



MAMMILLARIA THORNERI

Espinas y Flores

NEWSLETTER of the SAN DIEGO CACTUS & SUCCULENT SOCIETY, INC.
A Non-Profit Public Benefit California Corporation
VOLUME XXXIII NUMBER SEVEN SATURDAY, JULY 11, 1998 @ 1:00PM



July Program: Kelly Griffin

Aloes, A Broad View & Closer Look

Kelly tells us that the program will explain the title. So you must attend to find out! You will see plants you have never seen before. It should be an interesting adventure with a few surprises. This is a new program by our own SDC&SS member Kelly Griffin. Even if Aloes do not catch your fancy, Kelly promises that you will see them in a new light after seeing this presentation.

Kelly, who has been in charge of scheduling programs for the SDC&SS this year, also has this to say, "Just a heads up, the August program will feature Chris Barnhill, well-known botanist and noted photographer — see cover of May-June 1998 CSSA Journal. In the August program Chris will be focusing on Bulbines and Lithops."

Our cover: "A small group of three lesser long-nosed bats (*Leptonycteris curasoae*) hang from a dark cave ceiling roost after returning from a night on the Sonoran Desert. Their floral liaisons are betrayed by their whiskered muzzles splattered with pollen from century plants in the genus *Agave*."

Illustration by Paul Mirocha; taken from **THE FORGOTTEN POLLINATORS** by Stephen L. Buchmann and Gary Paul Nabhan of the Arizona-Sonora Desert Museum, Island Press / Shearwater Books, Covelo, CA; copyright 1996.

Please send your letters, artwork, poetry, Cactus or Succulent-of-the-Month articles, puzzles, comments, or criticisms, etc. to:



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*** NOTICE *** NOTICE *** NOTICE ***

☹ The July 11-12th Bus Trip to CSSA Show & Sale @ the Huntington Botanical Gardens has been cancelled. We were unable to find anyone willing to assume responsibility for this trip. Since we will be up there participating in this event, we cannot be down here riding the bus! If you have already paid for this trip and your money has not been returned, please contact our treasurer **Herb Stern**.

July 11 - 12: CSSA 33rd Annual Show & Sale @ Huntington Botanical Gardens. 1151 Oxford Road, San Marino 10:30 am to 4:30 pm Saturday — 10:30 am to 4:00 pm Sunday. Set-up Friday, July 10th 10:30 am to 5:30 pm. Judging begins @ 6:00 pm on Friday, July 10. All exhibitors must be members of the Cactus & Succulent Society of America or an affiliate thereof. CSSA show prohibits field collected plants in the judged portion of the show. For additional info contact show chairmen: **Duke Benedom (805) 526-8620** or **Joe Clements (909) 624-2282**.

July 25 - 26: Nor-Cal Cactus & Succulent Association Show & Sale - San Francisco County Fair Building at Ninth Avenue & Lincoln Way in Golden Gate Park, San Francisco; info: (415)665-8101.

August 22 - 23: Inter-City Cactus & Succulent Show & Sale @ the L.A. Arboretum, Arcadia — 9am to 5pm. We think this is the biggest & the most fun show. Every year it seems to get better - if this is possible. Show is open to all who wish to participate — please contact Larry Grammer (562) 599-1146 or Woody Minnich (895) 944-2784 if you wish to participate. Or if you can help — volunteer to work during set-up or teardown, or help with sales, tabulations, clerking, holding area, etc — you will learn what it takes to create a truly notable show! Besides being well organized both with regards to the sale and the show, this event features several very original & interesting related activities. Among them are the Alternative Awards, such as "The Hercules Hernia" Award for the heaviest entry and the "Gods Must Be Crazy" Award for the most out-of-this-world UFO entry. This year the show theme is **Creating Habitat**, and as in the past, there will be Walks, Talks & Demos cover such topics as Landscaping with Cacti & Succulents by Bill Baker & Joe Clements, Mimicry Succulents by Michael Vassar, and Staging Cacti & Succulents as Miniatures by Monte Woodworth & Joyce Buckner. For more information regarding this terrific show & sale please contact **Carol & Joe Wujcik @ (714) 963-3146** or <cawujcik@aol.com>.

October 23 - 25: Sonoran 2 - A Cactus & Succulent Conference - Seminar - Symposium in Tucson - For more information regarding this terrific event contact: **Carol Clapp**, P.O.Box 91560, Tucson, AZ 85752-1560; phone (520) 908-9001 or e-mail://www.desertcactus.com/tcss/ or kitfox@azstarnet.com.

THANK YOU! THANK YOU! THANK YOU!!

DEL MAR FAIR PARTICIPANTS & CONTRIBUTORS:

We hope you all get a chance to visit the San Diego Cactus & Succulent Society's exhibit at the Del Mar Fair. It is located right up front — the first exhibit you will see when you enter the main gate (O'Brian Gate). This exhibit would not have come together if not for the contributions and dedicated work from the following members: **Ken & Deena Altman** - for loaning us most of the beautiful succulents used in the exhibit; **Michael* & Joyce Buckner** - for loaning all of the rest of the succulent plants used in exhibit, including the Brachychitons which received "A Notable Plant" Ribbon! Michael created the garden design, obtained the raw materials, managed the overall construction, and took the photographs. Joyce put together the podium, did the typesetting, recordkeeping and made sure that all volunteers got enough to eat and drink! **John Devlin of Canyon Pottery Company** — for loaning us all the wonderful ceramic containers used in this exhibit. Next time you go to Canyon Pottery - tell them you saw it at the SDC&SS exhibit at the fair! If you have never been to Canyon Pottery — you are paying too much for your pots! Located in Mission Valley — 1544 Frazee Road, San Diego, CA; phone (619) 298-5157, Canyon Pottery has the largest selection of plant containers in San Diego County; **Sabrina Berry*** - for planting up many of these pots, for sketching a map and writing out the Latin names of all of these plants — NO SMALL FEAT!!, and for organizing and putting on an awesome BBQ on Saturday night! **Claudia Brown** - of the Palomar C&SS for the nice drawing which we matched up to Sabrina's plant names; **Monte* & Mary Woodworth**, **Rick Plant***, **John Williams***, **Jeff Wright***, **Alex Murphy***, **Paul Steward**, **Jeff Harris**, **Thomas & Laura DeMerritt**, **Ed & Debe DeLollis**, **Douglas Buckner**, **Stan Yalof** and **Susan Hopkins** — for all the Bad-Ass physical labor they put into creating such a nice display of succulent plants. And Special Thanks to **John Williams** who spent all of Sunday morning cleaning, watering, sweeping, and polishing while most of the rest of us were sleeping off Saturday night!

* Please Note: All members with * contributed no less than ten hours of hard labor towards the SDC&SS Exhibit — many have the blisters to prove it! If you enjoyed the exhibit — please give them a special thanks.

ψ The Monthly Benefit Drawing

May's Benefit Table contained several exciting specimens which were selected with the intention of enticing even our most jaded members — and that it did! Ticket sales were up! We would like to thank the following members for their contributions to the benefit table:

Betty Athy for the *Phalenopsis* hybrid; **Joe Quijada** for the *Echinocactus grusonii*; and **Michael & Joyce Buckner** for the *Euphorbia lactea spiralis*, and two TEX pots.

Thank you **Betty Athy** for procuring these wonderful specimens. Remember donations of plants or any other cactus & succulent related item are gratefully accepted.

