Freeze Hits the Garden

100-year Cold

A succession of hard freezes struck the Bay Area in late December, creating havoc among many of the subtropical beds in the Botanical Garden, and indeed, among Bay Area gardens in general.

Night-time temperatures in the East Bay Hills plunged to an unprecedented 16° Fahrenheit for several days prior to Christmas, and then again just before the first of the year. The record-breaking Arctic cold froze puddles solid, burst copper and galvanized piping, and reduced jade plants to sponge rubber.

As might be expected, plants in the Garden’s Mesoamerican beds and African hill suffered the most dramatic effects of the freeze. The small grove of Magnolia dealba trees lost most of its foliage, while the Mexican salvias froze to within six inches of their roots. South African succulents fared no better; much of their foliage whitened and their stems split. Most of the Canary Islands collection has now oxidized a sickly brown. And in other areas of the Garden there were losses as well: a few Chamaedorea palms froze; the Malaysian rhododendrons appear lost, the Tabebuia and Nicotiana of South America are dead to the ground. John Domzalski reports that in the nursery everything was frozen solid in pots for a week, and the young aloes will not come back. All of the Cymbidium so carefully tended by the volunteer propagators sustained leaf damage too.

Surprise Survivors

On the bright side, the cacti of the New World desert appear to have largely escaped the rigors of the freeze, as did most of the Asian and California collections. True to form, many Eastern plants in the North American beds withstood the Arctic blast, while the garden of old roses downright revelled in the subfreezing temperatures! And, although the sight of the necrotic leaf damage in the hardest-hit beds tempts one to tears, happily there are some surprise survivors. The aforementioned magnolias are showing renewed vigor since the freeze, while the Maurandya and Penstemon of Mesoamerica appear to be largely untouched. Some of the aloes are already flowering, and the bamboos and gingers are doing well. There is a Brazilian fuchsia whose leaves are actually intact! And a few South American melastomes appear to have vigorous undamaged stems. The large orange in the Herb Garden has survived, as did the aloe vera in the Chinese Medicinal Herb Garden.

A Unique Opportunity

There is another cause for celebration! The U.C. Botanical Garden is, after all, a research garden, among other things; the freeze has afforded us a unique opportunity to learn much more about the hardiness of plants in this climatic regime. Climatologically the Bay Area is much more unpredictable, day to day, than many of the otherwise compatible regions from which we draw our collections. For example, a perennial plant that in its
native habitat normally hardens very gradually over a period of several months, as the air temperature slowly drops, might not harden or drop its leaves here in our moderate climate. In fact, there were many trees in the garden that have not dropped leaves in years, but did in December! The Taxodium (eastern North America) has finally lost its leaves, as a good cold-hardy tree ought to do.

But some of the North American and herb garden collection was not prepared for the lightning strike of the freeze. All the Pelargonium are gone. And the lovely oleander in the European area froze clear to the ground.

On the other hand, a huge number of frost-sensitive plants did survive the freeze; perhaps the 5-year drought was partially responsible (see below). So, we may come away from this experience with new understandings that will not only contribute to science, but may also guide our horticultural policy.

**Ice Nucleators**

How do plants die in a freeze? It is the ice in the tissues of the plant that kills the living cells. Ice outside the cell draws water out of the cell; the cell can die from dehydration or from toxic accumulation. Ice inside the cell ruptures the thin membrane around the cell. But if that is true, why do some plants resist freezing events, while others succumb? Only in the last decade or so have we become aware that for ice to form on or in plant tissues, there must be ice nuclei present. That is simply where a microscopic bit of matter, called an ice nucleator, triggers the formation of an ice nucleus around which the ice will form. Potent ice nucleators, particularly certain bacteria, abound in plant tissues. So, a plant must adopt one of three strategies if it is to prevent freezing:

1. it must get rid of sensitive tissue (e.g., drop its leaves), or
2. it must get rid of water in sensitive tissue, or
3. it must get rid of ice nucleators in sensitive tissue

Some cold-adapted plants (black oak, gingko, eastern maples) routinely drop their leaves in winter. Other cold-adapted plants, such as the hardy boreal conifers that survive winters where the mercury regularly drops below -25 degrees F, have inherited a physiology that allows them to shift water out of their winter buds and woody vessels and still survive the resultant dehydration. And a few cold-adapted plants have the ability to keep nucleators out of the cells. All of these cold-adapted plants evolved at high elevation or high latitude, and became retrofitted to seasonal cold by the process of natural selection.

