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Tucson Cactus and Botanical Society
P.O. Box 3723 College Station
Tucson, Arizona 85700
Josephine Shelby Editor
Hugh Sloan Ass't. Editor

HAAG MEMORIAL CACTUS GARDEN NEWS

The Tucson Cactus and Botanical Society created and sponsors a cactus garden in memory of its founder, "Cactus John" Haag. The Haag Memorial Cactus Garden overlooks the desert valley. This Garden is not ours. We gave it to the Museum on May 8, 1965, for the enjoyment of all who visit there. Our Society as a whole will always be greatly interested in its future, and in materially advancing the goal of the Garden: constantly extending it. Members of this Society may donate plants to the Haag Memorial Cactus Garden. Those caring to do so should offer their plants to Mr. Joseph Brick, Mrs. Alice Wanner, or Mr. Ray Doss. These members of our Society constitute the committee that oversees the Garden.

Volume I First Quarter 1966 No. 5

On January 14th, Mr. Brick, Mr. and Mrs. Wanner, Mr. Cecil Mader, Mr. Charles Trimble, Mr. Roger Dean and Mr. and Mrs. George Rente repaired paths and cemented the retaining wall in the hedgehog area of the garden. For this work, Mr. Roger Dean generously provided his truck to haul several loads of rock which were needed for this work. Mr. Paul Shaw of the staff of the Arizona-Sonora Desert Museum cooperated in all these efforts with the group. At another time, nomenclature boxes in the Garden were repaired by Mr. Mader and Mr. Brick. A total of 62 hours work was devoted by these members to work in and for the Haag Memorial Cactus Garden.

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Timothy James Shaw arrived at the home of Mr. and Mrs. Paul Shaw on January 20, 1966 at 11:48 p.m., weighing 8 pounds 10 ounces. His father, Mr. Paul Shaw, is a very active and inspiring member of Tucson Cactus and Botanical Society, and is a member of the staff of the Arizona-Sonora Desert Museum.

DON'T YOU AGREE?

"Ferrocactus Wislizenii is one of the three barrel cactuses native to Texas. Mature plants are cylindrical, growing as high as eight feet and up to three feet in diameter. The flowers are about three inches across, ranging in color from yellow and orange to dark red. Referred to as the "candy barrel", it is often used for making cactus candy. The implication that the plant has any ingredients suitable for making candy is, of course, inaccurate. The succulent, white tissue is cut into small squares, boiled in water until tender, drained and boiled in a heavy syrup (sugar). Then, each piece is rolled in bar sugar and glazed in the sun. The fleshy tissue contains no sugar and has very little flavor, if any. This is hardly our idea of good candy."

-----quoted from Bettie Muckleroy, in Kaktos Komments, Houston.

"The fruits of the Mexican lemon cactus, ferrocactus hamatacanthus, are used as a substitute for lemons in Nueva Leon, Mexico. The greenish fruits persist on the plants nearly all winter. They have a high acid content, and Mexican cooks use them like limes or lemons in flavoring drinks, pies, and cakes. Unlike most other species of the genus, F. hamatacanthus fruit is very thin skinned, and the flesh is juicy and edible."

-----quoted from Larry Mitich in "The Sun Dwellers" in Cactus Points.

CACTUS FOR TODAY

Echinocereus Fendleri

Clumps not dense; the stems 1-5 or more; not crowded against one another, ovoid, 2-1/2-5 inches in diameter, flaccid, ribs usually about 9-10, not markedly tuberculate at the areoles; spines not abutting the surface of the stem; central spine one; at first very dark brown to black; gray in age, turned upward from the base, tapering, 3/4 to 1-3/4 inches long, stout, rigid, slightly curving upward the entire length, not flattened; radial spines 9-11, similar to the central but shorter, and white or pale grey; Areole circular, not bearing white felt at maturity.

Type locality - Near Santa Fe, New Mexico.

Distribution - Texas, Southern Colorado and Utah, Arizona, Chihuahua and Sonora, Mexico, and New Mexico.

Remarks- Throughout its very extensive range from Texas through to Arizona, and an altitude range of 1000-8000 ft., a very considerable variation occurs but intergrading between the varieties is so pronounced that several species have been erected for outstanding differences. These differences, because of intergradation can be given varietal rank only.

In its western range it meets Echinocereus engelmannii, and there two of the varieties are transitional to that species.

The specie was named for August Fendler who collected extensively in New Mexico and Venezuela. The four varieties are Boyce-Thompsonii, rectispinus, Bonkerae and robustus.

(Reference: Saguaroand Bulletin, Desert Botanical Garden of Arizona)

THANK YOU ---
GLOVER CLEANERS AND LAUNDRY

Tribe III.

Sub-Tribe 3 Echinocereanae

- Genera 1. Echinocereus
- " 2. Acanthocalycium
- " 3. Rebutia
- " 4. Chamaecereus
- " 5. Lobivia
- " 6. Echinopsis

Tribe III. Sub-Tribe 3 Genus I -- Echinocereus

78 species
5 species and 13 varieties in Arizona

Arizona species:

Echinocereus Fendleri
Var.

The meeting hall of the Tucson Cactus and Botanical Society is made available to us through the courtesy of Glover Cleaners and Laundry, with their compliments. For this generous offer, the Society is most grateful. It is hoped that members will patronize Glover Cleaners who offer skilled custom dry cleaning, suede and leather cleaning, and fur cleaning and storage. Phone Glover Cleaners and Laundry at one of their three conveniently located addresses, for pick-up and delivery.

PROPER PRONUNCIATIONS
FOR PERPLEXED PERSONS

- Cactaceae - (kāk-tā-sī-ē)
 Tribe I Pereskiae (pēr-es'ki-ē)
 Genera - Pereskia (pēr-es'ki-ā)
 " - Maihuenia (mī-wēn-i-ā)
 Tribe II Opuntiae (ō-pūn-tī-ē-ē)
 Genera - Pereskopsis (pēr-es'ki-op'sis)
 - Quiabentia (kē-ā-bēn-i-ā)
 - Pterocactus (tēr-ō-kāk-tus)
 - Nopalea (nōp-pay-lee-uh)
 - Tacinga (ta-sin-ga)
 - Maihuenopsis (mī-wēn-i-ōp'sis)
 - Opuntia (ō-pūn-shi-gā)
 - Grusonia (grōō-sō-nī-ā)
 - Consolea (kōn-sō-lē-ā)

Tribe III - Cereae (sē-rē-ē-ē)

Sub-tribes

- 1- Cereanae (sē-rē-ā-nē)
44 genera
- 2- Hylocereanae (hī-lō-sē-rē-ā-nē)
9 genera
- 3- Echinocereanae (ē-kī-nō-sē-rē-ā-nē)
6 genera
- 4- Echinocactanae (ē-kī-nō-kāk-tā-nē)
37 genera
- 5- Cactanae (kāk-tā-nē)
2 genera
- 6- Coryphanthanae (kō-rī-fan-thā-nē)
16 genera
- 7- Epiphyllanae (ēp-i-fī-lā-nē)
9 genera
- 8- Rhipsalidanae (rip-sā-lī-dā-nē)
8 genera

FENDLER HEDGEHOG CACTUS
ECHINOCEREUS FENDLERI

Flowers: April and May. One of the desert's earliest bloomers, with gorgeous magenta, red or purple flowers. Very conspicuous in spring along the highways and side-roads in the Southwest.

Color Photo by R. C. Proctor

MEXICO'S
CACTUS PUBLICATION

The organ of the Mexican Association of Cactology is "Cactaceas y suculentos mejicanos". \$5.00 per year. Write to Sr. Dudley Gold, Aniceto Ortega, 1055, Mexico, D.F. He is the secretary of this association whose business address is Apartado Postal 17626, Mexico, 17. D.F.

A SEARCH FOR CACTI IN MEXICO IN JULY 1961

Manuel and Audrey Diaz, the traveling companions of the Alan Blackburs, on this trip to Mexico, arrived in Tucson on the night before departure, from their home in Chandler, Arizona. They unpacked their car which was to be left at Blackburs' home, and all got a good night's rest.

We were packed and ready to leave at 7:15 a.m. It took us an hour and a half to drive the 80 miles from our home to the International Border at Nogales, Arizona. After standing in line for twenty minutes, Alan couldn't find his driver's license in order to obtain his visa for entry into Mexico. Betty finally found it for him. After getting the visas, we were told to go to the first inspection station a few miles down the road where we would be inspected and given a permit for our car. This we did, and, after tipping the inspector and his helper one dollar each, we were saved the trouble of unpacking the car. We were given our Turista sticker and bid a "Buenos dias".

We had filled our gas tank in Nogales, Arizona, and, as it is a good rule to keep the gas tank full when traveling in the Southwest and Mexico, we stopped to fill up at Santa Ana, 70 miles south of the border.

Hermosillo, 176 miles further south, was our next stop. It is the capital of the state of Sonora and the center of a large agricultural area. We inquired concerning trucking facilities, since we wanted to ship our collections back to Arizona as we collected along the way. We found that there are no trucking concerns that go all over Mexico, but only small firms having territories to serve. However, they all work together and will take care of any packages, passing them from one shipper to the next. How long it may take a shipment to come from Mexico City to Nogales, Arizona where all plants must fumigated before entry into the United States will be the thing that we shall have to find out.

Just as we were leaving Hermosillo, we stopped at a small refreshment stand for a drink of pop. We talked with the woman owning the stand about the plants she had growing there. She was very much interested in plants and told us of bringing a cutting of *Lemaireocereus marginatus* from near Tepic. It was growing near her home. We asked if her children would like to earn some money by gathering some Organ Pipe seeds for us which we would pick up on our way back. She promised to have some when we returned in three weeks.

South of Hermosillo the storm clouds were building up, and we had storms near the highway. We went through only one small rainstorm which cooled us a little, but we noticed the humidity nevertheless. We arrived in Guaymas at 4:15 P.M. and took lodging at the Guaymas Inn Motel on the north edge of town. After a swim in the pool, we dressed and had dinner in the Motel restaurant. Then, we took a drive over a rough dirt road to San Carlos Bay area. Alan collected cacti while the rest watched fish jumping in the water. Cacti collected included *Mam. Johnstonii* with three different spine formations, *Echinocereus scopulorum*, *Mam. dioica*. Returning to the Motel, we took another swim and retired at 9:30 P.M.

Up at 5 A.M. and on our way. We drove to Obregon where we stopped at the Motel de Oro. Food was very good, and Alan was able to get his favorite breakfast (avena con leche)—oatmeal with Pasteurized milk. No rain today, but some clouds. Driving was pleasant, although when we stopped, the humidity got to us. We stopped quite often along the way to take short hikes from the highway to see what we could find. Cacti species seen or collected were *Pachycereus pringlei*, *P. pecten-arborescens*, *Mam. swinglei*, *Lemaireocereus thurberi*, *Lophocereus schottii*, *Ferracactus herrerae*, *Rathbunia sonorensis*, etc. The above seem to be all along the highway from Hermosillo to Culiacan. Just after crossing the Sonora-Sinaloa state line, we found a plant with a red flower which we took to be *euphorbia* as it had milky sap and a three-celled fruit. We

planned to see if the fruit was ripe on our return.

At lunch time, we stopped at a wayside shady place at San el Porizo. Here, banana, mango, and papaya trees were growing. We ate our lunch beneath them. Arriving in Culiacan about 4 P.M. and having traveled 363 miles, we decided to stay at Motel San Luis where we had stayed on a previous trip. The first time, the food was very good, but things had changed; this time it was very poor. After dinner we drove around town and filled the car with gasoline. We observed that one avenue was planted with what looked like *Euphorbia Lactea*.

After a restful night, we were up early and on our way to San Blas. We lunched in Maza Ian and arrived in San Blas at 4:00 P.M. Manuel made arrangements for a boat trip up a fresh water river which was the place where the movie, "African Queen" with Humphrey Bogart and Katherine Hepburn was produced. Audrey, Betty, and Alan put on their bathing suits and headed for the beach. The tide was going out, and native women and children were digging for small clams which Manuel said were butter clams. We helped dig in the sand with our bare hands. Alan, having the strongest hands, found quite a few which were given to the women and children. Sometimes, instead of a clam, you get a crayfish in your hand. It wiggles like the dickens and startles you before you can drop it. After dinner, we again walked down the beach, but this time, the sand was covered with sand crabs whose eyes shine like diamonds in the light of Alan's hand lantern. These crabs are harmless and run from you, but it gives you a creepy feeling to see them scampering about.

