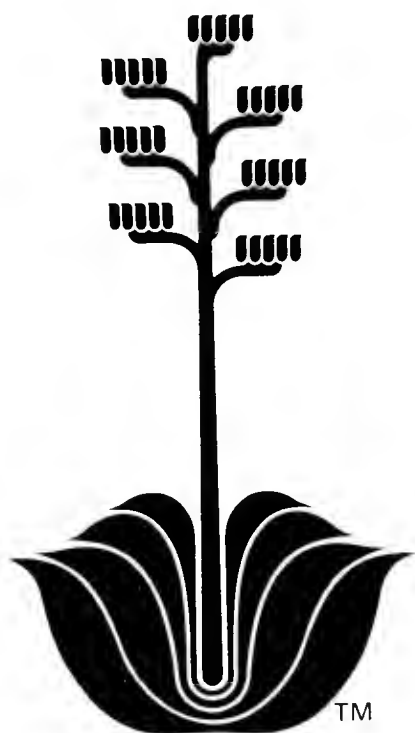


SAGUAROLAND BULLETIN

JANUARY, 1980





**DESERT
BOTANICAL
GARDEN**

ANNUAL MEMBERSHIP:

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Cover: The desert, as photographed by Hobart Pribbenow, a judge in this year's Garden Photo Exhibition; see page 11.

Director	Charles A. Huckins, Ph.D.
Research Botanist	Howard S. Gentry, Ph.D.
Curator of Herbarium	J. Harry Lehr
Superintendent	Russell Haughey
Business Manager	Janice Moats
Education Director	Sylvia Forbes
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Artist	Christina Dezelsky
Plant Propagator	Victor Gass
Gift Shop Manager	Lynn Trainum
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Horticultural Staff: Ross Berkheimer, Donald Conner, Wendy Hodgson, Nichole Holler, Howard Lyon, Marc Middleman, Patrick Quirk. Gift Shop Staff: Robyn Moats, Anna Shelstad, Clare Thomson, Lela Turner. Office Staff: Diane Batchelder, Tracy Peterson. Education Assistant: Mary Fulton.

Published and owned by the Desert Botanical Garden, Inc., a nonprofit institution, located in Papago Park, P.O. Box 5415, Phoenix, AZ 85010. The Saguaroland Bulletin is published monthly.

TRUSTEES OF THE DESERT BOTANICAL GARDEN. Officers: Chairman of the Board, John Rhuart. President, Henry C. Triesler, Jr. First Vice President, Donald W. Hutton. Second Vice President, Lillian Diven. Secretary, Lillian Mieg. Assistant Secretary, Barbara Kaiser. Treasurer, Alice Feffer. Assistant Treasurer, Margaret Caldwell. Members: Edward Burrell, W. H. Chester, John Daniels, Frank M. Feffer, Thomas A. Goodnight, Naomi Kitchel, Emelia La Tempa, Mary Lyon, Eric Maxwell, Mildred F. May, Charles F. Merbs, Duncan T. Patten, Bruce D. Pingree, Donald J. Pinkava, John F. Swift.

From the Director

It is my great pleasure to announce that a new Garden endowment of \$5,000 was established in mid-November. Contributed by Garden Friend Michael LeBeau for the purpose of establishing the Sue Jones Educational Fund, this endowment will be used to acquire on an annual basis, books and serial publications for the Garden's Richter Library. Sue Jones is a long-time friend of the desert and a new member of the Garden.

The Fund is an exciting development because it provides a regular means of keeping the Garden's original collection of works on desert plants (donated by Max Clemens Richter in 1967) updated and increasingly useful to students of desert life the world over.

* * *

Another welcome contribution is the \$1220 given by Valley National Bank in December for the renovation of one of the Garden's all-important service vehicles. It is most gratifying to have friends of the Garden who will donate resources for some of the more practical but absolutely necessary operations of the Garden. Such commitments represent a genuine appreciation for the challenges and difficulties in operating a private, nonprofit organization.

Many additional projects to improve existing facilities or initiate new programs await other Friends of the Garden who wish the opportunity to identify more closely with one of the most unique cultural institutions in Phoenix today.

—CHARLES A. HUCKINS

Dear Friend of the Garden:

I am pleased to announce the implementation of a new means of acknowledging outstanding volunteer assistance to the Garden.

In recognition of those volunteers who have contributed significantly to the welfare of the Garden over the past year, the Board of Trustees has authorized me to award a complimentary membership for the coming year to each individual who has devoted 100 or more hours of volunteer service to the Garden.

In the event that you do qualify for this recognition but are already a member of the Garden, yet wish to continue to support

it in a financial manner, your complimentary membership may be transferred to a friend who is not currently a member of the Garden.

If you did not accrue enough hours to qualify for complimentary membership this year, please be assured that *every* hour you give is appreciated and that your *continued* association with the Garden is one of its most important assets.

I and the rest of the staff look forward to working more closely with you in the year ahead for a better Garden and a more attractive community.

Sincerely yours,
CHARLES A. HUCKINS
Director

CACTUS SHOW VOLUNTEERS

The 33rd Annual Cactus Show will be held from March 22 through 30. There would never have been a Second Annual Cactus Show — much less a 32nd — without the help of Volunteers.

Last year, it took the combined talents and hard work of 101 Volunteers to make the Show the great success it was. Your help will make the 33rd Show another success.

Starting this month, and building week by week, pre-Show work is taking more and more of the staff's and regular volunteers' time. We need your help now, during the Show, and even after it.

Here is a check list of jobs-for-volunteers connected with the Show. Will you check the ones you want to do and let us know?

