Docent Program Vital to Garden

Joseph Conrad wrote of the artist: "He speaks to our capacity for delight and wonder, to the sense of mystery surrounding our lives..., to the latent feeling of fellowship with all creation..." The same could be said of our Docents at the Garden, for the task which they are trying to achieve, by the power of the spoken word, is before all, to make you see.

"When you lead a tour in the Garden, you have to make the science come alive!" So say our active docents [the persons who lead tours], and you don't have to know much about pedagogy to know that something exciting is happening as that enthusiasm begins to spread throughout the tour group. It is a real treat to watch a docent, when well-matched to a group, lead a tour, for inevitably five minutes or so into the tour her (his) face lights up, and the collective energy level increases palpably! By the end of the tour, not only have the group members learned something about plants, botany and our Garden, they have also thoroughly enjoyed their visit (and have associated that joy with the Garden). The docent has only an hour (often less) in which to bring about this stunning transformation; when it happens, it is nothing less than magical!

There is both an art and a science involved in interpretive education. The Docent Training program begins with the science, by exposing the potential docent to introductory college level botany, ecology, evolutionary biology, physiology, taxonomy, in the classroom, and to the native American uses of plants, ecological features of the vernal pool, the history and uses of floriculture, the medicinal value of Chinese herbs, and the adaptations of succulents and epiphytes, in the Garden.

Little by little, the art of teaching is introduced, at least inasmuch as it can be taught. The trainees are encouraged to pay attention to teaching techniques, formal and informal. After 18 weeks of the program (3 hours per week), the trainees venture into the Garden to accompany experienced docents, and finally, they attend graduation and become fully-accredited docents!

The docent program has been at the core of the Education Department at the Garden for over 16 years. Docents lead tours that range from such topics as "Flower Walk" and "Plant Travelers" to such esoterica as "Poisonous Plants" (generated by the Agatha Christie Centennial), and "Chemical Botany". They handle all age levels, from kindergarten groups to university classes to senior citizens, all interest groups, from Girl Scout troops to Garden Clubs. They often design their own tours, based on rough guidelines drawn up by committees of docents and education officers. And to think, they are all volunteers!
Early Docent Days

How did such an ambitious program ever evolve? After all, at its inception, the Botanical Garden was purely a research facility, functioning as a holding place for various scientific collections, and a handy source of specimens for dissection by botany students. After its move from campus up the hill to Strawberry Canyon, the Garden continued in its original scientific role. The general public (and most of the campus as well) was not encouraged to visit the Garden. While its value as a botanical resource was greatly enhanced over the early years, the public sector was largely ignored.

It was not until the early seventies, under the direction of Dr. Robert Ornduff, that a detectable shift in emphasis took place. The Botanical Garden began to take notice of the community at large, and the public was invited to the Garden. At about the same time, perhaps as a spinoff of the nascent “ecology” movement, public awareness of the Botanical Garden as a valuable resource shot up dramatically. As more and more visitors used the Garden, it became evident that volunteers would be needed to lead tours. Thus, the Docent Program was born.

In its early years, the Docent Program was responsible not only for tours for school-aged groups and interested adults, but also for the operation of the Visitor Center, planning and execution of the annual Open House, and the propagation of plants for the annual plant sale. This reporter joined two docents (Ruth Hendrix and Iris Gaddis) who were among the founding members, for a discussion of the early days of docenting in the Garden.

Ruth was in the first docent class (she and Margaret Mitchell are the only two active docents from that original group of 16). Anne Wharton, the part time education director at that time, had placed an ad in the local papers in late 1973, for a class beginning in early 1974, and sixteen persons showed up. Some of the group had some botany already, while others did not. Some of the trainees were students at Cal. Some were frustrated naturalists; others were attracted because of their backgrounds in art.

Other institutions use titles such as Tour Leader or Naturalist or Interpreter, but when I asked Ruth about the title, she peered over her water glass and stated quite emphatically that, “we decided on the name ‘docent’!” Ruth Hendrix went on to become the first President of the Docent Council, which organized around 1976. The Program attracted 18 more trainees in 1975, and 32 trainees in 1976! Not all trainees stayed in the program, but those that did were very dedicated and worked hard.

Iris Gaddis joined up in 1975, and has been at the Garden ever since. She has enjoyed her docent experi-
Docent Activity Expands

Although there have been a number of administrative and structural changes through the years (the Docent Council was originally part of the Friends organization, and became an independent entity under the guidance of Education in 1981, and the propagators and Visitor Center volunteers are now separate too), the spirit of the original group remains intact. About 250 people have completed the training, with the new class of 22 just graduated in April. They lead over 250 tours annually, assist in the Rainforest Rap school program, aid the 1000 Biology 1 students who visit the Garden, and now do School Outreach programs as well. There is also a Speakers Service.

A cursory look at the most recent class gives us a speech pathologist, several visual artists, a Cal student (who also taught Rainforest Rap), two teachers, a social worker, a computer consultant—a group with tremendously diverse interests.

To enhance each docent’s background, in addition to the Docent Training classes, there are optional enrichment programs that cater only to the active docents: field trips to vernal pools, Jasper Ridge, and other sites of interest, slide talks by persons prominent in their fields (from U.C., GGNRA, Strybing, other gardens), and lectures in horticulture, conservation, taxonomy, ecology.

And the Docent Council and Education programs have recently reinstated the Tour of the Month, which is offered on weekends at 1:30 p.m. and features aspects of the Garden that have seasonal interest (for February it was the Freeze; the March tour was Pollination; the April tour centers on the California native plants, and if you missed the Poisonous Plant day in March, that tour will be repeated every weekend in July).