Up at 5 A.M. next morning, we had a breakfast of coffee and bollitos (small rolls) and soon take off to the boat dock. We were met halfway by Tomas, our boatman, who just cannot believe that we Americans are ready to go at this hour of the day. The ride up the river is very interesting and picturesque. The river is about 50 feet wide at the mouth and tapers to 15-20 feet in most places. The large mangrove trees overhang the water, and their shade was a relief, as the heat and humidity were stifling. Beautiful flowers abound — lilies, orchids, cacti, and a beautiful tree of the linden family with both red and yellow flowers the size of a cup, lining the river. Birds of many kinds fly about. White and blue cranes, a small kingfisher, tree ducks, yellow and black casique — their long nests hanging from the trees, and noisy parrots, all entertain us as we float up the river. Water lilies form large colonies at the bends. Alan collected 3 or 4 different orchids, and 2 cacti, an epiphyllum and an acanthocereus. Manuel stayed a couple of hours to fish while the rest gathered various shells along the beach. There are not many visitors at San Blas at this time of the year, so we had the beach to ourselves. The heat was not so bad, but we felt the high humidity. We had electric fans in our rooms, and were able to get a good night's rest. When Manuel returned from fishing, we packed and left for Guadalaajara.

Beyond Tepic was a lava bed which had cephalocereus and an ereiocereus which we collected along with a tuberous rooted begonia. We climbed from sea level to 5000 feet at Guadalaajara, and ran into the afternoon rainstorm. The rain cooled us off, and the altitude kept us that way. West of Ixtlan del Rio we stopped to look at *Lemaireocereus montanous*, and we stumbled on a nice *mammillaria* with white wool and strong nipples. We thought it was *Mam. compressa* but will have to wait for later identification. Cultivated fields were along the highway in most places. Hence, collecting was out, although we stopped at various places along the way, to no avail. We stayed at the Motel Tropicana in Guadalaajara. The next morning we slept until 7:00 A.M., then, after breakfast, we looked up the post office to find the rate to ship a 20 kilo box — about \$2.50. We planned to ship a few boxes if we could get a permit to ship plants in Mexico City. Next, we looked up a large nursery, hoping to see some cacti, but they had only potted seedlings of no importance to us. We went on to Tlaquepaque where the glass factories are. We visited various stores and watched bottles being blown. After a few purchases, we continued on to Irapuato, arriving about 5:00 P.M. Along the way, we stopped at likely-looking sites for collecting, and again, we found a lovely green *Mam.* with a hooked central and four accessory centrals, 26 lateral spines, 8-13 spiral. It was found on a rocky hillside east of Atotonilco, elevation 5600 feet. All *Mams.* found so far, grow in rich leaf mold. Near Abasolo, we saw a *cereus* that looked like a *nyctocereus serpentinus* but having more spines. Also, we saw a small cholla and a species of *pereskia*. In Irapuato, we stayed at *Tosada de Belen* at the edge of town — food very good and both rooms and meals were reasonable.

-----continued next issue.

SOME INSECTICIDES AND THEIR USES

by C. A. Freeman

GENERAL SAFETY PRECAUTIONS

1. All insecticides are POISON.
2. Keep locked up and away from children.
3. Use rubber gloves if available while mixing and applying.
4. Always stand up-wind of area to be dusted or sprayed so it will be carried away from you by the wind.
5. If heavy concentrations are spilled on clothing, or skin, remove clothing and wash skin with soap and water immediately.
6. Read the labels.
7. Keep containers labeled.
8. Use common sense and do not be afraid of what you are using.

WHEN USED PROPERLY, ALL INSECTICIDES LISTED BY C. A. FREEMAN ARE NON-INJURIOUS TO THE AVERAGE PERSON.

MALATHION:

Safety: One of the safest synthetic organic phosphate insecticides. Do NOT apply to vegetables within 7 days prior to harvest. Residual action--- 5 to 7 days.

Spray: 2 teaspoons of 50-57% emulsifiable concentrate in 1 gal. water.
4 tablespoons of 25% wettable powder in 1 gal. water.

Dust: 4-5%.

WILL KILL aphids, mites, leafhoppers, Mexican bean beetles, thrips, squash bugs and stink bugs.

WILL NOT KILL fleas, beetles, grasshoppers, most worms, caterpillars, grubs, ants, slugs or snails.

CHLORDANE:

Safety: Do not apply to edible plants or plants forming edible parts. Will injure cucumbers, melons, squash and pumpkins. Residual action 10-15 days.

Spray: 3 teaspoons of 45% emulsifiable concentrate to 1 gal. water.
1-1/2 tablespoons of 50% wettable powder to 1 gal. water.

Dust: .5-6%

WILL KILL cutworms, grubs, wireworms, ants, slugs, snails. Use on vegetation around garden to control grasshoppers and blister beetles.

PRESIDENT'S COLUMN

Alan Blackburn lists below the publications on cacti and succulents which he has in his own library. There are other publications, of course; he has chosen these. Some are out of print. Asterisks mark the best ones for your library.

- | | |
|---|--|
| * Aloe of South Africa - | Reynolds |
| * Arizona Cactuses - | Marshall |
| Arizona Flora - | Kearney and Peebles |
| * Cactaceae - | Britton and Rose - reprint - 2 volumes |
| * Cactaceae - | Marshall and Bock |
| Cactaceae of Northeastern and Central Mexico - | Safford, A. E. |
| * Cacti - | Borg, J. |
| * Cacti of the Southwest - | Earle, W. Hubert |
| Cacti and other Succulents - | Scott, S. H. |
| * Cacti for the Amateur - | Haselton, S. E. - reprint |
| * Cacti from Seed - | Lamb |
| Cacti of Arizona - | Benson Lyman |
| Cactus - | Van Laren, H. J. |
| Cactus and Its Home - | Shreve |
| Cactus Book - | Houghton |
| Cactus Culture - | Schultz, E. D. |
| * Cactus Guide - | Cutak |
| California Cactus - | Baxter |
| Colorado Cacti - | Boissevain |
| Fantastic Clan - | Thorner and Bonker |
| * Glossary of Succulent Plant Terms - | Marshall and Woods |
| * Grow Cacti - | Marsden |
| * How to Make Cacti Flower - | Lamb |
| * Mammillaria Handbook - | Craig, R. T. |
| * Naturalists Lexicon - | Wood, R. S. |
| Our Native Cacti - | Higgins, E. B. |
| Plant Classification - | Benson |
| Rio Mayo Plants - | Gentry |
| Texas Cacti - | Schultz and Runyon |
| * Stapeliaceae - | White and Sloane - 3 volumes. |
| * The Succulent Euphorbiae - | White, Dyer and Sloane - 2 volumes |
| * Succulents for the Amateur - | Hazelton, S. E. |
| Unusual Plants - | Brown, J. R. |
| * Yuccas of the Southwest - | Webber, J. M. |
| Better Understanding of Xerophytic Plants - | Marshall, W. T. |
| Morphology of Cacti - | Bauxbaum, Dr. Franz - 3 parts |
| * U. C. System for Container Grown Plants - | Baker, Kenneth |
| * Cacti and Other Succulents - | Lamb - 2 vols. |
| * Cacti and Succulents - | Green, G. G. |
| Succulent Plants - | Bertrand - 1st & 2nd Edition |
| * Flora of Mexicana (In English) - | Pesman |
| | Misc. |
| ** Manuel of Southwestern Desert Trees and Shrubs - | Benson and Darrow |
| Desert Wildflowers - | Jaeger, E. C. |

THE DESERT

If you would discover how to raise strong children, capable of breasting an uncertain future, go into the desert and look around you.

The things of the desert have survival power.

There is the art of seizing rare opportunity. The barrel cactus sucks the infrequent rains into its central reservoir and lives through burning months like a contented camel. The chollas send out widespread shallow roots to gulp the showers.

There is the art of resisting the bad and thirsty times. When the rains quit, the ocotillo sheds its leaves to conserve its moisture. During drouth, the desert mariposa looks absolutely dead, hiding its living bulb deep beneath the ground.

The Arizona roundtail squirrel sleeps through the summer. The mesquite sends a tap-root far down to cool subsoil where there is a trace of wetness.

There is the art of making do with what you have. The jackrabbit gets most of its moisture from the juices of plants and can go months without a proper drink. But the kangaroo rat is more marvelous. Alone among the animals on earth, it takes hydrogen from the seeds it eats and oxygen from the air it breathes, and by a chemical process not yet understood, it manufactures its own H-2-O. It never drinks at all.

The desert is a marvelous testimonial to the power that life possesses if life only conditions itself to use that power. The garden plants, the hothouse flowers, the animals of the woods and streams and meadows will not survive upon the desert. The desert bakes and frosts in a 24-hour cycle. The desert blows and sometimes washes fiercely. Yet, except where sands are shifting or the bare rocks come through, you will find life teeming.

---quoted from "The Desert" by Jenkin Lloyd Jones,
printed in Arizona Daily Star

CHATTER BOX

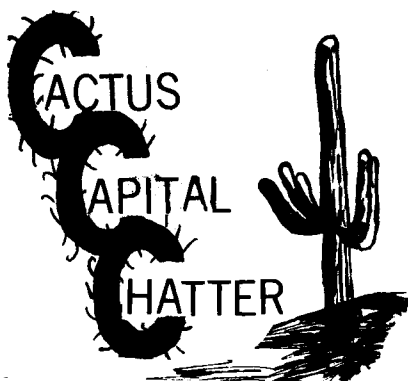
IN THE EXCHANGE DEPARTMENT

Other cactus societies publishing their own newsletters, bulletins and magazines, exchange them with Tucson Cactus and Botanical Society. They are:

1. Colorado Cactophiles Activities, 1251 Eudora Street, Denver, Colorado. 80220
2. Kaktos Komments, Houston Cactus and Succulent Society, 4103 Portsmouth, Houston, Texas. 77027
3. Cactus Digest, Henry Shaw Cactus Society, 3234 Delor Street, St. Louis, Missouri. 63111
4. New Zealand Cactus and Succulent Journal, Cactus and Succulent Society of New Zealand (Inc.) % Mr. R. L. Russell, 58 Cormack St., Mt. Roskill, Auckland, S.3., New Zealand.
5. CACTOCHAT, Christchurch Cactus & Succulent Society, 79 Crayke Rd., Fendalton, Christchurch 4, New Zealand.

IN THE SUBSCRIPTION DEPARTMENT

Any of our members who might like to subscribe to any of the above publications, may use these



CHATTER BOX

Follow us on CACTUS TRAILS that lead to the heart of Mexico; to magnificent Big Bend Park in Texas; to fascinating Boyce Thompson Arboretum, now a part of the University of Arizona Desert Biology Station; to Pinal County's little known but enticing Box Canyon. Become better acquainted with our experienced and inspiring "guides" who are, in order of the above places:

Alan Blackburn, Arizona-Sonora Desert Museum; Alan W. Morrison, retired from the U. S. Forest Service and an ardent naturalist and conservationist; Dr. E. Lendell Cockrum and Mr. Prior Thwaitts of the Desert Biology Station; Hugh Sloan, pharmacist-botanist and explorer of the unusual and the rare in Nature.

President Alan Blackburn has appointed another member to the Haag Memorial Cactus Garden Committee. Mr. Charles Trimble will now serve with Mr. Joseph Brick, Mrs. Alice Wanner and Mr. Ray Doss.

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Volume I Second Quarter 1966 No. 6

Prospective subscribers to Cactus Capital Chatter please note: make all personal checks to the order of Tucson Cactus and Botanical Society. Thank you.

All members of Tucson Cactus and Botanical Society are hereby reminded again to turn in to the editors of Cactus Chatter, Josephine Shelby and Hugh Sloan, reports of interesting trips made, items of general interest to the membership and any other material which they think might be usable in this publication.

Tucson Cactus and Botanical Society welcomes back to its membership this year, its founding president, Dr. William G. McGinnies and Mrs. McGinnies. Dr. McGinnies, a native of Colorado, is a graduate of the University of Arizona where he taught Botany and Range Ecology from 1926-1935. He holds a Ph. D. degree from the University of Chicago. His great interest in research led him into the Guayule Project in the U. S. Forest Service during World War II years. He spent three years on the Navajo Reservation in the Soil Conservation Service. He served as Director at Forest and Range Experiment Stations in the Central States, Rocky Mountain and Southwest Forest regions for twenty years. In 1960, he returned to the University of Arizona where he was Director of the Tree Ring Laboratory. A year and a half ago he became Project Leader of Arid Lands Research of the University of Arizona, which embraces all the deserts of the world.