Additionally, (I am now putting on my "Head Clerk" Hat.) I would like to acknowledge and thank the following members who arrived here very early on the morning of Saturday, June 6 to clerk: **Lee Badger**, **Joyce Buckner**, **Phyllis Flechsig**, **Sandy Frost**, **Kenny Graham**, **Camille Horak**, **Rudy Lime**, and **Herb Stern**; and to my tabulators: **Jeff Harris** and **Don Patterson**.

Thanks, **Kay Quijada**

BRAG TABLE WINNERS FOR MAY 1998:

JUDGED BY ED NOLAN

SUCCULENT:	FIRST PLACE:	Alan Weiss's <i>Pachypodium baronii</i> var. <i>windsori</i>
	SECOND PLACE:	Joe Quijada's <i>Sinningia leuchotricha</i>
	THIRD PLACE:	Don Patterson's <i>Aloe superfoliata</i>
CACTUS:	FIRST PLACE:	Shirley Berry's <i>Cochemea maritima</i>
	SECOND PLACE:	Don Patterson's <i>Sulcorebutia rauschii</i>
	THIRD PLACE:	Shirley Berry's <i>Mammillaria plumosa</i>

Tell them you read it in **ESPINAS Y FLORES!!**



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Please Bring in Goodies

SAN DIEGO'S RAREST NIGHT TIME CACTUS AFICIONADO

Submitted by Karen Miner

SAN DIEGO BAT CONSERVATION

One balmy September evening, Marc was sitting in Bruce's well-established cactus garden enjoying a cold beer and watching the flower bud on a *Cephalocereus palmeri* open its bloom to the night sky. Suddenly out of the darkness something swooped in and thrust its head deep into the throat of the flower, then just as quickly disappeared. It was later determined that the night time visitor was a Mexican long-tongued bat, *Choeronycteris mexicana*.

This highly migratory species of leaf-nose bat is known to eat the pollen and nectar of columnar cacti and agaves and is primarily distributed throughout Mexico. It only reaches into the U.S. in southern Arizona, southwestern New Mexico and western San Diego County. Less than 500 individuals have been documented in the U.S. since 1906, with few reported in San Diego since 1946, when over 30 were taken during what was termed an "invasion".

Research has shown that Mexican long-tongued bats typically roost in small groups of less than a dozen and sometimes up to 40 individuals. They hang from the ceiling by one foot, within a few inches of each other, and warily scan for potential intruders. They are usually found roosting in dimly lit shallow caves, mines or rock shelters. In western San Diego County, however, they have only been documented roosting in buildings, such as garages, laundry rooms or under porches, where they roost

alone or in groups of less than seven individuals. They typically occur in the other U.S. sites primarily between May and October, when they bear their single young. In San Diego they have only been found between the months of September and January.

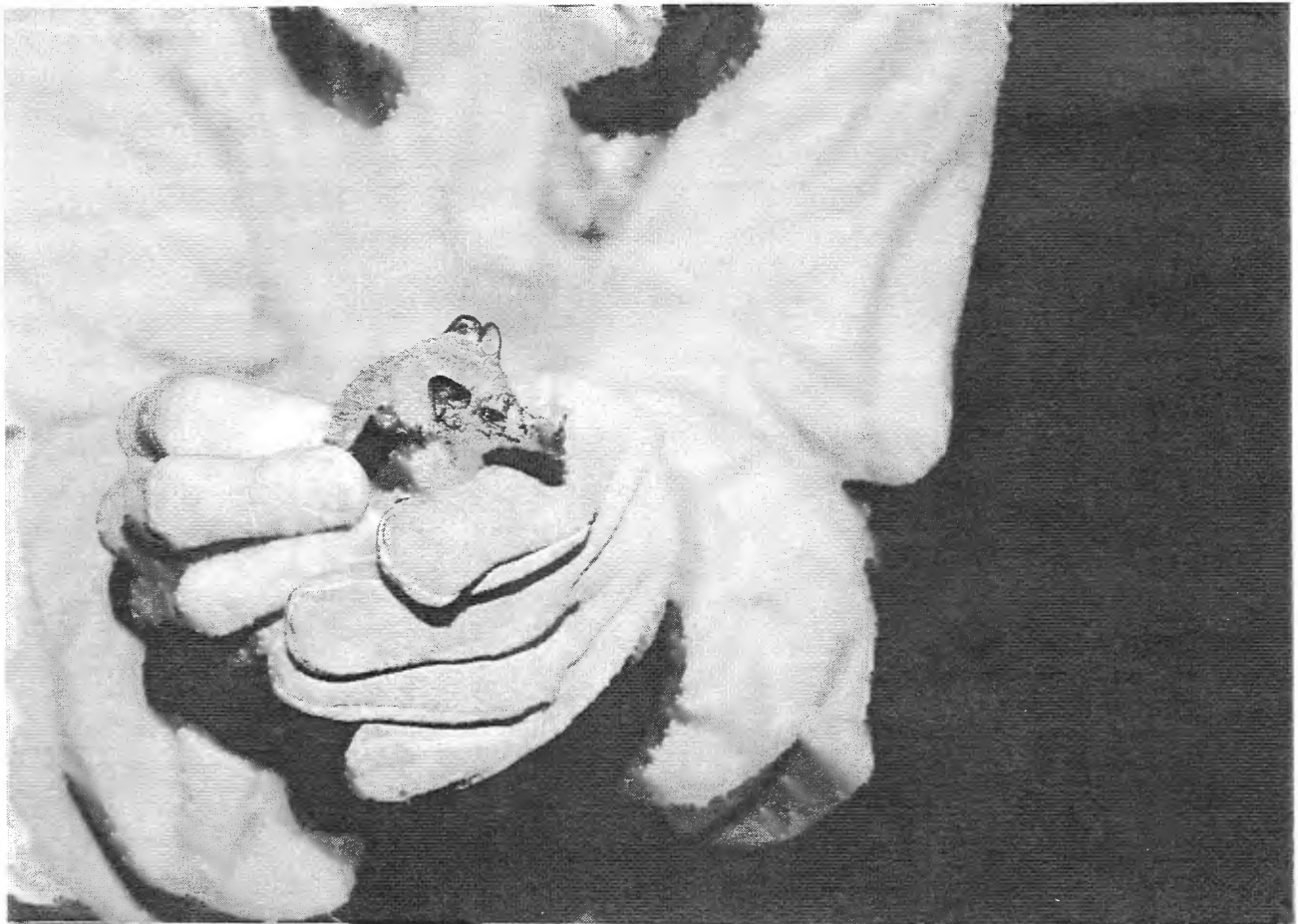
There are many species of columnar cactus and agaves within the Latin American portion of their range, from which they feed. The literature mentions species of *Myrtillocactus*, *Lemaireocereus*, *Ipomoea* and *Cieba*. In Arizona and New Mexico they feed on naturally occurring populations of columnar cacti (*Carnegiea (Cereus) gigantea* and *Stenocereus thurberi*), as well as *Agave shottii* and *Agave palmeri*, but have also been seen drinking from hummingbird feeders in peoples backyards. In San Diego, however, there are no naturally occurring populations of columnar cacti and the native agaves are primarily spring bloomers; when the bats are apparently not present. So what are the San Diego bats surviving on during the winter? Well in Bruce's yard, at least, they utilize blooms of *Agave wankleri* and *Cephalocereus palmeri*, when available. However, the pattern of bloom in this one garden is so irregular and unreliable, and the number of such gardens in San Diego so rare, it is a wonder how they find enough to eat. They likely patrol areas that have provided food in the past and gauge when pollen and nectar will become available.