All other plants must depend on acclimation to cold conditions (nongenetic responses that may minimize damage.) So, some of our cycads, in the face of our Arctic blast, became deciduous. Other plants managed to turn off their xylem flow as the mercury fell. We do not yet know if there are any species that can facultatively remove ice nucleators.
Supercool Plants

But, there is another dimension to all this talk about ice. Surprisingly, plant tissues do not necessarily freeze when the temperature falls to 32° F (0° C). They can be supercooled. Supercooling occurs most readily IF ice nucleators cannot enter the cells, OR IF there is relatively low water content in the tissues. Only a few species of plant are able to erect barriers against ice nucleators and survive the freezing stress.

But, all of our plants have been severely drought-stressed; this perennial lack of water may in fact have helped to save the plants that survived the freeze. By having a low water content in their tissues, they may have supercooled and avoided freezing, EVEN THOUGH THE AIR TEMPERATURE WAS WAY BELOW FREEZING! This process most likely occurred in tissues farthest away from the coldest air.

A further confounding factor is microclimate. In the Garden a plant can face north or south, east or west. It may be in full sun most of the day, or in the shadow of a building or tree. It may be on an exposed slope, or in a protected dale. When our Arctic air mass came through, day-time temperatures nevertheless did rise above the freezing point. So, plants exposed to full sun may have thawed, only to re-freeze that evening. And winds may have intensified the dehydration effect.

In most of our local gardens, the best policy is to wait and see what happens. If you remove plants at this early stage, you may be removing living tissue that is simply taking its time healing [except where the complete plant is quite obviously dead.] In some cases, as with the succulents that are oozing from the base, you may feel a strong compulsion to put the plant out of its misery, but if you can stand the temporary disgust you feel, and wait, your patience may be rewarded. Even the jade plants will decide to abscise, independent of your will, just above the wounded tissue, and to start anew!

Mortality is a natural process. In the Garden, as in nature, it affords the opportunity to put in new things, new cuttings, new seedlings. And so the curatorial and horticultural staffs welcome this unexpected chance to review the collection and enhance it as they see fit. Please use the freeze as an excuse to come up and see the Garden in a new light!

—Carol Baird

The New World Desert is already showing signs of renewed vigor, despite extensive leaf damage to selected plants (photo by Richard Anderson)
Ornduff’s Travels

Last November, 27 hours after leaving the San Francisco airport, the first sight that greeted my weary eyes were the enormous patches of California poppies that line the boulevards between Chile’s international airport at Santiago and my hotel. Since November in the southern hemisphere is equivalent to May in California, the poppies bore the smallish, yellow flowers of their summer phase. Nevertheless, they were a familiar and welcome sight in the bright early summer sunshine.

The following day, our small group of plant enthusiasts drove a short distance southeast of Santiago, to the Rio Clarillo Nature Reserve in the Andean Foothills. The hillsides were covered with Chile’s equivalent of chapparal, there called matorral, composed of shrubs unrelated to those of our own scrublands. The valleys and damper sites supported a woodland of Azara, Lithraea, *Persea*, Quillaja, *Cryptocarya*, and *Schinus*, mostly unfamiliar genera that en masse resemble our own Live Oak/Bay woodlands. Rock outcrops above the river canyon supported *Puya caerulea* and *P. berteroniana*, neither in flower at the time, but both adding an “exotic” touch to the otherwise California-like landscape.

Chile is, of course, many thousands of miles southeast of California on the other side of the equator. Santiago resides in the central valley, whose floor is about 1500 feet above sea level. Although the latitude of Santiago is that of San Diego, its temperature and rainfall cycles almost exactly parallel those of Sacramento. Based on the distance between Chile and California, one might expect that Chile’s flora is not closely related to that of California. While this may be generally true, my walk along the paths of the preserve turned up some familiar plants which, unlike the California Poppy, have achieved their present disjunct distributions by natural rather than human means.

