Hubby

Native Plant Society of New Mexico

NATIVE PLANT SOCIETY OF NEW MEXICO NEWSLETTER

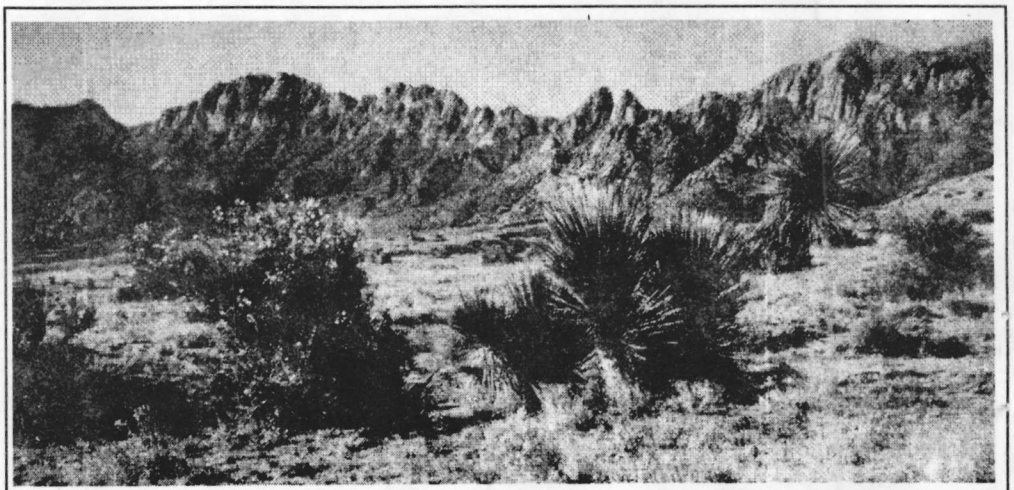
May & June 1991 Volume XVI Number 3

NEW MEXICO'S ORGAN MOUNTAINS: A FORAY INTO THE WORLD OF DESERT FERNS

Ed Alverson

Reprinted from Fiddlehead forum, Bulletin of the American Fern Society, Volume 14, Numbers 2 & 3

Much of my exploring has been (as it is for most people) vicarious, through the words and images of authors and explorers who have published books and articles on their respective local or regional fern floras. This vicarious exploration has also greatly stimulated my desire to see for myself the ferns of distant and unfamiliar lands.



The eastern side of the Organ Mountains. Aguirre Springs and the Pine Tree Trail are in the shadows beneath the highest peaks at upper left. Rick Castetter

One book that has caught my interest has been The Ferns and Fern Allies of New Mexico, co-authored by H.J. Dittmer, E.F. Castetter, and O.M. Clark (University of New Mexico Press, 1954). New Mexico is a large state, with a good diversity of habitats and vegetation; 75 species and varieties of pteridophytes are listed in the book. But the ferns that intrigued me the most were the "desert ferns," species that grow in the desert mountains of western Texas, New Mexico, Arizona, and northern Mexico. Many of these are species of *Cheilanthes*, *Notholaena*, and *Pellaea*; they are well adapted to surviving long periods of drought. From the book, it appeared that the greatest diversity of desert ferns was to be found in the Organ Mountains, a small mountain range a dozen miles east of Las Cruces, and only 40 miles north of the Mexican border. Some 29 species of pteridophytes were listed from this area.

When I took some time to visit relatives in Albuquerque, I knew that my opportunity to visit this enticing area had arrived. It was mid-day, but the weather was warm and summer-like as I drove the 200 miles of freeway south along the Rio Grande from Albuquerque to Las Cruces. My first stop was the herbarium at New Mexico State University, where I hoped to obtain specific fern localities from herbarium labels. To my surprise, almost all of the ferns of the Organ Mountains had been collected first by E.O. Wooton, turn-of-the-century botanist and author of an early New Mexico flora, who had resided in Las Cruces for a number of years.

The obvious place to begin my explorations was Tortugas mountain, a six-hundred-foot high knob of limestone only 3 miles east of the University. Walking through the desert scrub of sotol, ocotillo, and xerophytic shrubs, it took a few minutes to spot the first ferns amongst the rocks. They were cloak ferns, *Notholaena*, but they were, unfortunately, curled up from drought. The hybrid cloak fern, *Notholaena in-*

Continued on page 3

Inside.....

EDITORS' MESSAGE

With this our second issue, we begin to realize how much time and effort must have been put forth by past editors. It must have been a staggering task to do most of the work without the aid of a computer. We want to thank Ellen Wilde for her help in getting us started and praise her for a job well done.

We also wish to apologize for anything inadvertently left out of the last newsletter. A portion of the Otero Chapter reports was misplaced and didn't get in. We include it here belatedly with a promise that in the future we will try harder to catch slip ups like that one.

We repeat our invitation for articles, viewpoints, letters etc. If you have a Macintosh or IBM computer feel free to send us your material on a 3.5 " disk. We can even take your material over the phone provided you have access to a modem. Don't feel reluctant if you don't have any of these electronic wonders. We can take your typewritten work and laser scan it. Believe it or not, the computer can recognize your typewritten words! (It has trouble with broken or run together letters so if you do send us something, a good quality copy is appreciated). Once scanned and recognized the text can be edited as if we had typed it in ourselves. It takes about a minute to process an article that would take an hour to type. Of course, handwritten copy is also acceptable. The newsletter is being produced entirely by computer. Even the drawings and other graphics are added electronically. They are laser scanned and incorporated into the text of the newsletter where they can be electronically resized or cropped. Sometimes technology is as wonderful as a wildflower.

Rick Castetter
Tim McKimmie

The **Newsletter** is published six times per year by the New Mexico Native Plant Society. The Society is composed of professional and amateur botanists and others with an interest in the flora of New Mexico. Articles from the Newsletter may be reprinted if fully cited to author and attributed to the Newsletter.

Membership in the Native Plant Society of New Mexico is open to anyone supporting our goals. We are dedicated to promoting a greater appreciation of native plants and their environment, and to the preservation of endangered species. Members benefit from chapter meetings, field trips, publications, plant and seed exchanges and a wide selection of books available at discount.

We also encourage the use of suitable native plants in landscaping to preserve the state's unique character and as a water conservation measure.

We maintain a register of business and professional people who are members and can supply information and services related to native plants. To be added to this roster or to request information, contact the Membership Secretary.

Schedule of Membership Fees

Dues are $8.00 annually for individuals or families. "Friends of the Society" include organizations, businesses, and individuals, whose dues of $25.00 or more provide support for long range goals. To join us, send your dues to Membership Secretary, 443 Live Oak Loop, NE, Albuquerque, NM 87122

Advertising Schedule

Approved advertisements will cost $25 per year.

Newsletter Contributions

Please direct all contributions for the newsletter to the editors.
Deadlines for the next two newsletters are June 15 and August 15.