BOOKS FOR THE SUCCULENT PLANT ENTHUSIAST

Alan Blackburn, our knowledgeable president, offers for your choosing the following books from a list published by The Desert Botanical Garden Book Store:

1. Book of Cacti and Other Succulents, by C. Chidamian. Excellent on the growing, propagation and insect control of cacti and succulents.
2. Cactaceae, by Marshall & Bock. A 1963 reprint of the 1941 printing. An excellent book for the cactus fancier and student.
3. Cacti, by Borg. The only one volume work containing most of all the cacti species. Invaluable to the ardent amateur and keen student.
4. Cacti for the Amateur, by Haselton. Outstanding book with the answers to your questions on cultivation, propagation, etc.

EXPLORING TEXAS' WILD LIFE PARADISE

Just before dawn on January 22, 1966, a cold clear morning, the four families of our Carousel Trailer Caravanscraped the frost from their automobile windshields and were on their way to Texas for a winter's visit. We arrived at Rockport, Texas, the first objective of our trip, after spending a frigid weekend in El Paso. Rockport is on the Gulf of Mexico about 30 miles north of Corpus Christi. Unless one is a fisherman or a bird watcher, Rockport may ring no bells for you. Our interests with birds and bird photography. In spite of great cloudiness, we did some photographing and enjoyed looking for birds--always with the hope that some rare or unusual specimen might be observed.

Located immediately north of Rockport is the Aransas Wild Life Refuge which is under the administration of the U. S. Fish and Wild Life Service. Embracing perhaps 47,261 acres of land and coastal inland waters, its principal purpose is to provide a winter home for the now rare whooping crane. These cranes spend the summer in Canadian Arctic areas. However, the land areas provide a sanctuary for many forms of wild life. In one day's visit to the area, we observed 300 white tail deer, javelina, wild turkeys, European wild boar, armadillos and thousands of snow and Canadian geese, as well as many species of song birds. Later, we took a boat up the inland waterway and sighted a number of whooping cranes. Two years ago when we visited this area, there were but 32 of these rare birds in existence in the world. However, this year their population has increased to 42.

We proceeded next, to the agricultural area of McAllen, Texas, and in a few days we arrived at Big Bend National Park. The magnificence of this park defies description. I can but urge that those of you who have not yet been there to put this park high on your priority list of interesting places to visit. We parked at centrally located Panther Junction which is near the park headquarters. As many as five coyotes came at dusk to within 75 feet of our trailer to get food that we put out for them. Occasionally a couple of javelinas also arrived for a handout, but always in the absence of coyotes. Many other forms of wild life may be observed in the Park. Equally interesting is the plant life, and prominent in this category are the many forms of cactus, inside the Park as well as in surrounding areas.

Since collecting cactus within the Park is prohibited, several side trips outside the Park were made. The trip to Presidio located on the Rio Grande River about 90 miles west of the Park was very interesting. We left Panther Junction early, in order to have time to collect. The trip proved to be fruitful from this standpoint. Among the species we collected were: *Echinocereus dasyacanthus* (Texas rainbow); *Echinocactus uncinatus* and *hamatacanthus* (Texas fishhook); *Mammillaria pottsii*; *Escobaria tuberculosa* and *dasyacantha*; *Thelocactus bicolor* var. *tricolor*. Another day we spent in the Study Butte area in the immediate vicinity of the west entrance of the Park. There we collected *Echinocactus horizontalis* (Turk's head); *Echinomastus dasyacanthus*; *Echinocereus stramineus*, as well as some of the same species found on the Presidio trip.

On February 26th, somewhat regretfully, we hooked up our trailers to depart from this wonderful area. We were heading for Alpine, Texas, the home of Homer Jones. Most members of the Tucson Cactus and Botanical Society are not acquainted with Homer. He was a good friend of Cactus John Haag. He is a wholesale dealer in cactus. I spent two pleasant evenings visiting with him. It was through his help that we were able to make the maximum use of four days that we spent there.

A trip to the Hovey area about 20 miles north of Alpine, proved quite fruitful. There we collected *Homalocephala texensis* (horse crippler); *Echinomastus dasyacanthus*. There were many Turk's head, but we had already collected all that we needed of these. Quite interesting was the discovery of an *Echinocereus* sp., resembling the rainbow group but having fewer ribs. As yet, these plants remain unidentified, but since I have several with buds, possibly the flower will be the key to our problem.

On another trip, to Fort Davis, we collected a number of *Echinomastus intertextus*. In general however, that area seemed to be rather well stripped of good plants. Good things always must end all too soon. So it was with our trip to Texas, which ended on March 2nd. Inevitably I find myself anticipating another exploration of the wild life paradise of Texas and the Big Bend National Park.

-----Alan W. Morrison

CACTUS FOR TODAY

Mammillarias of Arizona, described by Paul Shaw, continue the botanical emphasis in our Society programs for 1966. Mr. Shaw presented the following informative outline on Sub-Tribe 6. Coryphanthanae. Choosing Genus 13. Mammillaria, he specialized in his remarks on Mammillarias of Arizona. "Mammillaria Handbook" by Craig describes 238 species. The key and outline are easy to follow. The subject is treated thoroughly. This book is recommended to persons seriously interested in Mammillaria.

SUB-TRIBE 6. CORYPHANTHANAЕ

Key to genera.

- | | | |
|----------|------------------|----------------------------------|
| | ψ / - υ / μ | |
| Genus 1. | Ancistro cactus- | (an-sis-tro-kak-tus) |
| | | No. of species - 3. |
| " 2. | Neolloydia - | (nē-ō-lōl-dī-ā) |
| | | No. of species - 5. |
| " 3. | Thelocactus - | (thē-lō-kāk-tūs) |
| | | No. of species - 27. |
| " 4. | Echinomastus - | (ē-kī-no-mās-tūs) |
| | | No. of species - 7. |
| " 5. | Mamillopsis - | (mām-i-lōp-sis) |
| | | No. of species - 2. |
| " 6. | Cochemiea - | (kō-chē-mē-ē-ā) |
| | | No. of species - 5. |
| " 7. | Coryphantha - | (kō-rī-fan-thā) |
| | | No. of species - 56. |
| " 8. | Neobesseya - | (nē-ō-bēs-ē-ā) |
| | | No. of species - 7. |
| " 9. | Escobaria - | (ēs-kō-bā-rī-ā) |
| | | No. of species - 11. |
| " 10. | Pelecypora - | (pēl-ē-sīf-ō-rā) |
| | | No. of species - 2. |
| " 11. | Porfiria - | (pōr-fī-rī-ā) |
| | | No. of species - 1. |
| " 12. | Solisia - | (sō-lē-sī-ā) |
| | | No. of species - 1. |
| " 13. | Mammillaria - | (mām-i-lā-rī-ā) |
| | | No. of species - 210. |
| | 1. | Bartschella - (bārt-shēl-ā) |
| | | (included in Mams) |
| | | No. of species - 1. |
| | 2. | Phellosperma - (fēl-ō-spūr-mā) |
| | | No. of species 1. |
| | 3. | Dolichothele - (dōl-i-kō-thē-lē) |
| | | No. of species 3. |

MAMMILLARIA MICROCARPA FISHHOOK CACTUS

A tiny plant from 3 to 6 inches high. Most widely spread small cactus in the Southwest: Arizona, California, Nevada, New Mexico, Texas, Utah and northern Mexico. The flowers are the most beautiful when they occur in full circles in July and August. The curved central spines are responsible for the name "fishhook cactus".

Color Photo by R. C. Proctor

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At our March meeting, the members were given plastic eggs as planters to start cacti seeds.

The directions are: throw away the paper separator; soak the seeds overnight in water; put 3 tablespoons of water into the mixture; spread the seeds on the mixture; press the seeds into the mixture; expose the planted seeds to sunlight for a minute or two; replace the top and keep the egg at a temperature of 75-80 degrees until the seeds germinate.

They can grow in this egg for the first few months or until next spring if necessary. After the seeds show their spines, add a spoonful of water with a weak solution of plant food. Any balanced plant food will do, as the seedlings must never become completely dry.

Get your seeds started, and we will have a contest to see who has the best seedlings in 3-4 months. Pros like Lou Fodor, Paul Shaw and Alan Blackburn will be the judges.

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THE UNIVERSITY OF ARIZONA DESERT BIOLOGY STATION

The Boyce Thompson Southwestern Arboretum is currently operated as a part of the University of Arizona Biology Station. It consists of a large collection of unusual plants from the hot, arid, and semiarid sections of the world. These plants and the natural geologic beauty of the region combine to make the Arboretum a mecca for thousands of visitors each year, with many returning year after year.

The Arboretum was conceived by the noted mining magnate, the late Col. William Boyce Thompson. Throughout his life, Col. Thompson strongly believed that the conservation and proper utilization of plant resources were the obligations of every individual. He deplored the careless destruction of vegetation, particularly of forest and grazing cover. He noted that the dry-climated plants, especially, had received little attention. As his contributions to mankind, Col. Thompson established and endowed the Boyce Thompson Institute for Plant Research in Yonkers, New York. This institute is devoted to conducting basic research in the biology of plants. Later (1927), Col. Thompson established and endowed an arboretum for the study of arid land vegetation under natural conditions. This arboretum was incorporated under the Laws of the State of Arizona and officially dedicated as the Boyce Thompson Southwestern Arboretum on April 6, 1930. Here were to be brought together, for growing and study for possible utilization, plants of the semiarid and arid regions of the world.

The acreage in this Desert Biology Station comprises deeded land and Tonto Forest land, approximately a total of 1100 acres. Among the very interesting plant areas are the following:

The Southwestern Native Area containing trees and shrubs of Arizona, New Mexico, Texas and Southern California.

The Australian Area.

The Economic Tree Area supporting walnut, pecan, persimmon, olive, pistachio trees, among others.

The Succulent Greenhouse where South Africa succulents are the main plants.

The Eucalyptus Grove where the Rostrata has been shown to thrive in Arizona better than all other varieties.

The Conifer Grove where none of the conifers are native. All are two needle pines.

Mammillarias of Arizona

M. Heyderi

var. maddougali

var. applanata

M. Oliviae

M. Mainiae

M. Wrightii

Var. wilcoxii

Var. viridiflora

M. Tetrancistra (formerly Phellosperma tetrancistra)

M. Microcarpa

Var. milleri

Var. auricarpa

M. Fasciculata

M. Lasiantha

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In 1965, the University of Arizona entered into an agreement with the Board of Directors of the Boyce Thompson Southwestern Arboretum to establish and operate the Desert Biological Station. This Station is designed to serve a threefold educational function: (1) The Boyce Thompson Southwestern Arboretum is to be kept open as a public education facility where people can learn about desert plants of both the Old World and the New World; (2) a research center for biologists interested in the desert; and (3) a training center for advanced students in the biological sciences.

Located on U. S. Highways 60 and 70 just three miles west of the town of Superior and 65 miles east of Phoenix, the Arboretum is readily accessible to many people. Being physically located within the Tonto National Forest, the area contains a fine stand of the vegetation native to Arizona's deserts. The attractiveness of the area has been increased by the addition of many hundreds of species of plants from the deserts of other regions. The Arboretum is located in the northern part of the Arizona Desert, as that portion of the Sonoran Desert east of the Colorado River and lower Gila River drainages is called. Altitudinally, this desert ranges from 1000 feet on the western border to between 3500 and 4000 feet on the northern and eastern borders. The Arizona Desert differs from the other Southwestern deserts in having an abundance of arboreal and succulent plants. Here the well-known giant cactus, the saguaro, attains its maximum size and population densities. On the eroding mountain slopes and the upper bajadas of the Arizona Desert saguaros are associated with small trees such as palo verdes, desert ironwood, and crucifixion thorn, as well as with a host of cacti and shrubs of the legume and sunflower families.

At and above the upper limits of the saguaro, where minimum winter temperatures become effective in limiting the distribution of frost-sensitive plants, the vegetation on rocky slopes is dominated by shrubby members of the lily and amaryllis families.

Here thrive such plants as the yuccas, agaves, bear grass and sotol, and the leguminous acacias and mimosas. On the broad intermountain plains, the ubiquitous creosote bush dominates the landscape except along the drainage patterns where larger shrubs and trees, such as the mesquites, catclaw and blue palo-verde occur. In the major canyons and washes skirting the higher mountains along the eastern and northern borders of the Arizona Desert are mixed groves of larger trees including Arizona sycamore, Arizona ash, Arizona walnut and Fremont cottonwood.

The Desert Biology Station region is the haven of many different species of animal life. A preliminary check list shows 70 species of mammals. Many of these are active only at night, and thus are not seen by the usual visitor to the area. The javelina (or collared peccary) is often seen, as are deer, coyotes, gray fox, ringtail cat, and an occasional bobcat. Pack rat nests abound; cliff chipmunks, Harris ground squirrels and rock squirrels are common.

