**A Classroom in the Rainforest**

Kapok trees, torrential rainfalls, and bushmaster snakes — not the usual kind of outdoor classroom. This summer, ten students from three continents participated in Tropical Conservation Education, a six-week course conducted at the Garden and in Costa Rica, and taught by Dr. Jim Affolter and Dr. Stephanie Kaza of the Garden staff, and Dr. Cathy Fringle, tropical field ecologist working in Costa Rica. The purpose of the course was to provide students with first-hand exposure to tropical biology, issues in tropical conservation, and strategies in environmental education. The course drew students and graduates from U.C. Berkeley as well as others from Oberlin College, U.C. Davis, U.C. Santa Cruz, and the University of Puget Sound. Overseas participants included a biology teacher from the International School in Paris and the education director at the Royal Botanic Gardens in Sydney, Australia.

In early July the class met at the Botanical Garden for two weeks of lectures, labs, and guest speakers on pollination ecology, rainforest structure, deforestation, and tropical curriculum. We considered perspectives from professional botanists as well as rainforest advocates. Among other activities, the students took a stand in a staged debate on the ethics of boycotting Costa Rican beef. Out-of-town students were graciously hosted by garden volunteers who opened their homes and refrigerators to their guests.

On July 13, we flew to San Jose, Costa Rica. We were met by staff from the Organization for Tropical Studies, a consortium of over 40 American and Costa Rican universities, including U.C. Berkeley, dedicated to tropical education and research. Since the primary purpose of our visit was to develop educational materials for use at OTS field stations, OTS generously subsidized a large portion of our room and board at the field stations.

**Trail of the Trees**

Our first stop was the spectacular lowland rainforest of La Selva Biological Station on the Atlantic slope. La Selva is one of the most active tropical research centers in the Western Hemisphere and hosts many natural history tourists each year. Here we ran into basking iguanas, raucous toucans, and a three-toed sloth, among other wonders. Our project was to develop and label an interpretive trail through the Holdridge Arboretum.

The Arboretum was once a combination of primary forest and cacao plantations. Beginning in 1970, the area was replanted with a rich collection of native tree species. It now contains more than 300 of the 450 tree species found at La Selva, including several large and now rare specimens of many commercially important species. In spite of its potential educational value, the Arboretum has always been underused by visitors to La Selva because of inadequate labeling.

In less than a week, our students transformed the Arboretum. They marked 300 tree specimens with engraved plastic labels prepared ahead of time in Berkeley, designed a new trail with designated stops, and completed an interpretive brochure with the assistance of Beth Farnsworth, a biologist and illustrator working with OTS to develop nature guides.
A Diversity of Forests

From La Selva we traveled to the dry forest of Palo Verde, another OTS field station. After an early night in our mosquito netting bunks, we walked the limestone cliff and marsh edge for views of tiger herons, laughing falcons, and spider monkeys. The vistas were most like California — open and dry, the big marsh a wealth of wildlife.

Our next stop was the high cloud forest of Monteverde where fresh cool air was a welcome relief after a week of 100% humidity. Here Chris Pires, UCB biology major, led us on a tour of the ridgetop flora. Tank bromeliads, cacti, ferns, and even ericaceous shrubs covered the tree canopy with a thick layer of epiphytes. The place was dripping with green and shrouded in Caribbean clouds. We were impressed to learn of the extensive efforts of the Monteverde Conservation League in education, reforestation, and land acquisition.

For the last two weeks we left the center of the country and headed south over the 10,000 foot mountain ridge, Cerro de la Muerte, to the Wilson Garden, the third OTS field station and sister garden to the U.C. Botanical Garden. Here in the coffee-producing highlands near the Panamanian border, we were serenaded by black-striped sparrows and bananaquits.

Our objective here was to prepare a series of handouts describing important tropical plant families well represented in the Wilson Garden collection. Assisted by Director Luis Diego Gomez and illustrator Gail Hewson student teams wrote and illustrated information sheets on palms, bromeliads, gingers, marantas, and heliconias. The students also designed a rainforest ecology trail loop and an entry kiosk, and offered recommendations for future interpretive projects. From the Wilson Garden we took sidetrips to a coffee cooperative and to Loma Linda, a farm with demonstration experiments in sustainable agricultural methods. The environmental consequences of rapid settlement in San Vito have taken a severe toll on the forest, but coffee exports are booming. The students questioned a local farmer, a pesticide distributor, the garden’s environmental educator, and the head of the regional conservation group APRENABUS, for the details of this one area — a case study in complex economic and population forces at work.