Unifying Aim

From its beginnings, the Docent Program has evolved into a large well-organized branch of the Education Department. And as it confronts the 1990s, further changes are anticipated, changes that will reflect the diversity of the trainee classes, as well as the growing diversity of the visiting public. But the one unifying aim will doubtless remain the same, to paraphrase Conrad:

“To arrest, for the space of a breath, the hands busy about the work of the earth, and compel people entranced by the sight of distant goals to glance for a moment at the surrounding vision of form and color, of sunshine and shadows, to make them pause for a look...such is the aim...And when it is accomplished — behold! — all the truth of life is there.”

— Carol Baird  
with Nancy Swearengen
We Kid You Not!

When Garden Supervisor Daniel Campbell considered the mechanics of clearing the Garden's "back-forty" last fall, he realized that he faced a severe problem. The southeast corner of the Garden, which has never before been developed, is the proposed site for expanded plantings. But as is common in California hills, the two and one-half acre area is overgrown with virulent poison oak and coyote brush. Contact with the potent oils in the leaves and stems of the *Toxidendron diversilobum* (poison oak) will trigger rashes and blisters in most people and some persons will have even more severe reactions. This makes clearing the overgrowth with a *chainsaw* a precarious undertaking, even with gloves, face shields, and protective clothing.

What were the other options? Controlled burning is a common clearing method, but it requires extensive safety coordination with campus and community groups. Once afire, the oils of poison oak volatilize into the air along with the smoke; inhalation of the smoke can be extremely dangerous. Deliberately setting fires during a year of such severe drought is also imprudent in this heavily populated area. *Bulldozers* are another way to clear brush. They don't react to poisonous oils, and do a quick and thorough job of clearing land. Unfortunately, the use of heavy machinery to clear steep slopes also destabilizes the terrain, and causes erosion. Campbell, however, had another option.

**Goats Hired to Clear Land**

He awarded the contract to a *herd of goats* — or actually to their keeper, Ken McWilliams. Goats do not react to the oils in the coyote brush and poison oak in the way that people do. In fact, goats even LIKE to eat the leaves and bark of the invasive shrubs. And, although goats consume thickets more slowly than a bulldozer or a burn would, they are easier on the land: they leave the slopes less vulnerable to erosion. And they also fertilize the soil and beat down undesirable vegetation with their hooves.

Most of the jobs McWilliams' goats are called in to do are related to fire prevention. With their hearty appetites, the goats can consume dry eucalyptus litter, eucalyptus shoots, and poison hemlock — all of which are potential fire hazards. According to McWilliams, once the goats consume the flammable plants, the less flammable native grasses and wildflowers thrive.

The poisonous plants produce less oil during their winter dormancy period. In order to take full advantage of the dormancy period, Garden staff members "frosted" the leafless stems and branches of the brush with hay so that the goats would find them more appealing. Sprouting spring leaves have the most virulent oils; the sooner the goats eliminated the overgrown brush, the less often staff had to come in contact with the new poisonous growth.

During their stay at the Garden, the goats were an unconventional attraction for visitors and staff. Many observers identified distinct personalities among the herd. Some goats were clever - even "sneaky", according to one gardener — always trying to escape. Some were aloof to people, others were friendly and enjoyed the attention they received at the fence. Many mornings, the sound of barking hyenas up the hill at the Animal Sciences Laboratory riled the goats, and they reacted with a "verbal rumbling" through the herd. Some of the males vied for territory and leadership by gnashing horns and butting heads on the hillside, always a treat for spectators.

People have been clearing land for development since the beginning of time. Newer methods have been introduced in the latter half of the twentieth century, to save time and labor in response to fast-paced growth. Unfortunately, we are now learning that some of these clearing techniques are harmful or ecologically unwise. In response to those hazards, people are devising new land-management techniques, or returning to low-tech age-old processes such as McWilliams' goats. With long-range planning and creativity, the Garden has demonstrated that it is possible to grow and develop without contributing to air pollution or causing erosion.

—Bobbie Ohs
New Parking Lot
For the Botanical Garden

Gardeners, by the very nature of their craft, learn early the value of patience. Years of planning, committee meetings, budget reports and traffic engineers' studies have finally produced results for the Botanical Garden. July is circled in red on the Garden's calendar, not for vacations or for the holiday, but for the commencement of the long awaited construction of a new, seventy-five space parking lot.

Designed in concept by Renee Bradshaw and Associates, the lot will be constructed by AN West, Incorporated. A landscape of California native plants, selected to blend the lot with the adjacent Mather Grove plantings by landscape architect David Arbergast, will soften the construction project.

Safety a Consideration

The parking lot, scheduled for completion in October, will address a number of parking and traffic safety concerns. Pedestrian safety in crossing Centennial Drive from the new lot to the Garden will be enhanced with (1) a new, larger crosswalk; (2) increased number of rumble strips in Centennial Drive to slow traffic; and (3) a proliferation of pedestrian crossing signs and flashing lights. Also, parking for the physically disabled will at last be provided. Two spaces, as close as possible to the pedestrian crossing, will be designated as reserved for the physically disabled.

Visitors to the Botanical Garden during the construction period from July to October will find that parking will be next to impossible. We have reduced our educational program and cancelled the plant sale in the fall to reduce visitor attendance during this period. Car pooling and the use during weekdays of the University's bus system is recommended. Please accept in advance our apologies for the inconvenience the construction project will cause.

—Daniel Campbell

FROM THE DIRECTOR
New Entrance Planned

A few years ago one of the Friends' Board members characterized the Garden's entrance as bearing a strong resemblance to that of Stalag 17, a fictional German concentration camp from World War II. A cyclone fence topped by barbed wire belies the friendly welcome that visitors do receive; indeed, many people are unaware that the garden is open to the public.

So, two years ago, when we learned that the campus would pave the parking area across Centennial Drive from the main garden, the Friends engaged architect Walter Brooks to design an attractive entryway and to address the needs of staff and visitors. Walter met repeatedly with the Project Development Committee of the Friends as well as with representatives of the Garden's staff and volunteers, and came up with a progression of increasingly fine-tuned schemes that will offer attractive and practical solutions.

