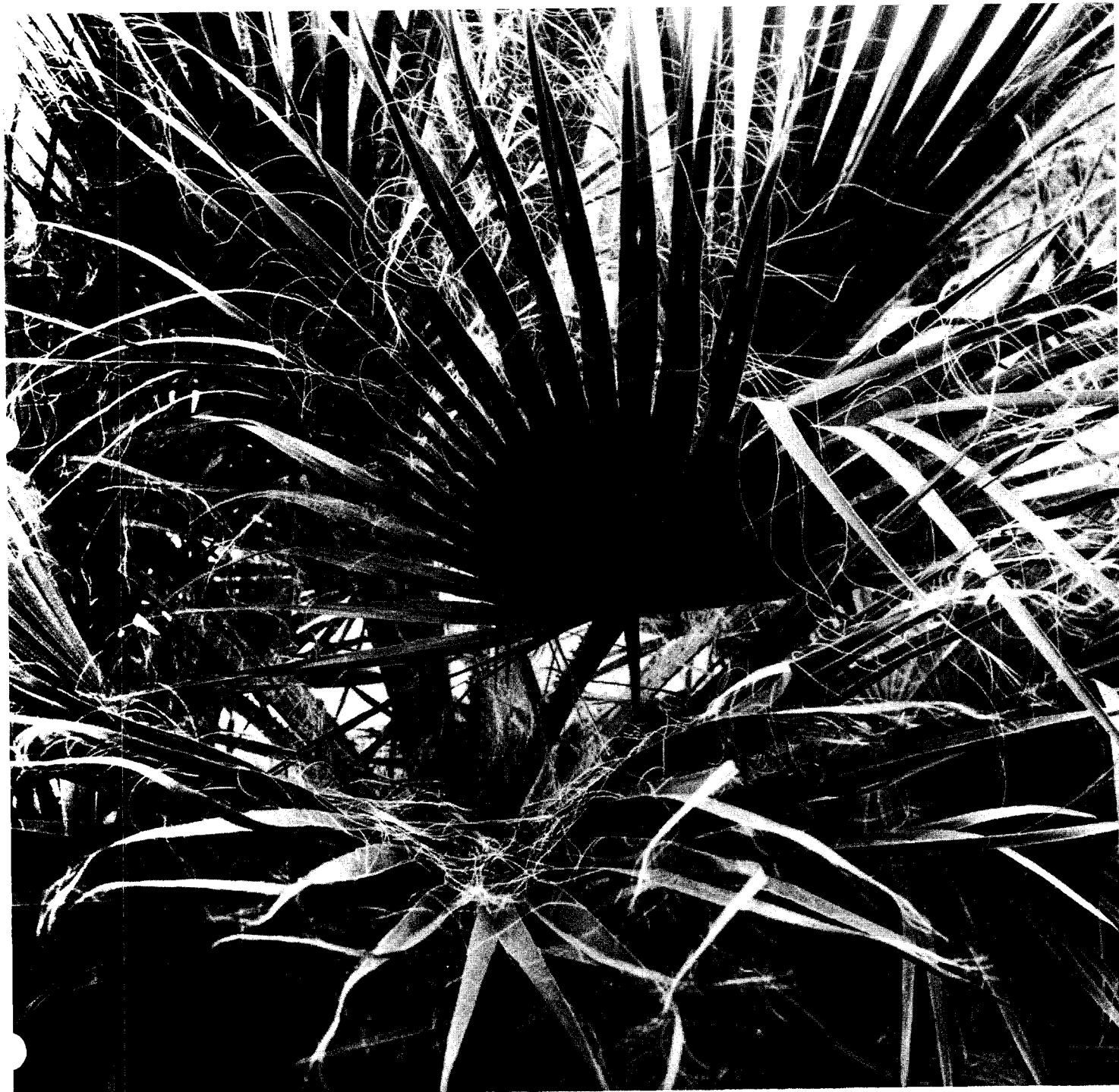
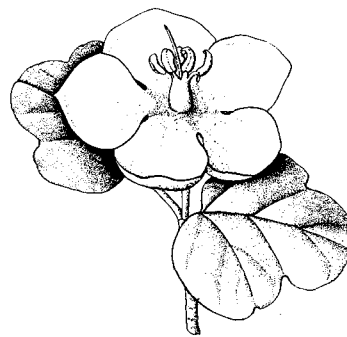


FREMONTIA

A Journal of the California Native Plant Society



FREMONTIA

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Margedant Hayakawa, Editor
Laurence J. Hyman, Art Director

MATERIALS FOR PUBLICATION

Members and others are invited to submit material for publication in *Fremontia* and the *Bulletin*. All time-value material should be addressed to the *Bulletin*. *Fremontia* is a journal for laymen about California plants. It hopes to be both readable and scientifically accurate. Technical botanical articles should be directed to other more scholarly journals. Please double-space copy, using wide margins and fresh typewriter ribbon, on 8½-by-11 paper, and include name, address, and phone number on the MS. As a general rule, in the interest of consistency, botanical nomenclature will conform to Munz, *A California Flora*. Please identify each plant referred to by its botanical name and, if there is one, by its common name. Photographs should be black-and-white glossy prints, preferably 8-by-10 size or accompanied by negatives.

THE COVER:

Imogen Cunningham, who was a member of CNPS, shortly before her death gave the editor a print of her Washington palm picture to use as a cover. Dr. Elizabeth McClintock, a botanist and her longtime friend, writes in this issue about both the palm and Imogen Cunningham's interest in plants.

California Native Plant Society

Dedicated to the Preservation
of the California Native Flora

The California Native Plant Society is an organization of laymen and professionals united by an interest in the plants of California. It is open to all. Its principal aims are to preserve the native flora and to add to the knowledge of members and the public at large. It seeks to accomplish the former goal in a number of ways; by undertaking a census of rare, endangered, and extinct plants throughout the State; by acting to save endangered areas through publicity, persuasion, and, on occasion, legal action; by providing expert testimony to governmental bodies; and by supporting financially and otherwise the establishment of native plant preserves. Its educational work includes: publication of a quarterly journal, *Fremontia*, and a *Bulletin*; periodic meetings and field trips and other activities of local chapters throughout the State. Non-members are welcome to attend meetings and field trips.

The work of the Society is done by volunteers. Money is provided by the dues of members and by funds raised by chapter plant sales. Additional donations, bequests, and memorial gifts from friends of the Society can assist greatly in carrying forward the work of the Society.

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Dues include subscriptions to *Fremontia* and the *Bulletin*.

Individual	\$ 8	Sustaining	\$ 50
Family	10	Contributing	100
Retired	5	Patron	250
Student	5	Donor	500
Clubs and Societies	10	Benefactor	1000
Supporting	20	Life	250

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Fremontia (Editorial): Margedant Hayakawa, Editor, P.O. Box 100, Mill Valley, CA 94941

Bulletin: R. Mitchel Beauchamp, Editor, P.O. Box 985, National City, CA 92050

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Washingtonia filifera at Twenty-Nine Palms, photographed in 1914 by Willis Linn Jepson. Courtesy Jepson Herbarium, U.C. Berkeley.

THE WASHINGTON FAN PALM

by Elizabeth McClintock

Washington fan palms (*Washingtonia filifera*) are native in the desert regions of western North America, from southern California to western Arizona and northern Baja California. With their tall trunks they are impressive palms in their native habitats, where they always occur in groups of a few to hundreds. These groups are often magnificent and breathtaking when seen in the protection of mountain walls and canyon sides near springs or seepages. In the past, to travelers in the desert, they were a welcome sight indicating a place to camp and find water.

Although isolated in their occurrence, the groups are so conspicuous and dominating that several present day place names refer to them. One of the largest and most picturesque groups is in Palm Canyon on the eastern side of Mount San Jacinto. Both the canyon and the nearby city of Palm Springs

take their names from the palms. Other place names are Thousand Palms, near Thousand Palms Canyon in Riverside County, Twenty-nine Palms in southern San Bernardino County, and Palm Desert at the foot of the Palms to Pines Highway. (Palmdale, out of the range of this palm, was named for the Joshua tree [*Yucca brevifolia*], sometimes called yucca palm.) The Pines to Palms Highway, one of California's spectacular mountain-to-desert roadways, begins near Idyllwild in the pines and may be followed to the palms near Palm Springs. Southward the Washington fan palm extends into San Diego County. In the Anza-Borrego area there is another Thousand Palms Canyon and a Palm Canyon.

Many of the isolated groves of the Washington fan palm around the western Colorado Desert are within the area of the Cahuilla Indians. Some of

the larger groves were important habitation sites of the Cahuilla; smaller groves were used as temporary or seasonal camping sites. The palms indicated water, as well as a place to find other useful plants and a pleasant area. The date-like fruit of the palm was used as food, either fresh or dried. The large palm leaves were used in house construction. Fibers of the leaves were used in basket making, and the stalks of the leaves were used for spoons and other cooking utensils. Another use of palm leaves was for sandals or footpads. It is probable that the uses of palms by the Cahuilla extended the distribution of the tree because people carried the seeds to their habitation sites and from these new plants may very well have grown.

It was south of the Borrego area in 1846 that Colonel William H. Emory with a party of the so-called Army of the West, under the command of General Stephen Watts Kearney, came upon a group of fan palms. They had been moving west from the southern end of the Salton Sea when they came to what is now the boundary of Imperial and San Diego counties at Carrizo Creek. Emory records this in his *Notes of a Military Reconnaissance from Fort Leavenworth . . . to San Diego . . . 1846-1847*. On November 29 he wrote: "We followed the dry sandy bed of the Cariso nearly all day, at a snail's pace . . . A few miles from the spring called Ojo Grande, at the head of the creek several scattered objects were seen projected against the cliffs, hailed by the Florida campaigners, some of whom were along, as old friends. They were cabbage trees and marked the locale of a spring and a small patch of grass." The cabbage trees which the Florida campaigners knew were the cabbage palm (*Sabal palmetto*) of the Carolinas, Georgia, and Florida.

Distribution

Although California and Arizona are adjacent states, the number of plants which they share is limited. However one of these is the Washington fan palm. As early as 1880 there had been a report of a palm in western Arizona, but it was not until 1923 that it was located and identified. The Washington palm occurs in only one locality in Arizona, in another Palm Canyon, in the Kofa Mountains, north of Yuma, in a strikingly scenic site.

The southernmost occurrence of the Washington fan palm is in the Sierra Juarez, a mountain range in northern Baja California. Ira L. Wiggins in the *Flora of the Sonoran Desert* cites the

locality of Cantillas Canyon and suggests that there are "probably others." According to William Gunther writing earlier this year in *California Garden*, January-February 1978, this palm occurs with the blue palm, *Erythea armata* (*Brahea armata*) along "waterways of the canyons which drop from the mountain heights to the desert floor." Because these mountains are almost uninhabited and roads are lacking, few people have seen these palms in their isolated canyons. This isolation should protect them from the hazards of population pressure which the palms in California desert areas are subjected to. However, Gunther reports an unusual catastrophic destruction of palms in the Sierra Juarez during the past three years by two hurricane-like storms, called *chubascos*. Before the storms occurred the number of both palms had been estimated to be well over 100,000. The storms destroyed about half this number. Water from the storms was carried to the thirty-mile long, usually dry lake bed of the Laguna Salada, where floating in the water were thousands of dead palms.

The Washington Palm in Cultivation

Washingtonias are among the most widely cultivated of palms. Probably only the date palm (*Phoenix dactylifera*) and the coconut (*Cocos nucifera*), both grown for their edible seeds, are cultivated more frequently than Washingtonias. There are two species of *Washingtonia* which are similar to each other and may be confused in cultivation. *Washingtonia robusta* is known only from canyons and along desert water courses not far from the coast in northern Mexico, in Sonora, in Baja California at Cataviña and Jaraguay (about 15 miles inland from Bahia San Luis Gonzaga), and in the southern part of the Baja California peninsula north and south of La Paz.

Both Washingtonias became known in Europe from seed taken there probably some time in the 1860s and were mentioned by various provisional names in European horticultural literature during the early 1870s. In 1879 Hermann Wendland (1825-1903), the well-known German authority on palms, published the description of the genus and named it "as a remembrance of the great American." A year later Sereno Watson in *Botany of California* published the first description of the genus and the species *Washingtonia filifera* to appear in the United States. In 1883 Wendland named and described *Washingtonia robusta*. The story of how seeds of these two palms reached Europe is not entirely clear, but the known facts



Palm Canyon, Mt. San Jacinto, photographed in 1901 by Professor Jepson. Courtesy Jepson Herbarium.

have been brought together by L. H. Bailey in 1936 (*Gentes Herbarum* 4 (2): 53–82). In all probability one of the early European seed collectors, Benedikt Roezli (1824–1885), for whom *Ribes roezlii* and *Erythea roezlii* (now called *Brahea armata*) were named, took seeds to Europe from plants already in cultivation in California.