Unanswered Questions

The course provided students with an opportunity to speak with people on all sides of the rainforest issue. We were impressed by the energy and dedication of local conservationists, but at the same time rather sobered by the difficult economic and social choices that face the citizens and government of Costa Rica. How much land can be effectively protected in national parks? What voice can Americans offer in conservation issues outside their own country? How do consumption patterns in the developed world contribute to deforestation in the developing world?

The students were left with many more questions than they had brought with them. But their desire to help conserve the rainforests was impressive. We all were grappling with what we could do about the terrible loss and destruction in rainforests within the context of our own lives. At the Botanical Garden, we feel education plays an important part in raising awareness and creating interest in tropical conservation. As one student summarized,

"Back in the States it was easy to get angry and depressed about deforestation and dislike the people who were doing it. Now being down here and witnessing the day to day struggles that people deal with, I have become much more aware of the human aspects of deforestation. This was one of the most worthwhile educational experiences I have ever had."

— Jim Affolter and Stephanie Kaza
Wild-collected Bulbs in Danger

Every year American, British, and European gardeners plant over a billion bulbs, almost all of them ordered from bulb catalogs or purchased in nurseries. Although most of these bulbs are propagated for commercial sale, some are wild-collected species dug straight out of their natural habitats in large quantities. Unfortunately, neither the commercial buyer nor the average gardener can always tell whether bulbs are from wild or cultivated sources. And some wild-collected bulbs are endangered species. Because the bulb trade deals in billions of bulbs, inspection for endangered species is almost impossible.

A Systematic Investigation

In the last several years the Natural Resources Defense Council has undertaken a review of commercial bulb catalogs while also investigating the international trade. NRDC staff member Faith Thompson Campbell has compiled information from studies of orchid trade data, Turkish export data, permits issued for the Convention on International Trade in Endangered Species (CITES), phytosanitary plant inspection records, and correspondence with botanists in Turkey, India, South Africa, and South America — the sources of many bulbs imported into the U.S.

What does this preliminary research reveal? One serious problem is the overall increase in bulb exports from countries where propagation is most likely not a common practice. In the last three years, India’s exports jumped from 100,000 bulbs in 1985 to over a million in 1987. Bulbs shipped from Swaziland in southern Africa increased from 300 in 1986 to over a million in 1988.

While officials state this is due to increased propagation of Amaryllis, South African botanists have some concerns about these data. This corresponds to a rather striking decline in exports from Turkey, where many bulbs are known to be wild-collected. This may mean that Turkey has begun to run out of wild sources for export bulbs.

Some of the species involved in trade are known to be rare or endangered. Bletilla striata is among 50 Japanese orchids listed in the Red Data Book as threatened by overcollecting. In 1985, Japan exported 61,000 bulbs of B. striata to the Netherlands and 105,000 to the United States. Though these plants were originally believed to be propagated, botanists have now raised doubts about these claims.

North American lilies and orchids are some of the most vulnerable to the international trade. All of the fawn lilies (Erythronium spp.) except the hybrid “Pagoda” are wild-collected. The most popular Trillium grandiflorum is most certainly from the wild, since no nurseries are known to be propagating it in commercial quantities. Cypripedium acaule is not cultivated commercially either, nor most of the species of Lady’s Slipper offered in catalogs. While some of these are carried by bulb companies, most are listed more frequently in wildflower catalogs. Since wildflowers are in vogue these days, this could mean an unexpected impact on some of our most rare species.

For some species, the export quantities are likely far above what the local ecosystem can replace through natural processes. Turkey alone has exported over 175 million bulbs of Galanthus, primarily G. elwesii, in the last five years. This number is about four times the amount recommended by Turkish botanist Dr. Ekim. How long is this scale of collecting feasible? Bulbs are a plant’s strategy for food storage, often representing more than one year’s worth of biological productivity. For most species a bulb must grow to a certain size before it produces bulblets or viable seed. It is unlikely that collectors in the wild are leaving reproductive stock in the ground as they collect.