The bird fauna is extensive. A total of 144 species has been recorded on the "Field Check List of Birds of the Desert Biology Station," issued in July, 1965. Gambel's Quail, Gilded Flickers, Cactus Wrens, Curve-billed Thrashers, and Black-throated Sparrows are abundant resident species, as are many other Lower Sonoran birds. The extensive irrigated areas of native and exotic trees and shrubs provide food and shelter for countless winter visitants and transients.

A number of reptiles and amphibians occur in the region, most of which are nocturnal. Diurnal species that are commonly seen during the warm months include: gopher snakes, red racers, patch-nosed snakes, horned "toads", whip-tailed lizards, zebra-tailed lizards, tree lizards, giant toads, and tree frogs. On rare occasions a rattlesnake may be seen.

No animals are maintained as captives at the Desert Biology Station. To those who wish to see native animals in captivity, we recommend a visit to the Arizona-Sonora Desert Museum west of Tucson.

-----Courtesy of Dr. E. Lendell Cockrum, Professor of Zoology, University of Arizona, and Director of the Desert Biology Station; and Mr. Prior Thwaites, Resident Supervisor of the Desert Biology Station.

CONQUEST OF PINAL'S BOX CANYON

At about 9:00 A.M. on March 17th, Hugh Sloan's party of ten, traveling in two cars, started north on Oracle Road, bound for Box Canyon in Pinal County. Beyond Oracle Junction, the roadsides were fringed with Blue Lupine, Filaree, Lesquerella, Phacelia, and a few California Poppies. Approximately one mile north of Florence, a few rods from the railroad tracks, we took a dirt road to the right, through irrigated farms nestled in the basin of the Gila River. At one point, we passed a dam under construction by the U. S. Army Engineers. This reservoir will conserve an estimated 50,000 acre feet of water annually for the Bureau of Indian Affairs, San Carlos project in Pinal County. Through this area there are many fantastic saguaros: some, unusually tall; others with uncountable arms; one, very unique with the top broken off and with the arms projecting in opposite directions like steer horns.

We soon began to climb slightly, through low foothills covered with chollas, saguaros, and desert shrubs. Then we entered the mouth of the canyon. The entrance is actually the exit of the stream at the lower end of the gorge. The view is truly magnificent: light brown walls studded with myriads of lichens and a large variety of flora. It is a rock hunter's, a botanist's, and a photographer's paradise. This narrow chasm measures from 50 to 100 feet in height, with a small stream trickling through the bottom. It is still a miracle how we traversed the canyon in ordinary passenger cars. Apparently, recent melting snows and spring rains had washed away the finer sand and left exposed bedrock for the roadbed, and boulders between which we inched our way slowly and carefully. However, we emerged with no human or car damage. In the deepest part of the gorge we passed several side canyons unmarred by the progress of civilization. We saw small barrels growing in crevices, and a fragrant chila (*salvia carnosa*) rooted in a niche of rock. We also noted Pink Penstemon, Encelia, Phacelia, *Streptanthus*, Tackstem, Lupine, Filaree, Lesquerella, Fairy Duster (*Calliandra*), Pygmy Daisy, Yellow Monkey Flower, desert Mallow, and many more.

After leaving the gorge, we traveled over a winding roller coaster road, for several miles. We found a nice place to eat our lunches by the roadside, after which we all felt much better. In the vicinity we found many hedgehogs, mammillarias, chollas and many shrubs. Travelling a few more miles, we approached the Phoenix-Superior Highway where we left behind our magnificent scenery and the beauty of that gorgeous gorge.

—————Hugh Sloan.

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A SEARCH FOR CACTI IN MEXICO IN JULY 1961

(Continued from Vol. I, No. 5)

July 6th—off to an early start. From Irapuato to Mexico City the country is all farm land under cultivation. Plant collecting is not too good although we stopped at spots where no cultivation has been done. On one hillside, we found a large robust cereus and two big clumps of *Mam. magnimamma* and also quite a few seeds of *M. magnimamma*. This hill is 8 Km. west of Queretaro; the altitude is 5800 feet. While we were there, a man came up to us, holding a small rabbit and asking if we cared to buy it. Manuel asked him about the cacti of this area and how work was. This man operated a rock crusher for the highway department, working a 14 hour day, for 13 pesos. Outside Queretaro on the way to San Juan del Rio, Betty found a beautiful specimen of a coryphanta which may be *cornifera*; also, more *M. magnimamma* and *Ferocactus latispinus*. South of San Juan del Rio on the toll road to Mexico City, on a hillside, we found *M. magnimamma*, *Fero. latispinus*, *stenocacti*, and a long nipped *mam.* with a hooked central spine which keys out with *Mam. zephyranthoides*.

We arrived in Mexico City at 1:30 P.M. where we were met by an enterprising young man, who, for 10 pesos, directed us to a quiet motel on New York Street, called Beverly Motel. The owner was from Yucatan, and Manuel was born in Yucatan. So, we decided that the motel would be all right. Shortly, we went to the Gardens of Chapultepec Park. As far as we are concerned, it is another zoo and botanical garden much in need of repairs. No plants were labelled, for example. Upon our return to the motel, Manuel called Mrs. Hella Bravo-Hollis at the University of Mexico. We were invited to meet her the next day at 10 A.M.

The following morning, we went to the University without Manuel who was ill, to keep our appointment with Mrs. Helia Bravo-Hollis. She was very gracious but spoke very little English. She arranged for Mr. Maximilian Mirandez, a retired teacher now in research at the University, to go with us. He showed us through the botanical gardens started two years ago and still under construction. These gardens are being built in and among the lava beds of a volcano. This will be a beautiful setting for the gardens. We hope to see them again ten years later. After going through a large greenhouse, we went to the Library. While we were in the gardens, Dr. Bravo gave Alan a plant that he admired (*Tretona uvarra* or *kniffolia*). *Tretona* has a beautiful red and yellow flower somewhat like an aloe. Mr. Mirandez gave Betty a cutting of *Senecio praecox*. Agaves from which pulque and tequila are made are labelled. *Atrorivens*, a wide leaf variety, is used for pulque, and *A. tequillana* is used for tequila. It has a long, narrow leaf. Both grow quite large. The base of the plant is used for these beverages.

The next day, we left after breakfast. After climbing a 10,000 foot mountain, the road dropped down to a high plateau around 8000 feet in altitude. Good farm lands lie along the way, but occasionally we spied a hillside or a pasture that had not been cultivated. We stopped to search for cacti. When we started this trip, Manuel remarked that he would like to find a good *Mam. elegans*. On one limestone hill, Alan found an *elegans*, and, on searching further, found three more. We went about ten miles further, and on a hillside close to the road, we found *Mam. elegans* all over the hillside. At our next stop, we found *Ferocactus robustus* in great, huge mounds, three feet high and four to five feet across. We also found a *coryphanta* and *Mam. colinsii*.

Along the way, not too far from Tehuacan, we saw fences made from *Lemaireocereus marginatus* and another *cereus* which we do not know. It has a red flower similar to *marginatus* but larger. A large yucca began to appear, and Alan stopped to take pictures of it and large mounds of *Ferocactus robustus*. He also found *Coryphanta pectinata* there.

Five miles or so, west of Tehuacan and about a mile south of the road, we saw a high mesa where yucca were growing and what looked like a *beaucarnea* at the top of the mesa. We planned to investigate later and continued on to Tehuacan where we took rooms at the Hotel Mexican. Manuel and Alan planned to hunt cacti the next day. After dinner, we unpacked all the plants collected; brushed all the dirt from the roots; gave them a final inspection; and left them out in the air to dry while we were in Tehuacan.

The next day, the girls stayed in town to take in the shops while Manuel and Alan went cactus hunting. They took the road to Vera Cruz and went about twenty miles into the mountains before running into heavy fog. They turned back and worked the canyon, the hillside and down to the valley, collecting *Agave potatorium*, *mams.*, small *echinocactus* and some *coryphantas*.

Back in Tehuacan by noon, Manuel and Alan took the road south towards Oaxaca that winds over high hills and valleys. On this road grows the tall white *Cephalocereus hoppenstedtii*, along with many other smaller plants. Here grow the small *Mammillaria viperina* in large clusters under the small bushes in sandy washes. Plants were collected of each species, including *hechtias*, *dykias*, orchids, *tillansias*, and *echevarias*. The *C. hoppenstedtii* have their cephaliums on the side that receives the most sunlight. Another very interesting plant is the *beaucarnea* some of which grows to a height of twenty-five to thirty feet, having a bulbous base six to eight feet in diameter.

When Manuel and Alan returned to Hotel Mexico, they cleaned and packed all freshly collected plants, as well as those they were drying. All plants were packed in the rack on top of the car, in preparation for departing in the morning.

We were up at 5 A.M. ready to go south on the road to Oaxaca to show the girls the *beaucarnea* and *C. hoppenstedtii*. After this, we departed for Puebla where we intended to remain during the night, in order to see the volcano peaks in the early morning before the clouds formed about them. Although

It was the middle of July, and we were at an altitude of 7500 feet, it was so cold that we wore our winter jackets which felt comfortable until midday. Arriving at Puebla, we had the car serviced; then, we shopped for a few trinkets and returned to Hotel Lastra. Nearby is the baseball stadium, and Manuel and Alan went to a game between Puebla and San Antonio, Texas.

Up at 4 A.M., we drove to a park to prepare coffee and watch the mountain volcano peaks at sunrise. The clouds covered the peaks so thickly that we could not see them. Leaving Puebla, we drove toward Pachuca on a road through good farm lands and valleys, but there were some spots where the collecting was good. We lunched south of Pachuca and found *Coryphanta erecta*, *Ferocactus nobilis*, *Coryphanta pectinatas* and others. Continuing, we came to the top of a long hill and looked back. We saw the peaks of both mountains, Popo and Sleeping Lady, outlined against the sky. Both were snow-covered. Alan took pictures, then drove through Pachuca toward the valley where grow the old men. This road leaves Pachuca at about 600 feet altitude, climbs to 8500 feet, and then drops down 4500 feet in Hasteca Canyon where are to be found the old men. They are truly beautiful plants and should be protected from collectors. We took pictures and two small cuttings. On the hillside, coming down, we collected *Mammillaria geminispina* which grows on an 80 degree slope among the rocks in rich leaf mold. Betty does not enjoy high roads, and this one was certainly not to her liking. We retraced our road to Pachuca and then headed for San Juan del Rio.

On the way there, we traveled through valleys and hills where there are large plantations of agave *atrirrens*. A juice for making pulque, a fermented drink, is extracted from these agaves. We took pictures of a pulque collector getting the juice from this plant. He cut the center stalk out of the plant, and shaped the heart of the plant like a bowl. Here the juice collects. It is collected twice a day. Each time, the bowl is lightly scraped in order to prevent the tissue from hardening. Eventually, the bowl becomes 8-10

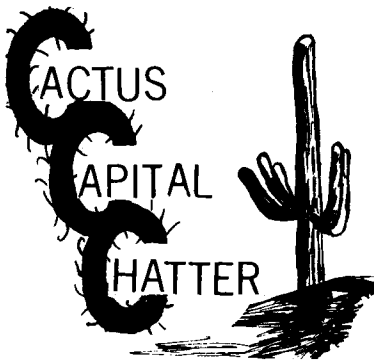
inches deep. The collector carries a large gourd about three feet long, and having a small hole in each end. The gourd is thrust into the bowl, and the juice is sucked into the gourd. The juice is retained in the gourd by holding a finger over the bottom hole. After going from plant to plant until the gourd is full, the collector empties it into a small barrel slung on the back of Mexico's beast of burden, the burro. These agave plants last about four months.

In San Juan del Rio, the cactus we had collected on the day before, we cleaned and packed. Then we packed them on the top rack which was full by now. Again, on our way, we visited Willie Wagner, a cactus grower and collector in Cadereytera which is near Queretaro. Back in the latter town, we were parked on the street, wondering where we could get something to eat, when a Mr. Stevens, a former Tucson resident, now living in Queretaro, stopped to talk to us because he knew by our auto license that we were from Tucson. When he learned that we were looking for a restaurant, he called a friend of his who has a boarding house with lovely rooms and mineral baths in an old Spanish home. She very kindly consented to have her cook prepare a meal for us. We had bollitos, tortillas, scrambled eggs, steak, coffee, chocolate, pan dulces, strawberry jam, hot relish and good drinking water, all for 10 pesos each, which is less than one dollar American money. Then, we were shown through the rooms and the mineral baths. Alan admired a small flower pot, and asked where he could buy one. She insisted that he take the one she had. We then drove to Irapuato, collecting along the way.

Next morning, early, we drove to Guanajuato. Above the town in the hills, we collected *Mam. gigantea* with two different spine formations. Guanajuato is a beautiful town located in a valley between high mountains. It would be a good place to spend a week's vacation. There is good cacti hunting in the surrounding areas.