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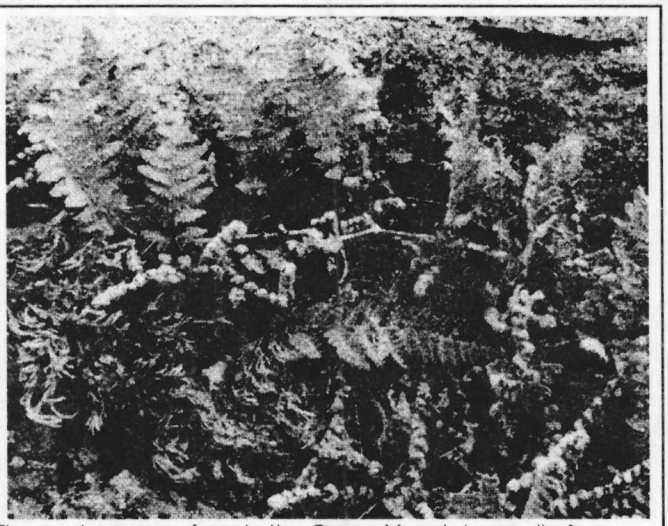
tegerrima, was more common, forming clumps of stiff, narrow fronds with numerous undivided rectangular pinnae, though the Cochise cloak fern, *Notholaena cochisensis*, a similar but more slender and less robust species, was also present. Climbing higher, I encountered a colony of the widely distributed slender lip fern, *Cheilanthes feei,* and a few plants of the border cloak fern, *Notholaena limiteana.* This is a delicate species with brittle stems, 3 to 4 times pinnate, the numerous oval segments dark blue-green above but covered with a white powdery wax on the underside.

At about this time, the cumulus clouds which had been gathering all afternoon began letting loose spurts and spatters of raindrops from their dark undersides, but while I took shelter under a rock overhang for a few minutes, the shower passed on. Moisture (or lack of it) is the most significant factor that shapes the desert flora. Xerophytic ferns are morphologically, physiologically, and ecologically adapted to a hot and dry environment; they emerge from drought induced dormancy into sporadic periods of growth when sufficient moisture is present. So it was interesting at this time to note the ferns response to this spring shower. Fronds did not revive instantly, as do mosses and liverworts upon re-hydration. The rather delicate, finely dissected fronds of *N. limiteana* and *C. feei* responded fairly rapidly, however, and within the hour were three-quarters revived. On the other hand, *N. integerrima* and *N. cochisensis*, with their thicker and less divided segments, recovered only slightly in the same time-period.

All these differences were to become trivial by the next day, as the clouds re-formed that evening and produced several hours of torrential downpour that turned the streets of Las Cruces into rivers and ponds. Over an inch of rain fell (in an area that receives under 10 inches annually), a fortuitous event for my circumstances, as there had been no substantial rain-fall in the previous four or five months. I was surprised to learn that most of the annual rainfall comes in the summer, with what is known as the "Arizona monsoon" quite the opposite of the mediterranean climate of my home on the west coast, where rainfall is concentrated in the winter months. As a result, the optimal time for botanical activity in the Mexican border region is autumn, when the plants are at their prime. A spring flora is virtually non-existent.

If I had been aware of this beforehand, I might not have made the trip; for there is little satisfaction in seeing ferns that are completely dormant, curled, and lifeless, like dehydrated sponges. As it turned out, I was just plain lucky; this freak thundershower was sufficient to bring the ferns back to life for the duration of my stay. The next morning I returned to the limestone slopes of Tortugas Mountain; the desert fragrant and alive from the recent rains. In the process of photographing the species I had seen the previous day, I encountered two additional ferns that I would come to see in greater quantity elsewhere, on non-calcareous substrates. There were a few clumps of Eaton's lip fern, *Cheilanthes eatonii*, and also *Notholaena standleyi,* a species with broadly pentagonal fronds, the undersides coated with a yellow wax. The diverse (and perhaps polyphyletic) nature of the genus *Notholaena* was well evident in this one locality.

Tortugas Mountain provided a splendid viewpoint from which to scan the Organ mountains, which dominated the eastern skyline. The Organs are a rather small desert mountain range, only 15 miles long and 2 to 5 miles wide (not much larger than the island of Manhattan), consisting of a north-south trending ridge of piercing granite spires, rugged cliffs, and sheltered canyons. This row of sharp peaks bears a resemblance to organ pipes, hence the name. The range is popular with rock climbers, for obvious reasons, though good fern habitats are easily accessible to the hiker. The ridge rises to an average height of over 8000 feet, with the Organ Needle, at 9012 feet, the highest point, rising some 5000 feet above the adjacent Mesilla Valley. These desert mountains lack dense forests, though many species of trees are found, especially in the canyons and on north facing slopes. Some of the canyons have year-round water, helping to maintain the unusual biotic diversity

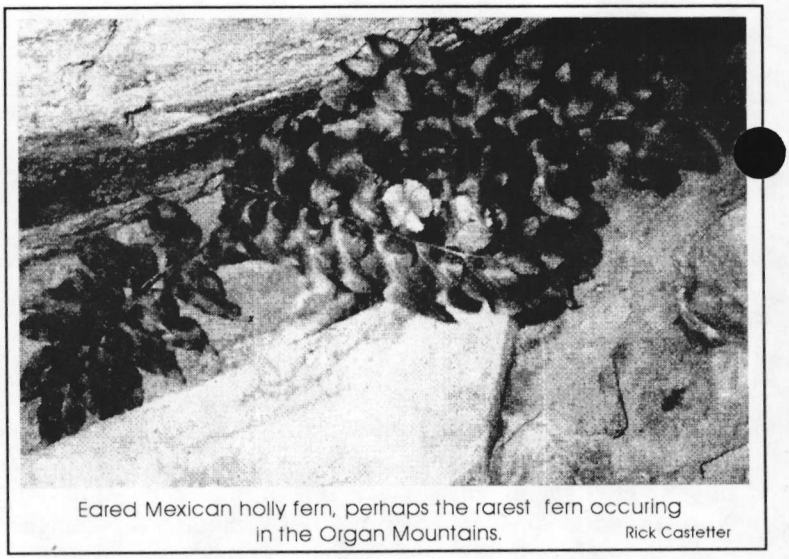


The most common ferns in the Organ Mountains are lip ferns (*Cheilanthes*). 7 of the 29 species of ferns found in these mountains are lip ferns. A dried spike-moss (*Selaginella*) runs from center left to center front. Rick Castetter

My first explorations in the Organ mountains proper were at Aguirre Spring, on the northeast side of the range at 5700 feet, where the Bureau of Land Management maintains a campground and picnic area. The camp is set in an open woodland of live oaks (especially *Quercus arizonica*) and al-