Alternate Choices

The NRDC is doing its best to educate gardeners and catalog consumers about the stories behind the bulbs. Some companies have decided not to sell wild-collected bulbs. In the United States and Great Britain, Burpee, Smith and Hawken, Hortico, and Tesco have all made this commitment. A more long-term solution to the problem is to promote “bulb farming” or extensive agricultural investment in species of interest. For example, plants of Venus Fly-Trap (Dionaea muscipula) are available for sale from tissue culture. As a consequence, collecting pressure on this rare southeastern native has dropped markedly. This kind of option encourages conservation-conscious gardeners to include ecological considerations in their landscape choices.

As our perspectives on the world shift from local to global, our gardens become reflections of the larger world. Every plant in the garden has a story — can these also be about sustaining wild ecosystems?

—Stephanie Kaza

*NRDC recommends avoiding these species: Bletilla striata, Cyclamen mirabile (sometimes exported as C. purpurascens or europaeum), Cypripedium spp., Eranthis hyemalis, Erythronium spp., Fritillaria spp., Galanthus elwesii, Narcissus asturienis, N. cyclamineus, N. triandrus, Sternbergia spp., Trillium spp., Tulipa praecox. A complete list covering the status of most popular spring bulbs can be obtained from NRDC, 1350 New York Ave. NW, Washington, D.C. 20005.
GARDEN NOTES

Cross-Country Connections

Daniel Campbell prepares to receive his award at the 1989 Convocation. (photo by Margaret Race)

Congratulations: Kudos to Daniel Campbell, Garden Manager, one of three U.C. Berkeley staff members recognized for distinguished service at the annual Berkeley Convocation at the Greek Theater in September. Daniel’s award was given on behalf of his outstanding dedication and great effort in improving the garden grounds and collections, appreciated by all of us at the Garden for many years.

Soozi de Mille, undergraduate docent par excellence, has launched her teaching career at Brooklyn Botanic Garden with Project Greenreach, a schools program in the Education Department. We miss her enthusiastic presence here and know she will be well-loved in her new job across the country.

The Garden was recently awarded $22,028 by the Institute of Museum Services to support the first year of a three year program to survey and map the outdoor plant collections. The grant will also enable us to implement a computer mapping system for more detailed record-keeping of garden beds.

New in the Garden: The tropical rainforest will be featured in Rainforest Rap, a new school program with teacher training sessions for the Garden. During the rainy months of winter, school groups will learn rainforest ecology through pollination and poster displays in the Meeting Room and tours to the Tropical House and orchid collection. Conservation of biodiversity will be a key theme.

The Strawberry Creek Restoration Project now has architects’ drawings and a proposed trail marked by pink flagging tape along the lower half of the creek. The project features three small study areas built into the side of the hill — by the lower waterfall, at the creek crossing to the North American section, and a watershed observation deck near the junction to the chaparral section. With the generous donation of seed money for the project from long-time supporter Elizabeth Hammond, U.C. Berkeley landscape design students Elise Brewer and David Kahn designed the trail and produced renderings and working drawings. The project is now ready for the trail crews — and the next stage of fundraising.

Travels: In September, Stephanie Kaza, Education Coordinator, presented a paper at the Brooklyn Botanic Garden’s Symposium on Children’s Gardens, entitled “Conservation Education: an Urgent Task for Botanical Gardens”. Roger Ratche, Kurt Zadnik, and Holly Forbes covered many miles in California this October, collecting for the 1989-90 Seed List. The seeds are drying now and will be ready for packaging in the next few months.

This summer Daniel Campbell traveled to our sister garden in Costa Rica, the Wilson Botanical Garden, and then to Australia in the fall on a tour of diverse plant communities and soil types, organized by the U.C. Santa Cruz Arboretum. On both trips he collected seeds and spores and made contacts for future staff exchanges.

Robert Ornduff, Garden Director, spent ten days collecting high-altitude plants in the Venezuelan Andes for further development of the páramo area in the South American collections. This fall, he visited Harvard’s Arnold Arboretum as a member of its Visiting Committee, the U. of Pennsylvania’s Morris Arboretum as chair of an American Association of Museum’s accreditation committee, and the Leach Botanic Garden in Portland, Oregon to conduct an AAM assessment.