Just when *Washingtonias* were first cultivated in California is not known. An English visitor to California in the early 1870s published a note in the July 15, 1876 issue of *The Gardeners' Chronicle* in which he told of seeing two *Washingtonia* palms

about twenty-five feet tall in a garden in Menlo Park. According to Bailey, three large trees of *Washingtonia filifera*, which he estimated to be about 35 years old, were growing in Los Angeles in 1884.

In 1889 *Washingtonias* were growing in the south of France and were said by William Watson to be “one of the glories of the Riviera.” Without saying which species, he reported plants ten to fifteen feet tall which were “not more than twelve years old.” Elsewhere *Washingtonias* have been planted in Italy, Algeria, Australia and the Hawaiian Islands.

IMOGEN CUNNINGHAM AND HER PLANT PORTRAITS

by Elizabeth McClintock

Imogen Cunningham, who died in 1976 at the age of 92, is best known for her portraits of people. However, during her nearly seventy-five years of photography she photographed many plants. Some pictures she made simply for the record because she was interested in the plants, but others because of the excellence of their composition and design are portraits ranking along with her portraits of people.

Imogen's portraits of people portray them as

interesting human beings because she was able to focus at the precise moment to show the essence of their character. It was no accident, however; she liked people and she was very perceptive. She also liked plants. She wanted to have them around her, and she made them a part of her life. Her well-worn three-volume set of Bailey's *Standard Cyclopedia of Horticulture* shows that she also studied them. She had a garden at her house at 1331 Green Street in San Francisco. It

Imogen Cunningham photographing Lester Rowntree in 1975. The resulting picture appeared in *Fremontia* in January 1976. Photograph by Margedant Hayakawa.



was a casual garden that showed she tended it only in her spare time; but it didn't look neglected because the plants did not need much care. The garden in the beginning had been laid out by a firm of landscape architects. She followed much of their advice, but she lived in her Green Street house for almost thirty years and the garden gradually became her own creation and the kind which she wanted and enjoyed. Her house, unlike most in San Francisco, has the garden in the front. A Canary Island date palm spreads across the entrance to the yard, a smaller New Zealand cordyline is on one side of the steps, and opposite is a clump of New Zealand flax, with a Mediterranean broom hanging over the sidewalk. English ivy, a dainty pale-pink oxalis, and baby's tears cover the ground under these plants. A special plant which she sometimes called my attention to was a shrub of *Rhododendron* 'Elsie Frye'. She was particularly attached to it because it had been named for an old friend in Seattle.

Interest in Succulents

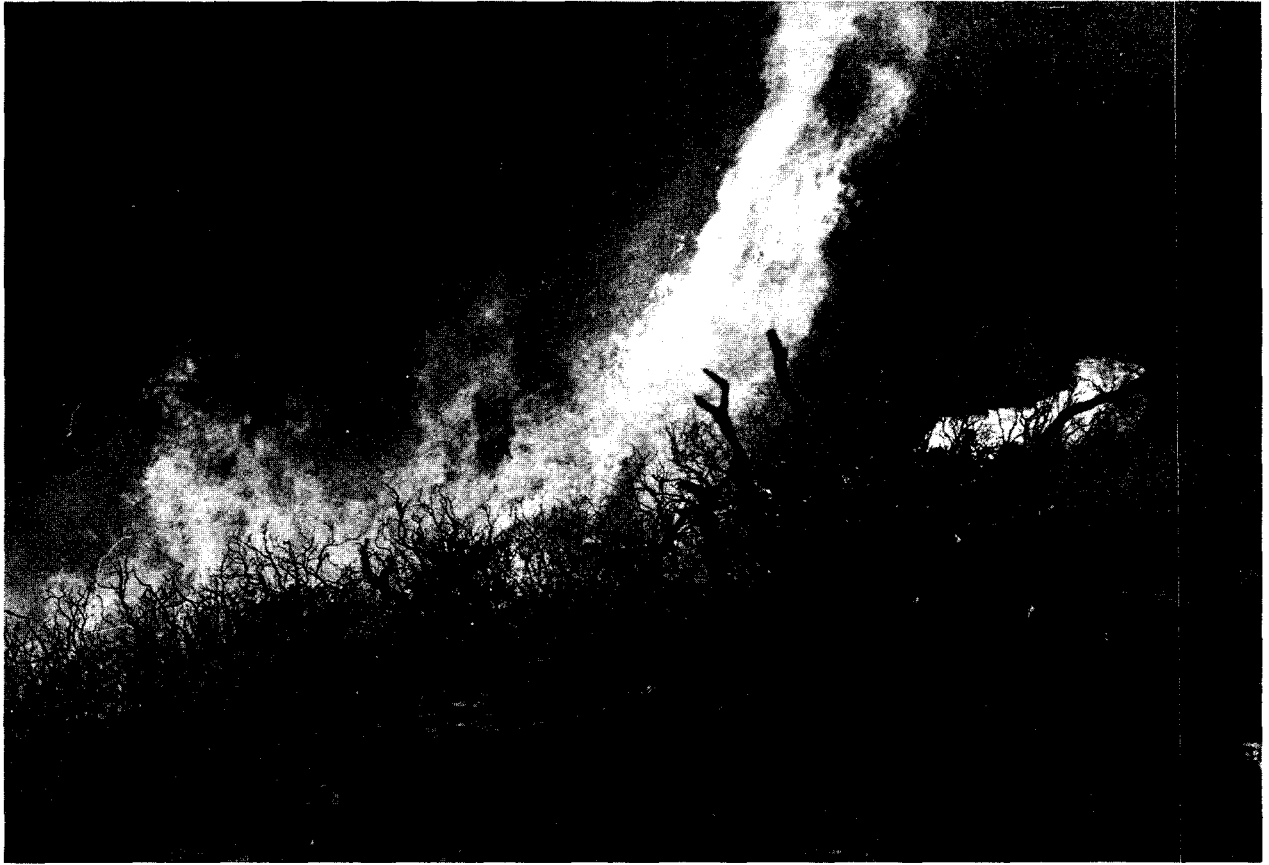
Close to the house was an assortment of succulents which she had a special fondness for. She had used succulents in a rock garden behind the house in Oakland where she lived when she was married to Roi Partridge and their three sons were growing up. It was during those years (Margery Mann refers to this period of Imogen's life in her introduction to *Imogen Cunningham — Photographs*) that James West, the well-known succulent fancier and collector of the 1920s and 1930s occasionally came to visit. (Imogen always regretted that she never photographed him.) She often spoke of him in connection with succulents, and I presume that some of her succulents and her interest in them came from him. The strong lines, forms, and patterns of succulents made interesting designs to photograph. A number of her plant portraits are of succulents. One of these, "Hen and Chicks," which shows a group of succulents with their leaves in basal rosettes, is included in *Imogen Cunningham — Photographs* (1973). Agaves formed the subject for three photographs of succulents in *Imogen! Imogen Cunningham Photographs 1910–1973* (1974).

Imogen lived most of her life in cities (Seattle, Oakland, and San Francisco), and so the plants she saw were plants of the cities — in gardens, parks, and along the streets. That does not mean that she would not have liked plants away from the cities, but it was in the cities that she lived and spent her time and where she found most of the plants she photographed. She sometimes used

trees or other plants as backgrounds for her portraits of people. The softness of the foliage seen in "Morris Graves in His Leek Garden, 1973" and in "Pentimento, 1973" and the form of the tree with its lightly furrowed bark pattern in "Mrs. Asawa, 1966" give a special character to the people portrayed and show the thought given to selecting the right plant as a background for the subject. Two of her favorite places in San Francisco to look for special backgrounds were the garden around the historical Octagon House of the National Society of Colonial Dames, at the corner of Union and Gough streets, and the Panhandle of Golden Gate Park with its assortment of different trees. She often photographed when she went to Golden Gate Park and to Strybing Arboretum where she visited the director of the Arboretum, Eric Walther, also a succulent enthusiast. I remember particularly her photographs of the dove tree (*Davidia involucrata*) and the king protea (*Protea cynaroides*) when their flowering was a novelty. These were made at Eric Walther's suggestion.

For many years Imogen was a member of the California Horticultural Society, and for the nearly thirty years that I knew her she rarely missed a meeting. In the mid-1960s I moved into her neighborhood and occasionally brought her home from the meetings. One of the features of these meetings is the display of plants brought by members who generously allow their specimens to be taken by other members after the meetings. Imogen nearly always left with one or two plants of special interest to her. Some of these she photographed later.

Imogen's photograph of the leaves of the Washington fan palm, sometimes called California fan palm, was taken, she recalled, in Death Valley. This palm is not native in Death Valley but is frequently cultivated in many places in California as well as other parts of the world. The plant photographed must have been a young one because it seems to be without an evident trunk. The fan-shaped leaves with their plaited divisions make an interesting pattern which is not distracted by the irregularity of the thread-like fibers peeling from the leaf divisions. The Washington fan palm, so often seen in California, usually is photographed to show its stately habit. Imogen, in her portrait of it, captures the artistic quality of the leaf pattern of what is really an ordinary, often seen, plant. Many of her portraits are of plants seen by all of us so frequently as to be almost commonplace, but the artistic qualities seen in her "Magnolia Blossom, 1925," "Two Callas, about 1929," and "Amaryllis, 1933" make these plants seem anything but commonplace.



In August 1977, fire burned 178,000 acres in Los Padres National Forest. Photographs by the author except where indicated.

THE MARBLE-CONE FIRE TEN MONTHS LATER

by James R. Griffin

For three weeks in August 1977 I watched the Marble-Cone fire char 178,000 acres of the Los Padres National Forest in Monterey County. Although smaller than the record-setting 219,000 acre Matilija fire of 1932 in total size and rate of spread, the Marble-Cone burn set new California records in the size of control efforts. Some 6,000 people, vast fleets of equipment, and more than \$13,000,000 were involved. The Marble-Cone fire also prompted record levels of public alarm over damage to vegetation, wildlife, and watersheds as well as concern over fire management problems in wilderness regions.

Why So Large?

Despite media reports to the contrary, the Los Padres National Forest was not prohibited from using mechanized equipment in suppressing the

fire within the Ventana Wilderness. However, wilderness and roadless areas inherently limit quick access of fire fighters and equipment, and the steep rugged terrain and dense vegetation of the Santa Lucias limited the operation of the sixty-one bulldozers mustered for the fire. The hazardous topography and cover conditions also made it impossible for the crews to work in many places after they had hiked or been airlifted to the fire. In addition, atmospheric conditions kept the advancing fire under an unusually dense smoke screen that hampered air operations. But perhaps the major factor in the spread of this fire was the extreme accumulation of dead brush and other material to feed the fire.

Only small portions of the Marble-Cone area had been burned during the past thirty years, and the majority of the land had not been burned for over forty or fifty years. Some portions of the area had been piling up fuel for at least seventy-six years.

But the single most important factor in the abundance of fuel was a wet, sticky snowfall on January 3, 1974 which crushed the crowns of the evergreen trees and shrubs. In many areas the branches broken by this storm in one night added more fuel than had accumulated in more than thirty years of fire control. On tens of thousands of acres at least ten tons per acre of dead fuel were lying on the ground or hanging in the trees. In the worst spots fifty tons per acre of broken branches were present. Then this dead wood was dried during two seasons of drought. Thus, the stage was set for the fury that erupted when lightning set four fires in the Ventana Wilderness on August 1, 1977. One strike was on Marble Peak; another was on South Ventana Cone. After these two lightning-caused fires merged the resulting conflagration was named the "Marble-Cone" fire.

Fire Frequency in the Past

After blaming fire control for causing an "unnatural" fuel level, what can we say about "natural" fire frequency in the Santa Lucias? In this Marble-Cone area almost nothing is known about either lightning- or Indian-caused fires prior to the arrival of the Spanish in 1769. During the Spanish and Mexican eras there were many reports of fires being set by Costanoan and Salinan Indians, particularly in valley or coastal grasslands. But none of these reports specifically is related to the Marble-Cone area. The Esselen Indians, who inhabited most of the Marble-Cone area, were gone before any observations were made of their use of fire. Undoubtedly the Esselens engaged in intentional burning and also caused some accidental fires, but we don't know any details.