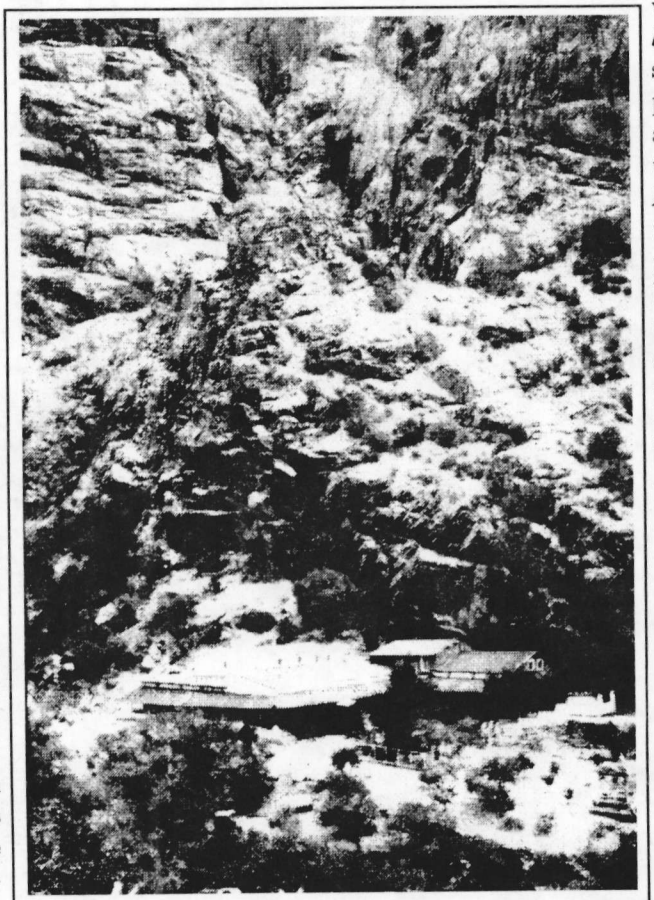
ligator juniper, *Juniperus deppeana*, so named for the resemblance of the bark to alligator skin. Above, the high Organ peaks rise to neck-straining heights; in the immediate vicinity of the camp are numerous outcrops of a coarse pinkish granite rock, abundantly covered (at least on their northern sides) by a greenish crustose lichen. Around boulders and rocks *Cheilanthes eatonii* was fairly common, with a distinctive grayish-green cast to its fronds. Fendler's lip fern, *Cheilanthes fendleri,* was even more numerous, forming sizable mats on rocky banks, the fronds with an olive-green cast. Also present (though scarce) was Wooton's lip fern, *Cheilanthes wootonii.* All three are finely dissected species with numerous bead-like segments, the fronds often 6 to 10 inches tall — which to me seemed large for a lip fern.

From the campground, a loop trail, called the "Pine Tree Trail," wanders up the mountainside. Interestingly, the greatest abundance of ferns was found along the lower portion of the trail, where it seemed that nearly every boulder or outcrop had its own fern colony. Under overhangs and around boulders there were nice clumps of the copper fern, *Bommeria hispida*, with small, hairy, tripartite fronds. It is a member of a small cheilanthoid genus restricted to the southwestern U.S., Mexico, and Central America. On the banks of a rocky wash were several plants of the spiny cliff-brake, *Pellaea truncata*, a large, stiff plant with dusty bluegreen segments. Most spectacular were some very large, even gangly, plants of the wavy cloak fern, *Notholaena sinuata*, with fronds up to two feet long. This species is a member of a small complex that involves two species seen the day before on Tortugas Mountain; *N. sinuata* has hybridized with *N. cochisensis* to form *N. integerrima*, which is a fertile species that reproduces by apogamy. Continuing on, the trail climbs up into stands of *Pinus ponderosa*, intermixed with copses of a deciduous white oak, (*Quercus gambellii*), resplendent in the fresh green color of the new leaves. Along these higher slopes, the woodland supported a number of trees extending from, or with relatives in, the eastern hardwood forests. In addition to *Q. gambellii*, these hardwoods included *Robinia neomexicana, Acer grandidentatum, Fraxinus cuspidata,* and *Ptelea trifoliata*. Reminders, perhaps, of a more humid climate in the distant past.



Eared Mexican holly fern, perhaps the rarest fern occuring in the Organ Mountains. Rick Castetter

But the scenic and pteridological climax of the Organ Mountains was probably Dripping Springs Canyon, on the western slopes directly below Organ Peak. Also known as Ice Canyon, at one time there was actually a hotel and resort refuge from the oppressive heat of summer. Now only crumbling adobe walls remain as a reminder of more prosperous times. It was into this canyon that I was drawn on my final day of exploring the Organ Mountains.



A dusting of snow adds relief to the solid stone backdrop of this turn of the century photo of Dripping Springs. Rio Grande Historical Collections, New Mexico State University Library

Approaching the canyon, I first entered a broad wash studded with live oak and hackberry, *Celtis reticulata*. Adjacent rocky slopes were covered with a spikemoss, perhaps *Selaginella rupincola*; in dry shade of rocks were good displays of *Notholaena standleyi* and *N. sinuata*. Here I encountered the golden cloak fern, *Notholaena aurea*, for the first time, the soft, hairy pinnate-pinnatifid fronds decorating the base of a cliff. The ferns continued as the canyon narrowed, its sheer walls providing much appreciated shade. At the springs proper, a stone wall had been built long ago to collect a pool of the clear spring water. The pool had long since filled in with rocks and gravel, but an outlet pipe still provided a constant water source under which one could take an impromptu cold shower, in the company of canyon wrens and yellow long-spurred columbines (*Aquilegia chrysantha).* But it was necessary to continue on, past the hotel ruins and up the increasingly steep and narrow canyon to find the real treasures. In particular, I was hoping to find the eared Mexican holly fern, *Phanerophlebia au-*

riculata, a rare southwestern relation of *Polystichum* and *Cyrtomium* that occurs at Dripping Springs in its only known New Mexican locality. Scrambling up over the water-polished bedrock, this mysterious fern appeared before me, in the dark, damp recesses at the base of the overhanging canyon wall. There were several dozen plants of *Phanerophlebia*, looking rather *Cyrtomium*-like, but only at this one restricted spot at about 6400 feet elevation. In the same habitat, the black-stemmed spleenwort, *Asplenium resiliens*, was much more abundant, and there were even a number of sporelings of *Phanerophlebia*, and *Asplenium* in the pockets of damp soil!

There were many more ferns in this portion of the canyon, some of which I probably missed for lack of sufficient time to explore. On the canyon wall above the *Phanerophlebia* were mats of the blunt-leaved spike-moss, *Selaginella mutica* var. *limiteana*; another spike-moss nearby was unidentified. On a south-facing slope was a small colony of Wright's cliff-brake, *Pellaea wrightiana*, growing up amongst the spiny pads of a cactus. *P. wrightiana* is a fertile allopolyploid hybrid that originated from the crossing of *P. truncata* (seen the previous day at Aguirre Spring) and *Pellaea ternifolia*. Another species present in this treasure chest of rockferns was the widespread purple cliff-brake, *Pellaea atropurpurea*, easily distinguished by its hairy, dull-brown stipes. Two more species of *Cheilanthes* were here, as well; they were the wooly lip-fern, *Cheilanthes tomentosa* (a primarily eastern species near its southwestern range limit), and fairy swords, *Cheilanthes lindheimeri*, a particularly elegant lip-fern with a dusty, gray-green color.

As the sun moved toward the horizon and the light faded, it was difficult (but necessary) to leave Dripping Springs Canyon and the Organ Mountains, with their bounty of desert ferns.