Structures Envisioned

Since the plans have yet to be finalized and campus approval is currently being sought, it would be premature to describe them in detail, but I can tell you that parking will be relegated to the lot to be paved this summer across Centennial Drive, attractive offices will be provided for both volunteers as well as paid staff, and additional conference rooms and another classroom will be provided. A modest research/teaching lab will be built, so that classes can be offered to the campus or community in a structure more appropriate for that purpose than the present meeting room. In addition, the volunteer propagating facilities will be consolidated in one location, rather than two as at present, and the entrance to the Mather Grove (one of the garden's real treasures) will be marked by an attractive arbor.

The present Rainforest/Desert House and all buildings presently in place on the main garden side of the road will be removed. A plaza will be built, leading to a strikingly beautiful glass conservatory. The pedestrian crossing at Centennial Drive will be improved, leading to the Garden entrance through an attractive pilastered wooden fence.

We have never assumed that the campus would assist to any significant extent in funding this project, which carries a price tag in the millions. The Friends have worked hard at devising a fundraising plan that has every mark of success. The net effect of all this will be a visually impressive, effective, and humane garden for its residents, both plant and human, and for the increasing number of visitors that take such pleasure in what we offer them.

—Robert Ornduff
Why Flowering Plants Diversified

The flowering plants, which first appeared approximately 135 million years ago, are the most successful and diversified plant group today. The tremendous variation within this group allows for exploitation of numerous environments and methods of reproduction. Flowers are the reproductive structures in these plants; a good deal of the variation is due to floral diversity, to attract specific pollinators that effect cross-pollination.

Pollination occurs when pollen lands on the stigma. Cross-pollination occurs when there is transfer of pollen from the anthers of one flower to the stigmas of a different plant, while self-pollination occurs when there is a transfer of pollen from the anthers of one flower to the stigma of the same flower. The advantage of cross-pollination is that it can produce genetic variability within a population. Self-pollination produces offspring that are genetically similar to the parent, and may be disadvantageous if the plant cannot adjust to changes in the environment. With cross-pollination, there should be enough differences between plants that at least some individuals of a species will survive such environmental changes.

Some angiosperms are wind-pollinated. But one of the problems with wind is that a lot of pollen is wasted, landing on inappropriate surfaces. Over evolutionary time, many flowering plants have specialized in the use of animals to move their pollen. By providing a tantalizing and distinctive reward (nectar, generally), and causing the animal to associate that reward with a unique attractant (a feature such as brilliant color or sweet fragrance), the plants can ensure that the animals will return again and again to the same species of flower.

Thus, in a broad sense, plants and their pollinators have coevolved, that is, they have adapted to each other’s needs. Insects, birds and moths all have specialized mouth parts for lapping up nectar. Bees have special pollen collecting baskets which they fill after cleaning their body hairs of pollen. Through time, they have developed one of the most fascinating mutualistic partnerships in the natural world.

Pollination “ Syndromes”

If, when you visit the Garden, you focus on floral structure, color and scent, you may be able to accurately guess the kind of pollinator for which each plant is adapted in its own native setting. (Recall that most of our plants are not Bay Area natives, and their specialized pollinators are not here in the Garden). The following is a brief listing of flower-types arranged by specific pollinators.

**Bee-pollinated flowers:** Have showy brightly colored petals, often yellow or blue, fresh odor (not too strong), landing platform (bees are not sensitive to the red end of the visual spectrum, and are more apt to locate flowers visually than by odor; examples include Arctostaphylos, Berberis, Ceanothus, Calendula, Digitalis, and many of the composites, peas. Many orchids are bee-pollinated, but do not offer nectar; they use deceit to attract bees.

**Beetle-pollinated flowers:** Are large, flat or shallow with greenish, purplish or off-white petals and a fruity odor (beetles are more olfactory than visual); examples include Calycanthus, Camellia, Magnolia, and many of the buttercups, aroids and palms.

**Butterfly-pollinated flowers:** Are often vividly colored, including red, and often have a tubular corolla that faces upright; they have fresh fragrances; examples include Buddleia, Lantana, many composites and crucifers.

**Bird-pollinated flowers (includes hummingbird flowers):** Have tough tubular fused corollas, often (but not exclusively) bright red, with great quantities of nectar; examples include some Nicotiana, Ribes, Penstemon, Fuchsia, Mimulus, Campsis, Salvia, Castilleja, Aloe, Heliconia, Lonicera, many cacti.

**Fly-pollinated flowers:** Smell like rotten or decaying matter; often dark (but some are small and white); examples include some Aristolochia, Anthurium, Tacca (all in the tropical house).

**Moth-pollinated flowers:** Pale flowers with heavy sweet fragrance, open in evening; Datura, Jasminum, Gardenia, Rhododendron fragrans.

**Bat-pollinated flowers:** Some tropical flowers and some cacti (Trichocereus).

Most of these plants will be in flower over the next few months; come see them and enjoy this encounter with coevolution!

— Linda Pollack
Exciting New Programs

As our garden membership grows and diversifies, so must our programs. Under the dynamic leadership of Program Chairs June Smith and Fred Coe, and Education director Dr. Carol Baird, with Assistant Nancy Swearengen, the number of programs and special events offered to the Friends (and general public) has almost doubled. Since our visitation includes gardeners, artists, botanists, students, horticulturists, photographers, tourists, schoolchildren, naturalists, university people and families, we have attempted to provide a broad diversity of programs. To our delight, most of these programs have been a resounding success, if we judge by enrollment figures.