San Diego's Rarest Night Time Cactus Aficionado

By Karen Miner — San Diego Bat Conservation continued . . .

Last year, San Diego Bat Conservation (a non-profit volunteer organization) got a call from a home owner in the Mount Helix area, asking for help in getting a group of six Mexican long-tongue bats out from under their house. Unfortunately, the new buyers didn't want to live with these gentle pollinators of the night hanging out under their floors. During the exclusion efforts, which took three days, the bats were held in a cage where they hovered and readily ate from a hummingbird feeder and a bowl of pureed plums and grapes. They were released after the home-owner secured the former roost and never seen again.

It is unclear just how many bats of this species visit San Diego each fall/winter, how they are distributed in the county and what else they use as food sources. Because of their transient nature (moving between temporary roosts, and readily flushing from roosts when disturbed) and night time activity, it is difficult to get an accurate population estimate. San Diego Bat Conservation has begun an effort to gather what information we can on the habits of the Mexican long-tongue bat in San Diego County. We primarily rely on calls from people who, like Marc, have seen bats feeding at flowers or roosting like hanging fruit in cave-like structures. You can help us to document the habits of this species by spending fifteen minutes, between a half-hour past sunset and just before sunrise, looking for bat activity at a blooming agave or columnar cactus (or hummingbird feeders), and reporting any observations to San Diego Bat Conservation at (619) 616-8581. Isn't it somewhat gratifying to know that the cultivation of cactus and succulents is also appreciated by such a rare and wonderful nighttime wanderer?



Choeronycteris mexicana — Handler: Karen Miner. Photographer: Bruce April

POST SHOW INFO

What a wonderful show! As I sat by the entry way on Sunday, the look on the faces of the people leaving was one of amazement. They were truly impressed with what they had seen. We even had several sign up as new members right on the spot. At one point, Woody Minnich came in and commented, "this is the first time I've seen more people in the show area than in the sales area". I attribute this to the hard work and quality plants displayed this year. True, there is room for improvement, but I'm sure most would agree that this was a good one. We have the following people to thank for our success;

JUDGES & CLERKS

Betty Athy
Shirley Berry
Dylan Hannon
Jim Kampworth
Lee Badger
Joyce Buckner
Phyllis Flechsig
Sandy Frost
Kenny Graham
Jeff Harris
Camille Horak
Rudy Lime
Don Patterson
Kay Quijada
Herb Stearn

VENDORS

Ted Alford
Michael & Joyce Buckner
Philip & Nubia Bunch
Dorothy Byer
Ed Delollis
Carl Dykema
Chuck Everson & Jerry Williams
Philip Favell
Phyllis Flechsig
Steven Hammer
Joe Kraatz
Woody Minnich
Gary & Bobby Noel
Ed Nolan

SETUP, SALES, & CLEANUP HELP

Pam & Lee Badger
Michael Cullen
Tom & Laura DeMerritt
Bruce Edwards
Joe Flaherty
Wilber Glover
Dan Hammons
Jeff Harris
Michelle Heckathorn
Susan Hopkins
Dick Hulett
Elibet Marshall
George Plaisted
D'edra Smothers
Tom Stiko
John Williams
Carol Jean Wolcott
Monte Woodworth
Stan Yalof

A very special thanks go out to our task leaders who put in countless hours to make this show successful. They are; **Joey Betzler, Tom & Laura DeMerritt, Tom Birt, Herb Stearn, Kay Quijada, and Pam & Lee Badger.**

I would also like to thank Kelly Griffin for setting up the talk by Rudolf Schulz on the succulents of Kenya and Monte Woodworth for creating, building, and donating a new trophy for Miniatures. The following names were the trophy winners this year.

Joe Quijada Best Cactus - *Parodia herzogii*
Best Euphorbia - *Euphorbia decaryi v. spirosticha*
Best Baja Plant - *Dudleya brittonii*
Best Seed Grown - *Melocactus disciformis*
Peoples Choice Award - *Neochilenia occulta*
High Points (50 or less entries)

Dick Hulett Best Mammillaria - *Mammillaria lenta*
Best Opuntia - *Marneopuntia marenae*
Best Graft - *Gymnocalycium mihanovichii v. friedrichii* crest
Best Miniature - *Ariocarpus kotschoubeyanus*
Best Aloe - *Aloe erinacea*
Sweepstakes Trophy

by Tom Knapik

POST SHOW INFO by Tom Knapik

Rudy Lime Best Mexican - *Bombax ellipticum*
 Best Pachycaul - *Fouquieria purpusii*
 Best Bonsai - *Operculicarya decaryi*
 Most Artistic Display
 Best Exhibit


Jean O'Daniel Best Sansevieria - *Sanseveria 'Koko Crater'*
 Dorothy Byer Best Succulent - *Ceropegia fusca*
 John Williams Best Epiphytic - *Rhipsalis horrida*
 Tom Knapik Best Agave - *Agave macroacantha*
 Alex Cardenas Best Sarcocaulon - *Sarcocaulon vanderietiae*
 Kelly Parrott Best Novice Cactus - *Melocactus azureus*
 Jeff Wright Best Novice Succulent - *Dyckia sp.*

Marylyn Henderson Best Echeveria - *Echeveria 'Ebony'*
 Steven Hammer Best Mesembryanthemum - *Dinteranthus pole-evansii*
 Monte Woodworth Best San Diego Succulent - *Bursera microphylla*

Congratulation to Jirasek Liselotte and Beth Sundheim for winning the door prizes. I want to also acknowledge Dick Hulett, who drove down from Los Angeles to enter more than 50 plants; Rudy Lime and Joyce Buckner, for their large wonderful displays which add so much to our show.

Thanks to all those who took the time and energy to prepare their plants and enter them. You'll make the show even better if you enter more next year. If you had the good fortune of seeing the thrilled faces and hearing the great comments of the general public after they had seen the show, you would realize how important your participation is and how significant this event is for the promotion and future of our club and hobby.

Tom Knapik - Show Chair



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DID YOU KNOW? THAT ALL BRAG TABLE WINNERS RECEIVE SCRIPT \$\$\$ REDEEMABLE AT OUR MONTHLY PLANT SALES TABLE??? YES, WE ARE USING FISCAL ENTICEMENT AS WELL AS GLORY TO ENCOURAGE ALL!! THE BRAG TABLE SERVES AS EXCELLENT "PRACTICE" FOR PREPARING YOUR PLANTS FOR SHOWING AT OUR BIG JUNE SHOW. SO DON'T BE SHY! CLEAN UP ONE OF YOUR FAVORITE PLANTS, LABEL IT WITH BOTH ITS NAME AND YOUR NAME, AND BRING IT IN. YOU MAY VERY WELL BE A WINNER IN MORE WAYS THAN ONE!!

JUST MY OPINION

BY JOYCE BUCKNER

I remember my first SDC&SS Show & Sale in 1981. Michael invited me — we had just started dating. I came on Sunday afternoon with my five-year-old goddaughter, Marcia, in tow. Michael gave us the grand tour. The show was much larger than now; there were three full rows of cactus entries, and at least that many of succulents. The step-up podium had been removed and the entire back wall and several corners of the room contained various displays — both artistic and educational in nature.