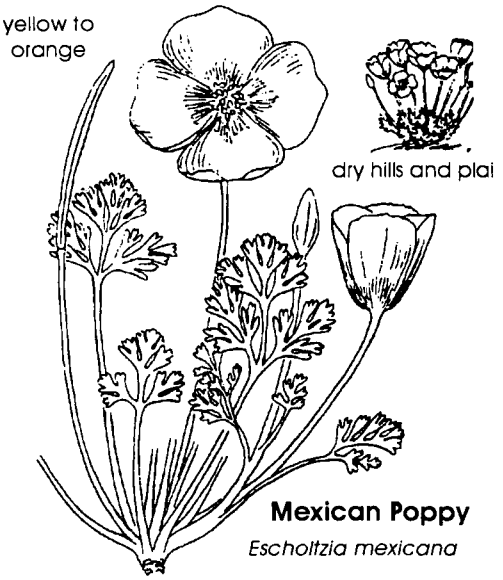
For the (mostly) vicarious explorer, it is most interesting to compare one's mental preconceptions with the actual experience. The biggest surprise for me was the sheer abundance of ferns in the Organ mountains. Sure, I knew that ferns grew in the desert (a fact that is scarcely apparent to the man-on-the-street), but to be so exuberant in their sheer abundance? Come on, gimme a break! So I had to see it to believe it. And I have, and I do.

In all, this first experience with ferns of the desert southwest was a rewarding one for me. But the primary way it affected me was to whet my appetite for another visit!

Walter F. Graf, 63, and a 14 year resident of Albuquerque, passed away on Friday March 29, 1991. Walter had retired from the U.S. Army after 23 years of service. He was always concerned about wildlife and conservation and belonged to many environmental organizations, giving generously of his time and resources. He was an enthusiastic amateur botanist, photographer, artist and collector of useless things. Although he loved to travel to far away places, he was happiest roaming the woods and mesas of New Mexico. He always tried to do his best, and will be missed. Contributions in his name may be made to the Nature Conservency for the Gray Ranch, 107 Cienega, Santa Fe, NM 87501.

Checklist of the Ferns of the Organ Mountains

- ❑ *Asplenium palmeri* - Palmer's spleenwort
- ❑ *Asplenium resiliens* - black-stemmed spleenwort
- ❑ *Asplenium trichomanes* - maidenhair spleenwort
- ❑ *Bommeria hispida* - copper fern
- ❑ *Cheilanthes eatonii* - Eaton's lip fern
- ❑ *Cheilanthes feei* - slender lip fern
- ❑ *Cheilanthes fendleri* - Fendler's lip fern
- ❑ *Cheilanthes lindheimeri* - fairy-swords
- ❑ *Cheilanthes tomentosa* - wooly lip fern
- ❑ *Cheilanthes villosa* - villous lip fern
- ❑ *Cheilanthes wootonii* - Wooton's lip fern
- ❑ *Cystopteris fragilis* - brittle fern
- ❑ *Dryopteris filix-mas* - male fern
- ❑ *Notholaena aurea* - golden cloak fern
- ❑ *Notholaena cochisensis* - Cochise's cloak fern N. sin var cochisensis
- ❑ *Notholaena integerrima* - hybrid cloak fern N. sin var int
- ❑ *Notholaena limiteana* var. *limiteana* - border cloak fern Pellaea lim
- ❑ *Notholaena sinuata* var. *sinuata* - wavy cloak fern
- ❑ *Notholaena standleyi* - Standley's cloak Fern
- ❑ *Pellaea atropurpurea* - purple cliff-brake
- ❑ *Pellaea intermedia* - intermediate cliff-brake
- ❑ *Pellaea truncata* - spiny cliff-brake
- ❑ *Pellaea wrightiana* - Wright's cliff-brake
- ❑ *Phanerophlebia auriculata* - eared Mexican holly fern
- ❑ *Selaginella mutica* var. *limiteana* - border blunt-leaved spike-moss
- ❑ *Selaginella* X *neomexicana* - (hybrid of *S. mutica* and *S. rupincola*)
- ❑ *Selaginella rupincola* - rock-loving spike-moss
- ❑ *Selaginella underwoodii* - Underwood's spike-moss
- ❑ *Woodsia mexicana* - Mexican cliff fern



Mexican Poppy
Escholtzia mexicana

CALENDAR

OTERO

4 May--Plant Sale--Lucille Wilson is in charge - 434-1506. The sale will be from 9:00 a.m. to 1:00 p.m. at the Garden Center in Alamogordo, across from the public library at 10th and Oregon. EVERYONE HELP. YOU WILL BE CALLED. We need people from about 7:00 a.m. until 1:00 p.m. If you want to bring some plants to sell, call Lucille. All plants should be well rooted before the sale.

25 May--John Connor of the Forest Service will lead a trip to look at endangered plants in the Sacramentos. MEMBERS ONLY. Meet at the Medical Center in Cloudcroft at 9:00 a.m. Bring a lunch.

22 June--Paul Gordon and Charley Pase will lead a trip to the Experimental Forest in the Sacramentos. Meet at the Cloudcroft Medical Facility at 9:00 a.m. with a portable lunch.

27 July--Field trip to Jack Peak-We will go through the Jicarillas and return through Ancho. Meet at 9:00 a.m. at Carrizozo on the N.E. corner of the intersection at the parking lot of the little store. Paul Gordon and Charley Pase are the trip leaders. Bring a lunch.

GILA

19 May, Sunday, 9:00 A.M.-- Field trip to Bead Spring. Bead Spring is accessed from State Road 78, the Bursum Road, at the Sandy Point Trailhead east of Mogollon. This is the area where Hummingbird Ski Area has been proposed. The trip leader is Deb Swetnam - 388-3086.

30 May, Thursday, 7:00 p.m.--Monthly meeting at the Carter House. One of our more recent members, Jack Carter, will give the program.

2 June, Sunday, 10:00 A.M.--Field trip to Mineral Creek. A small tributary of the San Francisco River, Mineral Creek can be reached by driving east from Alma (north of Glenwood) on forest road 701. Several miles up the road we will pass a large boulder (Cooney's Tomb) which marks the grave of an excavalryman killed by Apaches. At the end of the road a trail continues along the creek, a beautiful riparian area. The trip leader is Frank Knaus - 388-2371.

27 June, Thursday--Program: Flowers of China by Anita Morton.

30 June, Sunday, 9:00 A.M.--Field trip to the Sheridan Corral. Access is by forest road 146 off highway 180 between Leopold Vista and Pleasanton. The trip leader is Jay Hammel - 538-2859.

25 July, Thursday--Program: Rare and Endangered Plants by the U.S. Forest Service.

LAS CRUCES

EVERYONE IS WELCOME. Programs are on the second Wednesday of the month at 7:30 p.m., room 190 in the Ag. Building (Gerald Thomas Hall), NMSU. Field trips are on the Sunday following the meeting. We meet at 8:00 a.m. at the north-east end of the Pan Am Center parking lot unless otherwise indicated. Bring a lunch, water, a hat, sunscreen, wear good walking shoes and dress for the weather. A native plant field guide is recommended.