Programs for Adults this winter ran the gamut from Dr. Raabe's class on rapid composting (enrollment over 90), the slide presentations of an artist's garden (75) and Salvia (85), to the hands-on-workshops on grass identification (55 was the limit imposed by the number of microscopes available), and the 50 hardy souls who braved the downpour on Palm Sunday to take the Poisonous Plants Tour. In fact, interest was so high for a number of programs that we are "rerunning" them: Poisonous Plants in July, Grasses on July 13, Composting in the fall (and Herbs #1 will run twice that day).

Co-sponsorship

We are experimenting with several jointly sponsored programs this Spring. On the second Saturday of June, the internationally-renowned hummingbird photographers Robert and Esther Tyrrell will present a magnificent slide show on Caribbean hummingbirds at the Lawrence Hall of Science (the same show will repeat on Sunday). Participants will be invited to visit the Garden both days, for tours of our "hummingbird gardens", and discussions of the most appropriate plants to grow to attract hummingbirds. The Tyrrells presented a similar program on native hummingbirds several years back, and were most enthusiastically received.

Bobbie Ohs and Dr. Baird also worked with LHS on a prehistoric plant tour, to coincide with their DINOSAURS '91 exhibit. The tour brochure allows the visitor to follow the DINO DAYS signs to eleven exhibits marked by bright yellow dinosaur signs. Many families have walked the tour, and so have the Bio 1B classes. If you have an interest in the evolution of plants, here is an opportunity to indulge it; brochures are available at the Visitor Center. This year's tour ends May 17.

On the fourth weekend of June we are staging BUG DAYS, three days of insect exhibits from the San Francisco Insect Zoo, featuring LIVE black widow spiders, tropical walking sticks and iridescent beetles, carnivorous (insect-eating) plants, and many exhibits on plant/animal interactions and the use of natural enemies in place of pesticides.

Given the success of Travis Columbus' Grasses Workshop, the Education department is planning a series of Plant Identification Workshops to take place over the year. The next in the series will be an in-depth look at composites; there will also be a series on plant families.

U.C. Students Develop Programs

Connections with the University have also begun to expand. Rainforest Rap, the multi-media program on tropical rainforests, had a highly successful run this year, booked almost solid four days a week. The three instructors, Carmia Feldman, Randall Craig, and Tori Perkocha, are all U.C. students; they did an extraordinary job! Carmia is also leading a group of U.C. students in developing the School Ponds near the Mather Grove, so that they may once again be used in teaching aquatic ecology. And Linda Pollack, a U.C. student in Integrative Biology, worked as an intern in Education this spring, developing a multi-faceted pollination biology program. Her work was the basis for the March Tour of the Month.

We are trying to respond to your interests; if you have any ideas for future programs, please drop us a line (Education/Program, U.C. Botanical Garden, Centennial Drive, Berkeley CA 94720).

— Carol Baird
Ferns—Elegant Relicts of the Coal Age

One of the planet’s most widely distributed plant groups has representatives in almost every corner of the Botanical Garden, yet is often overlooked in the riot of floral brilliance that erupts each spring. That group, of course, is the Pteridophyta, the ferns and their allies. In one sense, the pteridophytes are the quiet sisters in the garden corner, providing a mere backdrop for the showy flowering plants that have superseded them evolutionarily. But, in another sense, ferns deserve superstar billing: their simple stately elegance of design has survived 400 million years of environmental insult and selectional vagary.

Ferns pre-date flowers, dinosaurs, cycads, redwoods. In fact, the group was the pre-eminent form of plant life on the planet during the Carboniferous Period some 350 million years ago. That period of the Paleozoic, called the Coal Age, is also known as the Age of Ferns. It’s true that at first ferns and their allies look somewhat alien and out of place today amid the flowering plants so familiar to us. But what a thrill to realize as you visit parts of our Garden that you are walking among living descendants of the earliest land plants!

Although they have well-developed internal plumbing, just as the flowering plants do, what makes the ferns unique among vascular plants is their use of a primitive form of reproduction, spore-forming sporangia, rather than seed forming flowers. Furthermore, in both the homosporous and the heterosporous ferns, the presence of water is essential for sexual reproduction, so their distribution has been largely tied to moist climates.

We associate ferns with the coolest, darkest, dankest places, and our botanical experience along Northern California’s shady creeksides tends to bear out this observation. Yet 80% of all fern species grow in tropical regions, and 5% of the remainder grow in arid regions. Ferns thrive in wet tropical forests, where they are moist and warm all year long. Most of the tropical rainforest ferns are epiphytic on the trunks and branches of canopy trees. Some ferns are petrophilous, that is, they are rock-lovers and grow well on bare rock.

In the Fern House

The Garden’s collection of pteridophytes is quite extensive, and is especially rich in tropical and subtropical species. Among our ferns are many common species, as well as some rare or unusual species of special interest to the fern enthusiast. The heated Fern House provides optimal conditions for an astounding variety of tropical ferns. You’ll find the largest rhizome (outside of the tree ferns) there, in Aglaomorpha heraclea, from Java, a spectacular staghorn. And in the sliding door case you will see an unusual petrophile, Elaphoglossum crinitum, Elephant Ear Fern, with its large simple fronds. This fern has special requirements, being a cloud forest species from Costa Rica. It must have its head in mist and its feet in lime.

Judith Finn, the Assistant Manager of the Garden, and gardener for the Fern House, points out that some of the oakleaf types, such as Drynaria quercifolia or Drynaria rigida, are deciduous; during part of the year they die back, lose their fronds, and appear to be completely dead. Around March or so, they regrow their fronds and assume their former growth form. Judith adds that among some of her ferns, surprisingly, too much shade, along with lack of humidity, will lead to an infestation of powdery mildew. Judith regularly uses the Frisco Fogger to humidify...
the ferns, and expects that with the Liquidambar tree that towered over the greenhouse now gone, her powdery mildew days are numbered.

