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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.

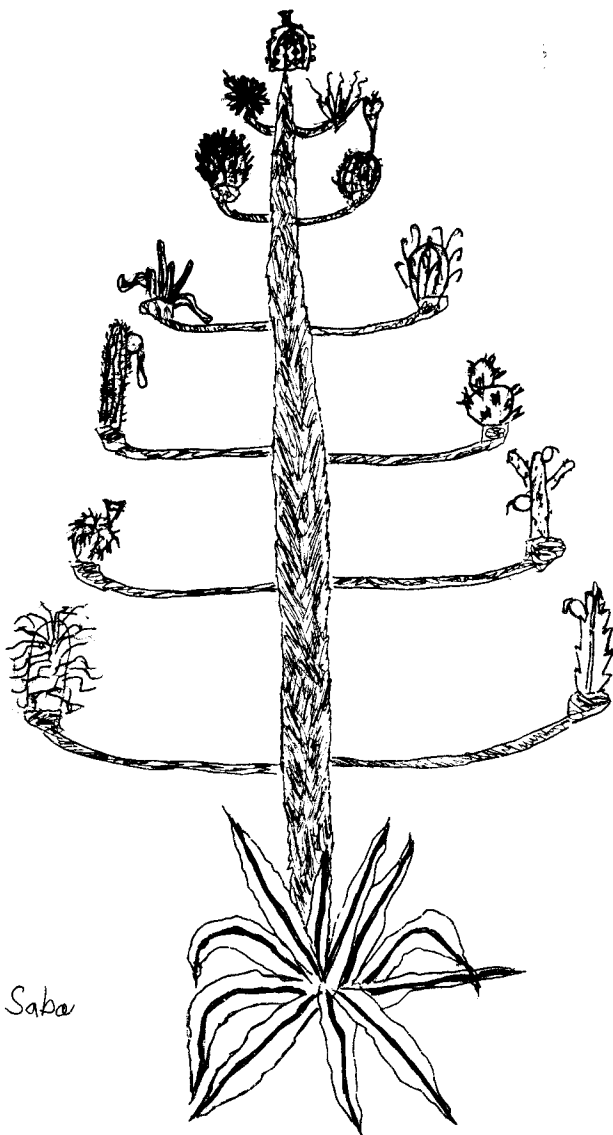
During the following months, I bought small potted cacti from the nursery in the neighborhood. However, an increasing interest caused me to start buying plants from cactus nurseries. About this time I became especially interested in the sub-tribes *Coryphanthanal*, and the rarer genera of the sub-tribe *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 ARIZONA<sup>1</sup>.

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.

<sup>1</sup>. 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.

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 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 papyrantha* - 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 argyrodermas. 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 La ctea, 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. Hoya 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.