There is no question, however, about the indiscriminate burning of the forests by American prospectors, hunters, and ranchers. By the late 1800s tales of huge fires in the Santa Lucias were common in newspapers and government reports. Federal surveyors seeking lands to become "Forest Reserves" were appalled by the extent of burning and the serious damage to timber and watersheds. One report mentioned that a large region of the central Santa Lucias embracing the upper watersheds of all major streams burned for weeks in 1894. Another report told of a fire which started from an untended campfire near Chews Ridge in July 1903. During the following months the fire burned a strip over six miles wide all the way to the coast. In October 1906 newspapers reported a fire of some 150,000 acres in the Santa Lucias. All these fires burned large portions of the Marble-

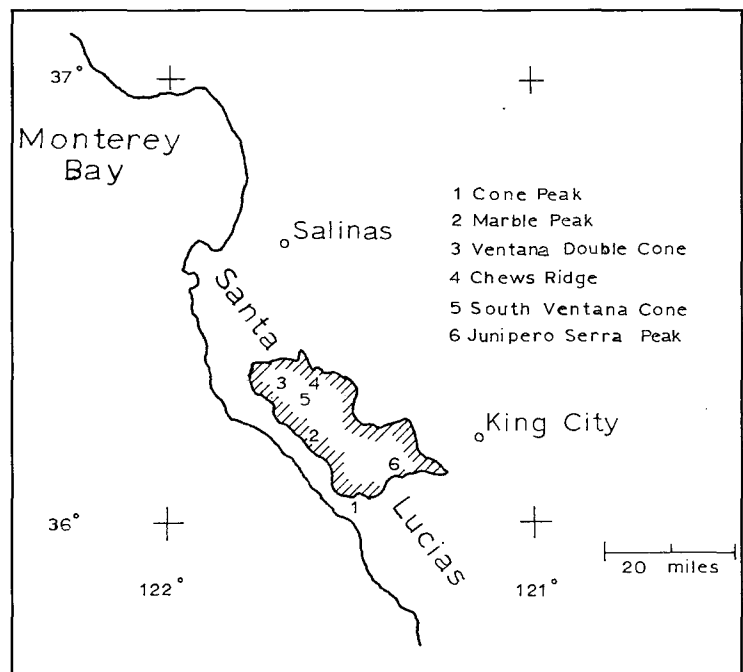
Cone area. After 1907, when the U.S. Forest Service started to manage the land, the frequency and extent of the fires declined.

Chaparral

Chaparral was a major vegetation type in the area of the burn. South-facing slopes and ridges, densely clothed with tall evergreen shrubs or scrubby live oaks, burned more intensely and more uniformly than other plant communities. One early and striking post-fire response in the chaparral was the unseasonal blooming of Spanish bayonet (*Yucca whipplei*). Apparently scattered plants which had not bloomed in the spring of 1977 were induced to flower by the heat. Within weeks huge panicles of ivory flowers rose above the scorched rosettes. Since the special moths required for pollination would not have been present at this odd season, I assume these flowers produced no seeds.

The scrubby interior live oaks (*Quercus wislizenii*) and canyon live oaks (*Q. chrysolepis*) were seldom completely consumed by the chaparral crown fires; they usually remained as charred trunks, perhaps five to ten feet tall, standing above the ashes. Within a month these oaks and other scrubs, such as coffee berry (*Rhamnus californica*), sprouted vigorously from the base. By the time freezing weather arrived in November many of these burnt shrubs had shoots several feet tall.

The burl-forming shrubs — chamise (*Adenostoma fasciculatum*) and Eastwood manzanita (*Arctostaphylos glandulosa* and its varieties) — often



burned to ground level. In portions of the burn where I observed these shrubs, they were slower to sprout than the oaks. Few burls sprouted within the first three months. Perhaps drought stress delayed response, but some of the burls probably were killed. One measure of the heat produced at ground level was the melting of bottles and aluminum cans which had been present in the chaparral litter.

Knobcone pine (*Pinus attenuata*) is found in some places in the chaparral in the Santa Lucias, and about half the Monterey County range of this pine was within the burn. From an airplane I observed that knobcone pine groves had been largely destroyed in the chaparral crown fires, but it is unlikely that all the seeds in the vast store of "closed" cones would have been consumed.

Two rare Santa Lucia endemics grow in the chaparral. Almost the entire range occupied by the Arroyo Seco bush-mallow (*Malacothamnus palmeri* var. *lucianus*) and Hickman sidalcea (*Sidalcea hickmanii* subsp. *hickmanii*) was burned. Both species are on the CNPS rare and endangered list. I would expect that such plants growing in the chaparral would be well adapted to fire; in garden situations the bush-mallow spreads vigorously by runners; but there must be weak points in their reproductive potential, or they would not be so rare. About half the known sidalcea localities were on a ridge below Pinyon Peak that received massive

bulldozer scraping. In this case only time will tell whether the sidalcea was extirpated from the ridge or rejuvenated in the new "open" habitat. Many disjunct or otherwise interesting herbs occurred in the chaparral regions of the burned area, mostly concentrated around Hanging Valley. It is to be hoped that most of these herbs will reappear.

The severely burned chaparral slopes suffered heavy soil erosion during the January-to-March storms in 1978. On slopes steeper than forty percent, most of the ashes, charred litter, and the upper inch or so of soil were washed off by sheet erosion by late January. A network of rills and small gullies was later cut into these steep slopes; at the top of some slopes the rills are now many inches deep and at the bottom channels were scoured several feet deep. The erosion and rapid run-off from such slopes had a disastrous effect on the riparian communities downstream. Probably the most significant habitat alterations resulting from the fire occurred in the streams.

As part of the rehabilitation effort 500 tons of annual rye grass (*Lolium multiflorum*) were aerially seeded over the burn. In areas where this grass has produced a thick cover the native herbs have severe competition. On other areas where the grass did not germinate or is sparse there are many fire-following herbs developing (*Fremontia* January 1977), but at the time of writing the herbs were not mature enough to identify readily. On limited

Within weeks after the fire *Yucca whipplei* produced out-of-season flowers.



Chamise and manzanita shrubs burned to the ground but still standing are charred trunks of oaks and one Coulter pine.



areas, particularly ridge tops, no grass or native herbs have started and only a few shrub sprouts or seedlings are present yet.

Mixed Hardwood Forests

Hardwood forests are another major vegetation type in the burned area. These forests, which are concentrated on north slopes and canyon bottoms, were damaged in various patterns. Some stands had severe crown fires, many had a ground fire which scorched the crowns, and some had a light ground fire that did little damage.

At lower elevations coast live oaks (*Quercus agrifolia*) and madrones (*Arbutus menziesii*) dominate the mixture. At higher elevations canyon live oak (*Q. chrysolepis*) is the most widespread tree, but tan-oak (*Lithocarpus densiflorus*) and interior live oak (*Q. wislizenii*) are locally abundant. All these trees sprout readily from the base when the crown is destroyed, but vulnerability of their crowns to fire varies widely. Canyon live oak has a sensitive crown. The thin dry bark is flammable and seems to invite self-destruction. Under some conditions canyon live oak crowns may carry a crown fire when there is not enough litter on the ground to burn. In contrast coast live oak has thick, wet bark which is extremely fire retardant. Hopeless-looking charred branches can produce new crowns.

Two months after fire new sprouts surround the charred trunk of interior live oak, *Quercus wislizenii*.



Some very small areas in the Marble-Cone region seem to have been free of damaging fire for many centuries. The oaks and madrones in such spots are massive, their trunks often well over sixty inches in diameter. In some cases the Marble-Cone fire was too much for these veterans, but in the bottom of Miller Canyon the largest canyon live oak that I know of in the Santa Lucias (ninety inches in diameter) survived without damage. Such trees are not large because the habitat is especially favorable for tree growth; they are large because fuel and topographic conditions preclude all but minor ground fires.

These unburned areas pose an interesting question. Are forests of large single-stemmed trees which started from seeds more "natural" than forests of smaller multiple-stemmed trees from sprouts? Both conditions exist in the Santa Lucias, but fires such as the Marble-Cone burn certainly reduce the proportion of large single-stemmed trees. Several such fires would convert virtually all the hardwood forests into thickets of multiple-stemmed sprout clumps. Whether light fires occur infrequently or severe fires occur more often these hardwoods will survive. The form of the stand will change, but the species will remain on the site in either case.

In the Santa Lucias Coulter pines (*Pinus coulteri*) are widely scattered within the mixed hardwood forest, but they seldom form extensive pure stands.

The Coulter pine thicket which started after the 1928 fire on Chews Ridge was killed by crown fire.





Old-growth Coulter pines which survived the 1928 fire on Chews Ridge were destroyed in 1977.



The Santa Lucia firs (*Abies bracteata*) grow, as here on Cone Peak, on steep and rocky slopes. Photograph by Wayne Roderick.

Where fire or other disturbance opens the hardwood canopy, seedlings of Coulter pines may come up abundantly in the openings. Ultimately the base-sprouting hardwoods will recover dominance, and the pines will survive only where there are gaps in the canopy.

After the 1928 fire on Chews Ridge many of the large Coulter pines, which germinated in the 1890s, survived and produced abundant seedlings. By 1977 these seedlings had become thickets of trees over fifty feet tall with an alarming amount of litter on the ground. Many of these pine thickets carried crown fires that left no adult trees to produce seeds. Elsewhere in the burned area surviving Coulter pines should produce seedlings within a few years, but areas such as the crowned groves on Chews Ridge will have only hardwood sprouts in the near future.

Santa Lucia Fir

Another conifer associated with the hardwood forest, particularly in the canyon live oak community, is the Santa Lucia fir (*Abies bracteata*). Almost every fir grove north of the Cone Peak region — more than two-thirds of the total distribution of this endemic — was within the burn. However, the bulk of the fir colonies grow on steep rocky terrain, and they were not seriously burned. The largest Santa Lucia fir (fifty-one inches in trunk diameter) survived the fire with no damage. This fir is in the bottom of Miller Canyon not far from the huge canyon live oak mentioned above. These firs survive not because of fire resistance; the species is rather sensitive to heat damage. They survive because they can grow on steep barren slopes that will not support strong fires.

Ground fires did burn into many of the fir colonies, and some trees on the fringes of the groves were killed. But the majority of the trees in the groves I have seen still have healthy looking crowns. Perhaps some latent heat damage will show up when the trees come under moisture stress this summer, but I suspect that insect damage may finally kill more firs than the fire. Two fir groves within the large 1970 Buckeye fire that were studied by Dr. Steven Talley displayed this pattern. Both groves lost only a small number of trees as a direct effect of the fire but seemed to have more mortality from insect damage. My general impression of the Marble-Cone burn area is that some firs were killed, some additional trees will die, but the species and even individual stands are in no way doomed. The firs had a heavy cone crop in 1977, and if the seeds are viable (they are often damaged by insects), there might be a good crop of seedlings to replace the tree losses.

One CNPS rare and endangered species, Muir's raillardella (*Raillardella muirii*), which is disjunct from the southern Sierra Nevada, has a tiny out-

post in the fir region on the summit of Ventana Double Cone. Several other interesting montane disjuncts which are common on rock outcrops at Cone Peak are scattered on the rocks at Ventana Double Cone. The fire burned slowly over this ridge without any complications by bulldozers or suppression efforts, and these plants were probably not seriously damaged.