Knowing virtually nothing about these odd-looking spiny plants, I carefully went through each of the displays — reading to Marcia and taking in what I could of a whole new plant world. Outside there were book and plant sales — there was no room for the Rainbow Gardens Bookshop inside. Marcia and I thoroughly enjoyed the plant sale. There seemed to me, to be an endless variety of blooming and exotic plants, all being offered at remarkably low prices. We purchased a couple of non-spined little bloomers (*probably Kalanchoes*) that a bent-over woman with bright happy eyes proudly declared that she had grown from seeds — or cuttings — we did not know the difference and were quite impressed. Michael explained: any member could bring plants to sell, the club took a small percentage — this was why the selection was so diverse and the prices were so good. We also bought a couple of lithops with beautiful little flowers — Michael tried to discourage us — a week later these guys looked like large weeping blisters and were pronounced dead during his next visit.

I remember my first SDC&SS Show set-up in 1982. Michael filled his little truck with rocks, plants, books, rusty tools, posters, etc. When he ran out of room there he began filling my Pontiac with still more plants. Something tall and spiny (*probably an Alluaudia*) ripped a hole in my headliner. When we got to Casa del Prado it was already late and dark. That is where I first met Rick Latimer. He immediately made us feel welcome and quickly came up with two tables to accommodate Michael's large elaborate display. After he had helped us unload both vehicles, he went back to setting up the show. And I, knowing that I was more of a hindrance than help to Michael, opted for helping — or at least observing Rick. This is when I had the conversation with him, where I thought he said he was president of the "Yuppie Society" which was actually the "Epi Society!" I watched as he carefully went through each category demarking the areas so that no plant would be mistakenly overlooked or judged in the wrong category. He added more tables where necessary, always leaving extra space between categories, making room in advance for additional early morning entries. He checked entry labels making corrections when they were needed. He looked up plant names, cleaned off the table cloths, swept the whole room and took out the trash. We all left together at about 11:30.

Later I learned that Rick, as show chairman or co-chairman with Frank Thrombley, would go through the show one more time, after the judges were finished. He would distribute several additional blue ribbons — one for every display, no matter how silly. He felt that anyone who took the time to put in a display deserved a blue ribbon.

Also, he would painstakingly check that all first time participants received at least one blue ribbon — even if it did not count, chances are they would not know that! In those days all entries were judged at the same level — no color coding — he just knew who was showing for the first time. Rick would also dole out a couple of red (2nd place) ribbons to particularly heavy, fragile, or cumbersome plants that had not been awarded a ribbon — "Hernia Awards" he called them. God, we miss you, Rick!

I remember my first SDC&SS Board of Directors meeting. It was in January of 1991; Chuck Adams who was past president and show chairman presented the board with a list of qualified candidates to serve as judges for the June show. All perspective judges on his list were from out-of-town, and even if they were members of SDC&SS none of them regularly attended the San Diego meetings, and therefore would not be familiar or bias towards anyone's plants. In 1991 and 1992 when Michael was president of the SDC&SS all board members participated in judge selection and all judges were committed to judging our June show by March.

I remember my first SDC&SS show and sale with real responsibilities — it was 1991 — I was club secretary — Laura DeMerritt was club treasurer, but she was out of town that weekend. Rick found a couple of cash boxes in our lockers. I got the one with a rusty hole where the long-lost key used to fit. A thick rubberband kept the box closed when not in use. We borrowed a couple of ten-key calculators with tape, but there was no electricity and no one had thought of bringing an extension cord! Solar powered and battery operated hand calculators appeared from the purses and wallets of members and customers alike. Phyllis Flechsig had brought a large stack "Succulent Care Instructions" printed on half sheets. We turned them over — did the math — and were now able to give everyone not only a receipt but also care instructions. When the morning rush got hot and heavy with a line, helping members stepped in, collected the seller's tags and listed plants in advance — by the time they got to us all we had to do was make change and mark their list paid! No one had to wait in line more than ten minutes — even in the busiest of times. And best of all, everyone got to ask a knowledgeable club member questions regarding their plant selection prior to dealing with the cashiers — we were really remarkably efficient. Rick stopped by several times during the day, emptied both cash boxes of all large bills and checks which he stashed in one of our lockers. When Laura got back we figured up how much we sold and worked backwards to figure out the sales taxes we owed — accurate enough for a one-time-a-year three day sale!

This is just my own opinion: I found this year's show & sale lacking. Lacking entries & displays. Lacking forethought, planning and trust. Lacking educational content. Lacking vendors & sale plants. Lacking spirit, enthusiasm and the sense of pride — of community one gets from a job well done. Lacking integrity and a sense of fair play. Lacking fellowship. Sunday night when the show was over I shed a tear for the good old days of the SDC&SS . . . and for Rick and all his kindness.

This listing of all ribbon winners adheres to the class schedule outlined in the Show Schedule. Green, Yellow and Blue entry cards are represented by the letters G, Y, and B respectively. The 'a' or 'b' stands for the two sizes. The number that appears before the exhibitor's name represents the first, second and third place ribbon that was awarded; HM is honorable mention. Please note: there were ties in several categories, and some awards are skipped. Judges are not obligated to award first, second or third place ribbons for each different class or category and they may award more. Notice that twice means that the person listed won two ribbons for two plants entered in the same class.

◆ DIVISION I - CACTI

1. Y/a) 1. Hulett 2. Knapik
2. Y/a) 1. Hulett
Y/b) 2. Henderson 3. Knapik
B/b) 1. Minnich
3. Y/b) 1. Quijada 2. DeLollis, D.
4. G/b) 1. Harris 3. Stiko, A.
Y/b) 1. & 2. DeMerritt, T. 3. Williams, Jo
5. G/a) 1. Badger, L. 2. Wright
Y/a) 1. Hulett 2. Cullen & Hulett
3. DeMerritt, T.
Y/b) 1. Cullen 2. Quijada 3. Hulett
HM. Cullen
B/b) 1. Minnich 2. Flechsig
6. G/a) 2. & 3. Harris
Y/a) 2. DeMerritt & Cullen 3. Hulett
Y/b) 1. Quijada
B/a) 1. Minnich
7. Y/b) 1. Hulett 2. Williams, Jo
8. G/b) 1. Parrott 2. Badger, L.
Y/a) 1. Quijada
Y/b) 1. Hulett 2. Quijada 3. Hulett
B/b) 1. & 2. Nolan 3. Minnich
9. Y/a) 2. Quijada 3. Knapik HM. Knapik
Y/b) 1. Williams, Jo 2. Knapik
B/b) 1. Minnich
10. Y/a) 1. Hulett 2. Hulett
Y/b) 1. Quijada 2. Hulett
B/b) 1. Minnich
11. Y/b) 2. Williams, Jo 2. DeMerritt
12. G/a) 2. Wright
G/b) 1. Wright
Y/a) 2. Williams, Jo 3. DeLollis, E
Y/b) 1. Murphy
13. G/a) 2. Parrott
G/b) 3. Birt
Y/a) 1. Williams, Jo 2. Hulett
Y/b) 1. Woodworth, Mo
14. G/b) 1. & 2. Birt
15. Y/a) 1. DeMerritt twice 2. Murphy
B/b) 1. Minnich
16. Y/a) 2. & 3. Knapik
17. G/b) 1. Harris
Y/a) 2. Cullen 3. Cullen twice
Y/b) 3. DeLollis, E
18. G/a) 2. & 3. Birt
G/b) 2. Badger, P 3. Wright
Y/a) 1. Hulett twice
Y/b) 2. Hulett 3. DeMerritt HM. Quijada
B/b) 1. Minnich
19. G/a) 2. Badger, L
Y/a) 1. & 2. Hulett 3. Knapik
B/a) 1. Minnich twice 2. Minnich
20. Y/a) 1. Knapik 2. Hulett
Y/b) 2. DeLollis, D 3. Hulett
B/a) 1. Minnich
B/b) 1. Minnich
21. G/a) 1. Wright
G/b) 2. Wright
Y/a) 1. Murphy
Y/b) 1. Quijada
22. Y/b) 3. DeMerritt