— Stephanie Kaza

Green Stuff instructor Soozi de Mille, her summer day campers, and their giant zucchinis. (photo by Richard Anderson)
Centennial Headlines

The Centennial Committee, chaired by Dr. Robert Middlekauff, Department of History, has been planning a series of events to celebrate the one hundred years of the Botanical Garden's association with the Berkeley campus. The theme of the Centennial is conservation of plant species and endangered ecosystems. Some of the programs and events in the planning stages are:

January 1990 — Opening ceremonies of the Centennial Year, including the planting of an endangered species in the Garden. Rainforest Rap Schools Program through mid-March, highlighting the Garden's tropical collections and sister garden relationship.

February — Historical perspectives on the Garden, with Dr. Lincoln Constance, Professor Emeritus and former director of the Garden, a brown bag lunch lecture.

March — Rhododendron lecture and tours of Rhododendron Dell, including some plants dating back to the early 1930s. Friends' travel tour of the Gardens of Portugal.

April — One-day symposium on International Conservation with Dr. Peter Raven, Director of the Missouri Botanical Garden and Home Secretary of the National Academy of Sciences. Morning bird-walk led by Dr. Robert Middlekauff, followed by breakfast at the Garden.

May — Evening members' preview party for the Spring Plant Sale, followed by next day public sale. Children's Garden Art poster contest awards ceremony.

June — One-day symposium on the Mediterranean Garden with Christopher Lloyd, British author and horticulturist.

April-August — Brown bag lunch docent-led tours of the Garden, especially for the campus community.

September — Strawberry Creek Symposium and docent-led tours of the newly renovated lower creek trail.


November — One-day symposium on the Changing California Flora, a look at native species, horticulture, and restoration.

December — Holiday Plant Sale.

January 1991 — Closing Ceremonies of the Centennial Year.

100 Years, 100 Days

As the Garden nears the end of its first 100 years, it has become a truly world class garden, due in no small part to the contribution of the Friends in money and time. To maintain this reputation during the Garden's second century, the Friends must become a larger and more affluent organization. In the Centennial Year, our goal is to double our membership.

One of the best ways to increase membership is by asking each current member to bring in at least one new member. To pique your interest, the Membership Committee has initiated a contest open to all members as of December 1, 1989. The theme of the contest is: "One hundred years, one hundred days, one hundred dollars, one hundred posters, and a century plant." The contest will last 100 days from December 1, 1990. Contest prizes are:

First: $100 gift certificate from the Visitor Center, to the person who sponsors the most new members.

Second: A plant propagated especially for the Friend who sponsors the next greatest number of new members.

Third: Choice of seeds from the 1989-90 seed list that is sent to over 300 botanical gardens and arboreta throughout the world.

Posters: The first 100 Friends who sponsor a new member will receive a silk-screened poster of the Garden's Alstroemeria. (acknowledged by certificate for pickup at the Visitor Center, limit one print per member).

Door prize: A special century plant propagated from the Garden will be awarded as a door prize on February 4th at the Friends lecture given by Dr. Lincoln Constance, former director of the Garden.

A membership to the Friends makes a thoughtful gift, especially in the holiday season. A gift card can be sent to the recipient, in either a holiday motif or an all-purpose gift card (please specify which). Please join us in celebrating this special year for the Garden.

—Gladys Eaton and Jim Van Sicklen

Alstroemeria poster art. (illustrator, Andie Thrams)
GARDEN SPOTLIGHT

Herbs for All Seasons

One of the most popular sections of the Botanical Garden, and one which is attractive year-round, is the Western Herb Garden (“Western” as distinct from the adjacent Chinese Medicinal Herb Garden). There are plants flowering here in most seasons, and even during the short time when there are few flowers, one can always enjoy the many different varieties of green and gray foliage, and the distinctive aromas arising from them. While most species at the U.C. Garden are wild-collected, this collection is an exception. The purpose of this garden is primarily educational; visitors are encouraged to smell and touch for themselves the marvelous diversity of traditional herbs.