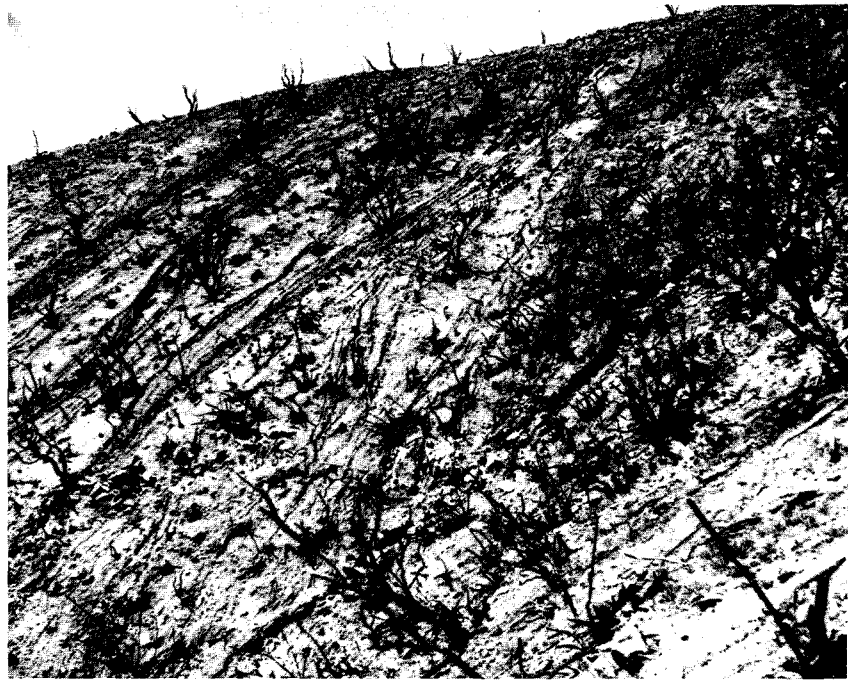
Mixed Conifer Forest

Several conifers which grow in the Sierra Nevada montane forest also grow in the Santa Lucias: ponderosa pine (*Pinus ponderosa*), sugar pine (*P. lambertiana*), and incense-cedar (*Calocedrus decurrens*). These conifers are not closely associated with each other; the sugar pine and ponderosa pine ranges usually do not meet. In all stands the old pines have vigorous hardwood understories. At least a dozen Sierran shrubs and herbs — including Sierra gooseberry (*Ribes roezlii*), creambush (*Holodiscus microphyllus*), pipsissiwa (*Chimaphila menziesii*), and a sedge (*Carex multicaulis*) — grow in the Santa Lucia forests but are not found elsewhere in the south Coast Ranges.

The best old-growth ponderosa pine forests in the Santa Lucias (Big Pines, Little Pines, Pine Valley, Pine Ridge) all burned in varying degrees. The stand that I have looked at most carefully is on the summit of Pine Ridge. This area last burned in August 1916 when lightning fires spread over several thousand acres there. By 1977 the fuel load on Pine Ridge was excessive, and the flames from the nearby South Ventana Cone lightning strike destroyed much of the cover on the southern portion of the summit. In this case the fuel hazard was strictly a function of the long period between fires; there was no snow breakage at this elevation.

The heat forced most of the 1977 ponderosa pine cones to open, but these seeds were not fully mature by August. Seeds exposed on the ashes, ripe or not, were quickly eaten by the surviving blue jays and chipmunks. Some mature ponderosa pines survive on the summit, but the seed supply will be limited in the next few years — the period when sprouts from the hardwood forest and chaparral species fill in the area. The extent of pine forest on the summit has probably been reduced.

The Marble-Cone fire burned only one minor outpost of the Cone Peak sugar pine population, but the entire Junipero Serra Peak sugar pine region was within the burn. Only isolated sugar pines on rock bluffs escaped unharmed. On the summit and adjacent slopes the damage was



A steep slope photographed in March shows surface erosion and many gullies over a foot deep.



A small drainage channel has been scoured to a depth of five feet, exposing oak and madrone roots.

locally heavy. Both sugar pine and Coulter pine trees of seed-producing size remain on the summit, and it will be interesting to see which pine regenerates better.

Dr. Steven Talley recently studied fire scars on sugar pines on Junipero Serra Peak, and he con-



An eroded slope has been seeded with rye grass dense enough to compete with native seedlings.

cluded that at least six fires had burned the summit forest between 1790 and 1901. Those fires had scarred some of the sugar pine trunks but had not killed mature trees. Last year's fire after a seventy-six year lapse killed many sugar pine veterans which had been on the peak long before the Spanish came.

Incense-cedar also occurs on Junipero Serra Peak in the deeper canyons, growing there because these canyons provide cooler, moister habitats, but also because the canyon bottoms do not burn as intensely as the ridges, and this partial fire protection helps preserve the Sierran conifers. Viewed from the air the topographic pattern of fire damage in the forest is striking, with the least-damaged sugar pine stands and the only incense-cedar stands in deep canyons. Undoubtedly incense-cedars were more widespread here in the past. A few more fires of this intensity will not only restrict incense-cedars to smaller portions of the canyons but might eliminate them from the peak.

Two CNPS rare and endangered species, Santa Lucia bedstraw, (*Galium clementis*) and Santa Lucia lupine, (*Lupinus cervinus*) are scattered on Junipero Serra Peak. The bedstraw tended to be in rocky spots within the forest that did not burn heavily. The lupine grew in openings in the forest that did have significant ground fires. Both should survive although perhaps reduced in numbers. The most attractive and restricted flower on the peak is the montane disjunct *Cycladenia humilis* var.

venusta. Its one small stand on Junipero Serra Peak is near the lookout tower on the summit. Part of this area was badly scraped by bulldozers; part had a moderate ground fire; part between bulldozer trails did not burn. The other Santa Lucia population of the cycladenia near Cone Peak was unaffected by the fire.

Redwood Forest

Coast redwoods (*Sequoia sempervirens*) are reputedly among the most fire resistant conifers, and some redwood groves along the Big Sur River canyons received a severe test. Within a month many of these charred redwoods were sprouting from the base, and some were sprouting all along the trunk. Probably the recovery of the redwoods which had their crowns destroyed in the Marble-Cone fire will follow the same pattern as those burned in the 1970 Buckeye fire, which was further south in the Santa Lucias. Thickets of basal sprouts ten feet or more in height are common now in the redwood groves of the Buckeye fire area. The trees which had trunk sprouts there now look like giant bottle brushes with dead branches poking through the tall column of green sprouts. A few redwood groves at higher elevations in the Big Sur drainage may have been killed outright. At least they showed no sign of sprouting when last viewed before the winter storms closed the area to any prudent observer.

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LOWELL AHART, RANCHER BOTANIST OF YUBA COUNTY

by Ida Geary

At Christmas of 1973 I was surprised to receive a package and letter at school from someone whose name I did not recognize. "Dear Ida Geary," the letter read. "Enclosed are some sheets of plant material that I thought you might find useful in your workshop in Plant Identification. Sincerely, Lowell Ahart." Mr. Ahart, I guessed, must have read about my classes in the *Bulletin* of the California Native Plant Society, a guess that later proved to be correct.

Fifty plants were in the package, each mounted on half sheets — half the size of professional herbarium sheets — and each in its own manila folder. On each was a large label, typed out neatly, with information about the plant — family, scientific names, where collected. Most were collected on the Peter Ahart Ranch, Honcut, California. Honcut, I learned by consulting a map, is north of Marysville, in Yuba County.

The collection was beautiful. Each plant, even difficult thick plants like salal and jimsonweed, had first been pressed perfectly and then mounted handsomely, like a botanical drawing or painting, on the herbarium sheet. I was mystified, but pleased.

From the correspondence that followed I learned that Lowell Ahart was a farmer and sheep rancher who had enjoyed a botany course at Chico State College in 1960 and was still pursuing botany as a hobby on the family ranch, where he and his brother Peter raise many crops — rice, hay, clover seeds, wheat and oats, sheep and cattle. From 1960 to 1973 he made around 850 sheets of pressed specimens to learn the plants of his area and places he visited, making many duplicates. After giving some 500 sheets to Dr. Robert Ediger for Chico State College, he sent some to me. On that visit to Chico he had learned about the California Native Plant Society, and on joining he read a mention of my class in the *Bulletin*. He thought I might be able to use his specimens. He has since said that he never really expected an answer.

I showed the plants to my class, and their reaction was the same as mine: these pressings are beautiful. I had just begun teaching pressing and mounting plants, and seeing Lowell Ahart's collection was an inspiration to all of us. We began taking more pains, first with pressing the plants and then with arranging them on the herbarium sheets. During a class visit to the California Academy of Sciences botany department shortly thereafter I told John



Lowell Ahart

Thomas Howell, curator emeritus of the department, about the gift.

"The plants are beautiful," I told him. "Would you like to see them?"

"Only amateurs have time to make beautiful pressings," Mr. Howell answered; but since he was working on a flora of the plants of Sacramento Valley and also on a Sierra flora — and Honcut is midway between — he agreed to see the collection. In the meantime I received another box of fifty more plants.

Mr. Howell's immediate reaction, when he opened the box of pressings, was, "These plants are beautiful." (He probably forgot that I had told him so.) I left the box with him, saying there were really too many for just my class and he could go over them in relation to his two floras. Tom Howell has been of much help to me, both through his book, *Marin Flora*, and personally, when I was working on my own book, *The Leaf Book*; so I was happy to be able to do something for him. I promised to bring in the other box of pressings soon, when I picked up this box, and gave him Lowell Ahart's address.

I left thinking I was lending Mr. Howell the plants Lowell Ahart had sent me but I learned in a very short time that he thought I was giving them to the Academy. I learned this when he sent me a copy of



Salal (*Gaultheria shallon*)
One of Lowell Ahart's herbarium specimens, collected
in Humboldt County

his letter to Lowell Ahart: “. . . After Ida Geary uses your specimens in her class, she tells me she will give them to the academy herbarium as an invaluable aid in my work on the flora of California . . .” Consternation. Immediately, and in great embarrassment I wrote Lowell Ahart that I was not giving away his gift, it was all a misunderstanding, and I still hoped to get some of his plants back. He reassured me in a return letter it was all right and that he would send some plants directly to Mr. Howell for his very own.

It turned out that despite the initial misunderstanding, I had brought two men together who from then on would be of help to one another. Mr.

Howell has been helping Lowell Ahart by making identifications of his plants — he has been collecting and preserving specimens of all the plants growing on the ranch. In turn, Lowell Ahart has been collecting for the Academy and also for other researchers whom Mr. Howell has put him in touch with. Instead of being an isolated rancher with a hobby he is now part of the scientific community. He has published a paper, "Field Observations on *Ammannia*" (a frequent weed of rice fields) in *Four Seasons* and is working on a flora of Sutter Buttes.

I quote from Mr. Howell's note to me Christmas 1974:

"What a wonderful year 1974 has been — and not the last important part of all the 'wonder' is our

discovery of Lowell Ahart, thanks to California Native Plant Society and you. He is a botanical treasure trove and as a result the flora of northern California will be the better and richer. I am most grateful to you for your thought in telling me about Lowell.

"During the year his botanical influence is being felt as far as Ohio (where he has corresponded with a researcher on a rice-field weed) and in the coming year he will help a U.C. student working under Dr. Baker on rice field weeds in general. For me he has helped with the Sierra flora and has added at least one species to the Goosefoot family there . . ."

The two men met on a trip that Mr. Howell and Gordon True made in the vicinity of the ranch.

Thorn-apple or Jimson Weed (*Datura meteloides*)
Herbarium specimen collected at Twenty-Nine Palms





Phacelia cicutaria, an annual of the foothill woodlands
Herbarium specimen, collected at Peter Ahart Ranch, Honcut

Lowell Ahart and I exchanged Christmas and Easter notes and mementos the next few years. Finally, when he came in to the Academy in the spring of 1976 on botanical matters, we all spent the day there together. The party included his two young cousins, Liz and Louise Ahart, who live on a nearby ranch. Liz works in an office in town but Louise, also a graduate from Chico (her major was

geography), is working with her father on their farm. They raise cattle and she is the only woman I know who knows how to shoe a horse. She too is interested in the plants on the ranches and invited us up "when the flowers arrive."

Unfortunately, even though we received notice, "The flowers are here," Mr. Howell was too busy early that spring with his Sierra flora to break away for a visit to the Ahart Ranch. The Marin Chapter of CNPS however, had a weekend field trip in the Sierra foothills north of the ranch in June, and Lowell Ahart and his cousin Louise were able to join us there.

The two ranchers arrived in a pickup truck in the back of which was a wooden box of materials ready for plant pressing. Lowell was a mine of information about the local plants and he also demonstrated for us, on the tailgate of the truck, how he presses plants.

Put down one corrugated board, he showed us, lay over it one piece of smooth thin cardboard, then one piece of newspaper, all the same size. Put the plant on the newspaper, arranging it as you will be mounting it. Then do the reverse: put on top of the plant one piece of newspaper, one piece of smooth thin cardboard, one piece of corrugated board. The thin smooth board keeps the plant from getting corrugated lines on it. Repeat for the next plant. After pressing all the plants at hand, tie the sandwich together at each end with twine.

Once the plants are home, Lowell weights them down under a three gallon can filled with dirt. They take about a week to dry if the plants are not fleshy, a little more if they are. He does not change the newspaper during the drying period, never even opens the plant press. He then keys out the name of the plant from the pressed specimen.