- B/a) 1. Minnich
- B/b) 2. Minnich
23. G/b) 3. Wright
Y/b) 1. Williams, Jo
24. G/a) 2. Badger, L 3. Parrott
G/b) 3. Wright
Y/b) 1. Hulett
B/b) 2. Noel
25. Y/b) 1. DeMerritt
26. G/a) 2. Wright
G/b) 3. Harris
Y/a) 2. Murphy 3. Murphy twice
Y/b) 1. Quijada 2. Henderson 3. Murphy
HM. Murphy
B/b) 1. Minnich
27. Y/a) 1. & 2. Hulett

◆ DIVISION II - OTHER SUCCULENTS

28. G/a) 1. Woodworth, Ma
Y/a) 1. Woodworth, Mo
Y/b) 1. Quijada 2. Williams, Jo
B/b) 1. Buckner & Dykema
29. B/a) 1., 2., & 3. twice Hammer
30. G/a) 1. Bunch twice
G/b) 1. Harris 2. Innis
Y/a) 1. Quijada 3. Marshall
31. G/a) 1. Woodworth, Ma & Wright
Y/a) 1. Marshall
Y/b) 1. Murphy 3. Frost
B/a) 1., 2. twice, 3. Hammer
32. G/a) 1. Badger, P & Badger, L
Y/a) 1. Murphy & Hulett
Y/b) 2. Marshall
33. G/a) 1. Harris & Wright
Y/b) 1. Hulett
34. Y/b) 2. Williams, Jo
G/a) 1. Woodworth, Ma
G/b) 1. Wright
Y/a) 1. Hulett 3. Woodworth, Mo
Y/b) 1. Hulett 2. Quijada 3. DeMerritt
B/a) 1. Hammer
35. G/a) 1. Woodworth, Ma 2. Woodworth, Ma
3. Wright
Y/a) 1. & 2. Marshall
Y/b) 1. Cullen 2. Woodworth, Mo 3. Hulett
B/b) 1. Buckner
36. G/a) 2. Harris
G/b) 3. Harris
Y/a) 1. Marshall
Y/b) 1. Hulett 2. Marshall
37. Y/a) 2. & 3. Marshall
38. G/a) 1. Badger L
Y/b) 2. Marshall
39. G/a) 3. Wright
G/b) 1. Badger P
Y/a) 1. Marshall
Y/b) 1. & 2. Henderson
B/b) 1. Flechsig
40. G/a) 1. Flaherty 2. Badger L 3. Innis
G/b) 1. Flaherty
Y/b) 1. Quijada 2. Marshall
B/b) 1. Buckner

1998 San Diego Cactus & Succulent Society Ribbons Winners continued:

41. Y/a) 1. Henderson 2. Woodworth, Mo
Y/b) 1. Williams Jo
42. G/a) 1. & 2. Badger, L
Y/a) 1. & 2. Woodworth Mo 3. Byer
Y/b) 1. Henderson 2. Byer
B/b) 1. Buckner
43. Y/a) 2. Cullen
Y/b) 1. Quijada 2. Henderson 3. Byer
44. G/a) 1. Nimick
G/b) 1. & 2. Wright 3. Westfall
Y/b) 1. Woodworth, Mo
B/b) 3. Dykema
45. G/a) 1. & 2. Wright 2. Badger L
3. Wright HM. Woodworth, Ma
G/b) 1. Peterson
Y/a) 1. Henderson 2. Woodworth, Mo
3. Murphy twice
Y/b) 1. Cullen 2. Woodworth, Mo
3. Quijada HM. DeMerritt
B/b) 1. Buckner 2. Noel
46. Y/a) 1. Hulett
Y/b) 1. Murphy
B/b) 2. Flechsig
47. Y/a) 1. Knapik
Y/b) 2. Woodworth Mo
B/b) 2. Buckner
48. Y/a) 1. Woodworth, Mo
49. Y/a) 1. Hulett
Y/b) 1. Murphy
B/b) 1. & 2. Lime 2. Buckner
50. B/b) 1. Buckner
51. Y/a) 1. Byer
Y/b) 1. Byer
52. G/a) 1. Woodworth Ma
Y/a) 1. Byer
Y/b) 1. Henderson 2. Williams, Jo twice
B/b) 1. Dykema
53. G/b) 1. Badger P
Y/b) 1. Hulett & DeMerritt 2. Byer twice
3. Marshall & DeMerritt HM. Hewlett
B/b) 1. Buckner
54. G/b) 3. Harris
Y/a) 1. Woodworth Mo
55. G/a) 1. Harris
Y/a) 2. Woodworth Mo
B/b) 1. Buckner 2. Dykema
56. Y/b) 1. Hulett 2. & 3. DeMerritt
B/b) 1. Lime twice
57. Y/b) 1. & 2. Hulett
B/b) 1. Williams Je
58. G/a) 1. Woodworth, Ma & Badger L
2. Berry Sa
G/b) 1. Badger L
Y/b) 1. Woodworth Mo & Murphy
2. Byer & DeMerritt 3. Hulett
B/b) 1. Buckner & Lime twice 2. Lime
59. Y/a) 1. Woodworth Mo
Y/b) 1. Cullen & Henderson
B/b) 1. & 2. Flechsig
60. G/a) 1. Badger L. 2. & 3. Wright
G/b) 1. Woodworth, Ma 2. Harris
- Y/b) 1. Hulett twice 3. Cullen
B/b) 1. Buckner
61. Y/a) 1. DeMerritt 2. Hulett
62. G/a) 1. & 2. Wright
Y/a) 1. Byer 2. & 3. Hulett
Y/b) 2. Cullen & Stern
B/a) 1. Williams, Je & Hammer 2. Hammer
3. Hammer HM. Hammer
B/b) 1. Williams, Je twice 2. Williams, Je
63. G/a) 1. O'Daniel twice 2. O'Daniel twice
G/b) 1. 2. & 3. Wright
Y/a) 1. Quijada & Woodworth Mo
Y/b) 1. Quijada 2. Williams, Jo
64. Y/b) 1. Knapik 2. Woodworth Mo
3. Williams, Jo
B/b) 2. Buckner
65. Y/a) 1. Williams, Jo 2. Woodworth Mo
Y/b) 1. Cullen 3. DeLollis D
66. G/a) 1. Wright
G/b) 1. Wright
Y/b) 1. Byer & Williams, Jo 3. Quijada
B/b) 1. Buckner 2. Dykema thrice
3. Dykema twice
67. Y/b) 1. Woodworth, Mo 2. Williams Jo
3. Hulett
B/b) 1. Buckner twice 2. Lime 3. Buckner
68. G/a) 1. Wright 2. Badger P 3. Wright
G/b) 1. Harris 3. Wright
Y/a) 1. & 2. Woodworth, Mo
Y/b) 1. Murphy
69. Y/a) 1. Williams, Jo
- ◆ DIVISION III - COLLECTIONS
70. G) 1. Innis
71. G) 1. Flaherty
Y) 2. Woodworth, Mo
B) 1. Flechsig
- ◆ DIVISION IV - SPECIALITIES
72. No entries
73. G/b) 3. Innis
Y/b) 1. Marshall 2. Quijada
- 73.5 Y) 1. Hulett
B) 1. & 2. Buckner
- ◆ DIVISION V - DISPLAYS
74. B) 1. Lime

We would like to thank everyone who participated in the 1998 San Diego Cactus & Succulent Show by entering plants, collections, displays, photography and artwork. The society as a whole greatly benefits from your participation. We hope that everyone who entered came home with a ribbon or two, and we hope you are all encouraged to bring in more entries next year.