8 May--PROGRAM: "Leaves" by Alice Anderson.

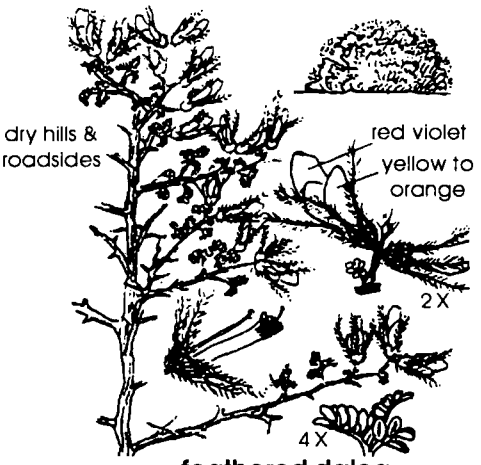
12 May--Field trip to Springtime - Luna Campgrounds.

12 June--PROGRAM: "The Forest Service and Endangered Plants" by John Connor.

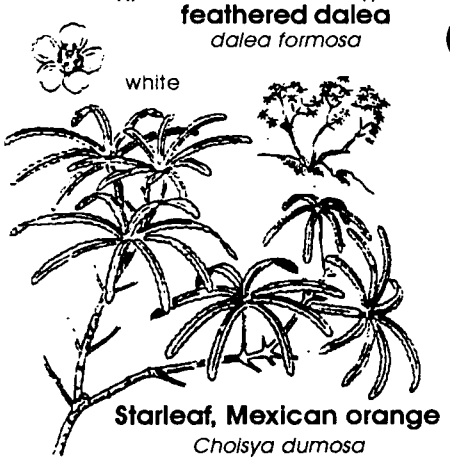
16 June--Field trip to Karr Canyon. We will have a pot luck lunch so bring your favorite dish and eating untensils.

10 July--PROGRAM: "Show and Tell" about native plants.

14 July--Field trip to Emory Pass. Optional camping trip. We will meet on Saturday at a campground nearby (to be announced).



feathered dalea
dalea formosa



Starleaf, Mexican orange
Cholsya dumosa

Many thanks to Robert Dewitt Ivey for permission to use his wonderful drawings from "Flowering Plants of New Mexico, second edition, in our newsletter

DON'T FORGET POSTER SALES

CHAPTER REPORTS

Otero - Jean Dodd

Members Jack Bristol and Wynn Anderson of UTEP told us about plans for the redesigning of the El Paso Centennial Museum grounds to reflect the El Paso desert landscape. When complete it will be a teaching garden both for school children, university students, and the general public. As an attractive garden it will be used as a retreat and for receptions.

The aim is to show people what native plants look like in a landscape. El Paso will raise water rates to discourage use of thirsty lawns and exotic plants. Watering will be allowed on a specified schedule so El Pasoans will, of necessity, learn to live in an arid environment where water is precious. To help them do this the complex will feature mulches, ground covers, runoff collection, drip-irrigation, and re-circulating fountains to illustrate water conservation. Ramadas of differing heights will be used to act as wind buffers and provide shade.

A mini botanical garden will show off the flora of the Chihuahuan desert. Part of the garden will serve as an ethnobotanic laboratory to show how plants have been used in the past and can be used in the future. Right now the project is very much in the fund raising stage. Any help would be appreciated including furnishing native plant seeds. The museum will be helping us by selling our posters. If you want to help in any way contact Jack Bristol, 2009 N. Campbell, El Paso, TX. 79902 or Wynn Anderson, 3015 Piedmont, El Paso, TX. 79902.

Otero held a Landscaping With Native Plants Seminar in Tularosa on March 24 with a panel consisting of members Tom Wootten of Las Cruces, Judith Phillips of Veguita, John Morton of La Luz, and Lisa Johnston of Artesia. Tom spoke on "Local ecology and its influence on landscape choices", Judith-"Ecology based landscape design", John-"Native grasses for lawns and ornamental use", Lisa-"Considerations in selecting plants for landscapes". All members of the panel had an input on 60 slides covering trees, shrubs, wildflowers, and grasses. Members of the audience were furnished a copy of the topic outline from each member of the panel as well as a list of the plants covered. Discussion of specific plants included plant ranges because members of the audience live from 7500 ft to the flats of the desert in Las Cruces (4000 ft).

As luck would have it the April issue of the New Mexico Magazine came out before the seminar with an article on landscaping with natives including an interview with Judith. That same day the El Paso Times had a full page article on xeriscapes. Their water board is considering mandatory xeriscaping. El Paso has just passed extensive restrictions on water use including requirements in the building codes for water saving devices.

We were fortunate to have Ted Hodoba of the Albuquerque chapter for our April 13 trip to a canyon south of Alamogordo. He helped us to identify the large variety of cacti and succulents that we saw. Most of the cacti were in bud. It is just the right time of year for blossoms and fragrance from many plants in that area. We saw lots of *Penstemon alamosensis* in full bloom, the fragrant *Choisya dumosa* with its white flowers, and the flowering ash (*Fraxinus cuspidata*) blooming all along the wash. We saw the most *Hibiscus denudatus* we had ever seen on a trip. We saw them in the Pelancillos. They had bare stems, but there were one or two blossoms on the bare branches. We stopped to see the delightful, very fragrant *Amsonia longiflora* on the roadside. It is the same plant we saw last year. It is the only one we have ever seen and it doesn't seem to be multiplying.

Gila - Ron Flemke

Due to heavy rains in early February the field trip to Steeple Rock was cancelled. At our February meeting Marian Zimmerman wowed us with some spectacular slides from Morocco. not only did we see some unusual plants but also some great photos of birds and their diverse habitats in that country. Thank you very much Marian.

On March 28th Ralph Ford-Schmid, a member of the Western New Mexico Biology Club, presented a program about a study he had conducted on germination techniques for various species of penstemon. Ralph found that the length of cool, moist stratification time needed for successful germination varies greatly from one species of penstemon to another. Space permitting, the results of this study will be published in a later Gila Bulletin.

We decided not to become involved with designing and installing a native plant landscape for the first Habitat for Humanity house being built.

See the April issue of New Mexico Magazine for an interesting article about landscaping with native plants.

There will be a Board of Directors meeting for the state organization on Sunday, May 5th at noon at the Bosque del Apache Wildlife Refuge near Socorro. Can anyone attend this meeting to represent our chapter? If so, please contact Bob or me.

From an original 95 wildflower posters we have only 10 left! In addition to posters being donated to schools by the Town and Country Garden Club the GNPS is also donating 5 posters to area schools. This will cover 211 schools both public and private in the area, including: Cliff, Central, Bayard, and Hurley.

There will be a Spring cleanup of the native plant garden at the Silver City Museum on April 13th at 1 p.m. Please show some support and lend a hand.