Leaving Guanajuato by Route 45, and having very little room left, we decided to go to Durango and then over the mountains to Mazatlan and home. We collected a few plants on the road between Guanajuato and Fresnillo: *Ferocactus latispinus*, a *stenocactus*, *Mam. uncinata*, *Cory. pectinata*, and *Cory. magnimamma*. We arrived in Durango in mid-afternoon, traveling 143 miles in six hours. We made stops along the way and hiked over hillsides, collecting nothing except a large mam., either *ap-planta* or *phaeacantha* which we will key out at home.

.....Alan Blackburn
concluded in next issue



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CHATTER BOX

Summer vacations that scatter us far and wide are now about to end and we welcome back the members who have been absent several times. Rally round, all members, for our October meeting which you will not want to miss. Mr. W. Hubert Earle of the Desert Botanical Garden will lecture to us on a subject to be announced later.

We have learned from Charles V. May, Acting Superintendent of Saguaro National Monument, that the National Park Service is sponsoring an investigation of ecological factors affecting reproduction and survival of the saguaro cactus. These studies are being conducted by Dr. Charles Lowe of the University of Arizona, and are expected to continue through June 1967. Some experimental planting of seedlings has been carried out by Dr. Stanley Alcorn, University of Arizona. However, initiation of any large scale program of planting has been deferred until the report on ecological studies can be evaluated.

Homer A. Jones of Alpine, Texas wrote us this note, reminiscing about our Cactus John's visits with him:

Alpine, Texas
June 23, 1966

Dear Mrs. Shelby:

Cactus John spent perhaps three afternoons with me, in different years, and of course, we talked cactus. I found him most interesting and knowledgeable on the subject. A point we were discussing was damage to certain plants from borers. Here, almost every *Homalocephalus Texensis* has the bottom and well up into the body riddled with them, encased in a hard mud and excrement shell. *Echinomastus Intertextus* seems on the way out, from borers and stock. Sheep eat the flowers, and if they miss any, they later eat the seed berry. Cactus John said that he had gone before the Arizona Department of Agriculture to tell them that worms and not tourists were mainly responsible for diminishing stands of cactus in Arizona. *Astrophytum* in Mexico suffer a great amount of damage from a type of borer which works on the underside next to the soil. One curious trait is that they never cut the plant loose from the roots, and, as they eat the flesh, they leave the core or center. Maybe it is too tough to chew.

On his last visit with me, I tried to get John to spend the night with me as it was rather late when he decided to leave. However, he wanted to make Van Horn, Texas that night so that he could get to Tucson the next day. He did so, and had his fatal heart attack that night.

Yours truly,
Homer A. Jones

Alan Blackburn's beautiful color slides presented with his always helpful and interesting commentary, at the July meeting of Tucson Cactus and Botanical Society, drew the thanks and appreciation of members and visitors alike.

CARE OF CACTUS

How to water cactus and whether to use fertilizer on it are important features of raising cactus successfully. It is safe to say that a cactus requires about 1/3 to 1/4 as much water as a leafy plant in like surroundings. Green-house beds should be made up with soil in such a way as to provide good drainage. Beds for plants should have a base layer of stone or broken bricks about 6 inches deep. Over this should be placed 6 to 12 inches of soil composed of equal parts of sand and garden soil. The use of manure or fertilizer is not necessary, and if employed at all, should be used very sparingly. After all planting is completed, it is well to cover all of the soil surfaces with a 1/2 inch layer of sand or fine gravel.

-----from "Cactus and Its Home", Forrest Shreve.

Most cacti and succulents can be potted in John Innes #1 compost which can be bought at most horticultural sundries supply houses. It consists of 7 parts of loam, 3 parts of peat moss, and 2 parts of coarse sand. It is often advisable to increase the amount of sand used. To this must be added 4 ounces of J.I. Base Fertilizer and 3/4 ounce of ground limestone to each bushel of mixture. For growing tropical Euphyllum, well rotted cow manure is suggested as a vital soil component. When potting Euphorbia, remember that a few, such as E. Virosa are poisonous and contain substances of a very dangerous or unpleasant nature if taken internally. The milky juice should not be allowed to enter eyes, mouth or cuts. The hands should be washed after handling them.

-----from "Desert Plants"

Sir Oliver Luss.

It seems in general, that fertilizers are not used extensively in cactus culture. To quote in part from Prof. J. Borg: "Chemical fertilizers should be avoided especially for potted plants. Small quantities of super phosphates, basic slag, or powdered phosphate rock might be used."

SHARP OBSERVATIONS ON A SHARP SUBJECT

A pin-cushion cactus would make a good pin cushion -- except for its needles.

A rugged individual and a rugged saguaro are similar--both have spines.

If you brush too close to a jumping cholla--you'll be stuck with it.

Why do prickly plants always have gorgeous blossoms--like roses, cacti, oranges and palo verde?

The Sonoran desert, unlike most deserts, is lush with vegetation. Contrast the Arizona desert, for example, with the California and New Mexico deserts.

All cacti are succulents, but all succulents are not cacti.

If you pull off a long, straight, central spine from a saguaro--an areole and six radial spines will usually come with it.

Every cactus seed has two cotyledons--that is, the seed is composed of two halves, like a bean.

Areoles, or spine-cushions, are always present in cacti.

All cactus plants are perennials.

The petals of a cactus flower invariably arise from the top of the fruit or ovary.

The cactus fruit is a berry enclosing the seeds; the berry is one-celled, having no divisions or partitions to divide into sections like an orange.

When I say Echinocereus Engelmannii, what do you think of? Me too -- that field trip near Globe, and the wonderful hedgehogs we collected there.

Some common names of large barrels: Compass, Fishhook; of small barrels: Beehive, Pineapple; of miniature barrels: Button, Paper-spined.

Some common names of cereus: Saguaro, Organ-pipe, Senita.

Some common names of chollas: Pencil, Teddy Bear, Buckhorn, Chain-fruit; of club chollas: Dwarf, Ground-mat.

Some common names of prickly-pears: Beaver-tail, Purple, Grizzly-bear, Juniper, Creeping Beaver-tail.

Some common names of hedgehogs: Rainbow, Claret-cup, Porcupine, Strawberry.

Some common names of pincushions: Cob, Counter-clockwise, Golf-ball, Pancake.

-----contributed by Harold Scott Thomas, member of
Tucson Cactus and Botanical Society.



CACTUS WREN AND SAGUARO BLOSSOMS

Here we see Arizona's State Bird - the Cactus Wren amidst the lustrous white saguaro blossoms of Arizona's State Flower. Our state bird's supreme achievement has been its complete and very successful conquest of the cholla in which it builds its nest.

CACTUS FOR TODAY

"To function continuously in the study of cacti and native flora-----". Thus reads a portion of the statement of the purpose of the Tucson Cactus and Botanical Society. Paul Shaw gave a talk at one of our summer meetings on Tribe II, Opuntieae. He stressed the Arizona species, giving specific and detailed descriptions. A fine array of plant specimens greatly added to the interest in and understanding of his talk.

The Cactus Chatter Gourmet recommends that you feature this delicacy made from the young and tender pads of the prickly pear plants:

PAN FRIED OPUNTIA

Wash and peel tender pads. Boil in salt water until very tender. Drench through beaten egg. Roll in cornmeal, and fry in deep fat. Or roll in slightly sweetened batter and fry as you would cakes.

----from Cactophiles Cactivities.

TRIBE II OPUNTIEAE

Genus 7 - Opuntia

Sub-genus 1. *Cylindropuntia*
Stems cylindrical, nipped
(chollas)

(Arizona species)

1. *O. ramosissima*
2. *O. leptocaulis*
3. *O. arbuscula*
4. *O. Kleiniae* - var. *tetracantha*
5. *O. versicolor*
6. *O. spinosior*
7. *O. whipplei* - var. *enoides*
8. *O. fulgida* - var. *mamillata*
9. *O. bigelovii* - var. *ciribe*
10. *O. echinocarpa*
11. *O. acanthacarpa* - var. *ramosa*,
thornberi

Sub-genus 2. *Corynopuntia*

Prostrate or spreading species with
unsheathed spines

1. *O. stanlyi* - var. *kunzei*, *wrightiana*
2. *O. parishii*
3. *O. clavata*
4. *O. puchella*,

OUR PRESIDENT'S PAGE

THIS AND THAT ABOUT GROWING CACTUS SUCCESSFULLY

Cacti and other succulent plants are found all over the world in areas where it is hot and arid for most of the year, although true cacti occur only in the Western Hemisphere, with the exception of a very few species.

Cacti is the plural form of the Latin word, Cactus. However, in English, one finds the word, "Cactuses" used. Cacti differ from all other plants, including other succulents, in several important respects. Strict definitions in Botany are difficult since there are many exceptions. Botanists agree that the Cactaceae are not closely related to any other family of plants.

Many persons find these differences from the normal members of the plant world interesting and attractive. At first, their names may be a stumbling block, but there are good reasons for them. No doubt, common names are easier to remember, but they often lead to confusion. Once their botanical names are accepted, one soon becomes accustomed to them.

A good introduction to cacti are dealers' catalogs, those with colored illustrations being preferred. When one is interested in cacti, it is well to join a society devoted to their study. The Cactus and Succulent Society of America is perhaps the best in this country. Their journal usually carries advertisements of dealers who publish catalogs and who supply plants.

Spring is the time of year when we begin to think of repotting plants that need a change of growing media, or of adding to our present cactus beds. The plants we get are usually bare root or cuttings if bought, traded, or collected. Bare root plants should be carefully examined for damage or disease; the damaged or diseased portions removed and treated with powdered sulphur or some similar preparation designed to assist in the forming of a callus or to check further infection. Any insect infestation should be treated accordingly. The roots should be trimmed off to about one inch as they are of no help in reestablishing plant growth, and they may become a source of infection. Next, they should be placed in the rooting media or directly planted in the ground. An advantage of bare root plants is that once roots have formed, they will do so again more rapidly than will a newly taken cutting.

Bear in mind that these plants thrive best in warm, even hot, weather, and they also root best under similar conditions, particularly cacti. Bottom heat helps, remembering that these plants must be kept relatively dry until roots begin to form; otherwise rot may set in. They seldom die from lack of water but soon do so if over-watered. Should they appear withered, spraying helps at this point, providing only the surface of the compost is dampened, not wet.

Unrooted cuttings require much the same treatment as do bare root plants, but first it is best to allow a callus to form. Do this by placing the cutting in a warm, dry and shaded place a few days to a few weeks. Some will last three to four months before planting becomes necessary. The formation of a callus and root development may be hastened by dipping in a hormone powder such as Rootone, Capstan, Cut-Start and similar products. After the callus has formed, the cuttings should be accustomed gradually to increased light.

When planting plants in pots, if the pot is not new, it is best to sterilize the pot in Clorox. When potting, cover the hole with a piece of broken clay pot, rock, or pop bottle cap to prevent the soil from draining away when watering. Fill to potting level; spread out the roots and fill the pot, shaking it from time to time to insure that the compost will filter down through the roots. Finally, firm down with thumbs or a blunt stick, since it is essential that no air pockets be left in the compost. A layer of 1/4 to 1/2 inch of pea gravel, crushed rock, granite, coarse sand, or similar material will prevent the surface from forming a crust, will admit oxygen to the soil, and prevent accumulation of moisture at the neck of the plant where rot usually begins. Repotting is not necessary every year under normal conditions; every second or third year should suffice, according to the condition of the plant. It is best that the pot be thoroughly sterilized as well as the compost, in order to prevent the spread of disease and pests. Soil removed in repotting should be destroyed or at least sterilized.

.....

Alan Blackburn

The oldest botanical garden in the Western Hemisphere thrives on the West Indian Island of St. Vincent. It was established in Kingston in 1765 to introduce exotic and commercial plants from the Far East to the West Indies.

A SEARCH FOR CACTI IN MEXICO IN JULY 1961

(continued from Vol. I, No. 6)

Early next morning, we were off to Mazatlan, 202 miles over the mountains, dropping from 10,000 feet altitude to sea level at Mazatlan. This road is a beautiful one, well engineered, and is the most scenic one we have been on in Mexico. Drop-offs on both sides of the road made it a miserable ride for Betty, but, with the help of a couple of tranquilizer pills, she endured the 80 plus miles of winding road down the mountains. The only plants collected were a black echeveria and the rare *Mammillopsis senilis* and another mam. which may be a variety of *senilis*. These were found between 8000-8500 feet. There were many other plants worth collecting, but this was all that we had room for. Continuing on, we arrived in Mazatlan about 6 P.M.