**THANK YOU EVERYONE!
SEE YOU NEXT YEAR!**

MEDICINE, MYTH AND MAGIC

The Ethnobotany of South African Succulents

By Pam Badger

Ethnobotany is the perfect science for me. It combines the study of people, which is my vocation with the study of plants, which is my favorite hobby. The most interesting place in the world for both fields is the south African region. This article will discuss some of the traditional as well as modern uses of succulent plants from this area.

The southern African region occupies a series of great plateaus and steep slopes. An extraordinary variety of vegetation results from the irregular distribution of rainfall. There are no dense forests, no climbers, nor luxuriant trees. Below the stony Kalahari, the southernmost terrace or "bush" is the richest area for species of its size in the world, about 25,000 species of flowering plants. This is the home of many of our favorite succulents amongst which are *Euphorbia*, *Adromiscus*, *Cotyledon*, *Crassula*, *Kalanchoe*, and *Aloe*. The rain starved area of the southwest cape, the Namib Desert and the stony Karroo are home to the rock mimicry plants of the Mesembryanthemaceae.

Indigenous peoples have also occupied this area for thousands of years and just as the plants have evolved in countless fascinating ways to survive the varied and rugged terrain, so have the people, to insure their survival, evolved lifestyles and uses for many of these plants. The result of this combination of remarkable biodiversity coupled with the cultural diversity has resulted in over 3,000 species used as medicine with about 350 commonly used and traded today.

Euphorbiaceae: *Euphorbia tirucalli* is originally from Uganda, Congo, and Zanzibar, where it is known as the 'milk bush' because of its poisonous white latex. Known as the 'rubber hedge' of Southern Zimbabwe, it has long been planted around *kraals* as a deterrent to marauders. The highly irritant and blinding latex is very effective in keeping animals inside the kraals safe. This plant is also used in Tanganyika as a remedy for impotence, a mosquito repellent, and a fish poison.

Euphorbia triangularis is a thorny succulent tree that grows to thirty feet throughout many parts of south Africa. It is non-irritant and is used in the eastern Cape region for the manufacture of an inferior rubber and as the basis for chewing gum.

Euphorbia candelabrum, a native to Sudan and Uganda, grows in many places over the continent of Africa. The Namib Bushmen use the latex in the production of poison arrows. The Bari people of Zaire also use it in poison arrows and as a protective hedge around their homes. The Goge people in Tanganyika use it in arrows and also as a game poison by introducing it into the animal's water — stupefying them to make them susceptible, without infecting the meat.

Euphorbia mauritanica is a much-branched, cylindrical plant growing to six feet in south Africa. It is used by Bushmen to make poison arrows — the latex being used for its cohesive properties. It is eaten in times of drought by wild animals, but is useless as a stock fodder because it contains 'virulent resin' which will taint the meat.

Euphorbia ingens grows to a massive size, up to thirty feet, throughout many portions of Mozambique, Natal, and Zimbabwe. In the Transkei two of these trees are planted alongside a hut where twins have been born. These are thought to ward off evil spirits from the children and the life or death of the tree is thought to influence the life of the child it represents. In many parts of southern Africa, the *Euphorbia* is synonymous with poison — due largely to the toxicity of this plant. It is used in small doses by the Zulu as a purgative in drastic cases and is said to often cause death from overdoses. The Sotho use a concoction made from this plant as a treatment for cancer. The Bantu use it as a fish poison by throwing pieces of the plant into the fish ponds.

Monadenium lugardae is used by diviners in the eastern Transvaal region. The oracular figures chew a piece of the root to produce visions of a prophetic nature generally involving an illness and its cure.

Crassulaceae: *Crassula lycopodioides* is a native of southwestern Africa. This spreading ground cover which grows upright to four inches, is an important sand binder in areas around the Namib Desert. It has been used as a remedy for dysentery in the Cape region. It contains tannin, and has been used by the Mfengu and Xhosa as a remedy for gall sickness in cattle.

Crassula arborescens is a delicate succulent that grows to heights of ten feet in the Cape and Natal. The root is astringent and the stems are eaten by the Hottentot. It has been used in the Cape as a cure for epilepsy and corns.

Cotyledon orbiculata is widely used medicinally throughout south Africa. The leaves are applied to corns and warts to remove them. A single leaf is eaten to kill intestinal worms. The juice is warmed and applied as drops for earaches and toothaches. Juice has also been known to be taken internally for the treatment of epilepsy.

Cotyledon wallichii is a branching, low growing, soft blue-green succulent native of Madagascar. The Zulu rub juices into the orbital ridges of young men who are courting — it is thought to fascinate any young woman to whom attention is directed.

Mesembryanthemaceae: *Pleiospilos bolusii* is a native of the Cape region and looks much like the rocks it grows amongst. It is edible by goats and is useful in maintaining them in times of drought.

Carpobrotus edulis is a creeping, freely growing, branching succulent that is planted as a sand barrier along subtropical seashores. Well known in California as our common "Ice Plant", it was brought here in the 1950's by the Army Corps of Engineers to hold sand dunes around Fort Ord. The fruit is edible, and is known as the 'Hottentot Fig.' It also has many medicinal uses which include gargling the juice to treat infections of the mouth and throat, and ingesting juice for dysentery and digestive troubles. It is also used topically — it is highly astringent, and used to treat eczema, wounds and burns. The pulp is used to treat toothache, earache and thrush.

Delosperma herbeum, a native of Cape Province, is a small delicate bush that grows to twelve inches. A powdered derivative is used by the Tswana, rubbed into the vertebral joints as a strong resistant to witchcraft.

Sceletium expansum and *Sceletium tortuosum* are used by the Hottentots of the Karoo. The roots of this plant are smoked or chewed to create a stimulate effect similar to cocaine.

Nananthus albinotus is used by various South African tribes. The entire plant is pulverized, and then added to smoke and snuff tobacco as an hallucinogenic.



Sceletium tortuosum
eighteenth-century
woodcut



Sceletium expansum,
eighteenth-century
woodcut

MEDICINE, MYTH AND MAGIC - THE ETHNOBOTANY OF SOUTH AFRICAN SUCCULENTS by Pam Badger

Dioscoreaceae: *Dioscorea sylvatica* (smooth) and *Dioscorea elephantipes* (corky) have large fleshy tubers that are hollowed out, and then water is boiled in them making a lotion which is used for cuts and sores. The Zulu also use a concoction made from this plant to treat hysteria, convulsions and epilepsy. The Zulu name for this plant translates to "drunkard" which refers to another possible use for this plant. In Central America and China a variety of this plant is used in the production of commercial steroids.

Aloaceae: *Aloe ferox* is distributed over 1,000 km throughout southern Africa. This is the widest ranging of all the aloes, as well as the most widely used by the people. It has been in common use in Africa for many years and continues to be of importance today in the production of "aloes," an important ingredient in purgatives for man and beast. A jam is made from the leaves which is widely traded. It is valued by several native tribes for the treatment of eye diseases. The nectar of the flowers is used as a narcotic.