The wildflower posters are here and are beautiful. Lucy Nolan has them. They are available to GNPS members at $7.50 each with a suggested retail price of $8.00. While at Lucy's take a look at her book catalog. If we can put together a large enough order we can

continued next page

receive a substantial discount. After the business meeting at our January meeting, Bob O'Keefe quizzed us on pruning techniques. By reviewing the correct answers on this short test, Bob gave us a very informative program about pruning. Thanks!

Las Cruces - Paul & Betty Shelford

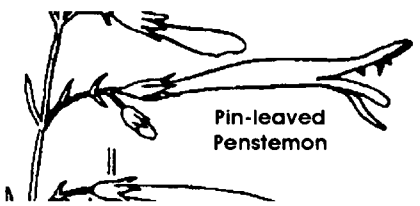
At our March meeting we discussed the forthcoming Earth Day activities. We will not only be selling the Spring and Summer Wildflower posters, but artist Nicki Threlkeld will be there to sign the posters. Tom Wootten spoke of holistic range management and also the need for members to write legislators to indicate the need for changes to the state and federal mining laws.

Dave Richman, NMSU professor of horticulture, talked and showed slides of epiphytic plants: free-living plants, not parasites, that grow on other plants. There are some 25,000 species of epiphytes in the world, although only one species is found in New Mexico. It is the reindeer moss which grows in the higher reaches of our mountains. He showed slides of orchids and ferns growing in Puerto Rico and in the neotropical areas of Florida.

We took a field trip to Black Mountain to seek out native plants in the blown-in soil of the black lava area. The only plants flowering were spectacle-pod mustard, scorpion weed, nama and paper flower, but at least 30 species were identified as we ranged over several hills on the lower slopes of this volcano crater. Of particular interest was the sand prickly pear cactus.

"Landscaping with Native Plants: Fact, Fiction and Fantasy" was the subject presented by Norm Lownds, NMSU professor of horticulture, at our April meeting. Due to the lack of definitive research, we don't really know what "Landscaping with Native Plants and Wildflowers" is. Landscapes are always changing, and there is considerable difficulty in comparing water use between one plant and another. The statement that "landscaping with native plants means no maintenance" is false. The assumption that native plants use less water is also dubious and probably false as well. Xeriscapes can reduce water use from 30 to 60%. There are seven principles of xeriscape landscaping: 1) Plan and design to conserve water; 2) Limit turf area to specific functions, such as evaporative cooling, children's playing area, etc; 3) Soil preparation; 4) Use mulches for water conservation; 5) Have an efficient irrigation system; 6) Use plants that are known to have low water requirements; 7) Maintenance is required.

Our April field trip to the Dona Ana mountains included several stops along the roadside to see the many native plants now coming into bloom. There were many Mexican poppies along with evening primrose, lupine, loco weed, wallflower, five-needle dogweed, fetid marigold and, of particular interest, the feathered dahlia. Six different varieties of the mustard family were identified on this trip.



PENSTEMON SOCIETY TO MEET IN NEW MEXICO

June 1, 2 and 3 will be the dates for a Southwest Regional Meeting of the American Penstemon Society this year. The group will meet in Albuquerque and go to Chaco Canyon, where *Penstemon angustifolius* puts on a great display, and then to El Morro and El Malpais, where we can expect to see about six more species. We plan to spend the night in Grants and return to Albuquerque the next afternoon for visits to Albuquerque gardens that feature penstemons. In the evening there will be a slide show, to which everyone is invited to contribute their best penstemon pictures, at the Albuquerque Garden Center. Monday morning the group will travel to Santa Fe to visit more gardens and nurseries. The meeting will end about noon on Monday. Final details of places to meet, to stay and to eat, and times, will be worked out by the first of May. Anyone with an interest in penstemons is welcome. For more information please call or write Ellen Wilde, 110 Calle Pinonero, Santa Fe, NM 87505. (505) 982-1406.

REMINDER: DUES INCREASE

Let this serve as a final reminder of the dues increase which was voted on at the board meeting on Fevruary 10, Dues will increase from $8 to $10 per year beginning July 1, 1991. You may pay your dues in advance at the old rate ($8) and for as many years in advance as your like, as long as they are received before July 1. Pay your dues through your local chapter or send directly to Jean Heflin, membership secretary, 443 Live Oak Loop NE, Albuquerque, 87122.

PRESIDENT'S MESSAGE

By the time you read this two important events will have passed: tax day and Earth Day. I hope you all survived tax day reasonably well.

As for Earth Day, Earth has survived another year. I really expect the planet itself to be around for quite some time. It is what is on the planet that is the real concern. More or less daily, some form of life becomes extinct, usually because of some action by Man.

Our newest chapter, the Carlsbad Madron chapter, has tentatively agreed to host the state meeting of NPS-NM later this year, with the Living Desert Museum as co-host. Although no date has been set, everyone who can should try to attend. The state meetings are a good way to visit another part of the state and, best of all, to meet others with similar interests.

With warmer weather finally here the natives are growing and blooming. Get out to observe them, study, and get to know them, and enjoy them!

Bob Reeves

MESCALERO APACHE MESCAL ROAST AND MOUNTAIN SPIRIT DANCERS

The popular Mescalero Apache Mescal Roast and the return of the Apache Spirit Dancers will take place at Living Desert State Park in Carlsbad May 16-19, 1991.

Historically, both the Pecos river valley and guadalupe Mountains were traditional hunting and gathering territories for the mescalero Apaches over countless hundreds of years. Their rock lined mescal roasting pits are probably the most significant and best known archaeological sites in the Guadalupes and Southeastern New Mexico.

It is the mescal plant—better known as the spike-leafed agave or century plant— that has lent its name to the Mescalero Apaches. This visit of Apache mountain spirit dancers marks only the fourth time in many generations that their sacred rituals will be performed in the Pecos Valley/ Guadalupes area.

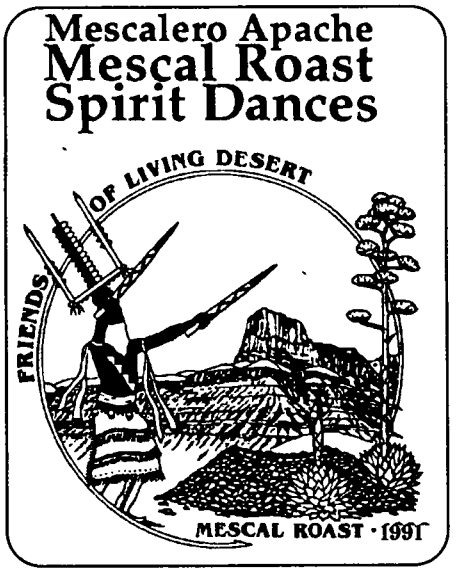
Generally, the purpose of Indian ceremonies like the mescal Roast is to bring people together to share nature's bounty and help set aside personal differences.

In the case of the mescal roast, the celebration at the Living Desert reenacts the ancient way of preparing this essential food. The Apaches called it mescal. We know it by the more familiar name of agave or century plant.

Mescal was a reliable food source with excellent storage properties. It could be easily dried and transported as the tribe moved to new locations. Mescal was literally a staff of live for these seminomadic Apache peoples who roamed the desert in what is now southern New Mexico, west Texas, and northern Mexico.