Some of the most fascinating ferns in the Fern House are the aquatic ferns in the genera *Azolla*, *Pilularia*, and *Salvinia*. Many of them float; you can find them at the near end of the Fern House or in the pool at the tropical house. Aquatic ferns love bright light and grow best in full sun.

Out in the Garden, the California section abounds with ferns, most of which are polypodies and are fairly easy to grow in our local gardens. Along the Strawberry Creek tributary between the alpine fell field and Centennial Drive are Licorice ferns *Polypodium glycyrrhiza*, the highly pinnatifid-leaved *Polypodium vulgare*, and Leather Polypody, *Polypodium scouleri*. You will also find the hard-to-grow Holly Fern, *Polystichum lonchitis*, narrowly restricted to montane regions, nearby.

The Asian area sports a rock garden planted almost entirely in ferns from Hubei Province, China. One or two have succumbed to last winter’s freeze, but most survived. There is a nice Chinese brake, *Pteris vittata*, among the rocks; it loves warmth, moisture and light shade. Several *Matteuccia* species have living fronds and will slowly recover. These and the *Cyrtomium macrophyllum* and *Polystichum neolobatum* were all collected by former curator Bruce Bartholomew in 1980.

Perhaps the most astounding ferns are the xerophytic ones. Arid and semi-arid lands support a number of hardy fern species that have become adapted to dry periods in a number of ways (1) small hairy fronds; (2) fronds that curl back in severe drought; (3) scototropism (growing toward the shade, of a boulder or rock outcrop). Many of these also bypass the sexual process, which accounts for their success in arid habitats. Since swimming sperms are not produced, the water is not essential to the establishment and growth of these ferns.

### Resurrection Ferns

Our Mexican section supports a representative of a unique group, the Resurrection ferns (includes the genera *Selaginella*, *Cheilanthes*, *Doryopteris*, etc) that occur in the U.S., Australia and parts of Africa. During dry times the fronds of Resurrection ferns lose their color, dry up and appear dead. After a heavy rain, however, the apparently dead fronds return to their vivified form and function normally.

No account of our ferns would be complete without mention of the spectacular tree ferns that reside in the New Zealand section. Tall relicts of a Devonian past, they still persist as light-gap pioneers in the major rainforests of the tropics. Although some foliage was damaged during the Christmas freeze, our several species are thriving once again.

Ferns have an overwhelming aesthetic appeal, and are widely grown in public and private gardens, and indoors too. Since there are over 10,000 species living today, there is a broad selection to choose from; the nursery trade stocks the most reliable of these, and we will have a few at the Spring Plant Sale. Indeed, local interest in ferns has swelled to the point that some Bay Area fern enthusiasts recently formed the San Francisco Fern Society, a group that meets regularly to discuss the cultivation and propagation of ferns. Next time you visit the Garden, why not walk among our living fossils, the ferns, and enjoy their remarkable beauty!

—Carol Baird
**A Busy Season**

**Director Retires:** As we went to press, it was announced that Dr. Robert Ornduff is planning to retire his Directorship of the Garden as of July 1, 1991, in order to return more fully to academic life. Dr. Ornduff, Professor of Integrative Biology at the University, has held the position of Director since 1973; during his tenure, major changes in the Garden have come about. He is highly respected in both the Garden community and the botanical world at large, and it is hoped that he will maintain an active presence at the Garden.

**Projects:** The Rose Garden is sporting a new pergola, constructed by Garden staff during the month of March. Gerald Ford adapted the Maybeck design of the Berkeley Rose Garden to our own needs, and produced a mighty and substantial structure, sure to outlast the elements.

As you wander below the meeting room along the new Strawberry Creek trail, you will find some changes. A new lower deck has been put in place by the waterfall, allowing the visitor to drop down to the level of the creek and experience the riparian setting. And there is now a new boardwalk leading to the deck.

The last of the senescent Monterey pines in the Asian section was removed this Spring. *Pinus radiata* has a life expectancy of no more than about 80 years, and begins to drop its huge limbs as it ages, so for safety reasons several trees were removed, and others pruned.

**Garden Notes**

**Mother Nature Strikes Back:** The Garden is surviving valiantly, despite the “triple-whammy” of the last four months (freeze, prolonged drought, followed by excessive rains). The Newsletter has documented the first two phenomena (Winter 1991, this issue); suffice it to say, the rains led to only one major calamity, a monumental slide in the new Mesoamerican section. Hopefully, the effects are only transient.

**Public relations:** Over the past year or so, Bobbie Ohs, our Garden publicist, has tremendously broadened the exposure of the Garden to the general public. Educational and Friends’ programs are now regularly calendared not only in all four major daily Bay Area newspapers, but also in 37 weeklies, in *Sunset* magazine, and even in public service announcements that are broadcast on several local radio stations. Thanks largely to Bobbie’s efforts, attendance at special events has doubled, and volunteer ranks are swelling.

**Staff activities:** Nancy Swearengen, the Education Assistant, will attend a conference on Volunteers in April. Late in the month, Garden Manager Daniel Campbell and Staff members Sean Hogan and John Domzalski will attend the Australian Plants conference held in Santa Cruz where Dr. Ornduff is one of the speakers. In May, Assistant Manager Judith Finn and Staff member Jerry Parsons plan to travel to Marie Selby Botanical Gardens in Sarasota, Florida, to attend the
Symposium on Epiphytes.

In June Roger Raiche will attend the International Conference on Serpentine Ecology in Davis. And in late June many of the staff will travel to Minneapolis for the American Association of Botanic Gardens and Arboreta (AABGA) annual meetings: Holly Forbes, Assistant Curator, plans to attend several seminars; Bobbie Ohs, Development Assistant, has organized, and will lead, a workshop on University and College botanical gardens, and both Dr. Carol Baird and Dr. Robert Ornduff will present papers at the conference.