Aloe hereroensis leaves are used in a concoction as a remedy for chest and heart pains. It is also given to dogs to treat rabies.

Aloe aristata is a small aloe that is placed in the hut of barren women in parts of south Africa. It is said that if it blooms under those conditions, she will become pregnant, if not she will remain barren.

Aloe asperifolia decoction, an extract obtained by boiling, has quite a few uses. It is drunk to treat kidney problems, asthma, epilepsy and colds. It is also drunk by women and livestock to induce the discharge of afterbirth. It is fed to donkeys if they eat poisonous plants, and a leaf is put in the water of chickens to relieve symptoms of falling over and paralysis.

Aloe dichotoma is commonly called the "quiver tree" from the customary use by natives for hollowing out stems to make quivers for their arrows.

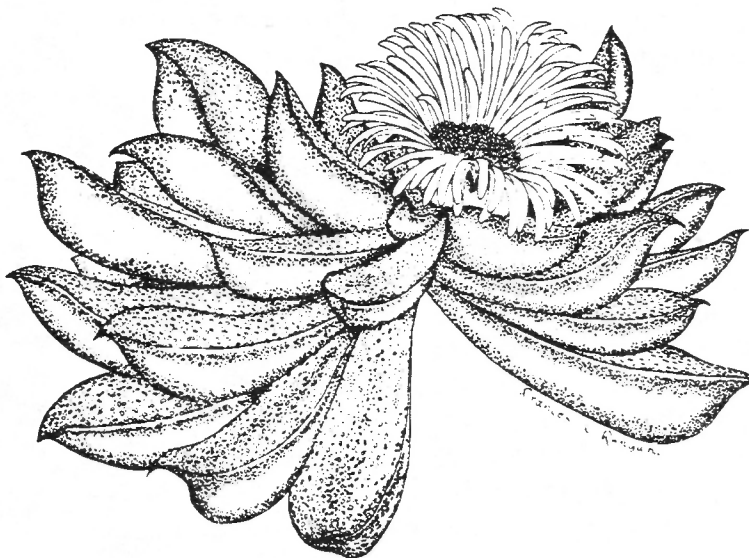
Asclepiadaceae: *Fockea edulis* is known by its common name "water root." The tuber has a high water content, and is eaten roasted by some native tribes, especially in times of drought.

Hoodia currorii stems are eaten raw after the removal of the outer skin and thorns. It is believed to lower blood pressure, cure colds, and relieve indigestion and stomach pains. The flesh is also applied to eyes to relieve pain, and pieces are added to sugar water to make a refreshing drink.

No matter how frustrated you may be with managed care, I **do not recommend** that you try any of these cures at home. Though the next time my chickens are falling over, I may be calling you to find a leaf of *Aloe asperifolia*!

- References:
- ① Ben-Erik Van Wyk, Bosch van Oudtshoorn & Nigel Gericke, MEDICINAL PLANTS OF SOUTH AFRICA, Briza Publications, Petoria, South Africa - 1997.
 - ② Veerle Van den Eynden, Patrick Vernemmen, & Patrick Van Damme, THE ETHNOBOTANY OF THE TOPNAAR, copyright: The Commission of the European Community - Universiteit Gent, 1992.
 - ③ William Emboden, NARCOTIC PLANTS (Woodcut illustrations & drawing below from this book.), The Macmillan Company, New York - 1972.
 - ④ John Hutchinson, A BOTANIST IN SOUTHERN AFRICA
 - ⑤ Watt & Breyer-Brandwijk, MEDICINAL AND POISONOUS PLANTS OF SOUTHERN AND EASTERN AFRICA

Nananthus albinotus



STANDING TALL

BY RON BURNIGHT

I have discovered that the secret of showing plants is balance. Oh, I don't mean the harmonic balance of colors or shapes or textures. I have discovered that judges are pretty picky about plants being centered in the pot, and, if the plants are tall, being pretty much straight up. (I usually settle for mostly vertical).

I traveled to a show recently which had judges who made absolutely no allowance for the tribulations of travel: and after crossing 16 railroad tracks, knocking into seven potholes, and hitting one curb which was where the driveway should have been, I discovered that some of my plants were farther off center than Newt Gingrich. Three ball cacti were lolling near the edge of their pots in a most forlorn manner. My Echinocereus pentalophus was hanging out of its pot like a seasick tourist's first voyage.

Well, I didn't have enough soil mix or time to repot. There was only one thing to do: clever titles would save the day! I labeled the three ball cacti, "Dejected, Rejected, and Suspected." The limp Echinocereus I named "Life after Sixty."

All to no avail. All I got for my trouble was a sarcastic note by the three ball cacti asking, "What happened to the other four dwarfs?"

I think I'll sue the State of California for misplacing that curb.

We "stole" this article from the 1998 Inter-City Pre-Show Newsletter, Carol Wujcik, Editor. (Thank You, Carol ! We missed seeing you and Joe at our show!) It is yet another delightful sketch by the now infamous Ron Burnight of Pahrump, Nevada. Knowing that he will be seeing this in our newsletter, we're kinda hoping that he has something hot & nasty for us! We could really use some contributions for our September issue, Ron!



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INCOME	
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Dues	530.00
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Miscellaneous	23.00
Name tags	40.00
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Benefit drawing	151.00
General meeting	645.00
Jan sale	3,829.20
Xmas on Prado	56.00
TOTAL Plant sale	4,681.20
TOTAL INCOME	13,820.63
EXPENSES	
Bank Charge	50.74
Clubs & coops	75.00
Earth Day-Balboa park	100.00
Jan sale:	
Lunch	101.14
Misc.	20.93
Plant vendor	2,564.05
Pot vendor	159.00
Sales tax	276.00
TOTAL Jan sale	3,121.12
Jan show:	
Program speaker	150.00
TOTAL Jan show	150.00
Library-new acquisitions	1,513.37
Newsletter-Espinas y Flores:	
Supplies	174.37
TOTAL Newsletter-Espinas y Flores	174.37
Plants:	
Benefit drawing	105.50
Monthly sales	490.82
TOTAL Plants	596.32

Profit & Loss Statement

1/1/98 Through 2/28/98

Category Description	1/1/98- 2/28/98
Pots:	
Monthly sales	3.00
TOTAL Pots	3.00
Printing	737.15
Program speaker	150.00
Refreshments	16.56
Service award	185.82
Tax, Business-Taxes & Licenses:	
State-State Tax	25.00
Tax, Business-Taxes & Licenses-Other	150.00
TOTAL Tax, Business-Taxes & Licenses	175.00
WAP supplies-WAP subaccount	149.42
TOTAL EXPENSES	7,197.87
TOTAL INCOME - EXPENSES	6,622.76