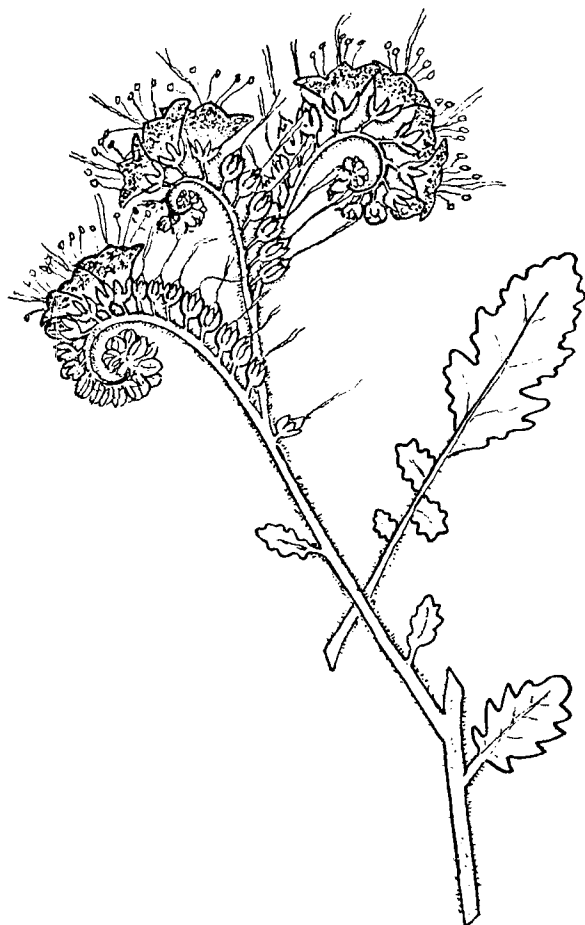
If he is sending the plants to the Academy, he told us, they go in the original pressing papers. For his own herbarium he uses all-rag paper for mounting, since wood pulp paper contains sulfuric acid which causes the paper to deteriorate in a hundred years or so. He uses airplane glue to affix the plants to the paper. Yes, airplane glue.

Other farmers and ranchers have been known to take an interest in botany — John Boys in the early 1800s in England was famous for his sheep at the time but is remembered now because of a herbarium he compiled of British grasses. Like John Boys, or closer to home, like Ernest Twisselmann in Kern County and Gordon True in Nevada County, Lowell Ahart is following in the tradition. "As far as I am concerned," Tom Howell has written in one of his letters to me, "Lowell Ahart has already taken his place among the California botanical amateurs to be remembered and commemorated."

WHY SOME PLANTS MAKE YOU ITCH

by Gary Reynolds

Plants have been warring against their various predators for millions of years. They can't run or hide very well, and the effectiveness of their mechanical defenses such as hairs and thorns is limited. Therefore their main defensive strategy has been to concoct an array of chemicals which are toxic or distasteful to those that would eat them. However, just as so many agricultural pests are in



Phacelia crenulata
Drawings by the author

time able to change their body chemistry to tolerate our best pesticides, so can some predator species eventually circumvent a plant's chemical defenses. When this happens, that plant species must experiment with new elaborations on its toxic chemicals in order to maintain their effectiveness. After eons of this chemical warfare these compounds have become the most diverse and chemically complex class of small molecules in nature. Along with other

chemicals that are used by the plant in its interactions with other organisms, these defensive chemicals are called "natural products" or plant "secondary compounds."

When you develop a rash after contact with poison oak, you have become a sort of accidental casualty in this chemical war. The allergenic chemical of poison oak, called urushiol, has certainly not evolved as a result of predatory pressure by man, but by coincidence the structure of this compound affects us in a quite remarkable way, involving the immune system.

There are two general types of contact dermatitis that one can get from plants. One is termed "irritant contact dermatitis." The rash one may get from the milky juice of some *Euphorbia* species or from the stinging hairs of nettle (*Urtica* spp.) is of this type, and is due to a direct toxic effect of the compound on the skin, the rash appearing within minutes to an hour or so after contact. Dermatitis from poison oak is of the other type, called "allergic contact dermatitis." This is characterized by a first "sensitizing" contact with the allergenic plant chemical, after which a rash may appear only after a week or more or may not appear at all. However, upon subsequent contacts with the plant, the rash will appear within only a day or so, and usually with greater severity. An explanation of how this happens has only recently been made possible by advances in the field of immunology.

Sensitizing Mechanism

Roaming throughout the tissues of the body are a class of cells called "T-lymphocytes," which act very much like policemen checking identification cards, determining which cells belong and which do not. Each of the trillions of T-lymphocytes in the body has a single type of chemical "receptor" on its cell surface, and this receptor will fit only one type of chemical structure, called a "determinant." Distributed among these trillions of T-lymphocytes are several million different receptor types. There exists in this number an active receptor for almost every possible determinant shape, *except* for those determinants existing on the normal cells belonging to that particular person's body. If any T-lymphocyte does find a determinant which fits its receptor, the cell which has that determinant is considered

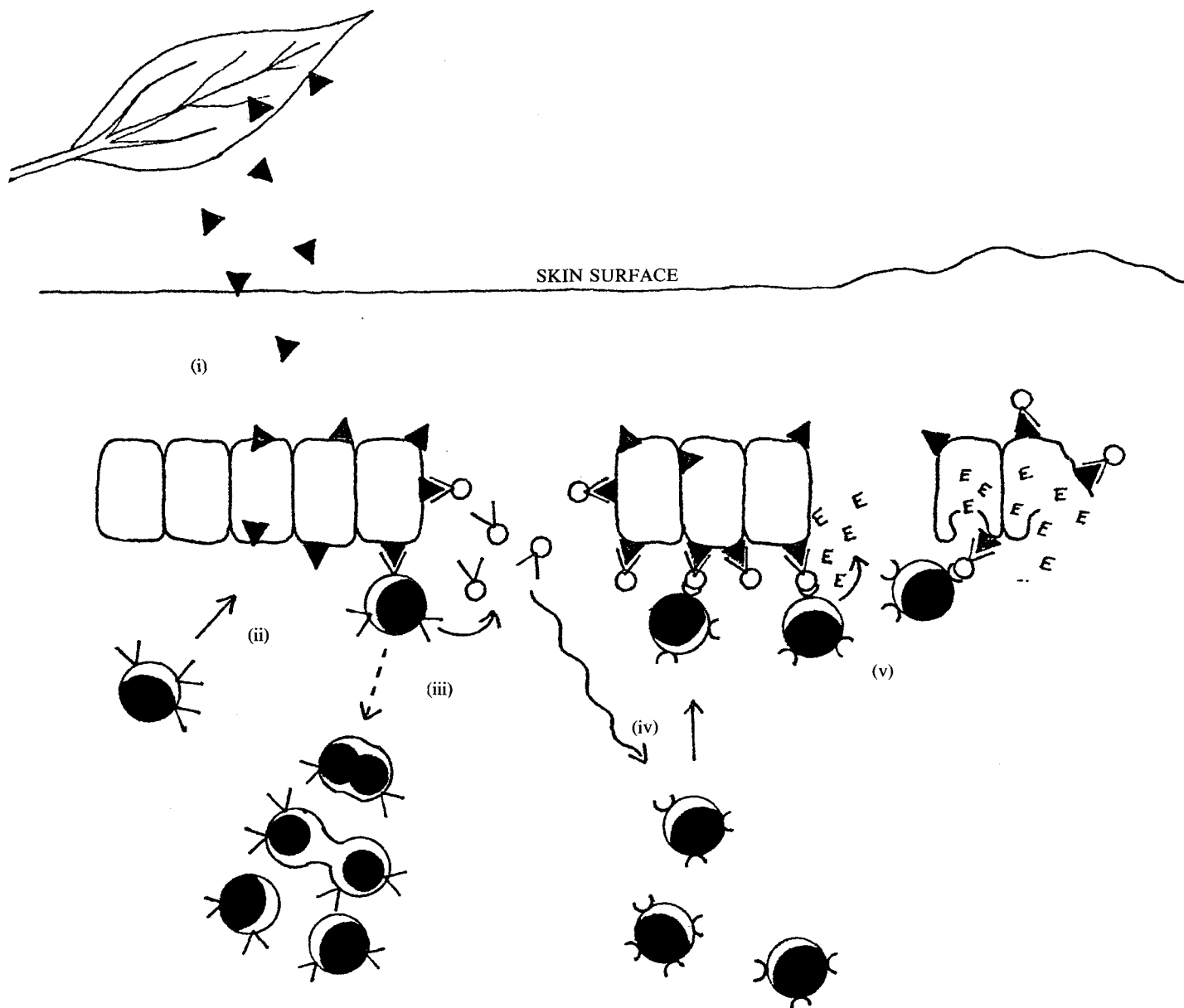


Figure 1. Hypothesized mechanism of allergic contact dermatitis.

- (i) An allergenic plant chemical (▲) is absorbed through the skin where it binds to the surface of cells in the skin tissues.
- (ii) A T-lymphocyte which possesses receptors (∨) on its own surface which "fit" the allergen binds to the allergen on the skin cells, and
- (iii) causes more T-lymphocytes identical to itself to be produced, and releases "lymphokine factors" (⋈) which can also bind to the allergen.
- (iv) The lymphokine factors attract "killer-lymphocytes" which have receptors (⋈) which recognize the factor (∪).
- (v) When the killer lymphocytes are bound to lymphokine factor on skin cells, they release toxic enzymes (E) which destroy the cells, producing a skin rash.

"foreign," and the T-lymphocyte initiates an immune system attack on that cell.

What apparently happens on contact with a plant such as poison oak is shown in the diagram. The vee's and triangles, hemicircles and circles represent complementary pairs of receptors and determinants. The allergenic chemical from the plant is

absorbed through the skin, where it binds harmlessly to the surfaces of cells within the skin and would eventually be metabolized by the cell in the normal replacement of the cell membrane. However, T-lymphocytes, pushing and squeezing their way through the body tissues, match their receptors to determinants on each of the cells they touch. If a

T-lymphocyte that possesses a receptor fitting the structure of the allergenic chemical finds an allergen particle bound to a skin cell, it does two things. First, it begins reproducing itself so that in several days there are many more T-lymphocytes identical to itself, with identical receptors. This constitutes the "sensitizing" period. Second, it releases a group of chemicals called "lymphokine factors" which specifically bind to the allergenic determinants on the skin cells. The lymphokine factors attract to the area another class of T-lymphocytes called "killer-lymphocytes." These killer-lymphocytes have receptors which bind to the lymphokine factors which are bound to the allergen particles which are in turn bound to the skin cells. The killer-lymphocytes then release enzymes which digest the skin cell membrane. Those healthy skin cells to which are bound an otherwise harmless plant chemical are destroyed in the same manner as if they were a foreign skin graft. The effect is the red blistering and itching rash with which too many of us are familiar.

There are several implications to this picture of an allergenic rash.

1) If a person by chance has no T-lymphocytes with the correct receptor for a particular allergenic chemical, then he will be completely tolerant of that chemical. This accounts for those few hardy individuals who can literally roll in patches of poison oak with impunity. They can be sensitized, however, by a white blood cell transfusion from a sensitized person, which then gives them the correct T-lymphocyte type.

2) Sensitization depends upon a chance meeting of the correct T-lymphocyte with the allergenic chemical. Since there are relatively few T-lymphocytes possessing the proper receptor before the sensitizing contact with a plant is made, the chemical may be absorbed and degraded before it is found by these few T-lymphocytes. Therefore, the chances of becoming sensitized increases with the amount of the plant allergen absorbed and with the frequency of contact. Because of this, gardeners are frequently hypersensitive to plants to which most people show no reaction. Similarly, some people will become suddenly hypersensitive to plants which they have handled with impunity for years.

3) Since there are many of the receptive T-lymphocytes after sensitization, a relatively small amount of the allergenic chemical absorbed into the skin is quickly found, and a rash occurs.

4) The weeping of the blistering rash is normal body fluid coming from tissues being attacked by killer-lymphocytes. This fluid is harmless to other areas of the skin and cannot spread the rash.

Poison Oak

By far the most common cause of plant dermatitis in California is poison oak (*Toxicodendron diversilobum*) (syn. *Rhus diversiloba*) a member of the Sumac family, the Anacardiaceae. Poison oak dermatitis is probably so common because the plant is so common, its allergen so potent, and because its habitat coincides so well with perfect places to picnic. The name of the poison oak allergen, urushiol, is derived from *urushi*, the Japanese word for lacquer ware and for the Japanese lacquer tree, *Rhus verniciflua*, of the same family, from the sap of which lacquer is made. Japanese chemists early in this century determined the basic chemical structure of the urushiol of the lacquer tree, which



Poison Oak
Toxicodendron diversilobum

turned out to be nearly identical to the allergens in poison oak. This was confirmed by the American occupation army in Japan when they came into contact with the beautifully lacquered toilet seats and bar tops provided by their hosts to help them feel at home.