Having been over the road from Mazatlan to Tucson previously, we did not plan to collect. We did pick up some seeds of the red bird of paradise and a few cuttings of *Rathbunia alamosensis*. This *Rathbunia* grows like a tree but will probably be a very tender plant. After arriving in Navajoa in late afternoon, we made a count and a list of all plants collected. This information will be needed when we go through inspection at Nogales tomorrow. We arrived in Nogales at 2 P.M. Our plants were taken to the inspection and fumigating building where all of them passed. We have no trouble over inspection at the border, due to our making sure that we have good, healthy plants with clean roots. After paying custom duty on the plants and clearing with the Inspection Department, we continued our trip home, completing a wonderful vacation.

Now, all that is left to do is to go to work to get some 265 plants and 130 cuttings either planted in the ground or potted.

Adios amigos.

----- Alan Blackburn.

BOOKS FOR THE SUCCULENT PLANT ENTHUSIAST

(continued from Page I, Volume I, Second Quarter 1966 No.6)

5. Cacti from Seeds, by Lamb. Complete instructions for a fascinating hobby.
6. Cacti of the Southwest, by Earle. Desert Botanical Garden Science Bul. #4. Guide to 118 species found between the Sierra Nevada Mts. and the Rio Grande River.
7. Glossary of Succulent Plant Terms, by Marshall & Woods. Description and pronunciation of botanical words as applied to cactus and other succulents.
8. Introduction to Desert Plants, by Marshall. Desert Botanical Garden Science Bul. #3. A study outline of the desert plants for layman and student.
9. Practical Gardening in Southern Arizona, by Phoenix Garden Center. Covers all types of floriculture and horticulture for desert areas. Planting guides.
10. Succulents for the Amateur, by Brown. A beginner's book showing 400 kinds of easy to grow succulents other than cactus.
11. The Observer's Book of Cacti & Other Succulents, by Scott. A good book describing easy to grow plants.
12. Meet Flora Mexicana, by M. Pesman. A pioneering type of guide book to identify plants and flowers that can be seen along the highways through Mexico. Arranged in 10 floral zones for easy reference.

HOW TO UNDERSTAND WHAT PLANT NAMES MEAN

Every plant has one complete, correct name and only one. Basically it consists of two parts, but sometimes more. The first part or word is the name of the plant genus, and it is called the generic name. The second identifies the species of that plant within the confines of its genus. This is the specific name, sometimes called in the peculiar way of science, the trivial name. It is anything but trivial. The varietal names, if any, follow after the first two and generally denote hybrids or improved strains that are increased or propagated by other means than seed sowing.

continued page 6.

The botanical name of what most people call the sweet violet is *Viola* (the genus) *odorata* (the species). *Viola* is the generic name for pansies, violas, and violets. The specific name, *odorata*, means, as one may guess without knowledge of the kind of Latin in which all scientific nomenclature is expressed, odoriferous, or scented and hence, fragrant or sweet. The garden violet is *V. cornuta*, often known as the horned violet, as the word "cornuta" might suggest. The horned appearance of the flower may well justify the name; at any rate, that was surely the inspiration.

Almost all specific names except those derived from place names or the names of people (*americana*, *sargentii*) have precise meaning in terms of plant qualities and characteristics. More often than not, the specific terms are apt and remarkably helpful in pinning down the particular plant you are concerned with. (To prove the rule, there are some whopping inconsistencies in the system, too.)

Below, arranged by categories of significance, are words or parts of words that should give you some easy clues to the meanings of many plant designations. Look for them alone or in combination as compound words. They may end in *-us*, *-um*, or *-a*, but their meaning will remain unchanged. Even if they are not always reliable, they are a real and important part of the pleasure of gardening.

Look for these, usually in compounds, to express quantity:

un-	=	1
bi- or di-	=	2
tri-	=	3
quadri- or tetra-	=	4
penta- or quinque-	=	5
hexa-	=	6
hepta-	=	7
octo-	=	8
ennea-	=	9
deca-	=	10
centi-	=	100
mille-	=	1000
multi-	=	many
mono-	=	one, single
pauci-	=	few
plenus-	=	full, double (many-petaled flowers)
poly-	=	many

These words call attention to important or notable parts of plants:

andrus	=	stamen
anthus	=	flower
carpus	=	fruit
caulis	=	stem
florus	=	flower
falius	=	leaf
lobus	=	lobe
pedatus, podus	=	foot
petalus	=	petal
phyllus	=	leaf

Some words denote pertinent times or seasons:

aestivalis	=	of summer
annus	=	annual
autumnalis	=	of autumn
hibernalis, hyemalis	=	of winter
nocturnus	=	of night
perennis	=	perennial
praecox	=	very early
tardus	=	late
vernalis	=	of spring

Other words denote important or featured colors, usually of flowers; sometimes of leaf, stem or bark:

albus	=	white
argenteus	=	silvery
atro-	=	dark
aureus	=	golden
azureus	=	sky-blue, azure
candidus	=	white
cardinalis	=	cardinal (red)
carneus	=	flesh colored
chrysanthus	=	yellow flowered
citrinus	=	citrus-like, lemon colored
coeruleus	=	dark blue
cyaneus	=	dark blue
discolor	=	of two different colors
flavus	=	yellow
fulvus	=	tawny orange
luteus	=	yellow
niger	=	black
purpureus	=	purple

continued page 7.

roseus	=	rosy
ruber, rubrus	=	red
sanguinalis	=	blood-red
violaceus	=	violet
virens	=	green
xanthinus	=	yellow

Here are the words that emphasize habitats or regions:

agrarius (agrostis)	=	of the fields
alpinus	=	alpine
aquaticus	=	aquatic
arenarius	=	of sandy places
australis	=	southern
borealis	=	northern
campestris	=	of the fields or open country
exoticus	=	foreign, not native
maritimus	=	of the shore or sea
montanus	=	of mountainous regions
nivalis	=	growing in or near snow
occidentalis	=	western
oceanicus	=	of the sea
orientalis	=	eastern
riparius	=	of river banks
saxatilis	=	growing among rocks
silvestris	=	of the woods

The following words denote pertinent size or shape, most often of leaf, sometimes of the whole plant or some other part:

abbreviatus	shortened
acuminatus	long-pointed, tapering
angustus	narrow
brevis	short
campanulatus	bell-shaped
cordatus	heart-shaped
cuneatus	wedge-shaped
digitatus	finger-form
elatus	tall
grandis	large
latus	broad
linearis	narrow
longus	long
macro	large
micro	small
minimus	very small
minor	small
nanus	small, dwarf
pachy	thick
parvus	small
planus	flat
platy	broad

Frequently, you encounter words stressing special plant characteristics of growth, leaf, stem, twig or other aspect that the person who first named the plant thought important, descriptive or helpful:

acris	acid, sharp
aggregatus	clustered
alatus	winged
baccatus	berried
calvus	hairless
capillaris	hairlike
caulescens	with stem
ciliaris (ciliatus)	hairy, fringed or margined
circinatus	coiled
complexus	encircled
complicatus	folded back or over
cornutus	horned
crassus	thick
crenatus	scalloped
cuspidatus	sharply or stiffly pointed
cymosus	flowers in cymes
deciduus	with parts falling (as leaves), deciduous
decumbens	reclining at base with tips upright
dendroideus	treelike
fertilis	fruitful
-ferus	bearing
filamentosus	thread-like
floribundus	flowering profusely
fruticosus	shrubby, bushy
glabrus	smooth
gracilis	slender
guttatus	spotted
hirsutus	hairy
hispidus	bristly
hortensis	of the garden
humilis	low-growing, dwarf
imbricans	overlapping
incisus	cut
inermis	without thorns or spines
involucratus	with a group or whorl of small leaves or bracts
labiatus (osus) lipped	lipped
lactatus	milky
laevis	smooth
lanatus	wooly
lanceus	lancelike, pointed
lineatus	striped, lined

continued page 8.

lucidus	bright, shining	patens	spreading
marginatus	with margin	pedunculatus	stalked
mollis	soft	pinnatus	with leaflets on the sides of the main leaf axis
mucronatus	sharp-tipped	pictus	variegated
muralis	growing on wall	pineus	of or pertaining to Pines
mutatus	changed, changeable	plumosus	feathery
nudus	bare, naked	pulcher	handsome
odorosus	fragrant	pungens	sharp-pointed, pungent
officinalis	medicinal	racemosus	with flower in a type of elongated cluster
-oides	like		by the Conde Nast Publications Inc."
oleraceus	of the vegetable garden or the kitchen		"Reprinted from HOUSE & GARDEN; Copyright (c) 1959
ornatus	showy, ornamental		
palmatus	divided or lobed		

THE UNIVERSITY OF ARIZONA HERBARIUM

Many plant lovers are anxious to familiarize themselves with the native vegetation of Arizona. Tourists inquire about the wild flowers of Arizona, as do the residents. Ranchers are anxious to learn about poisonous plants on cattle ranges. These are but a few of the questions that come to the staff of the University Herbarium from the public.

What is a herbarium? It is a library of pressed, dried, and identified plants for the purpose of research. The University Herbarium is a service institution of the College of Agriculture whose staff members answer questions about plants for residents and visitors alike. It is used by many departments of the University, but particularly by the workers in the College of Pharmacy and students of Range Management and Wildlife.

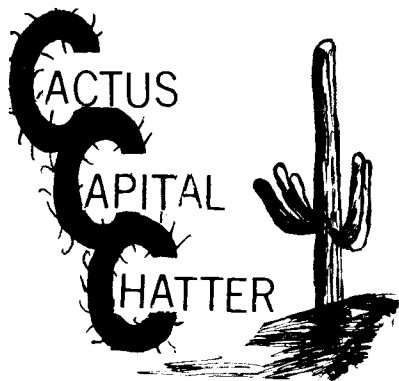
Once a plant is pressed and dried and mounted, it will last indefinitely. The oldest specimen in this Herbarium is over 130 years, received on exchange. The plants are housed in steel, air-tight, insect-proof, sealed herbarium cabinets. The specimens in the Herbarium provide an inventory of the plants growing without cultivation in Arizona. Although the Herbarium has emphasized Arizona, the Southwest and northern Mexico, the collection is not limited to these areas. It contains specimens from all parts of the world-----160,000 in all.

Among the numerous important collections which have been incorporated into the Herbarium are: the T.H. Kearney - R. H. Peebles one, of perhaps 15,000 specimens; Dr. Forest Shreve's collection of 30,000 specimens primarily from southern Arizona and northern Mexico; L. N. Gooding's 10,000 specimens. In order to increase its collection of world plants, the Herbarium maintains an exchange program with many universities and botanical institutions of the United States, Canada, Mexico and South America. Institutions in Vienna, Austria and in New Delhi, India have requested from the University of Arizona Herbarium a representation of the desert flora.

Dr. Charles T. Mason, professor of botany at the University of Arizona, is curator of the Herbarium. Your Cactus Capital Chatter staff is indebted to him for an interview which furnished this information. He also gave us permission to use material from a reprint from Progressive Agriculture in Arizona, Vol. XVII, No. 1, pp. 10-11, College of Agriculture, University of Arizona, January-February, 1965. We thank you, indeed, Dr. Mason.

 YOU HAVE AN IMPORTANT DATE

1. WITH WHOM? The Twentieth Annual Cactus Show.
 2. WHERE? At Webster Auditorium, Papago Park, Phoenix, Arizona
 3. WHEN? February 21st to February 28th, 1967.
 4. WHY? Your Tucson Cactus and Botanical Society will have its own table at this Cactus Show where our members will exhibit their choice plants. Let us go all out for a really fine showing from Tucson.
 5. BE SURE TO CHECK your announcement sheet for instructions. You received this on April 5, 1966.
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MY INTEREST IN CACTI AND SUCCULENTS

My interest in cacti and succulents was sparked when one of my brothers bought an *Opuntia Microdasys* at a general nursery, as a curiosity.