To Delight the Senses

A walk through this garden is always a source of pleasure and interest. The first beds we arrive at near the main path are planted with culinary herbs: mints, sages, chives, savory, parsley, tarragon, origanums — both useful and ornamental varieties, a European Bay tree (Laurus nobilis), trimmed to the traditional rounded shape, and a special collection of over a dozen varieties of thyme. Long considered to be more than a culinary herb, thyme was used in the past to treat physical and mental illness. Parkinson, the 16th century herbalist, said that thyme was “a speicall help to melancholick and spleneticke diseases”.

Near the North American area the border bed contains a large collection of scented-leaved pelargoniums with foliage of many different scents. Some smell of roses, others like peppermint, lemons, or nutmeg — all a great joy to brush against and pinch. One curious plant in this bed is the ‘chocolate peppermint’ pelargonium, with brown marks on its leaves and a peppermint odor. It is hard to decide whether it really smells of chocolate or whether this is just suggested by its coloration and its name.

The newest feature in the Western Herb collection — a Knot Garden (photo by Linda Cook)

Behind the pelargonium bed are herbs grown for their fragrance. These include the sweet-smelling lavenders, rosemary, and clove pinks, hyssop, pineapple, and clary sages, and violets. There is a large clump of orris root (Iris germanica var. florentina), a beautiful white bearded iris whose rhizomes are dried and used as a fixative in making perfume.

Liquor, Medicine, and Tea

Past the fragrance bed we come to a bed of plants used now or in the past for flavoring drinks. Among these are wormwood (Artemisia absinthium) for making absinthe, and angelica and juniper used to flavor liqueurs. Lemon balm, hops, and costmary or alecost (Chrysanthemum balsamita) are used in beer-making. Blackthorn (Prunus spinosa) has tiny plum fruits called sloes which are important for sloe gin. Sweet woodruff (Galium odoratum) is an ingredient in German may wine.

Up the hill, we come to the beds of medicinal plants, some of which were used as cures in the past, and some which are still in use in modern medicine. Here we find feverfew (Chrysanthemum parthenium), a pretty ferny plant used for treating migraine headaches; horehound (Marrubium vulgare), an ingredient in cough lozenges; valerian for insomnia and headaches; and tansy, an insect repellent and vermifuge. Foxglove (Digitalis purpurea) and monkshood (Aconitum napellus) are two plants whose expressive popular names describe the shapes of their lovely bright ornamental flowers. They are both extremely poisonous, but in small doses are very useful in the modern pharmacopeia — digitalis for treatment of heart disorders and aconite for fevers, inflammation, and pain relief.
Medicinal plants of historical interest are represented by lungwort (Pulmonaria officinalis) whose spotted leaves resembling a lung were thought to be a cure for lung diseases. This medical philosophy, in which plant parts were used to treat diseases of human organs resembling leaves, flowers, or roots of the plant, was known as the Doctrine of Signatures. Another example is the pansy or heartsease with its heart-shaped flowers, which was regarded as a cure for heart disease.

At the top of the Herb Garden, behind the medicinal beds, are two small ponds, a wonderful source of tadpoles for school tours in the spring. By the pond near the lawn are herbs for making teas. Some of the more fragrant and enticing are bergamot or Oswego tea, comfrey or bruisewort, licorice, lemon balm, catnip, and peppermint. Chamomile can be used as a tea to soothe indigestion, as in The Tale of Peter Rabbit, and the hips of the Rugosa rose makes a tea rich in vitamin C.

**Magic Potions and the Infinite Knot**

A newly planted bed near the North American area contains a group of mysterious magic herbs. The extremely poisonous Atropa belladonna, now grown commercially as a narcotic, is named for Atropos, the Fate who held the shear for cutting the thread of life. In Medieval times, women used an extract to enhance their beauty, hence the species name “belladonna”. Thorn apple or Jimson weed (Datura stramonium) with its curious prickly succulent fruits, is useful in the treatment of asthma, but also is very poisonous. Here we find viper’s bugloss (Echium vulgare), believed to cure the bites of vipers and to drive away melancholy. The mysterious mandrake (Mandragora officinarum), seen as shaped like a man’s body, was thought to scream when pulled out of the ground. As the scream was said to kill any human being who heard it, dogs were used to uproot the plants. Mandragora was once believed to be an aphrodisiac and was later used as a narcotic.