Other Plants Causing Dermatitis

There are many other California plants that can cause an allergic dermatitis. In 1932 Philip Munz reported that he received a severe poison-oak-like rash from *Phacelia pedicellata* and *P. crenulata* (desert heliotrope) while collecting the plants in the Mojave Desert. Curious to see if other phacelias caused him the same trouble, he found that he also was sensitive to *P. minor*, *P. campanularia* (wild Canterbury bell), *P. grandiflora*, and *P. brachy-*

Plants Causing Contact Dermatitis

California plants of the family Compositae reported to cause allergic contact dermatitis. (Mitchell 1975) (* Indicates introduced.)

<i>Achillea millefolium</i> *	Yarrow
<i>Ambrosia artemisiifolia</i> *	Low Ragweed
<i>A. psilostachya</i>	Western Ragweed
<i>Arctium lappa</i> *	Burdock
<i>Artemisia californica</i>	California Sagebrush
<i>A. ludoviciana</i>	
<i>Cichorium intybus</i> *	Chicory
<i>Chrysanthemum parthenium</i> *	
<i>Conyza canadensis</i> *	Horseweed
<i>Cosmos bipinnatus</i> *	Cosmos
<i>Cynara scolymus</i> *	Artichoke
<i>C. cardunculus</i> *	Cardoon
<i>Encelia californica</i>	
<i>Gaillardia pulchella</i> *	Blanket Flower
<i>Helianthus annuus</i>	Common Sunflower
<i>Helium autumnale</i>	Sneezeweed
<i>H. amarum</i> *	
<i>Heterotheca subaxillaris</i> *	Telegraph Weed
<i>Iva axillaris</i>	Poverty Weed
<i>Oxytenia acerosa</i>	
<i>Rudbeckia hirta</i> *	Black-eyed Susan
<i>Tanacetum vulgare</i> *	Common Tansy
<i>Xanthium spinosum</i> *	Spiny Clotbur
<i>X. strumarium</i> *	Cocklebur

Plants Causing Photodermatitis

California plants reported to cause phytophotodermatitis. (Pathak 1974) (* Indicates introduced.)

<i>Achillea millefolium</i> *	Yarrow	Compositae
<i>Agrimonia gryposepala</i>	Agrimony	Rosaceae
<i>Ammi majus</i> *	Bishop's Weed	Umbelliferae
<i>Anethum graveolens</i> *	Dill	Umbelliferae
<i>Anthemis cotula</i> *	Stinking Mayweed	Compositae
<i>Apium graveolens</i> *	Celery	Umbelliferae
<i>Convolvulus arvensis</i> *	Bindweed	Convolvulaceae
<i>Daucus carota</i> *	Wild Carrot	Umbelliferae
<i>Foeniculum vulgare</i> *	Fennel	Umbelliferae
<i>Hypericum perforatum</i> *	Klamath Weed	Hypericaceae
<i>Pastinaca sativa</i> *	Parsnip	Umbelliferae
<i>Ruta's graveolens</i> *	Common Rue	Rutaceae
Others possible:		
<i>Angelica</i> spp.		Umbelliferae
<i>Anthriscus scandicina</i>	Bur-Chervil	Umbelliferae
<i>Brassica</i> spp.*	Mustard	Cruciferae
<i>Chenopodium</i> spp.*	Goosefoot	Chenopodiaceae
<i>Heracleum lanatum</i>	Cow Parsnip	Umbelliferae
<i>Lomatium</i> spp.		Umbelliferae
<i>Psoralea</i> spp. Some*		Leguminosae
<i>Ranunculus</i> spp. Some*	Buttercup	Ranunculaceae

loba, but not to *P. distans*. I handle some of these plants frequently, although I attempt to minimize the amount and time the oils are on my skin, and I have not yet had a reaction. However, a friend, Dr. Pius Horner, became hypersensitive to *P. distans* while doing his dissertation on this plant. Others (Berry 1962) have reported a sensitivity to *P. parryi* and *P. viscida*, and Munz's *A California Flora* states that a close relative of the phacelias, *Turricula parryi* causes a severe dermatitis for many people.

The family Compositae probably has the greatest number of species which cause allergic dermatitis in California. Although the composites don't represent a serious problem for Californians in terms of numbers of persons afflicted, they are a problem elsewhere. About twenty years ago a Mexican composite *Parthenium hysterophorus* became established in India and Australia where, free of the natural checks on its population size, it has spread uncontrollably. With nearly five percent of this plant's dry weight being a potent allergenic chemical, *Parthenium* dermatitis has reached epidemic proportions in parts of India (Lonkar et al. 1974). This may not be such a remote story for Californians. In Saltillo, Mexico, last August there was an international conference on guayule, the "Mexican rubber plant," *Parthenium argentatum* which produces a very good natural rubber.

The rising price of oil is making a return to natural rubbers attractive, and the principal talks at this conference were in regard to the potential for large scale farming of guayule in the deserts of the U.S. and Mexico. There is at least one report of dermatitis from guayule (Smith and Hughes 1938). *Parthenium* dermatitis might become more frequent in California if plans are carried out to turn large areas of our deserts over to farming guayule. Regardless of any allergenic potential, however, the ecological consequences of such farming may be much more serious.

Sun Sometimes a Factor

The allergenic chemicals from some plants cause a rash only on skin exposed to the sun. This phenomenon is called "phytophotodermatitis," and has been reported to occur from plants in several families, most frequently from the Umbelliferae. The mechanism of this type of dermatitis is probably similar to that described above except that ultra-violet light is needed for the allergenic chemical to bind to a skin cell membrane. Wind-borne pollen from ragweed (*Ambrosia artemisiifolia*) and cocklebur (*Xanthium* spp.) causes in some people an allergic dermatitis that is frequently misdiagnosed as a "nervous photodermatitis,"

because it appears only on exposed areas of the body. The sinus allergy or "hay fever" due to ragweed is not a contact dermatitis; it occurs by a different mechanism than that described here and involves proteins in the pollen.

There are probably many other California plants, still unreported, which produce potential contact allergens. Because hypersensitivity to plants is dependent on the frequency of contact and the amount of allergenic chemical absorbed, many wild plants have probably been handled without their allergenic potential having been discovered. Relatively few of the many people who have gotten an allergic dermatitis in the outdoors are botanists or naturalists, and most are not aware of the identity of plants they have touched. It is quite likely that many cases of dermatitis caused by plants other than poison oak are assumed to be due to poison oak and are not reported.

Our laboratory, under the direction of Dr. Eloy Rodriguez at the University of California, Irvine, is interested in the chemistry and biology of plants which cause allergic dermatitis. The readers of *Fremontia* represent a large group of persons who could help us discover new allergenic chemicals in California plants. Many CNPS members have frequent contact with plants not often touched by most people and run a greater chance of becoming sensitized to some of these, and most are able to identify the plants which they see. I would appreciate hearing from any reader who has found himself to be allergic to a California plant other than poison oak. My address is Developmental and Cell Biology, University of California, Irvine, California 92717.

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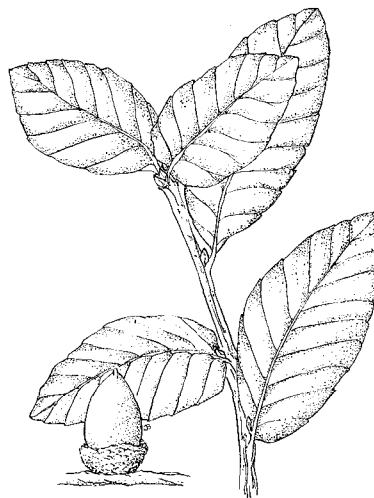
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NOT QUITE THAT VARIABLE

"Yes, indeed, *Dudleya greenei*, does seem to be a variable plant," one reader gently commented. In the April issue of *Fremontia* it came out looking very like the Island Oak in Dr. Ralph Philbrick's article "A Botanist's View of Santa Cruz Island." For the record and for the opportunity to publish again Jacqueline Broughton's fine drawings, here are both pictures with their correct captions.



Dudleya greenei, a variable island succulent that occurs in several forms on Santa Cruz Island.



Island oak (*Quercus tomentella*), an important feature of Santa Cruz Island woodlands; fossils of this tree have been found on the mainland, but now it is known only from the off-shore islands.

SOUTHERN CALIFORNIA'S VANISHING CYPRESSES

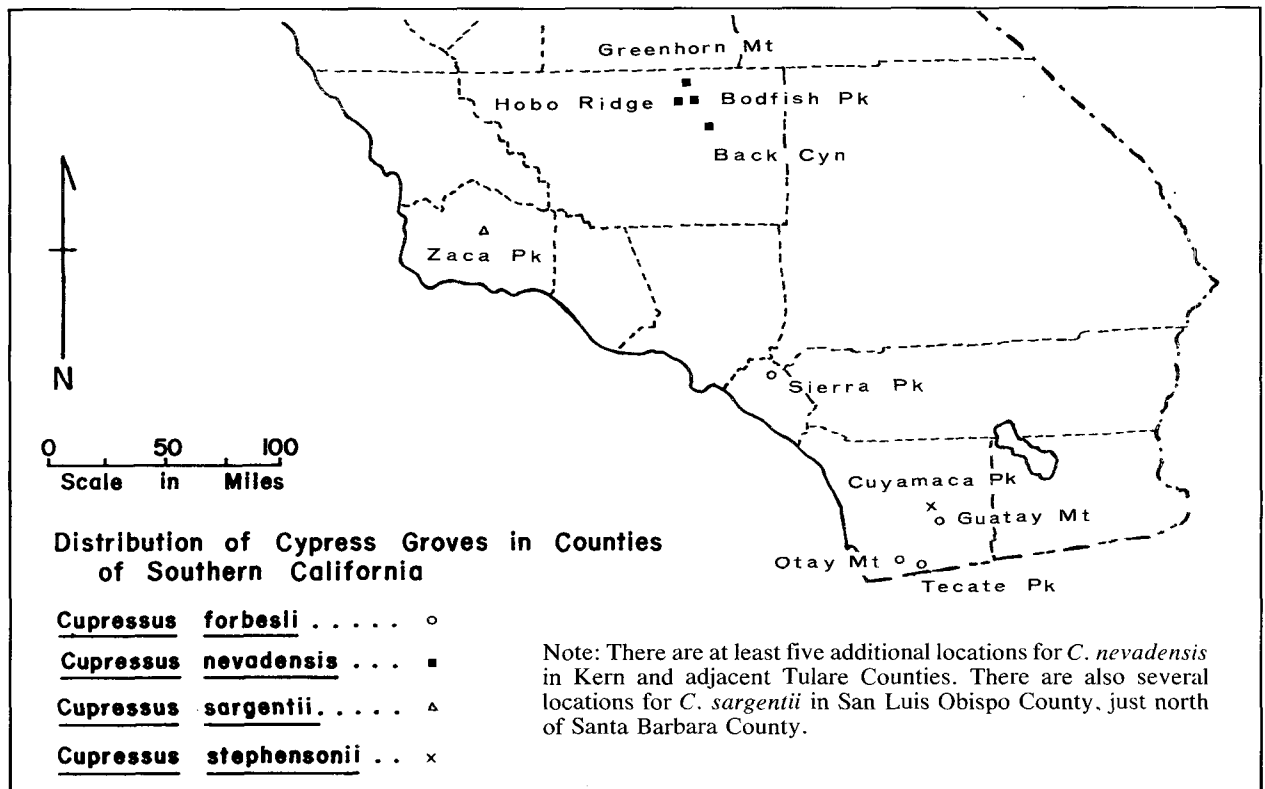
by Wayne P. Armstrong

In the eastern United States the word cypress is associated with the bald cypress of the swamps of Georgia, Florida, and Louisiana. The bald cypress is actually a member of the same family as the redwood (*Taxodiaceae*). The California cypresses (*Cupressus*) belong to the Cypress family (*Cupressaceae*) along with junipers, incense cedar, arbovitae, and Port Orford cedar. Probably the best known and most frequently photographed of all California cypresses is the picturesque Monterey cypress (*Cupressus macrocarpa*) along the rocky coast of central California. There are nine additional species of *Cupressus* native to the state. In fact, California contains approximately forty percent of all the cypress species on earth! They occur in isolated groves throughout the length of the state, from near sea level to almost 7,000 feet. About the only major regions of California where cypresses don't occur are the Mojave and Colorado Deserts, the Central Valley, and the arid mountains and valleys east of the Sierra Nevada. Unlike other coniferous genera, such as *Juniperus* and *Pinus*, *Cupressus* consists of species whose native habitats are mostly limited to the areas termed "arboreal

islands" by Bowers (1961). The scattered isolated groves represent relicts or remnants of more extensive cypress woodlands that once occupied many areas of California.