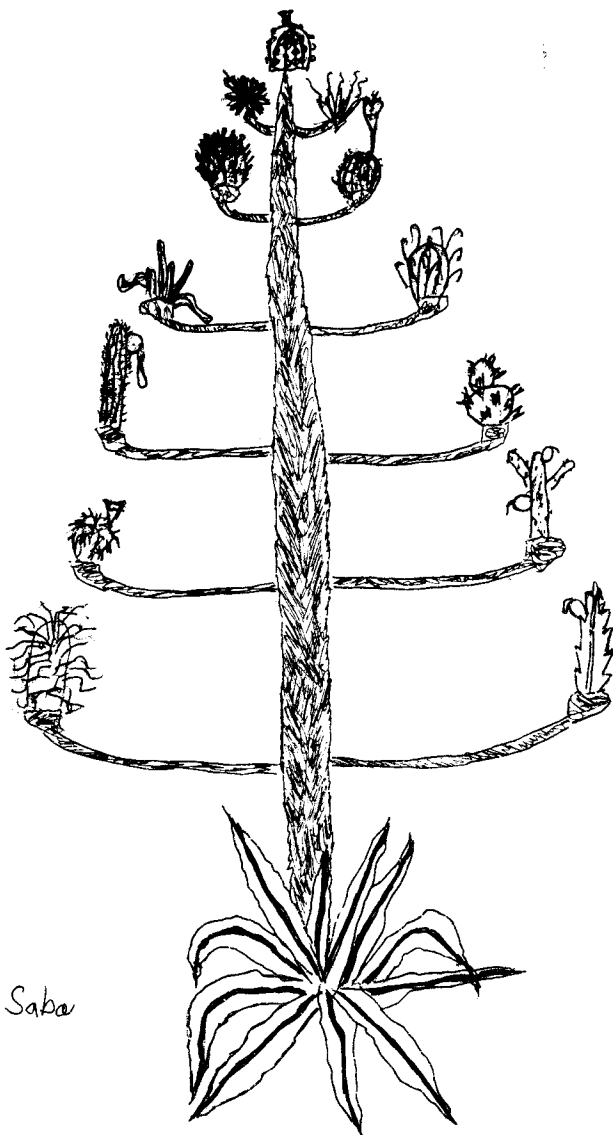
During the following months, I bought small potted cacti from the nursery in the neighborhood. However, an increasing interest caused me to start buying plants from cactus nurseries. About this time I became especially interested in the sub-tribes *Coryphanthanal*, and the rarer genera of the sub-tribe *Echinocactanal*.

Books have provided considerable encouragement in my hobby. The color photographs presented in "Arizona Highways" and "Flowering Cactus" are magnificent illustrations of cactus blossoms and forms. I have several scientific volumes on cactus including "Cacti of the Southwest" by Earle and "Cactaceae" by Marshall and Bock.

I appreciate the opportunity to associate with other cactus collectors through the Tucson Cactus and Botanical Society. I especially enjoy the field trips. Some of the members have given me valuable advice in growing cactus.

Richard W. Livingston, Jr.
 421 S. Downing Lane
 Tucson, Arizona 85711

(Richard is one of our younger, very enthusiastic members.



Paul Saba

YOUR CHRISTMAS TREE

A truly original "tree" dreamed up for you CACTUS fans. Its name: *Cact-istmas pictus ornatus dendroideus!!!*
 Its creator: our Junior botanical artist member- Paul Saba.
 Its message to you: HAPPY CHRISTMAS!

LIFE AND DEATH OF THE SAHUARO IN ARIZONA¹.

Charles H. Lowe
The University of Arizona

The death as well as life of the Sahuaro (Cereus giganteus, Carnegiea gigantea) is a subject of current research in our laboratory at The University of Arizona, and after a number of years of investigating the causes of death, I will summarize briefly here from the data for the Tucson area in southern Arizona. Perhaps needless to say, the sahuaros are here to stay regardless of some stories to the contrary.

First of all, sahuaros die at different ages for different reasons. We have found that one of the most important of these reasons can be the failure of young sahuaros to successfully establish root systems after seed germination during the summer monsoon. But this particularly fascinating story concerns sahuaros that are so small that they would hardly be recognized by most people as cacti at all, much less the giant sahuaro, so let us turn here to those causes of the demise of the large adults, the plants that the public is most familiar with--the giants.

The causes of death of large sahuaros are administered by agents that are capable of initiating physical damage to healthy sahuaro tissues in a serious way and on a large scale. These are two: 1) weather elements (primarily temperature), and 2) native animals (primarily rodents). The relative importance of these factors to two more recent proposals (overgrazing, and the so-called "bacterial necrosis disease") are as follows.

1. Weather elements.--The single most important natural force that affects all sahuaros today (on all sites over all of the many square miles of its geographic range in Arizona and Sonora) is the same single most important environmental force that has originally and continuously molded both the cactus itself and its present day geographic and ecologic distribution--this is the climate and weather. At Tucson it is the winter deficient heat (low minimum temperature) that is the deadly bottleneck for this subtropical species, particularly during the month of January.

2 and 3. Rodent Pressure and Overgrazing.--The next most important controlling forces in southern Arizona are rodent pressure and overgrazing. The first of these, the role of rodents, we have been able to analyze and evaluate with certainty. However, the relationship of rodent pressure today to overgrazing in the past, and indeed the actual role of overgrazing itself, is far more difficult to assess. With regard to overgrazing in general, it is beyond reasonable doubt that it has had a very definite and widely deleterious effect on southwestern biotic communities in general, and undoubtedly on sahuaro populations on some sites.

4. It may come as a surprise to residents of Arizona that the most continuously advertised (local newspapers) "cause" of all, the so-called "bacterial necrosis disease," is not a primary controlling factor in sahuaro death. This flamboyant misnomer, "bacterial necrosis disease," is not a control and is not a disease--it is the important natural process of tissue decomposition. Tissue decomposing is one of the most important basic industries in every natural community of plants and animals. One of the bacteria involved here, the species Erwinia carnegiana, is an important decomposer of dead and critically stressed cactus tissues and it has specifically evolved this capacity that insures final decomposition of sahuaros and other species. This important decomposer is present for natural decomposition of sahuaros that have been killed outright or critically damaged by other factors and, as a result, are plants that are dead or moribund.

¹. Extracted from a paper on "Life and Death of the Saguaro," presented at the annual meeting of the American Institute of Biological Sciences, University of Maryland, August 17, 1966. Research supported in part by research grants from the National Park Service and Rockefeller Foundation.

At Tucson, at the population level, this most critical damage that kills large sahuaros and seriously damages others is the periodic tissue freezing during some months of all winters. Most of the sahuaros critically affected by tissue freezing do not fall to the ground for several months (up to 2 or more years) afterward.

Thus unfortunately, tissue freeze-thaw commonly leaves a standing and still green sahuaro that is partly or wholly dead inside, fully doomed, and slowly decomposing and disintegrating during the last months on its feet. In this stage, it is very easy to convince people on a warm summer day that the black dripping spots (the so-called "bacterial necrosis disease") constitute the cause of death, when the real cause by freezing occurred inconspicuously several months earlier. Unfortunately for the problem of saving some of our most beautiful sahuaros, the data available at present indicate that the occurrence of bacteria and black dripping spots are merely the results and not the causes of sahuaro death.

 Dr. Charles Lowe is Professor of Zoology, Department of Biological Sciences, The University of Arizona. As an ecologist, he has been active in the study of sahuaro survival since 1950.

The staff of Cactus Capital Chatter greatly appreciates Professor Lowe's contributing this report which is of great interest and concern to all members of our Society.

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THE PATAGONIA - SONOITA CREEK SANCTUARY

The Sonoita Creek area near Patagonia is a favorite haunt of nature lovers and conservationists of Arizona as well as out-of-state visitors. About 320 acres in this area are thickly wooded with cottonwood, mesquite, ash, sycamore and willow trees. Sonoita Creek flows the year around and thereby has created an oasis in the desert there. More than 172 species of birds have been recorded in this haven for wildlife.

It has become vital that our forests, streams, ponds, marshes, remaining prairie, hills and mountains, undeveloped seacoast, wildlife, the natural beauty of our landscape, be preserved before they are destroyed by the rapid urbanization of our countryside. Every untouched, natural or wild area that can be saved from exploitation gives tomorrow's generations a living museum as a link to America's past. Natural areas are requisite to our way of life, for it is to nature that man frequently turns for inspiration. Also, they furnish the only true background against which to measure the changes that civilization has wrought in our environment.

The Nature Conservancy early in 1966 acquired this acreage along Sonoita Creek to preserve it in its natural state. This is the first time that this organization has purchased land in Arizona and set it aside for the protection of all types of flora and fauna. Once preserved, natural areas are used as "outdoor museums" so that the character of the land is not disturbed. Scientific research and outdoor education are encouraged on most areas. Non-destructive public uses such as canoeing, hiking, and nature photography are generally permitted. Construction of artificial features such as buildings, roads, dams, etc., is not usually allowed. The Patagonia - Sonoita Creek Sanctuary will function as a wildlife refuge, especially for birds.

Dr. Walter Phillips, University of Arizona professor of botany, is chairman of the Arizona Chapter of The Nature Conservancy which has been active in the state for ten years. There are 100 members statewide. What is The Nature Conservancy? It is a nonprofit organization whose primary purpose is to acquire land for the preservation and protection of all types of wild nature. These include biotic communities, geological features, and unique flora and fauna, as well as scenic areas and open space. To date, the organization has been instrumental in preserving nearly 60,000 acres of such land. Once the Conservancy builds up such areas, they are then turned over to other agencies, such as the National Park Service, the U.S. Forest Service, State Park

Systems. Dr. Phillips kindly talked with your editor about The Nature Conservancy. We are indebted to him for the details of this report and for material from two brochures published by The Nature Conservancy: "Living Museums", and "Questions and Answers about The Nature Conservancy".

Sunset Magazine, October 1966, carried a feature story on the Patagonia-Sonoita Creek Sanctuary. You will enjoy reading it on pages 5 and 6---"Near Patagonia---a walk in a bird sanctuary".

Have you read "The Quiet Crisis", by Stewart L. Udall? Holt, Rinehart and Winston published it. It was previewed in Saturday Review, Nov. 23, 1963. Read it to learn what he thinks the American people must be willing to do in order to preserve our environment--unspoiled.

ALAN BLACKBURN SCORES AGAIN

The New Zealand Cactus & Succulent Journal, Oct. 1966, page 100, features a short report on "Pulque Making". This information was taken from "Cactus Capital Chatter, Arizona, by Alan Blackburn".

SLATE OF OFFICERS FOR 1967 CHOSEN

The Tucson Cactus and Botanical Society elected officers for 1967 at its November meeting. Officers elected are: Rear Adm. Edward R. Halloran, USN, (Ret.), president; James Robbins, vice president; Nancy Clark, secretary; Joseph Brick, treasurer. The board of directors will be: Alan Blackburn, retiring president, Hugh H. Sloan, Col. Henry H. Jones, USMC, (Ret.), Charles Trimble, Rosa Christensen, John L. Meyer, P.G. Nichols, Alan Mollison and David Spring.

CACTUS FOR TODAY

The study of cacti at the August meeting of the Tucson Cactus & Botanical Society featured TRIBE III CEREEAE. Alan Blackburn delivered another of his informative and interesting talks, specializing on Genus 21. Ferocactus, and Genus 24. Echinocactus. He presented the following outline to members as a guide for following his talk:

8 SUB-TRIBES

Sub-tribe #4 - ECHINOACTANAE - Flowers at central areoles - fruit dry.

Key to genera.

Genus 1. Denmoza	Genus 20. Stenocactus
Genus 2. Ariocarpus	Genus 21. Ferocactus
Genus 3. Strombocactus	Genus 22. Neowedemannia
Genus 4. Obregonia	Genus 23. Gymnocalicium
Genus 5. Leuchtenbergia	Genus 24. Echinocactus
Genus 6. Encephalocarpus	Genus 25. Homalocephala
Genus 7. Lophophora	Genus 26. Astrophytum
Genus 8. Copiapoa	Genus 27. Eriocyce
Genus 9. Coloradoa	Genus 28. Pyrrhocactus
Genus 10. Pediocactus	Genus 29. Malacocarpus
Genus 11. Toumeyia	Genus 30. Notocactus
Genus 12. Epithelantha	Genus 31. Parodia
Genus 13. Aztekium	Genus 32. Frailea
Genus 14. Neoporteria	Genus 33. Mila
Genus 15. Arequipa	Genus 34. Sclerocactus
Genus 16. Oroya	Genus 35. Utahia
Genus 17. Matucana	Genus 36. Neogomesia
Genus 18. Hamatocactus	Genus 37. Blossfeldia
Genus 19. Weingartia	

Genus 21 - Ferocactus - Commonly called "Barrel cactus" because of their shape.
About 30 species are known. Some grow to 12 feet high.

Arizona Species-

1. *F. wislizenii*
2. *F. covillei*
3. *F. acanthodes*

Baja California species-

- F. acanthodes* var. *rostii* - *F. coloratus* - *F. gracilis* - *F. viscaianensis*
F. rectispinus - *F. diguettii* - *F. horridus* - *F. chrysacanthus* - *F. Johnstonianus*
F. peninsulæ - *F. orcuttii* - *F. tortulospinus* - *F. townsendianus* -

Desirable species-

- F. latispinus*, *nobilis*, *alamosanus*, *rectispinus*, *coloratus*, etc.