- | | |
|--|--|
| <input type="checkbox"/> Pre-Show mailings | <input type="checkbox"/> Helping set up Show |
| <input type="checkbox"/> Typing | <input type="checkbox"/> Acting as host, hostess |
| <input type="checkbox"/> Sales in Shop | <input type="checkbox"/> Being guard or "traffic cop" |
| <input type="checkbox"/> Selling Self-Guided Tour Books | <input type="checkbox"/> Helping with publicity |
| <input type="checkbox"/> Restocking in the Shop | <input type="checkbox"/> Keeping attendance count |
| <input type="checkbox"/> Registering entries before Show | <input type="checkbox"/> Answering visitors' questions |
| <input type="checkbox"/> Mailing, stuffing envelopes | <input type="checkbox"/> Lettering, posters, etc. |
| <input type="checkbox"/> Membership Booth | <input type="checkbox"/> Distributing posters |
| <input type="checkbox"/> Listing entries, exhibitors | <input type="checkbox"/> Miscellaneous chores |
| <input type="checkbox"/> Figuring totals during Show | |

How many days a week? On weekends? An occasional evening? When? Now? During the Show? After? Call 941-1217 and tell us.

Volunteers needed now through the Show.

DR. CHARLES A. HUCKINS — AN INTERVIEW

Q. Dr. Huckins, what attracted you to the Desert Botanical Garden and the Phoenix area?

The Garden has much potential for growth and that's exciting to anyone who deals with living things. At the present time the Garden has a membership of about 900 from the greater-metropolitan area of Phoenix with its population of almost one and one-half million people. In contrast, the Missouri Botanical Garden, located in St. Louis with a greater-metropolitan population comparable to that of Phoenix, has a membership of over 10,000! That alone indicates we have much room for improvement in inducing the public to become involved with and to support the Desert Botanical Garden.

The Garden is a young one — just over 40 years old — but it's on a firm financial footing with a demonstrated responsibility for balancing its budgets.

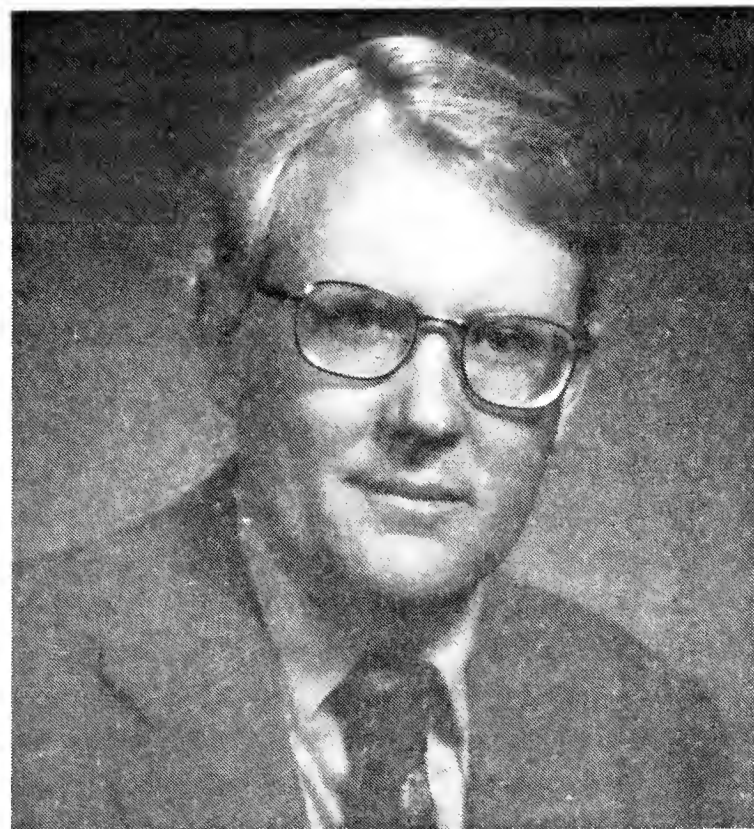
The Garden is undeveloped in many ways but it already has a number of fine resources. Some examples are: the Richter Library with over 6,000 volumes and serials on desert plants; the Earle Herbarium with over 18,000 plant specimens of the flora of our southwestern deserts; and a well-documented collection of living plants, including over half of the world's different kinds of cacti.

The staff of the Garden is small in number but very talented and quite versatile. It is exciting and rewarding to work with people who can implement what they plan.

The Garden has a good reputation internationally through its publications and seed lists which are distributed to 150 institutions throughout the world.

The Board of Trustees is acutely aware of the responsibility of the Garden to serve the greater Phoenix community and is eager for me to direct the improvement of our displays and educational services to the public.

In summary, there is a tremendous



Dr. Charles A. Huckins, Director of the Desert Botanical Garden.

attraction in meeting a major challenge to increase significantly the Garden's support through memberships, foundations and governmental agencies in making the Garden more attractive to visitors, and in effectively delivering critically important messages about the desert, its plant life and how that plant life affects all life.

Furthermore, from a personal point of view, both my wife and I are attracted to Arizona by the beautiful climate, the casual lifestyle and the magnificent scenery, all available without sacrificing the cultural and material advantages that the metropolitan area of Phoenix has to offer.

Q. What do you see as the basic objective of the Garden as an institution, and what are some of its goals?

The basic objective of the Garden is to conserve, grow and study plants from the arid regions of the world and to educate the public about the many and diverse ways that man depends upon these plants.

Some specific goals directed toward satisfying that objective in the near future include:

Development of a new Garden entrance to improve visitor services and provision of an effective medium in which to orient visitors to the Garden and its enormous collection of living plants;

Implementation of a comprehensive system of interpreting the Garden's living exhibits (including, a guide map to the Garden, a uniform means of labelling individual plants and groups of plants, pictorial Garden directories);

Improvement of the accessibility of the Garden and encouragement of utilization of the Garden by the handicapped and other minority segments of the population through facility improvements and program design;

Improvements to the physical facilities of the Webster Auditorium to enhance its function as a site for major exhibitions and displays (installation of track lighting and air conditioning);

Development of a new greenhouse facility that will model the latest technological developments in energy efficiency and serve as a propagation facility for rare, endangered and desirable arid-land plants;

Computerization of the plant records system to enable the Garden to improve its ability to monitor rare or endangered species grown and maintained at the Garden;

Development of a major new section of the Garden devoted to the display of plants of Australian arid-lands, many of which have considerable potential landscape value to the Phoenix area; and

Installation of a path lighting system that will permit enjoyment of the Garden at night.