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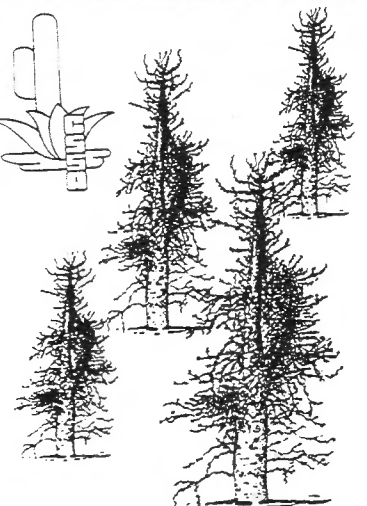
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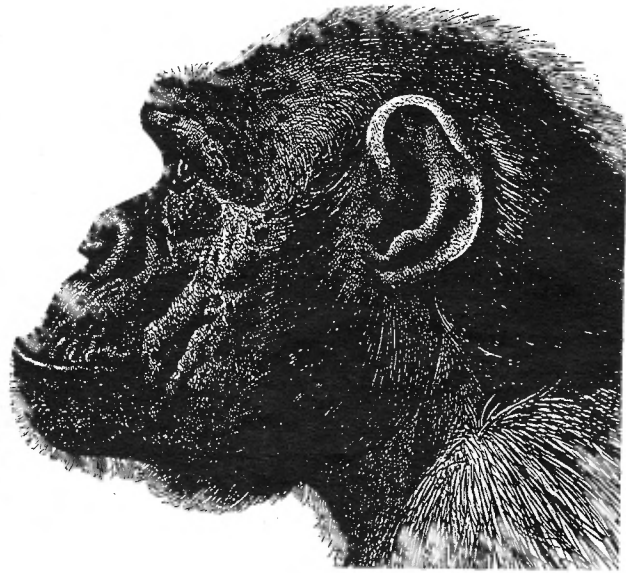


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God bless America.
Let's save some of it.

— EDWARD ABBEY

WISE AND
OTHERWISE



By Michael Buckner

Though I have looked everywhere
I can find nothing lowly in the universe.

— A. R. AMMONS (STILL)

Choeronycteris mexicana — Long-tongued Bat

Found usually in the Sonoran life-zone. This nectar-feeding bat is apparently a fall vagrant from Central Mexico. It was first recorded from the county in September 1946. Many subsequent records obtained in October 1947 and 1963, and December 1947. SDNHM specimens: (39) all San Diego area.

— Suzanne I. Bond, TRANSACTIONS - AN ANNOTATED LIST OF THE MAMMALS OF SAN DIEGO COUNTY, CALIFORNIA, San Diego Society of Natural History, vol. 18, no. 14 — April 1977.

Recent studies have established that bats are regular and important pollinators of agaves, especially *Agave palmeri*. The bats of the genus *Leptonycteris*, subfamily Glossophaginae, are anatomically structured for nectar-lapping and pollen feeding. They are of migratory habit and have been observed to feed in small flocks during the seasonal flowering of *Agave palmeri*. Anthers dehisce during night hours. These bats feed on flowers other than agave, but certain structures of the latter are notably coadaptive with bats; e.g., abundance of nectar in a strongly scented mass in individual cuplets held erect by geotropic flowers. The tough short leathery tepals of the Ditepalae appear unusually well structured to support the clambering bats and protective of the nectar-holding tubes. Such structures and functions in disparate organisms can develop only over long periods of time and indicate adaptive evolution. Geologic time is an appropriate term in the case of agaves, where generation spans require 15 to 20 more years. If you ever asked yourself, how and when did agaves get this way?, this co-adaptation is one clue to consider. I would call this bio-relationship another case of symbiosis, rather than a "syndrome."

Presumably, other members of the Ditepalae participate in the bat-agave symbiosis, because their flowers are structurally similar. There is a wave of nectar flow from spring to winter, north to south. Starting with the spring flowering *Agave colorata* in Sonora and Chihuahua to *Agave durangensis* and *Agave wocomahi* through Durango and Zacatecas, which flower up to December. South of there the winter bloomers of the Group Crenatae are in flower production and could lead the bats via the Group Hiemiflorae to Central America. Is this the migratory pathway of *Leptonycteris*, a nectar flyway mutually evolved?

— Howard Scott Gentry, AGAVES OF CONTINENTAL NORTH AMERICA, University of Arizona Press, Tucson, AZ, c. 1982.

There is an apparently close interdependence between these bats and their food plants. Annual bat migrations seem to be associated with the times that agaves and cacti flower in certain areas. The plants benefit, too; long-nosed bats are important pollinators of some cactus and agave species. In Big Bend, the bats rely almost exclusively on the flowers of agaves, including the well-known century plant (*Agave harvardiana*).

The long-nosed bat was once very common in Mexico, but recent surveys have revealed massive population declines. In Big Bend, 10,650 bats were counted in 1976, yet during 1980-1984 only 1,000 were estimated each year. Several factors have contributed to this severe loss, including the undeservedly poor public image many bats still have, which leads to incidents of vandalism and mass killing at roost sites. Perhaps the biggest problem, however, is the intensive harvesting of wild agaves in Mexico by "moonshiners" for the small-scale production of tequila and other alcoholic beverages. This practice has resulted in a loss of food sources along the bats' migratory routes, a serious problem when one considers that the high metabolic rate of this mammal requires it to feed very frequently.

— "Endangered Species Conservation at Big Bend National Park" (*Benzing & Fleming*), ENDANGERED SPECIES TECHNICAL BULLETIN Vol. XIX No. 2 (1994), Dept. of Interior, Fish & Wildlife Service, Washington D.C.



"Oh, my God," she says. "Oh, look at them all. This is great!"

Urine and feces rain down on us. We look up and we cannot look away. Bats storm across the top of the vault, a torrent of wings and squeaks. They streak the canyon center and swirl and then funnel off. This is the major flight. The free-tails give a faint echo of the thunder of twenty years ago when perhaps 100 million tiny mammals squealed from the room in the rock wall and took to the night sky, an army of hearts, lungs, and fangs ranging out twenty, thirty, forty miles, beasts ripping the soft abdomens from moths, feasting in the dark hours.

A crescent moon hangs and the bats become fine lines etching the glowing face. In four minutes it is over. A flight that once took hours is now 240 seconds. The cave falls silent.

They are gone.

When Cockrum (*E. Lendell Cockrum*) finished his banding, 88,176 bats had been tagged. From this he plotted the colony's migration route from Arizona to Sonora and Sinaloa in Mexico. This helped him understand the dying.

When the bodies were examined back in the laboratory, the scientists found dieldrin, toxaphene, and DDT. The colony kept shrinking and Cockrum began to understand why. He had already noticed that bats had deserted Tucson. Once they had roosted in the old buildings of the university campus and were a common sight under the street lights. Then with the massive use of household pesticides they vanished.

He began tracking DDT sales in Arizona. Five hundred and forty thousand pounds were sold in 1965, and by 1966 the quantity had reached 1.07 million pounds. In 1967, 2.52 million pounds were poured on the land. The agricultural district of the Gila Valley lies within easy reach of the bat cave and they fed heavily there.

That might be part of the answer.

When the United States ended the use of DDT in the late sixties, the colony did not repopulate. Below the border, the use of DDT continued, as it does to this day.

The bats acted as sensors for a world man created but ignored. They roamed the global skin where the insects fly and swallowed the parts per million and per billion that human beings measured and monitored. These chemicals were concentrated in the mother's milk and the young suckled lustily.

Cockrum thinks the tradeoff was reasonable. He likes bats and hates the idea of man causing the extinction of any creature. But, he hastens to add, he has worked in the Third World.

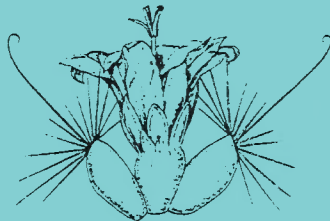
He puts it this way: would you rather die of a tropical disease in your twenties or perish in your sixties because of toxic chemicals? But of course, no one polls the bats on their views.

They simply die, humans live, the crops grow. It is part of this time in this century.

— Charles Bowden, **BLUE DESERT**, University of AZ Press / Tucson, 1988.

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