Four species of *Cupressus* occur in the inland mountains of southern California, from Santa Barbara and Kern counties to the Mexican border. These species are Tecate cypress (*C. forbesii*), Cuyamaca cypress (*C. stephensonii*), Sargent cypress (*C. sargentii*), and Piute cypress (*C. nevadensis*). Most of the southern California groves occur in fire-climax chaparral. Some groves contain bushy trees and dwarfed cypress thickets which blend in with the surrounding chaparral.

Cypress species are very difficult to identify from illustrations or dried herbarium specimens. The small woody seed cones and foliage of several species are remarkably similar. In fact, there has been considerable disagreement among authorities as to their exact classification. Probably the best way to distinguish them is to compare the foliage, cones, and bark of mature trees, preferably in the field. The table comparing southern California species may be helpful in segregating them. I have



	Bark cherry-red, smooth, exfoliating (peeling) annually in thin, non-fibrous plates.	Bark gray-brown, persistent, rough and fissured (i.e. not exfoliating).
Foliage gray (glaucous) and very resinous; each leaf exuding a tiny drop of clear resin which turns whitish upon drying.		Piute Cypress - (<i>C. nevadensis</i>)
Foliage gray (glaucous) or gray-green and only moderately resinous; some leaves with a tiny resin droplet which turns white upon drying.	Cuyamaca Cypress (<i>C. stephensonii</i>)	
Foliage bright green or dusty green and not resinous; leaves without resin droplets or (usually) with non-functional glandular pits.	Tecate Cypress (<i>C. forbesii</i>)	Sargent Cypress (<i>C. sargentii</i>)

Comparison of foliage and bark characteristics of southern California cypresses (*Cupressus*).

several species growing in my yard and they are really beautiful native trees, provided they are not crowded out by more aggressive trees and shrubs. They require well-drained soils and need very little watering once they become established. In fact, overwatering tends to produce a shallow, poorly developed root system (at least in the case of my Tecate cypress). The bushy trees get extremely topheavy when the branches are soaked by rain and may blow over rather easily. It is a shame that more nurseries don't carry these outstanding drought-tolerant evergreens. The beautiful green and silver-gray species make excellent contributions to many landscape situations, particularly arid regions with poor soils.

Tecate Cypress

Four isolated groves of Tecate cypress (*Cupressus forbesii*) occur in the Peninsular Ranges of southwestern California. Three groves are located in San Diego County on Guatay Mountain, Otay Mountain, and Tecate Peak. A fourth grove, on Sierra Peak in the northern Santa Ana Mountains of Orange County, marks the northernmost limits of this species. Isolated groves also extend about 150 miles south in peninsular Baja California. All groves in California are mixed with chaparral and have been burned repeatedly. In several groves the cypresses form dense thickets of dwarfed trees interspersed with chaparral shrubs. From a distance it is difficult to distinguish the cypresses from chaparral shrubs. Unburned slopes and canyons and exposed ridges often contain large, old individuals. One tree on Sierra Peak is over 200 years old. With the exception of those on Guatay Mountain, the chaparral shrubs are generally sparse and stunted within groves of Tecate cypress. These



Tecate cypresses in the Sierra Peak grove. Old trees on these exposed sites have escaped recurrent fires. Man in picture is the author's father. Photographs by the author.

characteristics are presumably related to the shallow soils occupied by these groves, described by Wolf (1948) as coarse, rocky, and sterile.

Cuyamaca Cypress

The Cuyamaca cypress (*Cupressus stephensonii*) is restricted to the southwest slopes of Cuyamaca Peak in San Diego County. Fire-killed trees and cypress thickets are scattered along the drainage



A mature Cuyamaca cypress on the southwest side of Cuyamaca Peak is one of the rare large individuals remaining.



A stand of Sargent cypresses, confined to serpentine outcrops on a ridge east of Zaca Peak, illustrates the isolated nature of southern California cypress groves.

of King Creek near its headwaters. Several large cypresses approximately thirty feet tall have escaped fires in this area. Wolf (1948) reported trees up to forty-eight feet high, but these were apparently killed in a 1950 fire. According to Jack Reveal (1978), these trees (near Santa Catarina) have more glandular foliage and may represent another variety of Arizona cypress (*C. arizonica*). The Cuyamaca and Piute cypress are also considered varieties of the Arizona cypress by some authorities. The gabbroic soils on Cuyamaca Peak support a vigorous growth of dense chaparral, and there is obvious competition between the cypress thickets and the impenetrable chaparral. There are also scattered individuals of Coulter pine (*Pinus coulteri*) among the cypresses. This is the only cypress grove in Orange and San Diego counties that is associated with pines.

Sargent Cypress

The Sargent cypress (*Cupressus sargentii*) is confined to the inner and outer Coast Ranges from Red Mountain in northern Mendocino County to Zaca Peak in Santa Barbara County. This 400-mile range extends through at least ten counties. Throughout its range Sargent cypress is typically confined to rocky outcrops of serpentine. The Zaca Peak location marks the only known occurrence of Sargent cypress in southern California. There the trees form a small isolated grove on the summit and northeast slope of a long ridge approximately three miles east of Zaca Peak. The main stand consists of small trees about twenty to thirty feet tall. Numerous, small pole-like trees grow close together in swales. The cypress trees are interspersed with scattered digger pines (*Pinus sabiniana*) and chaparral shrubs.

Piute Cypress

At least nine groves of Piute cypress (*Cupressus nevadensis*) are scattered along forty-five miles of the central Kern River drainage, including parts of northeastern Kern County and adjacent Tulare County. These trees receive considerable winter precipitation in the form of snow. They are associated with foothill woodland and chaparral, and some groves contain dominant members of the pinyon-juniper woodland. The largest and certainly one of the most beautiful groves of Piute cypress is located on the north slopes of Bald Eagle and Bodfish peaks, just south of Lake Isabella. The grove occupies several hundred acres and includes

some of the most symmetrical and pyramidal cypress trees of all the native groves in California. The foliage of Piute cypress is strikingly gray-green and very glandular or resinous with a striking aroma. During February and March some trees appear yellowish because of abundant male (pollen) cones.

Reproduction Following Fire

Most cypress species produce abundant clusters of persistent, unopened seed cones. The cones remain closed on the branches for many years and often open and release their seeds following fire. I have seen closed cones of Tecate cypress, some of them estimated to be thirty years old, partially enveloped by exfoliating bark. When triggered into growth by fire the tremendous number of persistent, unopened seed cones, each containing about 100 seeds, often results in dense thickets of dwarfed trees. Competition for water, nutrients, and light within the thickets certainly accounts for the diminutive size of the trees. The most astonishing densities in all the southern California groves occur on Sierra Peak in Orange County. When sampled in 1966 the Tecate cypress thickets on the northwest slopes of Sierra Peak had densities of 21,020 trees per acre. Along erosion channels where seeds accumulated, incredible densities of 170 individuals per square meter were counted. Examinations of the smallest cypresses (which looked like mere seedlings) revealed that they were seventeen years old, correlating with a fire in 1948. Similar dwarfed thickets of cypresses established after known fires are found on Cuyamaca Peak, Tecate Peak, and Otay Mountain.

Bare mineral soil (devoid of duff and dense brush) and full sunlight are most favorable for the germination of cypresses. These ideal substrate conditions are produced by fire. I have studied groves of cypresses in southern California for the past fifteen years, and the only places I have seen cypress seedlings are in recently burned groves or along firebreaks.

A good example of the tenacity of cypresses in the face of fire is the Greenhorn Mountain grove of Piute cypress (located about four miles west of Lake Isabella near Wofford Heights, in Kern County). In the fall of 1961, this tiny grove was reduced from three mature trees to a single tree but responded by producing approximately forty seedlings the following spring. The lone parental tree and seedlings occupy roughly the same area as the original grove. When visited in November 1976, some of the young cypress were twenty to

thirty feet tall, and some trees already bore mature unopened seed cones.

With the exception of the Guatay Mountain grove, every cypress grove in Orange and San Diego Counties has burned at least once during the twenty-two year interval between 1944 and 1966. A fire in September 1970 narrowly missed the grove on Guatay Mountain. Between 1965 and 1975, portions of the Tecate cypress grove on the northern slopes of Tecate Peak have burned at least twice. Some groves of cypresses sampled quantitatively during the past fifteen years show increases in area and density, and others show marked decreases. For example, observations and data indicate that the fire of 1950 reduced the grove of Cuyamaca cypress on Cuyamaca Peak substantially. Very few large individuals are left and practically all reproduction is confined to the King Creek drainage. Another fire in 1970 killed many of the twenty-year-old trees which grew after the 1950 fire.

Most fires occur during the fall months and often coincide with dry "Santa Ana" winds. Unusually dry winter seasons or poorly timed rains are important factors affecting cypress reproduction. Another factor appears to be intense competition with well-established resprouting shrubs and very high densities of herbaceous "fire-follower" wildflowers. The shrubs can quickly resprout from subterranean basal burls or stumps and rapidly cover the burned slopes. In fact, many chaparral shrubs are actually invigorated by occasional fires.



A stand of Piute Cypresses on Bald Eagle Peak, with Lake Isabella and the town of Bodfish in the background.

The seeds of some shrubs, such as ceanothus, require the heat of a brush fire before they will germinate. I have recorded some tremendous densities of wildflowers in burned cypress groves which undoubtedly compete with the cypress seedlings. The density of white phacelia (*Phacelia brachyloba*) on Tecate Peak five months after the fire of October 1965 was 22,208 individuals per acre. The next spring (May 1967), golden ear-drops (*Dicentra chrysantha*) formed almost impenetrable thickets on the same burned slopes. Each year different species show up with the greatest densities as succession progresses. In 1970 the highest density of any species was golden yarrow (*Eriophyllum confertiflorum*) with 23,392 individuals per acre!

Future of Cypress Groves

Five main factors appear to be influencing the distribution of cypresses in southern California: increased aridity since Pliocene time, competition with more aggressive chaparral species, grazing, urbanization, and disruption of normal fire frequencies. Fossil evidence indicates that during less arid times cypress groves were much more extensive than today. For example, cypress fossils have been found in Miocene deposits from the Mojave Desert which date back more than twenty million years, before the massive Sierra Nevada was uplifted. Twisselmann (1962) suggested that the Piute cypress in the southern Sierra Nevada is a relict species precariously surviving on the western edge of a once vast cypress woodland that extended across the Mojave Desert into Arizona. As the climate became increasingly arid, the cypresses were replaced by more drought-resistant pinyon-juniper woodland and desert.

Studies in southern California indicate that chaparral species are better adapted than cypresses to this dry climate with its accompanying fires (Armstrong, 1966). Throughout California cypress groves frequently occur on poor, shallow soils or rocky outcrops where they survive and reproduce within other plant communities, such as chaparral. With the possible exception of Sargent cypress (which apparently grows best on serpentine soil), their edaphic (soil) restrictions appear to be caused by competition rather than soil preferences. The cypresses have a better chance to survive on these impoverished soils because the chaparral is sparse and stunted. It is probably premature to generalize about soil preferences until further studies have been made. Reveal (1978) believes that the high water-retaining capacity of gabbroic soils on

Cuyamaca Peak may have been an important factor in the survival of cypress along King Creek. The fact that most cypresses grow vigorously on more favorable sites with good topsoil (both in the wild and under cultivation) indicates that they do not necessarily prefer poor soils. However, cypress trees growing on rugged, rocky soils in the wild certainly appear to be better anchored and able to withstand strong winds and rain, compared to bushy trees under cultivation, particularly in rain-soaked, loam soils.

The last three factors influencing the occurrence of cypresses are a direct result of human activities. Wolf (1948) predicted that human pressures may eventually result in the total destruction of some native cypress populations. Cattle grazing is certainly one of the detrimental pressures on some southern California groves. The most severe impact of grazing is on the susceptible cypress seedlings. Fire followed by intensive grazing could eliminate a grove. Wolf (1948) also cites several examples of cypress groves being cut down for fence posts. Cypress groves that occur on private property are at the mercy of the land owners.