The open sandy patches among the shrubs were filled with many annuals closely related to those in California. *Clarkia tenella*, *Amsinckia calycina*, *Collomia biflora*, *Madia sativa*, and a *Plagiobothrys* species were all present. The Chilean *Clarkia* and *Amsinckia* species are the only members of their respective genera that occur naturally outside western North America. *Plagiobothrys* is concentrated in western North America, but in 1983 I encountered *P. australis*, happily native on Queen Victoria Rock in Western Australia, but barely distinguishable from our own native species, so this genus strays into Australasia from the Americas. *Madia sativa* is widespread in western North America; Munz considers it to be introduced on this continent. On drier hillsides were plants of *Armeria maritima*, here with white flowers rather than the pink ones characteristic of our own populations of this species. The rocky bed of Rio Clarillo harbored *Mimulus luteus*, a Chilean counterpart of our own *M. guttatus*. The geographic reality of the locale was emphatically stated by the presence nearby of plants of the gigantic herb *Gunnera chilensis* that we saw accompanying the monkeyflower elsewhere.

Higher in the Andes we saw *Fragaria chiloensis*, restricted to coastal localities in western North America and one of the parents of the large commercial strawberries so important to our state’s agriculture. Even the Chilean weeds were familiar—the English daisy, white clover, plantain, cat’s tongue, oxtails, and other common weeds of California gardens have established an equally conspicuous presence in the lawns of Santiago and the road cuts along country lanes. In wetter localities, foxgloves were common, and pastures were white with ox-eye daisies, both exotic species easily seen in Marin County and other coastal localities.
The Eurasian origins of these weedy immigrants, all of which have invaded the New World in historic times, are well known. But how do botanists explain the occurrence of the numerous native genera present in Chile and western North America, but not in the intervening vast terrain or in other regions of the world with Mediterranean climates?

My own studies of two members of the sunflower family, *Blennosperma* and *Lasthenia*, indicate quite clearly that the single Chilean species of each of these otherwise essentially Californian genera are derived from North American stock. In fact, *Lasthenia kunthii* of the vernal pools of Chile’s central valley is so similar to *L. glaberrima* of western North America I doubt if it would be recognized as a separate species if it grew naturally on this continent. Many other genera with this “amphitropical” distribution have been studied and for most of these, the consensus is that the Chilean representatives have been derived from North American ancestors. Two notable exceptions that come to mind are *Calandrinia* and *Acaena*, whose North American species are ones with South American progenitors.

It is not immediately obvious how these long-distance migrations have occurred. Winds and oceanic drifting are both unlikely. Migratory birds have been implicated as unwitting messengers of seeds. Even more problematical is why the exchange of flora has been so overwhelmingly unidirectional. The balance of botanical payments is very strongly in Chile’s favor. One explanation is that the Mediterranean climatic zone of western North America is many times larger in area than that of Chile, and supports proportionally more species. If the exchange between these two areas was proportional to the number of candidate migrant species in each of them, the number of migrants would be weighted in the north-to-south direction. Obviously, we will never know just how this interesting pattern of distribution came about, but should you visit central Chile, be prepared to see some familiar “faces.”
FROM THE DIRECTOR

Thanks to our computer, the hard work of Holly Forbes, and the help of a few expert advisors, I can report that the garden now contains 17,734 accessions. An accession represents an entry in our records, referring to seeds, cuttings, spores, plants, or other propagating material newly acquired for the collection. At present, our computer cannot tell us how many different species are in our collection, but hopefully that information can be generated in the near future. We have fewer than 17,734 different kinds of plants, since some species are represented more than once. We estimate that we have about 12,000 taxa (a taxon is a species, subspecies, variety, etc.), but I suspect the figure, once it is known, will be higher than that.

Thanks also to the computer, I can report that in 1989 the garden accessioned 2000 acquisitions; someday, in theory, there will be a plant in the collection with a label bearing the code 89.2000. That was the last acquisition made in 1989. At the time of writing in November, 1990, we have 1940 accessions for the year. If the rate continues through November and December, the 1990 total will be about 2328 accessions. In our annual report for the fiscal year 1979-1980, we recorded 807 accessions for the year. If we assume that the average number of accessions during the last decade has been about 1500 per year, this suggests that our present collection developed over the course of the past 12 years. However, we have just finished celebrating our 100th anniversary, so does this mean that for its first 88 years not much went on in the garden?

Of course not. I would go out onto a limb and venture to say that the majority of accessions made each year do not survive. The seeds do not germinate, the seedlings die, or the plants give up the ghost once they are planted out in the garden. This is not due to poor care, since the care our plants receive is expert. The problem is that virtually everything that comes into the garden is in cultivation. There is no place to obtain pertinent cultural information, since we may be the first garden to try to grow the species. Thus, we use good sense, but even then, we lose many interesting things each year. Last winter was hard on the collections, and many of you will remember the disastrous winter of 1974, when in 48 hours unprecedented freezing weather eliminated about one-quarter of the garden’s outdoor collections. The plants on African Hill and those in the New World Desert all were particularly hard hit; yet both collections today contain specimens that survived the Big Freeze quite well, even though in their native haunts they would never have experienced more than a light frost.