Genus 24 - *Echinocactus* - Small barrels. Top of plant bearing wool. Dry fruit with wool.

Arizona species -

1. *E. horizonthalonius*
2. *E. polycephalus*
3. *E. polycephalus* var. *xeranthemoides*

DECEMBER MEETING - FUN IN THE SUN

Members of the Tucson Cactus and Botanical Society are gathering at the Palo Verde Camping and Picnic Area, located in beautiful Tucson Mountains near the Arizona-Sonora Desert Museum, on Sunday, December 11 at 1:30 p.m. for a picnic.

This is a beautiful time of the year for the Society to meet on the desert to enjoy its beauties as we approach the holiday season. The picnic committee has arranged a gift exchange. Each member is asked to bring a gift which is associated with cactus culture. Suggested gifts are plants, containers, tools and gloves.

The dinner will be potluck. There are rumors of some interesting and tasty dishes being prepared by our members. The remainder of the afternoon will find the group busily engaged in general conversation and enjoying the last of the "cowboy" coffee.

WE MEET THE CACTI OF NORTHERN ARIZONA

Director W. H. Earle of the Desert Botanical Garden introduced to us southern Arizona cactus devotees the cactus plants of northern Arizona, at our October meeting. Potted specimens which he exhibited aided us in identifying these cacti less familiar to most of us.

Plants discussed at the Oct. 8th meeting of the TUCSON CACTUS & BOTANICAL SOCIETY:

Sclerocactus whipplei - found around Pipe Springs National Monument, Arizona.

Sclerocactus polyancistrus - northwestern portion of the state.

Utahia sileri - west of Fredonia, Arizona.

Pediocactus paradinei - east slopes of Kaibab Plateau.

Toumeyia papyraantha - along the Mogollon Rim north to Holbrook, Arizona.

Toumeyia (Navajo) *peeblesiana* - around Holbrook, Arizona.

Toumeyia bradyi - east of Navajo Bridge over the Colorado River.

Coryphantha vivipara var. *arizonica* - throughout northern Arizona but sparse.

Echinomastus johnsonii - amongst the Joshua trees northwest of Kingman, Arizona.

Echinocereus triglochidiatus - found amongst junipers throughout northern Arizona.

Echinocereus mojavensis - northwestern corner of Arizona.

Echinocereus melanacanthus - Prescott north to Seligman, Arizona.

Toumeyia fickeisenii - north of Tarweep, north of Colorado River.

HAAG MEMORIAL GARDEN NEWS

On October 13, 1966, the following members of our society groomed and manicured the Memorial Garden by trimming bushes, cleaning and clearing paths, and following other recommendations made by Paul Shaw there. Those who spent the day thus were: Mr. Trimble, Ray Doss, Alan Mollison, Mr. and Mrs. John L. Meyer, and Mr. and Mrs. Leo M. Wanner.

CACTUS IN HIGHWAY PATH GETS TENDEREST CARE

The State Highway Department is about to embark on its ninth cactus-stockpiling project, to save plants growing in the path of projected roads. These plants will be used in future highway landscaping.

State Highway specifications writers have risen to the challenge to save thousands of stately saguaros and other spiky specimens from being bulldozed into oblivion. In the newest stockpiling project, 102 cacti will be transplanted from the path of the new Nogales-Tucson interstate highway to a stockpile area where the highway crosses Pima Mine Road. Officials concede that all this work costs money. They added that federal aid is available for transplanting cacti from state stockpiles to landscaped roadsides, but not for creating the stockpiles. They said that the stockpile is the only way the Highway Department can get highway landscaping plants so representative of Arizona, in such abundance.

-----Quoted from The Arizona Daily Star, November, 1966.

ARIZONA AND SONORA PLANTS AND CANCER RESEARCH

Professor Jack R. Cole in the University of Arizona College of Pharmacy is extracting antitumor properties in plants collected in Arizona and Sonora. These properties will be tested and evaluated by the Cancer Chemotherapy Center in Bethesda, Maryland.

THE TWENTIETH ANNUAL CACTUS SHOW

Your favorite and most prized succulents must appear at this show---both to prove your own skill in gardening, and to enhance the representation of our Tucson Cactus & Botanical Society's entry. Already it is time to start preparing your individual entries. Read your instructions.

THE TUCSON BOTANICAL GARDEN

Harrison G. Yocum, of 1628 N. Jefferson Avenue, Tucson, invites the public to visit his Tucson Botanical Garden. We did. We feel certain that you would enjoy it as much as we did. In view of the interest of so many people, he has collected native and exotic plants, especially cacti and rare palms, to promote study and appreciation. He is convinced that wonderful landscape possibilities can be created with the wealth of material that thrives under average Tucson conditions. Besides the wide variety of cacti and succulents, many subtropical species do well with adequate care. Because of their slow maturity, eventual beauty and difficulty in obtaining rare species, the palms are the most prominent in his botanical garden. They are largely all in the seedling stage, not exceeding ten years. A number are attaining luxuriance. Common ones include some members of Washingtonia, Phoenix, Butia, Trachycarpus, Erythea, Sabal and Chamaerops. He is testing some of the rarer palms---carpernicia, jubaea, livivstona, nannorrhops and trithrinax--- for their endurance under the Tucson climate. He has grown palms coming from Puerto Rico, Malagasay, Cuba, Brazil, India and the East Indies successfully.

200 kinds of cacti and succulents are in his extensive collection. He has planted the cacti among some of the unusual rocks and ores of his fine collection of rare rocks and minerals. Being surrounded by desert and mountains, Tucson is fortunate in that a wide variety of rocks can be used for attractive "rockscaping". Rocks and cactus go together naturally, and infinite designs can be created with them. In addition, colorful rocks can be used to enhance foliage plants, thus combining botanical and mineralogical specimens to good advantage.

Mr. Yocum has extended an invitation to the Tucson Cactus and Botanical Society to visit his Tucson Botanical Garden. The material for this account of his garden is taken from a reprint of his paper appearing last April in The American Horticultural Magazine.

THE U. S. NATIONAL ARBORETUM

Have you heard of the National Arboretum? Yes? Have you visited it? If not, perhaps you will, one day when you visit our national capital. A century ago, a few persons dreamed of an arboretum in the National Capital that would take a place among the world's noted botanic gardens. These gardens long have been known for their contributions to botany, agriculture, and the general sciences no less than for their public services in pleasurable education and recreation.

The U. S. National Arboretum occupies 415 scenic acres in the Mount Hamilton section of the District of Columbia. Its higher hills overlook the Capitol and the Washington Monument to the south. The Arboretum is an educational institution—an outdoor museum, in which one can study many kinds of trees, shrubs and other plants which are arranged in pleasing patterns. It is a research institution. It uses its plants for cultural observation and in breeding and testing programs. In cooperation with the New Crops Research Branch of the Department of Agriculture, it distributes new plants and seeds to other botanic gardens of this country. You may be interested in knowing that the Desert Biology Station of the University of Arizona, at Superior, is a cooperator in this Plant Distribution Program. This is a yearly distribution to some 120 arboreta and botanic gardens in this country of new or improved plants received from foreign sources, domestic nurserymen, botanic gardens, or individuals, or developed through breeding at the National Arboretum. The institution receiving this material tests and evaluates it. If an item appears to be of ornamental value for their area, they are encouraged to make propagation material available to nurserymen, plant specialists, etc., so that the plant will become established.

The National Arboretum is a place for recreation. Not a picnic area and not a park in the usual sense, the Arboretum does offer opportunity for the diversions of observation, study, and walking its many trails among planted displays and stream-edged woodlands. When the azaleas are in bloom, 20,000 persons may visit here in a day. At all seasons, there is a steady flow of callers—tourists, scientists, gardeners and school children.

This information is taken from a brochure, "The National Arboretum", Agricultural Research Service. U. S. Department of Agriculture, courtesy of Mr. Joseph Garvey, Curator of Education.

OUR SALUTE TO THE SOCIAL HOUR HOSTESSES
OF 1966

Lena Marvin, Lura Fuller, and Betty Blackburn have won the appreciation and thanks of our entire membership. They have conducted most successfully, the social hour with refreshments, that regularly follow our meetings. During this hour, members chat with one another and with visitors, and compare notes on cactus and related subjects. In the winter, home-baked cookies donated by three members per meeting are served with hot coffee. During hot weather, iced tea is served with the cookies. Cookies left over are frozen, to be used next time. Betty Blackburn has assumed the responsibility for setting the room in order after the meetings.

HARK! OUT-OF-STATE SUBSCRIBERS TO CACTUS CAPITAL CHATTER!

We hope that you plan to subscribe to the Chatter for 1967. As soon as you have decided to do so, please let us know in advance of January ~~1967~~. Thank you.

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LOIS AND NANCY CLARK VISIT CHRISTCHURCH, NEW ZEALAND SUCCULENT GARDENS!

Leah McCausland of Christchurch, truly enjoys the succulent family, she says in her letters to the Clarks of our group. In two glasshouses she has about 2500 potted plants and several hundred seedlings that she has grown. She prefers cactus but also has the smaller growing crassulas, euphorbias, kalanchoes, stapeliads and lithops argyrodemas. The cactus that she planted outdoors in her rock garden do not flourish, due to extremely damp winters. Fifty miles inland from the coast, her sister in Ashburton grows a variety of succulents outdoors very successfully: trichocereus, echinopsis in huge clumps producing 100 flowers at a time; stenocactus; lobivias; mammillarias, among many others. Interested hobbyists span the Pacific Ocean with such interesting letters and visit each other's gardens!

GLEANINGS FROM OUR EXCHANGE

Agave Americana are a modern source of steroids and are also used in a variety of ingenious ways by primitives. The tender shoots are eaten as a cooked vegetable or raw in salads. The fleshy part of the broadest leaves is scraped off, leaving a strong flat piece of "paper" which the Aztecs used for their picture writings or codices. The thorn on the tip of the leaf can be pulled off in such a way that a yard long strand of very tough "thread" is attached to this "needle" all ready for sewing. Ropes are made from the plant. The fermented juices have been used since prehistoric times to produce the beverages mescal, pulque, and tequila. The plant has also been found to be rich in yeast and vitamins.

From the book, "Green Medicine" by Margaret B. Kreig.

South African natives shred Trichocaulons, a plentiful succulent of the country, and eat the licorice-tasting shreds in order to clear the throat of accumulated phlegm.

From The Cactus & Succulent Journal of New South Wales, and quoted in Colorado Cactivities.

The carrion smell of some of the Stapeliad species is usually associated with blooming succulents. Others have a delightful fragrance, according to "Hahniana" writing in Christchurch, N.Z. Cactochat. It is surprising to find that some of the most significant flowers are the most appealingly perfumed. Euphorbia Valida blossoms have a pleasant lime-like scent. Crassula Lactea, C. Barklei, and C. Lycopodooides are sweetly scented, the blooms of the latter having a fragrance reminiscent of the old-fashioned musk plant. Some Lithops are endowed with perfumed blossoms. Euphorbia Atrispina flowers have a decidedly lemon perfume. Hoyia Camosa is also numbered among the fragrant bloomers.

VALEDICTORY FOR OUR 1966 SOCIETY YEAR

FROM YOUR RETIRING PRESIDENT

This, my last message to you, is one of thankfulness. Thankfulness that I have been privileged to be your president and to have such willing helpers as officers.

I should like especially to thank Mrs. Lena Marvin and Mrs. Lura Fuller for a job well done in managing the serving of refreshments for all of our meetings. Mrs. Albert Wegner and Mr. Joe Brick were my main backstays. My thanks to both of you.

Many of our members have told me what a good bulletin we have in our "Cactus Capital Chatter". I think that our Chatter staff should take a big bow. Many thanks, Mrs. Shelby.

The office of president must have a great deal of help, and I am sure that we shall all be behind our new officers for 1967. Our Society is growing and will grow larger, but in order to do so, it must have a working membership. Let us all help our new officers for 1967 work toward a better Society.

ADIOS.....ALAN BLACKBURN

FROM YOUR RETIRING CACTUS CAPITAL CHATTER STAFF

First, the staff expresses its real gratitude to those members who accepted and delivered writing assignments for publication in the CHATTER. Next, our thanks to non-members who so willingly furnished excellent information to be used. They are, among others, staff members of: Desert Botanical Garden, Phoenix; Desert Biology Station and Boyce Thompson Arboretum, Superior; University of Arizona Herbarium and the Department of Botany; Conde Nast Publications.

It has been a very satisfying challenge that we accepted--to edit your Society's publication. We join you in anticipating an ever increasingly better publication for 1967.

Josephine Shelby, Editor. Hugh Sloan, Assistant Editor.