Armchair Traveler

If we only had Dorothy’s magic slippers for instant peeks at distant lands! But even without these we can be transported through space and time by the wonderful books we have today. Stay-at-homes or future travelers can increase their affection for plants and pleasure in their gardens by reading all about them in other parts of the world. Here are a few suggestions — old standbys, reprinted works, and new titles — for the armchair traveler.

1. Australian plants for small gardens, by Gwen Elliot. ISBS $17.95
2. Australian plants identified, by Gwen Elliot ISBS $24.95

Gwen and her husband Rodger own a nursery near Melbourne, and have enthusiastically promoted Australian plants for gardens at home and abroad. They will be featured speakers at the symposium on plants of the South Pacific, sponsored by U.C. Santa Cruz and the Australian Plant Society of California in April.


An abbreviated version of an earlier work, this is a well-illustrated reference for plants of this region.

4. Flowers of the Mediterranean, by Oleg Polunin and Anthony Huxley, Chatto & Windus, 1987

Three classic, well-illustrated titles written by experienced botanists and world travelers.


The second edition of the standard, easily carried field guide to the plants found in Baja California.

8. Lingering in Tahoe’s wild gardens, a guide to hundreds of the most beautiful wildflower gardens of the Lake Tahoe region, by Julie Stauffer Carville. Pub. by the author, 1989

Planned for hikers of all abilities and many interests, the plants, animals and birds seen along the trails are identified and described.

9. Pharaoh’s flowers, the botanical treasures of Tuhtankhamen, by F. Nigel Hepper, HMSO 1990 $24.95

A fascinating picture of everyday life in ancient Egypt is shown by the plants existing 3000 years ago.


Superbly illustrated by colored photographs, this is a practical field guide to a rich wildflower area.

— Elly Bade
Spring Plant Sale
Friday, May 10 Members' Preview Party, 5pm-8pm
Saturday, May 11 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/alpines, 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!

Cacti/Succulents: Aeonium, Agave americana, A. parvifolia and others all very nice miniatures, Borzicactus, Crassula, Dudleya, Echeveria albicans, E. glauca, Gymnocalycium, Mammillaria, Notocactus, Rebutia vallegrandensis, Sempervivum, Sedum, S. purpureum.

Herbs: new feature: culinary favorites: Annuals and Perennials—Basil, Chervil, Chives, Garlic, Chives, Marjoram, Oregano, Parsley, Rosemary, Tarragon, Thyme. Ornaments: 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), and others.

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


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


Perennials: (along with rock garden plants, over 150 hardy forms as of March): Anemones asters, astilbes, astantia, campulas, daylilies, foxgloves, hellebores, Incarvillea mairei 'Bees pink,' Iris (bearded and non-bearded), lily species, Lobelia spp., Paeonia spp., Penstemon spp., Phlomis tuberosa, veronicas, and more.

Rock garden: Aquilegia spp., Campanula spp., Geranium spp, geums, Primula florindae, Veronica, and many others.
California natives: Many understory plants from the Mather Redwood Grove, including *Vancouveria hexandra* (Inside-Out Flower), *Asarum caudatum* (Wild Ginger), and *Maianthemum dilatatum* (False Lily of the Valley). We will again feature drought-tolerant plants for low-water landscapes, especially many species of *Arctostaphylos*, *Artemisia*, *Ceanothus*, *Diplacus*, and *Salvia*.

There will be some bulbs as well.

**Roses:** 'Therese Bugnet' - hybrid Rugosa (1950); 'Mermaid' - *Rosa bracteata* hybrid (1918) 1917 medal winner (NRS); *Rosa banksiae lutea* - Yellow Banksia (1824), 'Russelliana' - hybrid Multiflora (pre-1837), 'D'Aguessoau' - Gallica (1837), James Mitchell' - Moss (1861), 'Celsiana' - Damask (pre-1750), 'Madame Plantier' - hybrid Alba (1835) 'Madame Isaac Pereire' - Bourbon (1881), 'Marquise Bocella' - hybrid Perpetual (1842), 'Raubritter' - hybrid Macrantha (1936), 'Danae' - hybrid Musk (1913), 'Kathleen' - hybrid Musk (1922), 'Penelope' - hybrid Musk (1924), 'Phyliss Bide' - Climbing Polyantha (1923), 'Dr. Grill' - Tea (1886), 'Lucetta' - English Rose (1983) And a large selection of species roses: *Rosa boissieri, R. divina, R. elliptica, R. rupincola, R. sericea, R. soulieana.*