Q. What role do you see the Garden playing in the total cultural atmosphere of the greater Phoenix area, today and in the future?

Today, the Desert Botanical Garden plays a disproportionately small but nevertheless significant role on the Phoenix cultural stage. This role is small because of the Garden's traditional focus on the scientific aspects of its plant

collections, but this role is significant because the Garden has concentrated on developing an impressive collection of desert plants native to the southwestern United States and Mexico and which effectively characterizes this unique section of the country.

In the future, the Garden should play a major role in the culture of Phoenix and Arizona. Living plants — man's most important partners in his struggle for survival on earth — figure significantly in his sense of well-being and provide the inspiration as well as raw materials for some of his most significant cultural expressions — the decorative and fine arts, horticulture, music and religion to name a few.

The vital relationship between man and the plant world about him is one which the Desert Botanical Garden is in a central position to portray with its vast living collections of plants and considerable reference tools represented by the Richter Library and the Earle Herbarium.

Although plants are one of the most critical factors in man's equation for survival, their importance is often overlooked; the challenge for botanical gardens and arboreta in the 1980s will be to project effectively this message to the general public.

Modern man has almost all but lost an innate sense of dependence on plants for his survival. This dependence has probably always been somewhat incompletely understood because of man's omnivorous nature.

Within this century, there has developed an acute awareness on the part of the scientific community of the complex inter-relationships among living organisms and the physical world about them. Even as the century draws to a close, we still have difficulty in appreciating some of these complexities and in making them comprehensible to the general public.

It will be a challenge to this garden and others like it to provide the public with personal, first-hand experiences with the beauty, satisfaction and value of green plants. In this vein, an important theme

will be to make connections between aboriginal man and his utilization of native plants and our recent technological period, with its emphasis on monoculture, mechanical harvesting techniques and chemical methods of disease and pest control, to make a more lasting heritage for future civilizations.

Just as it is important for us at this Garden to acknowledge and recognize the work of those who have gone before us in developing this fine botanical institution, we must also take responsibility in raising the consciousness of desert-living man to the importance of his natural plant resources, the need for careful management of these plants and their natural environments, and the wisdom of balancing all of man's activities with his environment, on a global scale.

Thus, among the most vital tasks of this institution will be to use the objects in its collections to demonstrate the value of plants, their special relationship to man, and their profound effect upon human culture.

Q. What have been some of the Garden's major achievements since its founding?

We rise on the shoulders of those who have gone before us. Some of the major achievements of the Garden during its 40-year history include:

The founding of the Garden itself as the only botanical institution dedicated from its beginning to the study of the plant life of deserts and other arid regions;

The acquisition of the Max Clemens Richter collection of botanical books and prints which form the nucleus of the Garden's library of more than 6,000 books and serial publications on deserts and desert plants;

The development of the Lois Porter Earle Herbarium which now includes over 18,000 specimens of plants collected primarily in Arizona and northern Mexico. This resource and the library constitute major reference tools in the understanding of plants of North American deserts;

The establishment of a living collection of over half of the world's different cacti;

The offering of one of the stronger educational programs among botanical gardens in the country today, with dozens of different classes, field trips and workshops on botanical, horticultural and related subjects being presented every year;

The development of a strong international seed exchange program with 150 botanical institutions throughout the world. The Garden is only one of a handful in this country which offers seed of documented wild origin.

Q. Where are you looking for the support that the Garden will need to develop its programs?

It is often stated that the importance of a civilization may be indicated by the richness of its cultural heritage. In a period of declining affluence and increasing competition for the leisure dollar, the worth of a cultural institution in the 1980s will probably be indicated on its financial statement — in terms of dollar amounts of support and diversity of contributing organizations.

The ultimate test of a cultural institution's worth should be in demonstrating its effectiveness in reaching the public with its stated message.

Convenient and quantifiable indicators will probably be used to determine an institution's effectiveness: the size of its membership, the number of annual visitors, its value as a teaching resource as measured by numbers of teacher workshops, school tours, etc., the usefulness of its applied research programs, the undeniable value of its pure research activities, etc. Its worth to the community will probably be measured by its membership enrollment and support from the corporate community and local governmental agencies. Its value as a regional or national resource will probably be scored by the number of annual visitors and the support from large private foundations and state or federal agencies.

The days are gone when we could depend on one public-spirited individual to initiate

a major cultural resource or a select group of people dedicated to a specific purpose to maintain it.

Because of the broad and ambitious purposes of the Desert Botanical Garden, it must be prepared to seek, to be worthy of, and to receive financial support from a wide range of sources, in all directions and at all levels. Support must be encouraged from casual visitors, public-spirited individuals, corporate donors, private foundations and governmental agencies.

More specifically, the Garden will be asking for assistance from among the corporate community over the next several months. Once that drive is well under way, a Spring program to attract individual memberships, particularly at higher levels of giving, will be implemented. From this program it is anticipated that a "Friends of the Garden" group will be organized, consisting of actively involved Garden members who will help to bring the Garden into sharper focus in the community. By early fall, the Garden plans to solicit support actively from among government agencies and private foundations for specific improvements. All the while, new activities are being planned and developed to promote Garden attendance. It is hoped that within a few years, the base of support for the Garden will be more evenly balanced among a variety of financial sources.

Dr. Charles A. Huckins, the new director of the Desert Botanical Garden, was formerly Chairman of Indoor Horticulture at the Missouri Botanical Garden, St. Louis.

Born in Hawaii in 1941, Dr. Huckins comes from a distinguished family of public servants. His father, Captain Thomas Huckins, USN (Ret.) was a member of the intelligence team which broke the Japanese code early in World

War II and his maternal great-great grandfather, Ninian Edwards, was the "Father of Illinois," being its only territorial Governor, first United States Senator and third state Governor.