Although we may miss the tree aloes and other venerable plants that succumbed to the 1974 freeze, the garden would become a less interesting place if we did not lose plants now and then. It would become a static collection, whereas now an occasional unexpected demise provides a space for us to try something different. One of the gratifying things about being associated with a museum of living plants is that these plants change during the course of a year. They flower, fruit, produce fall colors, defoliate, and yes, they die. But each time we lose a plant, we have something different and perhaps even more interesting to take its place.

Berberis darwinii, a hardy evergreen shrub from Chile.
A Time for Renewal

The freeze of '90: Daniel Campbell, Judith Finn and the rest of the dedicated Garden staff expended extra personal effort last December when the freeze struck the Garden. Among other things, they were kept busy far into Christmas Eve tending burst pipes and broken lines. Many many thanks for your devotion!

As an aftermath of the freeze, in January of this year, Daniel drew together reports from each member of the horticultural staff as to the current and projected state of the various beds of the Garden. These data will be used to implement new planting strategies in the hard-hit sections of the Garden, and will also be distributed to regionwide agencies.

The second 100 years: On January 2, the Friends of the Garden, marked the close of the Centennial year, and celebrated the start of a whole new century at the Botanical Garden. Following a lovely reception organized by Friends Vice President Gladys Eaton, both President of the Board Bob Riddell and Director of the Garden Bob Ornduff thanked the Friends and the major donors for their generous support, gifts of time and money that have allowed the Garden to grow and prosper over the decades. The third speaker, Wilbur Gardner, Dean of the College of Natural Resources, addressed the prospect of the next one hundred years of the Garden, now under the very hospitable wing of that College.

New in Education: On January 2, Dr. Carol Baird joined the Botanical Garden staff to direct the Education Program. Dr. Baird comes to us from the majors course in Biology on campus, where she functioned as both Academic Coordinator and part-time Lecturer. Carol completed her dissertation on the ecological community of nectar-feeders that use Heliconia species while she was in residence at La Selva in Costa Rica. She received her Ph.D. from the University of California, Berkeley, in 1987.

Travel: Elaine Sedlack, horticulturist for the Asian area and Chinese Medicinal Herb Garden, recently returned from the International meeting of the Rock Garden Society, in Washington, D.C. Elaine writes that “I saw the National Arboretum's new Asian Valley planting, of which Lawrence Lee is the curator. Lee, whom I had met in Nanjing two years previous, also showed slides of his trip to the Huangshan range in Anhui Province. I met some private collectors and saw slides by a member of the Sino-American Botanical Expedition to Shen-Nong jia in Hubei Province. We also saw the recently expanded Bonsai and Penjing collection at the USNA. Thank you, Friends of the Garden!”

Sean Hogan was a recent visitor at the Missouri Botanical Garden in St. Louis, where he presented a talk on the taxonomy of Lewisia (Portulacaceae) and spent much time in the herbarium. He met many influential botanists (even the legendary Armen Takhtajan, with whom he discussed... systematics), and thoroughly enjoyed his stay!

Dr. Carol Baird visited Brooklyn Botanic Garden late February, where she met with Development officers and the various Education directors, in the hope of learning how to go about expanding our own program.
**BOOK REVIEWS**


This handsome volume is of interest to the Friends of the University of California Botanical Garden not only because of its focus on California gardens, but also because the author is one of our own members! A Harvard-trained landscape architect, Helaine Kaplan Prentice came to California nearly 30 years ago to work in the Oakland City Planning Department. She has written a book that is really two books in one. The first is a reference guide to fifty-five Southern California public gardens, with information on location, the size of the collection, and the major attractions of each garden.

The “second book” is a carefully constructed aesthetic, cultural and historical record of 25 outstanding gardens, many built by men of great wealth, some by people of lesser means. You’ll find the Huntington here, along with several less well-known but enchanting gardens. These gardens reflect their owners’ perceptions that Southern California is a plantsman’s paradise. Represented are native plant gardens, collectors’ gardens, estate gardens and city parks.

too large to carry as a field guide when visiting the Southland, this book is good winter reading (along with seed and plant catalogs) when planning a horticultural holiday.


