Sat, APRIL 25
Enjoy a talk with slides given by Robin Parer, well known Bay area expert on Geraniums and owner of Geraniume Nursery in Kentfield, California. Meeting Room 10am-noon. $8 members, $11 non-members.

ART IN THE GARDEN Weds, APRIL 29-JUNE 10
The popular watercolor class at the Garden, offered on Wednesday mornings from 9:30 am to noon. Beginners are welcome. A Saturday series will be offered in the fall. Meet at the Meeting Room. $45 members, $55 non-members.

MAY

PLANT CLINIC Sat, MAY 2
Bring your ill plants to see Dr. Robert Raabe, UC Plant Pathologist. First Saturday of the month, Meeting Room, 9am-12.

OLD ROSES Sats, Suns MAY
Tour of the Month features the very fine Old Roses collection. Tours are free: meet your Docent at the Visitor Center at 1:30 pm.

SPRING PLANT SALE Fri, SAT, MAY 8-9
Members Preview: Friday 5-8pm. First choice of rare and beautiful species of roses, California natives, rhododendrons and many others. 10% surcharge added to purchases. Public Sale: Saturday 10am-3pm.

GRASSES Sat, MAY 16
Join grasses expert Travis Columbus in a grass identification workshop, that concentrates on the major important groups of California grasses. Ornamental grasses will also be discussed. Meeting Room, 9am-4pm. $35 members, $45 non-members.

JUNE

PLANT CLINIC Sat, JUNE 6
Bring your ill plants to see Dr. Robert Raabe, UC Plant Pathologist. First Saturday of the month, Lower Meeting Room, 9am-12.

GENERAL TOUR, WITH EMPHASIS ON HERBS Sats, Suns JUNE
Tour of the Month features Chinese medicinal herbs and European culinary, medicinal and ornamental herbs. Tours are free: meet your Docent at the Visitor Center at 1:30 pm.

CHINESE MEDICINAL HERBS: Sat, JUNE 6
Principles of Chinese herbal medicine, with a special emphasis on anti-viral and immune-enhancing herbs, with Barbara Witt, licensed acupuncturist. Includes tour of Chinese Medicinal Herb Garden. Meeting Room, 10am-noon. $10 members, $15 non-members.

LAVENDERS Sun, JUNE 14
Well-known Bay Area speaker and author Robert Kourik (Designing & Maintaining Your Edible Landscape; Gray Water Use in the Landscape) presents a delightful slide show and lecture on lavenders. Meeting Room, 10am-noon. $10 members, $15 non-members.

HERB PROPAGATION WORKSHOP Sat, JUNE 20
Learn a variety of ways to propagate herbs through demonstration and participation. Experience the propagation of herbs by seeds, cuttings and division. Meeting Room, 9am-noon. $10 members, $15 non-members.

GREEN STUFF DAY CAMP JULY 13-AUG 14
Week-long programs for children with instructor Carmia Feldman and an assistant from the UCB campus, on the wide world of plants, how people use plants, plant stories, art and games. Sessions I (7/13-17) & III (8/3-7) for 5-7 years old, 9am-2pm M-F; Sessions II (7/20-24) & IV (8/10-14) for 8-11 years old, 9am-3pm M-F. $100 per session. Call 642-3352 for registration information.

COMING ATTRACTIONS:

7 PM CLOSING Weds, Memorial Day through Labor Day

NATURAL GARDENING SERIES Thurs eves beg. SEPT.10

BUTTERFLY GARDENS Sat, SEPT.19

AFTER SCHOOL BOTANY CLUB Wednesdays, beg. SEPT. 23

FALL PLANT SALE Sun, SEPT. 27

FRIENDS ANNUAL MEETING & PICNIC Sun, OCTOBER 4

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. Pre-registration is suggested, as classes fill early.

The Garden is open every day of the year except Christmas from 9:00am to 4:45pm. 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