In 1963, Charles Huckins received a B.A. in Biology at Brown University where his interest began to focus on plants. After a tour in the Marine Corps Reserve, Dr. Huckins returned to academic life at Cornell University, where he received a M.S. in Horticulture in 1967 and a Ph.D. in Botany in 1972.

After graduation, Dr. Huckins received the William Frederick Dreer Award from Cornell University and a research grant from the University of Oxford, England, for post-doctoral study in Europe and Asia.

In his spare time, Huckins enjoys gardening, water sports of all kinds and travelling with his wife, the former Mathilde Germaine Demisay. A first generation American born in Brooklyn, New York of French parents, Mrs. Huckins holds a graduate degree in French, has a distinguished career in nursing administration, specializing in geriatric care, is passionate about Arabian horses and loves to fly, being licensed in both single- and multi-engined aircraft.

Also involved with geriatric care, Dr. Huckins is one of the charter members of the National Council for Therapy and Rehabilitation Through Horticulture. In 1973 he helped implement the first horticultural therapy program in a private nursing facility in the country, Clove Lakes Nursing Home, Staten Island, New York.

Dr. Huckins is a member of Phi Kappa Phi, Pi Alpha Xi and Sigma Xi national honor societies. He is also active in the American Association of Botanical Gardens and Arboreta.

Dr. Huckins was formally introduced at a Garden reception honoring him on Sunday, November 11, 1979, 4-6 p.m.

DESERT PLANTS

Southwestern Staff of Life

The uses for desert plants are myriad. They serve as a staple food for humans and animals, medicines, stiff brews; they provide the basic ingredient for health care items and cosmetics, materials for arts and crafts, and are looked upon as sacred objects. The "Uses of Desert Plants," provides the theme for a special exhibit at the Garden, January 12 through February 3. An exhibit of living plants such as *Simmondsia chinensis*, *Parthenium argentatum*, and *Acanthosicyos horrida*, will be on display in the Cactus House; a graphic exhibit on the subject of useful plants of the desert will be displayed in Webster Auditorium.

One of the more rare and unusual plants in the living exhibit has been propagated from seed by Garden plant propagator, Victor Gass. It is a thorny plant, native to the Namib Desert in South West Africa. Very likely, *Acanthosicyos horrida* is not cultivated elsewhere in the world. The mature shrub attains a height of 1.2 to 1.5 meters, has opposite thorns and no leaves. The plant does, however, produce a delicious fruit under extremely dry conditions. The fruit has a leathery rind, is about 7 cm in diameter, and has seeds and pulp that are melon-like. The Naras melon, as the fruit of this plant is called, constitutes the chief food of the natives for several months of the year.

Tepary Bean, *Phaseolus acutifolius*, produces seeds that are often cooked with deer meat; the beans are reported to taste like Mexican pinto beans. This plant along with *Aloe vera*, *Agave tequilana*, *Simmondsia chinensis* and other desert plants that man uses, will be on display in the Garden exhibit. After the exhibit closes in early February, these plants eventually will form a special permanent exhibit in the Garden proper.

For centuries, people of the Southwest have found uses for many of the plants represented in the Garden. The Zunis considered plants as sacred and believed some plants had actually been dropped to

earth by the Star Peoples. The plant world is symbolically depicted by blue-green on the sacred Zuni rain-dance costumes worn by the rain-makers. Zunis include many plant designs on their fabrics, ceramics and ceremonial objects. The Papagos harvest fruit from the Saguaro for making jelly, jams, and candies. Sometimes, Saguaro fruit is ground to make a type of flour.

Practically every part of the prickly pear has had a use, some time or other, and indications are that the prickly pear, or nopal as some species are called, has long been under cultivation in Mexico (fig. 1). The leaves of the plant can be roasted on coals and eaten, or peeled and cubed to produce a dish called *wapolitos*.

The possibilities for making drinks out of desert plants are nearly as unlimited as the food varieties: cactus wine, tequilla, and a jojoba coffee substitute. A sweet drink can be made from mesquite.

Recipes for plant medicines include saguaro gruel for sick babies; manzanita is reported to cure everything from dropsy to poison oak.

The Garden exhibit, this month, is a reminder of the union that man has formed with the plants on this earth.



"Planted nopal for burns of the body:"
Plate 90 from The Badianus Manuscript,
An Aztec Herbal, 1552; reprint, Johns
Hopkins Press, 1940; in the Richter
Library Collection.

IN BRIEF

NEW BOARD MEMBERS

Three new board members have been selected to fill openings on the Desert Botanical Garden Board of Trustees. John Daniels, Vice President of the Valley National Bank has been appointed for a three year term. Mr. Daniels will be serving on the Growth Committee. Mrs. Roger Lyon has been appointed to a two year term. She will be serving on the Development Committee. Mr. John Swift, Administrator of Special Projects at Arizona Public Service was elected to a three year term. He will be serving on various committees including the Growth Committee. The Garden extends best wishes to these new Board Members.

NEW UNIFORMS

The Horticultural Staff of the Garden is starting off the New Year in new outfits that consist of khaki-colored slacks, long-sleeved tailored shirts, that have the Garden Insignia on the upper arm, and alternate shorts and short-sleeved shirts. These smart looking uniforms will enable one to identify the Staff when visiting the Garden.

NEW PROCEDURE

A new procedure, respective to registration for Garden sponsored courses, workshops and field trips, has recently been implemented. Registration for these events will be guaranteed *only* if full payment of the fee is received two days prior to the beginning of each event. Registration will be strictly on a first-come, first-served basis. The adoption of this procedure has been prompted by the significant number of people who, in the past, have reserved places for up-coming events and then have failed to appear on the day of the scheduled event, while others have been turned away. The new procedure for registration will be:

—Mail a check in for fees as soon as the decision is made to attend.

—All of fees will be refunded if a course fills up before a check is received.