First published in Australia in 1986 as The Greening of Gondwana, this remarkable and beautiful book is finally available to readers in North America. It is an illustrated history of the evolution of plants through millions of years of Australia’s existence as a continent. The author, a noted paleobotanist, is now curator of the plant fossil collections in the Australian Museum in Sydney.

Australia is the world's smallest and flattest continent. It was originally part of Gondwana, the ancient super continent of the southern hemisphere. The breakup of Gondwana set it adrift as a floating ark, which has not yet come to rest. It carries upon it a wealth of animal and plant species found nowhere else in the world. In the book the evolution of Australian land plants is traced from the earliest forms to the present day through beautifully preserved fossil specimens. The author also examines the vegetation of each historic age in relation to that of the world at large, In the end there is an analysis of modern Australian flora in relation to recent geologic history.

As an invitation to the author’s fascinating study, the cover photograph of a fossil Kauri pine (Agathis jurassica) superimposed by a living twig of a modern Kauri pine—little changed after 175 million years—is irresistible. The extremely clear text with supporting drawings, maps and superb color photographs make this the most exciting and readable book on paleobotany today.

— Elly Bade
Southern California Council

Last spring, as a part of the Centennial effort to expand support, the Garden welcomed a Charter Council of Southern California Friends. This group is vital in that it will raise awareness in Southern California of the important collections, education programs, and conservation projects here at the Garden.

The Charter Council is led by three ambitious co-chairs—Bitsy Hotaling, Veva McKee, and Kay Onderdonk—who organized on behalf of the Garden early in 1990. UC Berkeley History professor and long-time Friends' member Bob Middlekauff, who is a Visiting Fellow at the Huntington Library this year, played a key role in enlisting this support for the Botanical Garden in Southern California. In November 1989, following a reception hosted in Pasadena by Mr. and Mrs. Kingston McKee and Mr. and Mrs. Richard Hotaling, the Friends encouraged the formation of the Council as a part of the Centennial agenda. Twelve couples from the area joined as charter members, including UC Berkeley Foundation Chairman Preston B. Hotchkis. Eleven more Southern California couples have joined the Friends in response to an invitation letter written by the three Co-chairs this fall.

Given the distance, new Southern California Friends who want to visit the Garden are often limited to times of special Bay Area events. With this in mind, the three Co-Chairs planned a pre-Big Game lunch in the Garden for new members. On Big Game Day 1990 (November 17), Southern California Council members, along with Friends board members and Garden staff, enjoyed a tour given by Manager Daniel Campbell, and a box lunch catered by Narsai’s Cafe. Vice Chancellor Leatsch (formerly Director of the Garden), and Bob Middlekauff also attended. Everyone had an enjoyable time before trekking down to the Game in a shuttle provided by the Garden.

The relationship between the garden’s outstanding collection of plants and the role it plays in educating the public about the value of environmental protection is an important message to spread throughout California. The group continues to spread that message, planning a lecture and reception in Los Angeles next summer. Their active role in support of the Garden can be recognized as a significant accomplishment of the Centennial year.

—Bobbie Ohs

MEMBERSHIP

The Membership Committee has announced expanded benefits to members at various levels.

All members receive the NEWSLETTER, advance notice of workshops, lectures, and tours, discount on Visitor Center purchases, discount on educational classes, early admission to Spring Plant Sale, discount on subscription to American Horticulturist magazine, and volunteer opportunities.

At the CONTRIBUTING level ($50 - $99) members receive all of the above plus a GARDEN POSTER which can be picked up at the Visitor Center.

The SUPPORTING level ($100 - $249) adds to the above an invitation to a PRESIDENT’S RECEPTION and recognition in the NEWSLETTER.

At the SPONSOR level ($250 - $499) the member is invited to TOUR THE GARDEN WITH THE DIRECTOR in addition to the above. Dates for 1991 are: Wednesday, March 13 at 8:30 a.m. or Saturday, March 16 at 8:30 a.m.

A PATRON ($500 - $999) will receive in addition to the above, a PATRON’S PLANT which has been collected or propagated by one of the Garden staff and then made ready for distribution by volunteers. This is a plant which as yet is not on the market or available to the public. The name and species of the 1991 Patron’s Plant will be announced in the spring NEWSLETTER.

A BENEFACTOR ($1,000 and above) will receive all benefits plus an ALFRESCO DINNER IN THE GARDEN with the President of the Friends and the Director of the Garden. The date is to be announced.