In the middle of the herb garden, we find its newest and most distinctive feature — a Knot Garden. Kenneth Woodbridge, in The Oxford Companion to Gardens, describes a knot garden as “a garden planted in the form of a knot, a figure of continuous interlacing bands, expressive of an unchanging or endless situation, hence a symbol of infinity.” Knot gardens were popular in Europe in the 15th and 16th centuries and were often planted under windows so that people could look down on them as on a piece of embroidery. The knot here is composed of silver thyme, dwarf hyssop, santolina, and wall germander, an agreeable blending of greys and greens in plants of similar habit.

The Western Herb Garden dates back to the 1940s, when local gardener Betty Rollins and some of her friends planted it with cuttings from their own well-established herb gardens. This same group maintained it with devotion until the 1970s when it was handed over to the care of the Botanical Garden staff. Now it is a source of particular joy for the pre-school Five Senses tours as well as the visually-impaired tours. While visitors are generally admonished from touching most garden plants, here in the Western Herb Garden, it is a necessity! There is much more here than we can see in one visit. So come back again and again and in all seasons, to see all that pleases the eye, nose, and tongue in this delectable garden.

— Jaqueline Woodfill

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**Herbs as Symbols**

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<thead>
<tr>
<th>Herbs as Symbols</th>
<th>Meanings</th>
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<tr>
<td>Ox-Eye Daisy (Chrysanthemum leucanthemum) — Purity, loyalty, love, and innocence</td>
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<tr>
<td>Dandelion (Taraxacum officinale) — Absurdity</td>
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<tr>
<td>Hawthorn (Crataegus laevigata) — Emblem of hope</td>
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<td>Heartsease (Viola tricolor) — Remembrance of things past, happiness; seeds symbolize the Trinity</td>
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<tr>
<td>Lavender (Lavandula officinalis) — Luck, purity, sweetness, virtue, undying love and cleanliness</td>
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<tr>
<td>Lily-of-the-valley (Convallaria majalis) — Purity</td>
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<tr>
<td>Mints (Mentha spp.) — Wisdom, cheerfulness, hospitality, and virtue</td>
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<tr>
<td>Strawflowers (Helichrysum bracteatum) — Attachment and constancy</td>
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<tr>
<td>Tansy (Tanacetum vulgare) — Immortality and healing of wounds</td>
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</tr>
<tr>
<td>Thyme (Thymus vulgaris) — Courage, bravery, strength, and activity</td>
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The Friends of the Botanical Garden will hold their annual Holiday Plant Sale on December 9 from 10am to 3pm at the Botanical Garden Meeting Room. The sale will feature a wide array of lovely plants for holiday gifts, including many hard-to-find species. Proceeds from the plant sale go to support the Garden's programs, activities, and general operations.

Holiday special items include ferns, cacti, succulents, epiphytic orchids, and Cymbidiums. All of the plants have been propagated from the garden collection, from seed of other botanical gardens, from collectors' gardens, and from seed houses in the United States.

A special feature for this sale are the diverse ferns cultivated by volunteer Iris Gaddis. From delicate and lacy to thick and leathery, from two inches to 50 feet tall, over 10,000 species of ferns and fern hybrids exist, many now introduced into cultivation. A number are reliable and adaptable as background plantings or garden specimens. Because many ferns can grow in shady areas where few other plants will thrive, they are sought out by discerning and thoughtful gardeners. Here at the Botanical Garden, we propagate and introduce exotic species as well as the more familiar ones we have all come to love.

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**FERN AND FERN ALLY SPECIALTIES**

**Adiantum raddianum** — an extremely variable species with many cultivars including A. r. 'Pacific Maid', a compact form with fan-shaped pinnules, A. r. 'Gracillimum' with pendulous finely divided segments, and A. tenerum 'Fergusonii' with deeply-lobed segments.

**Anemia phyllitidis** — American tropics. A member of one of the earliest fern families in evolutionary history. The fruiting portion is united with the fertile leafy frond, suggesting the common name of “flowering ferns”.

**Araioestgia hymenophylloides** — A beautiful fern with very finely divided fronds and one of the most beautiful of the Davallias. Easily maintained in warm, humid conditions with air movement.

**Asplenium bulbiferum** (Mother Fern) — Australia, New Zealand. A very adaptable forgiving fern with shiny fronds that is attractive outdoors or as a houseplant. Plantlets develop on the leaves and are easily propagated.