Harvesting Mescal Plants

As in past years, traditional counselors of the tribe come to Carlsbad before



the roast to harvest the agave plants and supervise the lighting of an oak-branch fire in the mescal pit. To prepare the agave for roasting, the spike-tipped leaves are carefully cut away leaving the agave heart. The heart looks somewhat like an artichoke heart, but is about the size of a pineapple or cabbage head.

At the opening ceremony on Thursday, the eldest traditional counselor begins by offering a prayer in her native Indian language. This bestows a blessing on the mescal pit, the Living Desert State Park, and the city of Carlsbad. Next the cabbage sized mescal hearts are thrown into the pit onto the bed of red hot coals.

As part of the ritual ceremony, a youth will throw mescal into the center of the pit. The pit is then covered with grama grass and burlap to seal in the heat and moisture.

Finally, after four days of cooking, the pit will be reopened at noon on Sunday. In keeping with Apache tradition of bringing people together, the cooked mescal will be shared with Park visitors. Roasted mescal tastes sweet—almost sugary. Many pieces are soft and smooth like the meat of an apricot or peach. Others are more stringy, like an artichoke heart.

Dance of the Mountain Spirit

On Friday and Saturday evenings, the second highlight of the Mescal Roast ceremony will be two evenings of Dance of the Mountain Spirits. This will be performed after dark as is done during sacred ceremonies of the Mescalero Apaches, where a small fire burns in the pit of a medicine teepee. Small cooking fires still smoulder in the arbor of oak brush.

But most eyes are on the giant bonfire in the center of the ceremonial circle as its flames arch skyward. A group of singers near the big fire start an age old chant in Native American language. Then at the proper moment, five mysterious figures dance into the circle, swaying, posturing, and gesticulating.

Four of the figures are black with red masks. Their upper bodies are painted black with symbols in white on their chests and backs. Each wears a mystical headpiece or crown, and buckskin skirt and leggings. Each dancer brandishes a broad wooden stave-like sword or wand in each hand. A fifth figure is masked and painted in white. Tied to the rear of his belt may be a cowbell that clangs as he stomps, prances, and jests.

The group of five circles the fire dancing and chanting. They circle the fire, charge into the flames, thrust their wands at each other and at the onlookers. This is the Dance of the Mountain Spirits. To understand it and recapture the performance of long ago, look deeply into the dancing flames and dark shadows. picture in your mind this old Apache legend of the first men who saw the mountain spirits.

As it was told to the Apache elders in their youth, the legend behind this dance is as fascinating as the dance itself. It deals with the healing powers of the spirit dancers who suddenly materialized in a lonely cave high in the mountains. The spirit dance is recreated to drive away sickness and evil and to bring good health and good fortune.

MAINTAINING THE NATIVE GARDEN

Susan Wachter

Summer Tips

1. Unless you are collecting the seed, remove flowers when they fade. Even then limit seed development to prolong the flowering stage. Early flowering meadows should be cut back after bloom to reduce seed set.

2. Most plantings will need water at least every week to every two weeks depending upon plants and climate.

3. Mulches help retain moisture, apply them as necessary. The ground around the plant should be covered sufficiently to remain cool and dark.

4. Sow buffalo and grama grass lawns when night temperatures become warm. This can be as early as April in southern New Mexico and June at the higher elevations.

5. Sow perennial flower seeds for next year in mid-summer. Don't count on summer's rains to water sufficiently.

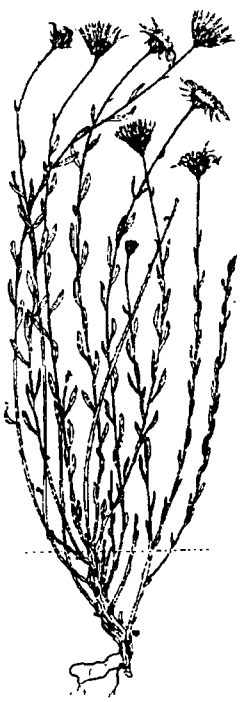
6. This is the time to take soft wood cuttings.

7. Plants, such as forestiera and desert willow, that tend to sucker when pruned should be pruned now.

8. Warm temperatures bring new insects, red spider mites in particular. Natural predator populations always lag behind populations of their prey. If spraying becomes necessary, first look to the less environmentally damaging products from companies such as Safer's.

small-headed goldenweed
Haplopappus microcephalus

The two illustrations used on this page are from; A Handbook of Rare and Endemic Plants of New Mexico, 1984, University of New Mexico Press.



Zuni Fleabane
Erigeron rhizomatus

VOLUNTEERS AND INFORMATION NEEDED

The State of New Mexico, through the Forestry and Resources Conservation Division, is responsible for developing lists of rare and endangered plant species in the State. We also work for the U.S. Fish and Wildlife Service to research rare plants that are candidates for Federal listing under the Endangered Species Act and perform recovery projects for species that are already listed. Sound like fun? Well you can help. This summer we will be doing distribution and population surveys for five species of rare plants. These include the Zuni fleabane *(Erigeron rhizomatus)* in the Zuni and Datil Mountains; the Acoma fleabane *(Erigeron acomanus)* near Grants; Kerr's milkvetch (*Astragalus kerrii*) in the Capitan Mountain vicinity; the small-headed goldenweed (*Haplopappus microcephalus*) west of Tres Piedras, and; the puzzle sunflower (*Helianthus paradoxus*) in the lower Pecos River valley.

If you have a few days or a few weeks to spare, a desire to explore some of the more remote places in New Mexico, are able to hike all day over rugged terrain, have reliable transportation and can work on your own with a minimum of supervision, then you may want to join us on one or more of the above expeditions. If you are not particularly interested in the above plants, we have a list of over three hundred species for which we need more information. Anyone who feels they might have information or time to contribute to rare plant conservation in New Mexico should give us a call at (505) 827-5830 .

Bob Sivinski and Karen Lightfoot-NM Forestry and Resources Conservation Division

BOOK REVIEWS

COLORADO FLORA

By William A. Weber

William A. Weber has become a legend in his own time. Recently retired as curator of the University of Colorado Herbarium his has been a career spanning five decades during which he brought our knowledge of Colorado flora to a peak. In doing so he has built on the shoulders of giants-among them Harold D. Harrington. author of *Manual of Plants of Colorado* [1954], still the only complete flora of Colorado with keys and descriptions. But his primary contribution has been to hearken back to the earlier botanists who lived in the West and were largely ignored by the Harvard establishment. Chief among them were Edward Lee Greene. 1843-1915. Aven Nelson 1859-1952, and Per Axel Rydberg, 1860-1931.