—A \$3.00 handling fee will be charged if registration is cancelled more than 48 hours before the beginning of the class; the rest of the fee will be returned.

—No part of the fee will be refunded if there is a failure to notify the Garden within 48 hours that one will *not* be attending an event for which one has registered.

—A stand-by list will be maintained for each course, workshop and field trip for those who are unable to confirm their registration by check, or unable to enroll because an event is filled. Stand-bys will be notified if openings become available.

Remember, the only way to be sure you are registered is to pay your fees in advance.

CACTUS SHOW

March 22 through March 30 mark the dates of the Garden's 33rd Annual Cactus Show. Exhibits will be accepted March 17 through 19; Members and Exhibitors will preview the show on the evening of March 21.

Garden Members are encouraged to enter the show and to help make it another Cactus Show to remember. For help in putting together a winning exhibit, plan to attend the two day workshop, "Getting Ready for the Cactus Show." The first day, Wednesday, January 9, will be devoted to specimen plants in the morning, and dish gardens in the afternoon. Thursday morning, January 10, cactus enthusiasts can study dried arrangements; the afternoon session will consider buttons and miniatures. The classes will be taught by Cactus Show blue-ribbon winners, Joan Skirvin, Martha Passwater, and Lela Turner, and Garden Education Director, Sylvia Forbes. Class enrollment is limited to 60.

DESERTS OF THE WORLD

Visit the mighty Catalinas, glimpse the predawn gold over Monument Valley, gaze upon moon-drenched saguaros, garner a bee's-eye view of multi-hued desert blossoms, survey snow-dusted prickly pears and storm-shrouded valleys — experience all these views within the Desert Botanical Garden at this year's Third Annual Photographic Exhibition, "Deserts of the World," from January 26 to February 2.

The "Deserts of the World" Exhibition owes its continued success to its highly qualified Chairman, Garden Member Dottie O'Rourke. For three years, Dottie has been the motivating force behind the development of the show and the solid reputation that this show has gained. This year Dottie is being assisted by Co-Chairman Gen Evans, also a Garden Member and Volunteer, and by a committee comprised of Garden Docents, Volunteers, and Staff Members. Dottie and Gen have been very active in photo shows and have collected their own share of awards and honors for their outstanding photographic work. Both of these women are active members in The Photographic Society of America.

The judges for this year's show, too, are well qualified for their task. Marjorie Cushing, a specialist in cactus photos, is a three-star exhibitor in the Photographic Society of America's International Salons; John Cacheris is listed in PSA's Who's Who in Nature Slides; and Hobart Pribbenow is a four-time winner of the Arizona State Fair's resident award for black and white prints. Mr. Pribbenow's stunning print appears on this month's cover of *Saguaroland Bulletin*.

For your pre-show trip to "Deserts of the World," plan to join Garden Members and Exhibitors on Friday evening, January 25, from 7 to 9 P.M. (Closing date for entries is January 12. For further information contact the Chairman of the exhibition or the Desert Botanical Garden.)

A SPECIAL GARDEN

The December 1979 issue of the magazine, *Architectural Digest*, featured a six page article on the subject of the garden of Desert Botanical Garden Board Chairman, John Rhuart. Each issue this prestigious, international magazine highlights exceptional homes and gardens throughout the world. It is a publication highly respected for the superb quality of its color printing. The color photos of Mr. Rhuart's garden are truly spectacular. Copies of this issue are on sale in the Garden Gift Shop.

The title of the article about the Rhuart garden is, "Gardens: Desert Haven, Imaginative Landscaping under the Arizona Sun." In the text, John Rhuart is quoted as saying, "Ever since I was a boy, I have planted things, watched them grow and admired the beauty of flowers . . . It is a pleasure to show my garden to people who are gardeners at heart and share my passion. I have been all over the world to visit magnificent gardens, and the common interest with total strangers is very satisfying. All this has been close to my heart all my life."

CALENDAR OF EVENTS

The Desert Botanical Garden Calendar of Events has a new format. The new, four-fold calendar includes a registration form for classes and a membership blank. When the forms are removed, the calendar will remain intact for convenient posting. The calendar will be issued quarterly, so more detail may be presented on Garden events. The calendar cover for the Winter Quarter (January, February, March) is a photo copy of the drawing, *Aloe Humilis Africana Arachnoidea*, Fig. 27, from *Praeludia Botanica*, the 1715 edition. This rare work, by Caspari Commelin, M.D., was published in Leiden, The Netherlands. This book, along with the first edition, 1703, is housed in the Richter Library rare book collection. Aloes, similar to that depicted in Commelin's book will soon be blooming in the Garden's Succulent House.



DESERT BOTANICAL GARDEN

PO. BOX 5415
PHOENIX, AZ. 85010

Garden Events

JANUARY

- 7 **Basic Botany of Flowering Plants** — A beginning course in the essentials; four Monday sessions: 7 P.M.
- 8 **Introduction to the Desert** — A basic course about the Arizona desert; four Tuesday sessions: 1:30 P.M.
- 9 **Getting Ready for the Cactus Show** — A two session workshop; Specimen plants: 10 A.M.; Dish gardens: 1 P.M.
- 10 **Getting Ready for the Cactus Show** — A two session workshop; Dried Arrangements: 10 A.M.; Miniatures: 1 P.M.
- 12 **Pruning** — A workshop in techniques and tools; Saturday: 10 A.M.
- 19 **Rackensack Creek/Humbolt Mountain Field Trip** — Saturday: 8 A.M.
- 25 **Member's Preview of the Third Annual Desert Photography Show:** 7-9 P.M.
- 26 **Third Annual Desert Photography Show** — A juried show of desert plants and landscapes; through February 3: 9 A.M.-5 P.M.

FEBRUARY

- 9 **Hidden Canyon** — A field trip to a beautiful spot at South Mountain; Saturday: 8 A.M. Limit, 25.
- 11 **Desert Wildflowers** — An introductory class in desert wildflowers; two Monday sessions and one field trip: 7 P.M.
- 21 **Nature Photography** — Hobart Pribbenow presents two Thursday afternoon classes on taking plant photos: 1:30 P.M. Limit, 30.