**TREES AND SHRUBS**

<table>
<thead>
<tr>
<th>Species</th>
<th>Origin</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Acer crataegifolium</em> (Aceraceae)</td>
<td>Japan</td>
<td>slow-growing, coniferous</td>
</tr>
<tr>
<td><em>Araucaria araucana</em> (Araucariaceae)</td>
<td>Chilean conifer</td>
<td>drought- and freeze-tolerant</td>
</tr>
<tr>
<td><em>Cistus spp.</em> (Cistaceae)</td>
<td></td>
<td>drought- and freeze-tolerant plants; sold at Visitor Center as they bloom</td>
</tr>
<tr>
<td><em>Cornus alba</em> 'Sibirica' (Cornaceae)</td>
<td></td>
<td>large plants</td>
</tr>
<tr>
<td><em>Cornus capitata</em> (Cornaceae)</td>
<td>Himalayas</td>
<td>large evergreen shrub or small tree; flower heads surrounded by attractive sulphur-yellow bracts followed by large strawberry-like fruits; moderate growth to 30'</td>
</tr>
<tr>
<td><em>Dombeya burgessiae</em> (Sterculiaceae)</td>
<td>'Wedding Flower' or 'Rose mound'; origin: Kenya &amp; Natal; small evergreen tree, with palmately veined, broad cordate leaves to 2 cm long; charming pale pink flowers with red veins across cluster; tropical</td>
<td></td>
</tr>
<tr>
<td><em>Exbucklandia populnea</em> (Hamamelidaceae)</td>
<td>rare tree from the Himalayas</td>
<td></td>
</tr>
<tr>
<td><em>Halimium lasianthum</em> (Cistaceae)</td>
<td></td>
<td>drought- and freeze-tolerant plant</td>
</tr>
<tr>
<td><em>Hebe hulkeana</em> (Scrophulariaceae)</td>
<td></td>
<td>with white flower spikes</td>
</tr>
<tr>
<td><em>Keteleeria davidiens</em> (Pinaceae)</td>
<td>Japan, Taiwan; tall, evergreen trees, growing in dry regions in far East; related to and resembling Abies; young trees are conical in habit, becoming flat-topped in age; zone 8</td>
<td></td>
</tr>
<tr>
<td><em>Pinus densiflora</em> (Pinaceae)</td>
<td>Japanese Red Pine, origin: Japan, Korea; may reach 100'; a favorite of Japanese gardeners for dwarfing</td>
<td></td>
</tr>
<tr>
<td><em>Pinus pinea</em> (Pinaceae)</td>
<td></td>
<td>origin: from Spain, Portugal, east to Greece and Asia; flat spreading head is one of the most picturesque and characteristic in Italy; valued for its edible seeds; takes heat and drought when established; 40'-80'.</td>
</tr>
<tr>
<td><em>Pinus sylvestris</em> (Pinaceae) (Scots Pine)</td>
<td></td>
<td>origin: N. Europe, Asia; large (70'-100') tall-stemmed tree; very hardy, not for desert areas, wind resistant</td>
</tr>
<tr>
<td><em>Stachyurus hisalalis</em> (Stachyuraceae)</td>
<td>Himalayas; the sole representative of its family, with several species, a strong growing shrub, with long shoots to 3 meters or more; racemes 4.5cm long, flowers cup-shaped, wince-purple to rose-pink, opening in early spring; rare and unusual species</td>
<td></td>
</tr>
</tbody>
</table>
New Members

Mona Abadir  Rhoda Bunnell
Jan Allan  Laurie Bussis
Joanne and Scott Anderson  Rick Carell
Susan Ashley  Stephanie M. Carlisle
Ruth Bardakci  June E. Cleland
Shirley Barker  Jerry B. Clapp
Linda A. Bell  Barbara Coe
Henry M. Bolcom  Mr. & Mrs. Robert Comartin
J.E. Bowen-Williams  George & Alice Constantin
Alan D. Bradshaw  Marilyn Couch

Naarin Danesh  Mr. & Mrs. William S. Needham
John & Susan Dean  James Nylbakken
Margaret Deans  Elizabeth O'Shea
Ronald R. Duke  Ron Pagan
Marlynn R. Dykstra  Cheryl Palmer
Mr. & Mrs. Walter Ehlers  Marilyn A. Pekasky
Peter Ehrlich  Kirk Alan Pessner
Fred H. Field  Mrs. Alison Pinohuk
Suzanne Fields  Adam Rhodes
M. Emily Frainier  Loretta L. Rice
Mrs. Elinor B. Freitag  Christine Rioux
Lee & Patrick Hackett  Tansy Robinson
Gwendolyn J. Halpin  Jackie & Skip Rochefort
Lynnette P. Hardin  Celia Ronis
Louise Gamble Harper  Elizabeth, Steven & Louise Rosenberg
H.T. Harvey and Associates,  Cathy Schickler
Ecological Consultants  K.B. Shepard
John P. Hartman  P.M. Sherman
Ellie Heebner  Jean Stein
Roy Hoyer  Sandy Steinman
Merilee Huth  Blake D. Stevenson
Kevin Johnson  Jean Ann Todd
Mary Ann Johnson  Lucy Tooper
Diana Toes Kettner  Mr. & Mrs. Forrest Tregea
Carole Kraft  Ze'ev Vered
Donald K. Larkin &  Julie Waldman
Maria C. Freeman  Jack Wallace
Mrs. M.H. Lar Rieu  Robert & Patricia West
Mr. & Mrs. Richard H. Keatinge  Siv Larson Wheeler
Mr. & Mrs. Richard H. Keatinge  Gail Williamson
Mr. & Mrs. Richard H. Keatinge  Zonta Club

Grateful Thanks

Mona Abadir  Ned G. Heringer
Elly & Bill Bade  Mr. & Mrs. Grant Inman
Alan J. Bearden  James H. Jones
Berkeley Horticultural Nursery  David Shaw King
Chevron*  Mrs. M.H. Lar Rieu
June E. Cleland  Le Nore Mary Marker
Michael Concannon  Mrs. Philip N. McCombs
Jane & William Frazer  Leta Nelson
Louise G. Harper  Mrs. John Robert Shuman
Dr. & Mrs. Carl Helmholtz  Jane & Nelson Weller

* Company match

In the Winter 1991 Newsletter, we incorrectly identified the hosts of a November 1989 reception held in Pasadena. The Garden would like to correct the record by pointing out that the reception was generously hosted by Mr. and Mrs. Richard H. Keatinge of the Southern California Charter Group. The Newsletter regrets the error.
And to the following friends for their gifts for Special Projects:

Mrs. Eugene Kodani, in memory of her mother Haruko Obata, for the Japanese Stroll Garden Project
Joan Rock Mirov, for rose arbor restoration and endowment
Douglas James Ng, for the Strawberry Creek Restoration Project
Lizzie Lee, for the Horticultural Staff Development Fund
Louise Gamble Harper, for the School Pond Project
California Native Plant Society, East Bay Chapter, for Interpretive Materials for the Serpentine Project

In Honor:
Bob Raabe, from the Richanbachs

In Memory:
Scott Beamer, from Iris & Norris Gaddis
Mrs. Haruko Obata, from E. Y. Schelstraete
Barbara Husted, from Mr. & Mrs. Rex Reelfs, Dr. & Mrs. Fred D. Fisher, Mr. & Mrs. George A. Johnson, Mr. & Mrs. Peter C. Johnson & Mrs. Jean Nunally
Mrs. Meri McHenry, from Callie and Claude McRoskey
William B. & Lena H. Reynolds, U.C. class of 1898, from Mr. & Mrs. Lewis Reynolds

Two study tables and benches have been donated to the Garden since the last Newsletter. One was given in memory of Al Stout by his friends at Morrison and Foerster, and another in memory of Wayne Martin Atanasu, donated by his family and friends. Each donation of a study table and bench enriches the Endowment Fund.