**Blechnum occidentale** (Hammock Fern) — Tropical America to Chile. A small fern with elegant fronds which remain fresh a long time in flower arrangements. New fronds are colorful pink or salmon.

**Blechnum penna-marina** — A charming little fern with spreading rhizome, member of a group of small species in North America, mountains of the tropics, and in Australia, New Zealand. New fronds are rosy red.

**Dennstaedtia cicutaria** — Central and South America. A large (36-120”) lacy, attractive fern of the rainforests. Tropical and subtropical, spreading rhizomes.

**Diplazium lanceum var. crenatum** — Japan, China. A dwarf, slow-growing fern with compact growth, prized in Japan where a number of unusual cultivars have been developed.

**Quercifilix zeylanica** — Asian tropics. A tiny (2”-6”) lacy, attractive fern of the rainforests. Tropical and subtropical, spreading rhizomes. Spicy foliage is also used in Asian cuisine.

**Sclerathea bullata** (Black Caterpillar Fern) — Malaysia, Indonesia, New Guinea, Polynesia. An appealing, unusual fern of the Davallia family with black-haired rhizomes, attractive in hanging baskets.

**Selaginella pallescens** — Tropical America. A rosette-forming fern with colorful light green fronds. Easily grown.

**S. willdenovii** (Electric “Fern”) — North India, Vietnam, Malaysia. Spectacular climber with wiry stems and electric blue-colored spreading fronds.

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With technological advances in printing and photographic techniques, plant books are becoming more attractive than ever. The two books reviewed here are beautiful examples of fine close-up photography that comes close to replacing the art of botanical illustration. Both are available in the Botanical Garden Visitor Center.


Roger Phillips' and Martyn Rix's earlier illustrated guide, The Bulb Book (now out of print) was so popular that they have now authored a new series of guides to garden plants using the same successful format. Shrubs is the second in this series, following Roses. Although the shrubs described have been chosen because they can be grown outdoors in the British Isles, California gardeners will find this a useful reference as well.

The book is unusual in its superb photographic illustrations, irresistible to the aesthetic eye. Full page color plates compare foliage and flowers of related plants, and smaller pictures show shrub flowers, fruits, and habit to enhance the text. Plant arrangement is primarily by flowering season, beginning with late winter and spring, and continuing through autumn fruits and color. Major genera are grouped together. Botanical names and cultivation requirements are given for each plant. Though not listed in the contents, there are sections on Chilean and southern hemisphere shrubs. The bibliography and glossary are useful, as is the worldwide list of nursery sources and shrub gardens to visit, including the U.C. Botanical Garden.


Today the public interest in herbs and herbal medicine extends to plants used throughout the world in all cultures. Very good references on Chinese herbal medicine or on Native American uses of plants are now widely available. The New Age Herbalist is one of these good modern reference books, devoted mainly to herbs common to Western healing traditions.

The format of this book is similar to that of Shrubs. There are many full color illustrations of herbs in the glossary at the beginning of the book, making it a pleasure to identify the plants described. A line drawing of each herb precedes the text which includes plant parts used for various culinary and medicinal purposes, the chemical constituents of the plant, and cautionary notes. Further chapters discuss practical herbalism, herbs for natural living, herbs for nutrition and health (including recipes), herbs for healing, and herb gardening with many suggestions for growing and preserving herbs.

—Elly Bade
CONTRIBUTIONS

New Members

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

Dr. Carol J. Baird  
Roxanne Baxter  
Alan Berling  
Joann Bierman  
Torsten Blomberg  
Gail & Doug Brown  
California Association of Nurserymen — Central Chapter  
Ann Clarkson  
Ann Wheeler Cotter  
Kathleen Croker

Peter D’Amato  
Julie & David Dempster  
Helen Dixon  
Kathryn Dohrmann  
Delaree R. Dowling  
Philip W. Edinger  
Janet & Stephen Edwards  
Helena R. Foster  
Mary Klee Frank  
Dianne & James Fristrom  
Mike Foulkes