The Garden is open every day of the year from 9 a.m. to sunset.





SAGUAROLAND
BULLETIN

FEBRUARY, 1980



**DESERT
BOTANICAL
GARDEN**

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Cover: First place black and white plant portrait in the Third Annual Photographic Exhibition at the Garden, "Three of a Kind," taken by Richard E. Dale of Sun City.

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A NEW OPUNTIA IDENTIFIED IN SOUTHWESTERN UTAH

By W. Hubert Earle

Director Emeritus, Desert Botanical Garden

Opuntia basilaris Engelmann & Bigelow 1856 var. *woodburyi* Earle var. nov.

* "A varietatibus ceteris differt articulis in arena incohaerente serpentibus, areolis tumidis, et spinis elongatis in areolis superis displicatis."

This opuntia is an eye-catching beaver-tail because of its creeping habit, brown glochids, bright light-green colored stems, and long spines on the upper end of the pads. It was found in the summer of 1978 by Dr. L. A. Woodbury, Toquerville, Utah, a retired Associate Professor of Biostatistics, Division of Radiobiology, University of Utah. The plant is well established in an area approximately 2.4 km by 9.8 km in southwestern Utah.

Opuntia basilaris var. *woodburyi* is an attractive, prostrate, creeping prickly pear which grows in chains on red sandy soil. Winds blow the fine soil onto the stems, sometimes causing them to form mounds 25 cm to 30 cm high and .9 m to 1.8 m in diameter. Pads are 10 cm to 15 cm long, 8.9 cm to 11.43 cm in diameter and 1.9 cm thick; the pads are bright light-green in color, glabrous, obovate to rhomboid in shape. New pads emerge from the underside of the parent pad. Spines are 2.5 cm to 5 cm long, occur singly or in pairs in are-

oles located only on the upper corner of the pad, porrect, ascending and descending, light-cream in color and .8 mm in diameter. Areoles are round, 1.6 mm to 6.3 mm in diameter, filled with copious dark glochids which are tan to brown, 6.3 mm to 16. mm long, and not easily detected.

Flowers appear in late May and are light to dark pink, 5 cm to 6.9 cm in diameter and 5 cm long. Fruit is 2.5 cm to 3.1 cm long and 2.2 cm wide, dry and spineless. The cream-colored seeds are lumpy, flat and .9 cm wide.

TYPE LOCALITY — Fort Pierce, Wash, Washington County, Utah.

DISTRIBUTION — Fort Pierce, Wash, south-southwest of Hurricane, Utah and adjoining red sandy washes at 1341 meters to 1402 meters elevation.

Holotype sheets of above variety are deposited at the Herbarium of Arizona State University, Tempe, Arizona and the Lois Porter Earle Herbarium at the Desert Botanical Garden, Phoenix, Arizona.

*Latin diagnosis by Dr. David J. Keil, Polytechnic State University, San Luis Obispo, California.



THE ANCIENT ALOES

By Vera Gamet

Dutch voyagers probing inland in the middle of the 1600's were probably the first white men to view the South African deserts, ablaze with blooming aloes. The Portuguese had rounded the Cape of Good Hope and explored hundreds of miles of unknown coastline a century and a half earlier, but they didn't think highly of South Africa and they couldn't get along with the natives. Nothing much was known about South Africa until the Dutch established the Dutch East India Company and subsequently the Colony in 1652.

On November 1, 1674 an "amateur", a Dutchman with the characteristic Dutch interest in plants, is recorded as having collected aloes and having brought them into the Company's gardens at Table Bay to see if they would thrive there. They did. Twenty years later, many aloe species had been introduced into the Company Gardens, and by the early 1700's aloes were being raised in Holland from seed sent from the Cape of Good Hope by the governor of the Colony.

Aloes are indigenous to all parts of Africa, the island of Madagascar, the Mediterranean region and parts of India and China. They are found in greatest concentration in South Africa. Their numbers increase and their succulence becomes more pronounced as their range deepens into the southern part of the continent. Over 200 species are native to the Union of South Africa. Over the entire continent they have adapted to extreme and varied climatic conditions from deserts with long droughts, high temperatures and unrelieved sunshine, to arid cold; other species of aloes thrive in the mist and humidity of life under a waterfall. They are marked by great diversity in shape and size.

Aloes generally give the impression of green stemless rosettes growing directly out of the ground. They may be 15 cm miniatures or 2 m giants. They may be shrubs with shaggy stems, or vines that tend to climb and rest on the shrubs

around them (see the *Aloe ciliaris* in the Leaf Succulent House). They may be trees 10 m tall. Their thick, fleshy, lanced-shaped leaves are arranged spirally to form the rosette, with a stem or without it. The leaf edge is spiny, and the outer surface convex; the leaf is somewhat three-cornered in cross-section and covered with mottled whitish spots or lines. Each leaf tip is hard and stiletto sharp.

Aloes are called succulents because they store life-sustaining moisture in their waxy-coated leaves. This is not simply stagnant storage. The leaves are photosynthetic centers of the plant, with large, thin-walled cells and conspicuous air spaces that allow movement of glucose throughout the plant as it is needed. As the watery glucose is consumed, the cells simply contract; on the occasion of the next rainfall, the cells expand with easy elasticity.

The tubular flowers grow in short stalked racemes, the ones at the bottom opening first and blossoming, then proceeding toward the tip. The inflorescence may appear as a single spire, or as a multibranching candelabra, in orange or yellow, soft salmon-pink tipped with green, or brilliant red as in the Hidden Foot Aloe, *Aloe cryptopoda*, in the Leaf Succulent House of the Garden. From October to April the South African veld is aflame with blooming aloes. The same blossoming period persists in the Northern Hemisphere. Wherever aloes become established, they tend to keep to the flowering habits of their origin. Their genes tell them when to bloom and bloom they do, brightening up the northern landscape just when it is most appreciated.