Weber's studies in the Rocky Mtns. and more recently in Europe and the Altai in Russia, led him to bring back many of the generic names given western flora by these perceptive people. This is the main source of Weber's sometimes controversial and often troublesome nomenclature. He is not so much introducing a new nomenclature as resurrecting one proposed a century ago. This is probably the only problem with Weber's latest and probably last field guide, Colorado Flora: *Eastern Slope,* 1990, University of Colorado Press, Niwot Co, 80544. Beyond that it is a real gem. *Eastern Slope* (ES) builds on Weber's two previous floras: Rocky Mountain Flora, 1976 (of which ES is a complete revision) and Colorado Flora: *Western Slope, 1987*. These three have much in common and, if you have been using either,ES should provide a most convenient companion. As you might suspect, the dividing line between these two floras is the continental divide. Thus WS can be used into Utah while ES contains flora of the great plains also.

In the WS and ES floras reside all the plants of Colorado (ferns, gymnosperms, monocots, and dicots)—2260 species, and so you need to learn a bit to use them. If you have never used a serious field guide (this is no "Wildflowers Made Easy"), here might be a fine start. More introductory level field guides, Ruth Nelson's (yes, she was Aven's wife) Guide to Rocky Mountain Flowers. or Dewitt Ivey's Flowering Plants of New Mexico 2nd ed. are excellent in their own right as well as being preparation for Weber's complete flora. But Weber helps too in the early pages of both ES and WS. He is well aware that no large flora can be used if the reader doesn't pretty much know what family the specimen comes from, and so he discusses how to know his "big 22" families which contain 80% of all species.

Also included in these introductory pages are fascinating discussions of Weber's own career, spent entirely at Univ. of Colo., and descriptions of the major ecological areas of the eastern slope, particularly of the "parks". Weber lists all the families in three columns, latin, common, and three letter acronym. Thus we have, Nyctaginaceae, Four-O'clock, NYC, and Asteraceae, Sunflower, CMP/AST (the CMP because this family has recently been renamed from Compositae to Asteraceae). Weber also gives an excellent discussion on how to collect and preserve botanical specimens including much wise advice on what form herbaria usually want contributions. The introduction goes on to discuss terminology and plant structures with advice for further reading. These suggestions are badly needed because ES really makes no attempt to teach plant structure. The introduction finishes with brief descriptions of botanists honored in Colorado plant names. Thus under Greene, Edward Lee, 1843-1915 we read, "field botanist and clergyman in Colorado and New Mexico, later botanist at the University of California, Berkeley, one of the most knowledgeable persons of his time as to the Colorado flora."

Turning to the end of the book we encounter over 100 pages of superb botanical sketches of some four hundred species. Many of these appeared in Weber s two earlier floras, but many are new. (The guide also contains 64 color plates of particularly interesting species). The book concludes with an extensive glossary of botanical terms, and indexes to common names and genera.

But the above does not do justice to this Flora, for it is deep within the keys that Bill Weber is at his best. Interspersed are not only helpful hints to identification. but also pithy or wistful remarks about the species. His brief introductions to the families are gems of insight and information as well as personal comment.

For instance:
"LAMIACEAE/LABIATAE (MINT FAMILY): What would be left of the good life if we did not have this family? For scent, flavor, and that little something extra in our foods We depend on mints: rosemary, lavender, sage, spearmint, peppermint, basil, thyme, horehound, marjoram, oreg-ano, and savory! *Citronella was* once the only reliable insect repellant. Coleus plants used to be in every home, before we learned about African violets. Probably only the Apiaciae come close to supplying as many important culinary herbs."

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A few other quotes:

About gentians—"While the tradition in America has been to lump all gentians into a single genus, the genera recognized here are distinct on morphological grounds chromosome numbers, electron-microscopic characters of the pollen grains, and life histories."

On where Happlopappus spinulosus went- "Machaeranthera pinnatifida (Hooker) Shinners.....This and other yellow-flowered species eventually may be transferred to other genera, since they do not fit too well in *Machaeranthera.*

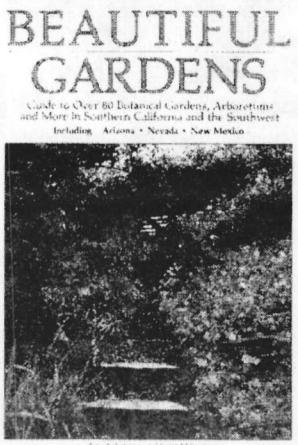
On a change in nomenclature probably derived solely from friendship and respect—ASKELLIA Weber, 1984 "for Askel Love, 1916-, renowned Icelandic botanist and cytogeneticist....Askellia nana (Crepis)"

In summary, the book is a joy to have and will undoubtedly replace most other guides to Colorado and the nearby Rocky Mountains. I close with Weber's own words from his Introduction:

"In such matters the reader is requested to bear with the author, for a definite statement subject to modification is often preferable to silence. Plants with blue flowers will throw white-flowered mutants. Low plants growing on a well-manured site may assume giant proportions. And the beginner will always find a flower with six petals when there should be only five. One of my old bird-watching mentors always used to mumble under his breath: 'Birds don't read books.' Neither do plants."

C. F. Keller

BEAUTIFUL GARDENS

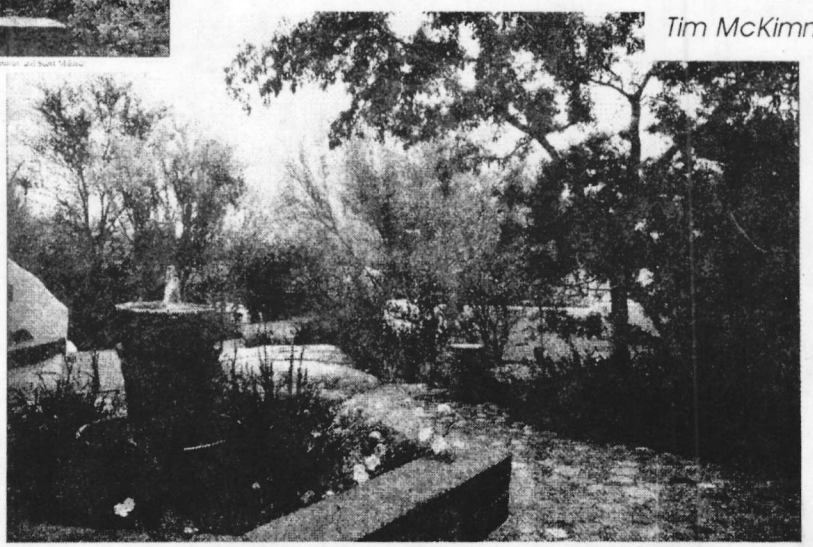


Travelers of the southwest with an interest in plants and landscaping will benefit from carrying this book in the car when vacationing. Numerous color photographs are included in this guide to over 80 botanical gardens, arboretums, private estates, and commercial nurseries in New Mexico, Arizona, California, and Nevada. Many of the sites emphasize water conservation and native plantings.

A four state map of the sites permits planning ahead for visits. Directions are also included for the larger sites. The general layout of the gardens, plant types to be found, histories of gardens, and fees (if any) are given. The book also contains an index.

The authors' (Eric A. Johnson and Scott Millard) credentials include writing for Sunset, Arizona Highways, Ortho, and HP books. Beautiful Gardens is published by Ironwood Press and sells for $12.95.

Tim McKimmie



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