Patricia Gallinatti  
Kay Gjeltema  
Rowena Jackson  
Ralph W. Jones  
Richard Josephson  
Mr. & Mrs. C. Judson King  
Maggy Kongsgaard  
Geraldine L. Knowles  
Emily Kreitz  
Larry B. Lambert  
Henry Leland  
Jill Light  
Barbara Newell Lindberg  
Peter J. Maloney  
Ben McGimsey  
John & Terry McKeelvey  
Jean M. Mitchell  
Susan E. Minger  
Mr. Diablo Iris Society  
M. P. Murphy  
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The Friends wish to thank these donors who have made a substantial gift over and above membership:

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In Memorium

The Friends wish to acknowledge the deeply-felt loss of Frantisek Wolf to the Botanical Garden community of friends and give thanks for these donations given in his memory by:

Bill & Eleanor Bade
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The Friends also offer thanks for these gifts in memory of Geraldine Knight Scott, for the Japanese Stroll Garden:

Katherine Field Caldwell
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Generous donations were also given in memory of Al Horton by:

Stan Farwig
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Our thanks also for these donations given in memory of:
Chris Filmer, from Virginia & Bert Bloch
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Mary Louise Tavella, from Duke & Marlene Leffler
Mario Trucco, from Duke & Marlene Leffler

And in honor of:
Myrtle Wolf, from Robert Ornduff
Iris Gaddis’ 50th Wedding Anniversary, from anonymous donor.

The Friends are also grateful for a new bench which has been donated to the Garden by Delarees Dowling in memory of her husband, John. This is the twentieth bench given to the Garden and the first to be placed in the Mather Redwood Grove.

Acknowledgements

The new Alpine Fell-field in the California area was dedicated on Sunday, September 17, 1989. Donors contributed over $22,000 to bring this new exhibit to the public. Special thanks to Joan Mirov, Stella May Knouse, Myrtle Wolf, California Native Plant Society, San Francisco Bay Chapter, American Rock Garden Society, Western Chapter, Ron Lutsko, Jr., Phil Johnson, Warren G. Roberts, Olive and W. George Waters, and the Friends of the Botanical Garden.

The Annual Meeting of the Friends on October 17, 1989 was cancelled due to the earthquake. The treasurer’s, membership and major gifts reports will be published in future newsletters or reports are available on request.

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
• Volunteer opportunities

Friends of the Botanical Garden Membership Application

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

☐ Student .................. $7.50
☐ Individual .................. $20
☐ Family .................. $30
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☐ Supporting .................. $100
☐ Sponsor  .................. $250
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Name ____________________________
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Was your membership stimulated by a current member? ☐ yes ☐ no

If so, please list name: ____________________________

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
Calendar of Events

HOLIDAY DECORATIONS Sat, DEC 2
Make wreaths and arrangements from unusual dried natural materials with expert Wayne Roderick. 9:30am-12:30pm, Meeting Room. Limit 18. $20 members, $25 non-members.

PATRICK BOWE Thurs, DEC 7
Here to introduce his new book Gardens of Portugal, Patrick Bowe will show slides of some of the highlights of next spring’s garden tour to Portugal. Lecture and book-signing at Haas Clubhouse, 7:30pm. $3 members, $5 non-members.

HOLIDAY PLANT SALE Sat, DEC 9
Orchids, bromeliads, ferns, cacti, succulents, garden and nature books for holiday gifts. Meeting Room, 10am-3pm.

RAINFOREST RAP Sat, NOV 18 and Tues, JAN 9
Teacher training workshop on rainforest biology, pollination ecology, and the Garden’s tropical collections in preparation for winter school programs. Curriculum and background materials provided. $10, Meeting Room. Requires pre-registration.

A HUNDRED YEARS OF HISTORY Sun, FEB 4
Former Director of the Garden, Dr. Lincoln Constance, will offer a historical perspective on the events and explorations that have shaped the Garden’s collections. Meeting Room, 12noon. Bring bag lunch, coffee provided.

THE GARDENS OF PORTUGAL MARCH 16-30, 1990
Patrick Bowe will lead this Friends’ tour to historic gardens and museums in Lisbon and Oporto. The journey will take us through the Lima Valley and on to the nearby mountains and remote villages of the Peneda-Geres National Park to see the native Mediterranean flora.

For information on classes and events, call the Visitor Center, 642-3343.

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.

Friends of the Botanical Garden
University of California
Berkeley, California 94720

Address Correction Requested