For further information on any of the above, please call the Friends’ Assistant at 643-7265.

Please note that some of the above mentioned benefits may reduce your tax deductible donation.
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- Mr. & Mrs. Edward Engs, III
- Margaret Galbraith
- Theodora Gauder
- Mrs. Adolphus E. Graupner, Jr.
- Marion Greene
- Pamela & Elmer Grossman
- Elizabeth Hammond
- Mitchell Harvey
- Virginia Havens
- Francine Dunham Henderson
- Ned G. Heringer
- Eleanor & Jack Higson
- Mrs. Edward A. Howard
- Ann & Rob Ingham
- Mr. & Mrs. Grant Inman
- Jane Davenport Jansen
- M. Anne Jennings
- Myrtle Wolf
- Sarah M. Gale, from Susan Henke & Otto Becker
- Yuri Kodani and family
- Aetna Foundation*
- Michael & Susan Addison
- Dr. Carol Baird & Dr. Alan Harper
- Priscilla & Richard Battelle
- Laura P. Bechtel
- Mary Bowserman
- Lawrence V. Brooks
- Calif. Native Plant Society-S.F.
Calendar of Events

DINO DAYS GARDEN TOUR  Mon-Fri, FEB 4-MAY 17
Dinosaurs may be extinct, but some of their favorite foods are still growing, even in Berkeley! In conjunction with Lawrence Hall of Sciences’ Dinosaurs ’91 exhibit, the Garden will provide a self-guided tour of prehistoric plants. Secure brochure at Visitor Center.

EFFECTS OF THE FREEZE OF ’90  Sats, Suns, FEB
The Tour of the Month returns, with our first month devoted to the 100-year freeze and its effects on the Garden. Tours are free; meet your Docent at the Visitor Center at 1:30 p.m.

AN ARTIST’S GARDEN  Sat, FEB 23
Marcia Donahue is an artist and garden designer whose wit and imagination will lead you through a slide tour of her widely chronicled garden. 1-3pm, Meeting Room, $3 members, $5 non-members.

POLLINATION IN THE GARDEN  Sats, Suns, MAR
Tour of the Month brings you a pollinator’s view of our Spring burst of flowers. Tours are free; meet your Docent at the Visitor Center at 1:30 p.m.

PLANT DISEASE CLINIC  Sat, MAR 2
Bring your sick plants for free consultation with Master Gardeners and others on infection, disease, and pest problems.

GRASSES WORKSHOP  Sats, MAR 16 & 23
Join grasses expert Travis Columbus in an exploration of the major features of the grass plant, and how to identify the important groups of California grasses. Ornamental grasses will also be discussed. 10:30am-1:30pm, in the Meeting Room both Saturdays. $35 members, $45 non-members, PRICE includes both workshops.

ABOUT SALVIAS  Sun, MAR 24
California’s leading authority on the genus Salvia, Betsy Clebsch, gives an illustrated talk on her favorite subject. 1:30-3pm, Meeting Room. $3 members, $5 non-members.

WILDFLOWER PHOTOGRAPHY  Thurs, MAR 28
LECTURE/WORKSHOPS  Sat, Sun, MAR 30-31
Join John Smithers, nationally known photographer and lecturer for the National Wildflower Research Center, for an evening lecture on the mastery of the camera, tripod, lighting and composition, depth-of-field, and close-up techniques for wildflower photographs. People who wish hands-on instruction, as well as critiques of their work, may attend the weekend workshops. Lecture: 7pm, Meeting Room. $10 members, $15 non-members. Workshops: 9am-12noon & 5-7pm, Meeting Room, $125 members, $130 non-members. PRICE includes cost of Thursday lecture.

COMING ATTRACTIONS:
MARK YOUR CALENDARS IN ADVANCE!

WATERCOLOR CLASSES  Weds, APR 10-MAY 22
A series of seven watercolor classes 9-11:30am.

HERBS  Sat, APR 28
First in a series of three classes.

SPRING PLANT SALE  Fri, Sat, MAY 10-11
Members-Only Preview Party & Sale, 5-8pm Friday.

HUMMINGBIRDS  Sat, Sun JUNE 7,8
Joint program with Lawrence Hall of Science, with tour of the Garden’s hummingbirds and hummingbird plants!

NINTH ANNUAL SYMPOSIUM  Sat, Sun SEPT 28-29
“Gardening With the Elements” – a challenging program of lectures and tours.

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

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

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

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