Some cypress groves in southern California are on National Forest lands, but the present policy of "multiple use" does not insure their protection. In fact, the methods of fire prevention on some government land are questionable with respect to the cypresses. For example, a wide firebreak was cut through the lower end of the Tecate cypress grove on Guatay Mountain destroying several large trees. Another huge international firebreak sprayed with herbicides was cut through one of the finest stands of Tecate cypress in the heart of the Otay Mountain grove. Probably the only way to insure total protection for these beautiful rare natives is to establish nature preserves or state parks. Part of the Cuyamaca cypress grove occurs within Cuyamaca Rancho State Park. Other cypress groves located within Natural Areas of the Bureau of Land Management include the Bodfish Peak grove of Piute cypress and the Otay Mountain grove of Tecate cypress.

The present human population boom in California, with its accompanying urban sprawl, has put demands on large areas of virgin land. For example, portions of the groves of Monterey cypress (*Cupressus macrocarpa*) and Gowen cypress (*C. goveniana*) on the Monterey Peninsula have been destroyed for housing developments and golf courses. In other areas increased taxation and land values are forcing more intensive use of wild lands, including the cypress groves. This process has already occurred in the Sierra Peak area where strip mining for underlying clay deposits has



Remains of a parent tree, killed by fire, rises above a crowded thicket of Tecate cypresses, grown up as the result of a fire in 1948. Sierra Peak grove.

destroyed a large portion of the Tecate cypress grove. A continuation of these operations could completely eliminate this grove — the northernmost stand of Tecate cypress in North America.

Complete fire protection, or an increased fire sequence, might be detrimental to the limited cypress populations. Without fire, some cones on broken branches or dead trees might partially open and release some of their seeds. However, chances are that these seeds will land on hostile sites with dense chaparral, heavy soil litter (duff), or unbroken vegetation canopies. Even if optimum bare mineral sites are available, seed dissemination may not coincide with ideal climatic conditions. The thin-coated seeds readily lose their viability through desiccation. Fires occurring too frequently over the same area can destroy a grove if they eliminate the young cypresses before they have a chance to produce sufficient seed cones. I have observed Tecate and Cuyamaca cypresses fourteen years old with mature seed cones.

Paul Zedler (1977) believes that the natural fire interval in Tecate cypress must be longer than 40

years, and that burning as frequent as 25 years would probably lead to their extinction in local areas. Dr. Zedler's conclusions are also shared by Jack Reveal in his study of the Cuyamaca cypress. In fact, Reveal states that the Cuyamaca cypresses need total protection from fire until the year 2000 in order for trees to grow and produce abundant cones, and until more is known about their ecological requirements.

It is difficult to say with certainty whether or not cypress groves in southern California are gradually dying out. Distribution maps by Griffin and Critchfield (1972) show several stands of cypresses which no longer exist. Mature trees of one now-extinct stand of Cuyamaca cypress were described by Wolf as recently as 1948. He also reported native Tecate cypresses in Santa Ana Canyon, in Orange County. If any cypresses still occur in Santa Ana Canyon, they are extremely rare. With the exception of Tecate cypress, very few cypress groves in southern California have been sampled quantitatively to predict future trends of the groves based on ecological factors. It is perhaps too soon to make any valid predictions concerning their survival. Groves that appear to be decreasing in density and size may lead to future expanded thickets given optimum climatic conditions.

Cypresses probably once covered vast areas of California but their numbers have been reduced to isolated stands. In fact, their genetic isolation is undoubtedly responsible for the unique characteristics within different populations which we now consider to be different species. Perhaps sound ecological management and the establishment of natural preserves can save these interesting remaining relict species from extinction.

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NATIVES FOR YOUR GARDEN

by Marjorie G. Schmidt

Western Pink Phlox

Phlox speciosa subsp. *occidentalis*

Family: Polemoniaceae

Other Names: Showy Phlox

Habit: This western phlox is a low, evergreen, spreading perennial, which branches from a slightly woody base. It is generally a small, rangy plant, but in exposed places it may form a rather tight almost circular mat, up to a foot and a half across. It has a straggly and often far-ranging root system.

Foliage: The leaves are narrow and pointed; when mature they are dark green; when new in the spring they are bright green.

Flowers: The typical five-petaled phlox flowers are lobed or notched, with some variation in the depth of the indentations. They occur in terminal clusters and on short side branches, often so abundantly as to make the mat a solid pink. The color is a chalk pink but may also be a bright rose pink, verging on crimson rose, or, rarely, white. The plants begin to bloom in late April or early May, continuing into June and July at higher elevations.

Distribution: The species *Phlox speciosa* (*speciosa*, by the way, means showy) occurs in Washington and Oregon and eastward to Montana; the subspecies *P.s. occidentalis* is found in California. Munz also lists *P.s. var. nitida*, which is less pubescent and is found from the inner Coast Ranges

to Plumas County and northward to Washington. I can find no mention of this variety in horticultural literature. *Phlox speciosa* subsp. *occidentalis* occurs on rocky hillsides, mountain flats and slopes, in the foothills and in the Sierra Nevada between 1500 and 2000 feet, from Fresno County north, and in the north Coast Ranges. It is fairly abundant in many parts of Trinity County, and especially in the Siskiyou Mountains and north into Oregon.

Culture: For good germination seed should be stratified in damp sphagnum moss at a cold temperature for about eight weeks. The seeds, which will become plump, should then be planted in a mixture of coarse sand, screened leafmold, and soil. Pots should be kept moderately moist and lightly shaded until the slender stems with the first linear leaves appear. Since the small plants are reputed to be touchy when handled, it might be better to plant the seed in fiber pots and to set out the whole pots with the bottoms removed so that there will be no disturbance of the roots. So far I have not been successful in growing this phlox from cuttings.

In the wild this phlox grows in gritty, well-drained soil, on north- or east-facing slopes, or on forested flats or ridges. Those who have had some experience in growing it recommend morning sun, sharply drained soil, and dryness in late summer for a dormant period.

Discussion: The genus *Phlox* is entirely American except for one species, *P. sibirica*. Selected forms of several species, both eastern and western, have long been popular garden materials. The famous English writer on rock gardens, Reginald Farrer, speaks of the phloxes as America's greatest contribution to alpine gardening. In *North American Rock Plants* W.H.A. Preece says that, once established, *Phlox speciosa* is apt to be long lived,



Western Pink Phlox
Phlox speciosa subsp. *occidentalis*
Drawing by Joan E. Thomson

an opinion that is shared by most writers. Anderson McCully in *American Alpines in the Garden* mentions that the species inhabits limestone ledges in the Blue Mountains in Oregon. The late Ira Gabrielson, whose *Western American Alpines* has been a rock gardeners' bible, says that *Phlox speciosa* has the habit of growing at the base of various shrubs, is not easy to establish in the garden, but is worth trying again and again.

James Roof mentions the presence of *Phlox speciosa* subsp. *occidentalis* on Anthony Peak in Mendocino County in *Four Seasons*, November 1965, where it is accompanied by the elegant little *Viola hallii*. Milo Baker, in his *Partial List of Seed Plants of the North Coast Ranges of California*, 1972, notes its occurrence in the same area.

In my experience plants may appear as scattered individuals or in fairly large separated colonies. They occur, for example, on slopes of coarse sand a few miles west of Redding, then again in mixed forests around 5200 feet in Trinity County. It is always a joyful thing to behold when the mats of pure pink hang down along the road banks. This phlox may be a fire follower; it appeared in quantities following a devastating fire on Hayfork Summit several years ago. For two or three years thereafter the plants were spectacular, but gradually these displays diminished, and lately the flowering has not been so abundant.

My seed collecting experiences have often been disappointing, since not all capsules contain seed, and even if they do there is generally only a single seed in each capsule. One hot July day, with perspiration running into my eyes, I tried capsule after capsule, finding only about one in each cluster with ripe seed. It required many hours of searching to get a half teaspoon of seed. Despite its unresponsive tendencies, however, the western pink phlox is a tantalizing beauty, worth every effort to bring it into cultivation.

NOTES AND COMMENTS

Seed Collectors Please Note

From member Rosalie Osbaker of San Diego comes an appeal for California native plant seeds for two botanic gardens in Israel. Michael Avishai, Curator of the Botanical Garden, Hebrew University of Jerusalem is seeking seeds collected in the wild of *Juniperus californica* or *J. occidentalis*, evergreen chaparral shrubs, and "any other important western plants." The aim of the garden, writes Professor Avishai, is the introduction and cultivation of plants from primary wild populations. A list of North American plants already in the garden

and of those desired may be obtained from him. The Havath-Noy Gardens, Rupin, Israel would like to obtain seed of *Berberis haematocarpa*.

International Botanical Congress

The Thirteenth International Botanical Congress will be held in Sydney, Australia, August 21-28, 1981. For information on program, field trips, etc. write Dr. W. J. Cram, Executive Secretary, 13th I.B.C., University of Sydney, N.S.W. 2006, Australia.

Back Issues

The CNPS office reports that the following issues of *Fremontia* are in very short supply: April 1973, July 1973, October 1974, January 1976, July 1976, and April 1978. The donation of any unwanted copies of these issues would be much appreciated.

Addition to Nursery List

Robert D. Wright, a professor of botany and ecology at the University of Redlands, and a CNPS member, sends word that he has opened a nursery at his home in Redlands, as an offshoot of his University research on methods of propagating and growing native plants in landscape situations.

"On the University campus," Professor Wright reports, "we are developing a landscape botanical garden of California natives, as well as a small arboretum of native trees. Visitors are welcome during the week." The following listing is an addition to the article "Some Commercial Sources of California Native Plants" (*Fremontia* July 1977). Information on further native plant nurseries is invited.

Knobcone Nursery, 509 Camino Real, Redlands, CA 93973. (714) 792-7945. R only. No mail order. Saturdays only. Ground covers, shade trees, shrubs, wildflowers, featuring chaparral and lower montane forest plants from Redlands vicinity. Natives only.

Source List of Plants

The California Garden Clubs, Inc., offers a fifteen-page publication, "A California Source List for Plant Collectors," (all kinds of plants). It is available for 35¢ from Corrine A. Bromberger, Horticultural Chairman, CGCI, 530 West Sunset Drive, Redlands, California 92373.

A New Journal

The first issue of a new international scholarly quarterly *Journal of Ethnopharmacology*, is scheduled to appear this fall. Published in Switzerland (P.O. Box 851, CH-1001 Lausanne 1), the journal will publish research papers concerning medicinal substances and practices from past and present cultures in all parts of the world. The principal language of the journal will be English. "Many valuable drugs of today (e.g. atropine, digitalis, reserpine) have come into use through the study of folk remedies, and many natural products have served as prototypes of synthetic remedies," the prospectus points

out. The editors are Dr. Laurent Rivier of the University of Lausanne and Dr. Jan G. Bruhn of Karolinska Institute, Stockholm.

Thank You, Mr. Jensen

Dear People of *Fremontia*:

I am fearful that my subscription to your fine magazine might have expired or is about to do so. Herewith is a check for \$10. I am a senior citizen and a shut-in so use whatever money you need for any purpose.

I do enjoy every word you put out. In particular the story of Lester Rowntree — it makes me want to throw rocks at myself to see the years I wasted!

Living on the Lee-of-the-Hill of San Bruno Mountain, to watch the beautiful yellow violas, hound's tongues, and mission bells all dug out and dumped on some garbage fill while a beautiful home is built of cedar and redwoods and the vision of where they once stood stands before my mind.

I enjoy your *Fremontia* and hope you all stay encouraged to keep up the good work.

Byron P. Jensen
Brisbane, California

NOTES ON CONTRIBUTORS

Wayne P. Armstrong, who teaches biology at Palomar College, wrote the chapter about cypresses in *Terrestrial Vegetation of California*.

Imogen Cunningham, the noted photographer, was a member of the California Native Plant Society. She died in San Francisco in 1976.

Ida Geary is the author of a new book *Plant Prints and Collages*, published by Viking Press in June. It deals with the botanical techniques she teaches and has written about in *Fremontia*.

James R. Griffin is co-author of *The Distribution of Forest Trees in California* and author of *Plants of the Highest Santa Lucia and Diablo Range Peaks*, both published by the U.S. Forest Service. He is Associate Resident Ecologist at the Hastings Natural History Reservation in Carmel Valley.

Willis Linn Jepson (1867–1946), Professor of Botany at the University of California, was the author of *A Flora of California* and *A Manual of the Flowering Plants of California*, among other works.

Elizabeth McClintock is Research Associate in the Department of Botany, U.C. Berkeley.

Gary Reynolds is a graduate student at the University of California, Irvine. His field is plant biochemistry and his particular interest is the interaction of plants and animals.

Wayne Roderick is Director of the native plant botanic garden in Tilden Park, Berkeley.

Marjorie G. Schmidt has made a career experimenting with native plants and writing professionally about her garden experiences.

Joan E. Thomson is a San Francisco artist.

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