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
☐ Individual ...................... $25
☐ Family .......................... $35
☐ Contributing ................... $50
☐ Supporting ..................... $100
☐ Sponsor ......................... $250
☐ Patron .......................... $500
☐ Benefactor ...................... $1000
☐ 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

DINO DAYS GARDEN TOUR Daily through MAY 17
In conjunction with Lawrence Hall of Science's Dinosaurs '91 exhibit, the Garden will provide a self-guided tour of prehistoric plants. Secure brochure at Visitor Center.

CALIFORNIA NATIVES Sats, Suns APR
Join the Garden's Jerry Parsons, horticulturist, and Diane Kothe, volunteer propagator, to learn about planning and planting your herb garden. 1:00-4:00 pm Meeting Room. $10 members, $15 non-members.

GENERAL TOUR, WITH EMPHASIS ON OLD ROSES Sat, SUN MAY
Tour of the Month features the fine Rose collection.

DROUGHT PROGRAM: Saturdays, MAY 18, 25 and JUNE 1
Series of practical talks on coping with the drought restrictions in your garden this season. 10:00am-12:00, in the Meeting Room each Saturday. $5 per talk or $12 for the series, members, $10 per talk, non-members.

PLANT SALE: MEMBERS’ PREVIEW Fri, MAY 10
Members-Only Preview Party and Sale. Refreshments and entertainment. Memberships sold at the gate. 5-7:30 pm

SPRING PLANT SALE Sat, MAY 11
Bromeliads, bulbs, cacti, succulents, natives, ferns, grasses, herbs, orchids, perennials, roses, shrubs, trees and vines, rhododendrons. Open to the public 10am-3pm.

GENERAL TOUR, WITH EMPHASIS ON HERBS Sat, SUN JUNE
Tour of the Month features Chinese medicinal herbs, and European culinary, medicinal and ornamental herbs. 1:30 p.m. Visitor Center.

HUMMINGBIRDS Sat, SUN JUNE 8-9
In conjunction with Lawrence Hall of Science, a program on hummingbirds by the world-renowned team, Robert & Esther Tyrell $7 members, $9 non-members (phone 642-5134 for reservations on credit card). LHS slide show: either Sat. 7:30-9:00 pm or Sun. 1:30-3:00 pm The Garden will offer free tours of its hummingbird garden both days (phone 642-3343 for times)

CHINESE MEDICINAL HERBS Sat, JUNE 15
Principles of Chinese herbal medicine with a special emphasis on anti-viral and immune-enhancing herbs, with Barbara Wilt, licensed acupuncturist. Includes tour of Chinese herb garden. 10:30 am-12:30 pm Meeting Room. $10 members, $15 non-members.

BUG DAYS Sat, SUN, MON JUNE 22, 23, 24
Come see living insects from the San Francisco Insect Zoo 10am-3pm. Meeting Room area. $1 child, $2 adult.

HERBS: Harvesting your herbs Sun, JUNE 30
Part two of the series. 1:00 -4:00 pm. $10 members, $15 non-members.

POISONOUS PLANTS Sat, SUN JULY
Tour of the Month repeats the popular Agatha Christie Centennial Tour of Poisonous Plants. 1:30 pm. Visitor Center.

GRASSES Sat, JULY 13
Join grasses expert Travis Columbus in a repeat of his very successful grass workshop. 9:30am-4:30pm. Meeting Room. $35 members and full-time students, $45 non-members.

TREES Sats, Suns AUGUST
Tour of the Month brings you the trees of the Botanical Garden. 1:30 pm. Visitor Center.

INTRODUCTION TO THE GARDEN Sats, JULY 20- AUGUST 17
Explore various sections of the Garden in depth with docents. 10am-noon. $25 members, $30 non-members, $7 per session. Phone 642-3352 for more information.

GREEN STUFF DAY CAMP Mon-Fri, JULY AUGUST
Week-long programs for children with instructors Randy Craig and Tori Perkocha, on the wide world of plants, plant games and stories, plant/animal goings-on, growing plants, using microscopes. Sessions I July 15-19 & Ill Aug. 5-9 for ages 8-11, 9am-3pm. Sessions II July 22-26 & IV Aug. 12-16 for ages 5-7, 9am-2pm. $90 per session. Call 642-3352 to register.

COMING ATTRACTIONS
NINTH ANNUAL SYMPOSIUM: Sat-Sun, SEPTEMBER 28-29
John Greentree, leading authority on ornamental grasses, and Allen Paterson, David Streatfield, and Roger Raiche, will be featured speakers at this two-day symposium. Gardening with the Elements, with special focus on garden design that deals with small spaces, drought conditions and unpredictable weather. Morrison Auditorium, California Academy of Sciences. $75 members, $90 non-members.

FRIENDS’ TRIP TO COSTA RICA JANUARY 1992
FRIENDS’ TRIP TO SOUTH OF FRANCE APRIL 1992

Friends of the Botanical Garden University of California Berkeley, California 94720 Address Correction Requested

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

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