In the Western Hemisphere, aloes are pollinated by hummingbirds. In Africa, the long-billed sunbirds probe deep into the nectaries below the stamens and pistils, and emerge with their heads well powder-

ed with pollen to brush over the pistil of the next flower visited.

The medicinal use of aloe has been known for at least two thousand years, and if early documents are correctly interpreted, for four thousand years. The oldest aloe illustration known dates from 521 A.D. and is now in the National Library in Vienna. It almost certainly is *Aloe barbadensis*, the common, well-known medicine plant "aloe vera", formerly potted near every kitchen door. The healing gel is easily obtained; cut the leaf and let the juices run.

Over the intervening centuries aloe has been used to correct or alleviate many ailments. It has been used as a purge everywhere. Its aid in healing burns cannot be disputed. During World War II, botanical gardens were practically depleted of aloe when military hospitals found it indispensable in treating radiation burns. Aloe leaves were simply sliced and laid over lesions to relieve pain and itching, and to stop the irritation of constant

scratching. Relief was obtained within twenty-four hours.

Russia and Japan are known to be continuing their research into the use of aloe, relative to X-ray burns, using sophisticated techniques. The United States shows less interest in the therapeutic applications of the aloe plant. The list of pharmaceutical uses of aloe goes on indefinitely, cures of incredible variety, often gluttoned with magic and superstition, and often with proven effectiveness.

Aloes are an Old World plant and are not native to North America; however, some aloes flourish in the Arizona desert. Depending on their location and species, they are generally hardy, undemanding plants, with no special cultural problems. They like sunny locations, preferably with partial shade. Good drainage and protection from freezing are important factors for their survival. Today, aloes are grown more for use as handsome ornamentals than for medicinal use.



The aloes are in bloom at the Garden this month (photo by Marc Mittleman).

SNAKES AT THE DESERT BOTANICAL GARDEN

By Russell Haughey
Superintendent, Desert Botanical Garden

At least seven species of snakes have been identified on the grounds of the Desert Botanical Garden. None of these snakes is dangerous, although one species, the night snake, *Hypsiglena torquata*, is poisonous to small animals.

Most people do not find snakes attractive. Many people regard snakes as vile, vicious, slimy creatures which should be killed on sight. Members of the Garden staff occasionally find a harmless snake, such as the long-nosed snake, *Rhinocheilus lecontei*, or the common gopher snake, *Pituophis melanoleucus sayi*, slain along a Garden path, allegedly by an uninformed visitor who mistook the innocent victim for a rattlesnake.

For the unknowledgeable, the gopher snake is, admittedly, easily mistaken for a rattlesnake. Aside from its markings and the flattened shape of its head, both which vaguely resemble a rattlesnake's, the gopher snake mimics the actions of a rattlesnake by coiling and hissing and rattling its tail. Although the gopher snake has no rattles in its tail, the tail may make a rattle-like noise as it vibrates against leaves or other debris. Like rattlesnakes, gopher snakes thrive on a diet that consists principally of rodents. Gopher snakes are very helpful in controlling populations of ground squirrels, mice, rabbits and other pests. They will, however, eat almost any small animal including young and adult birds and bird eggs.

A Garden staff member once observed a gopher snake eating eggs in a Gambel Quail nest under a prickly pear. A group of shocked onlookers watched as the snake swallowed the rather large eggs, 3 cm by 4 cm, by making use of its special jaw structure to accommodate the eggs. The lower jaw of snakes is divided at the chin by elastic ligaments which separate. The upper and lower jaws are connected by the quadrate bone which is connected to the jaw bones by elastic ligaments which

allow the lower jaw to "dislocate." These features permit the snake to eat its meals whole. The gopher snake observed in the Garden, stretched its elastic jaws over each egg and swallowed it. The outline of the eggs was apparent as they moved down the body of the snake. When the eggs were about 10 cm into the snake's body, the creature flexed and broke the eggs against an inwardly protruding vertebra. This action could be heard as well as seen by the dismayed onlookers.

It may seem cruel to some individuals that a snake be allowed to consume an unhatched covey of quail, but this event is part of the natural life cycle that controls excessive populations.

Gopher snakes are found over almost all of the United States west of the Mississippi. Although there is a wide variation in its markings, the southern Arizona gopher snake generally has a row of brown blotches on a yellowish-tan background that runs down his back. This variety will sometimes grow to a length of over two meters.

The red racer or coachwhip, *Masticophis flagellum piceus*, is the next most common snake in the Garden, after the gopher snake. Seven varieties of the coachwhip are found in the southern half of the United States from coast to coast and south to Veracruz, Mexico. The coachwhip is a long, slender snake with a remarkable variation in coloration. The variety known as the red racer, found in southern California and Arizona, has two distinctive patterns of coloration. One pattern is usually light red with black or brown crossbands on the neck; the other variety has an entirely black back.

The red racer is a rather aggressive snake. It actively pursues prey, and when cornered attacks fearlessly. Racers are extremely hard to capture because of their camouflaged coloration and amazing speed. The red racer uses his climbing

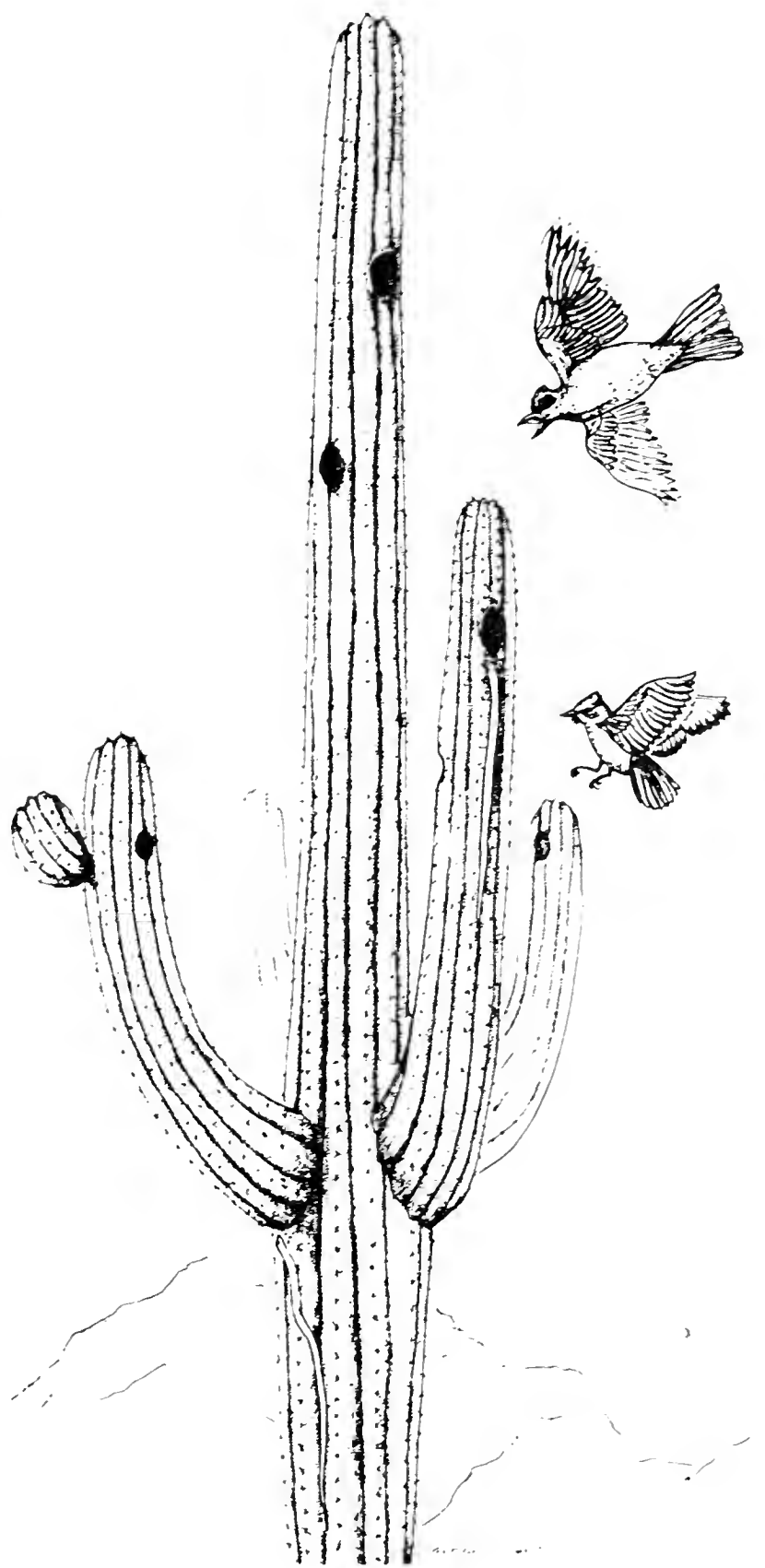
skill when making a quick escape. He eats rodents, lizards, insects, other snakes, and birds. In the spring these snakes are often seen as they climb in the rafters of the Cactus House and Succulent House at the Desert Botanical Garden, searching for House Finch eggs or for the young.

Last May, the author observed two red racers who were climbing a saguaro in the Garden, in an attempt to reach a Wied's Flycatcher's nest in an old Gila Woodpecker's hole near the top of the saguaro. The snakes slid up the saguaro between the ribs and then across the spines, checking out empty woodpecker holes along the way. They made it to the ends of two of the branches four meters below the nest. They were not able to go any higher because of the absence of spines on the old saguaro trunk, above the point where the branches joined the main stem. The adult flycatchers were understandably agitated about the snakes and repeatedly swooped down and attacked them. Garden visitors, watching from below, could hear the birds hit the spines of the cactus as they made their run. Eventually, the snakes lost interest and slithered down the saguaro.

One of the more interesting snakes in the garden is the night snake, *Hypsiglena torquata*. This snake is a member of the group of rear-fanged snakes. Unlike rattlesnakes, rear-fanged snakes have grooved teeth in the back of their mouths. When they capture prey, they bite one end of their victim and, by chewing vigorously, imbed paralyzing venom. Within seconds the victim becomes paralyzed. Although the night snake is poisonous to its prey, it is harmless to humans.

Night snakes are nocturnal and have evolved with elliptical pupils like those of a cat. They seek rocky terrain and are usually found under rocks during the day, or crossing the road at night. Their range extends from Washington south to Guerrero, Mexico and east to south-western Kansas.

Adult night snakes are small, measuring from 30 cm to 120 cm in length. They have a small, distinct head with vertical bars through the eyes; they are beige or gray



Red-racers climbing a saguaro, a Garden scene captured by Wendy Hodgson.

with brown or dark gray spots on their backs and a yellow or white belly. A distinguishing feature is two large, dark-brown blotches just behind the head.

The worm snake, or western blind snake, *Leptotyphlos humilis humilis*, is another fascinating snake found in the Garden. The snakes closely resemble

earthworms in appearance. They are slender, with no discernible head, colored pink, grey or brown and measure up to 25 cm in length. Their rudimentary eyes are covered by unmodified scales. At the tip of their tails there is a short spur which they use to push themselves along the surface of the ground, and as a defense to prick an attacker. The western blind snake ranges from southern California, southeast through Arizona, to western Texas and northern Mexico.

The principal food of the blind snake is the larvae of ants which it finds by following the pheromone trails of raiding army ant columns back to their nests. The slender snake has no trouble travelling down the ant tunnels to where the ant larvae are. The blind snake is most often seen as it crawls along wet surfaces on rainy nights, or discovered as it hides under boards or rocks.

Occasionally, the king snake, *Lampropeltis getulus*, is observed in the Garden. It is found from Oregon, south to Tamaulipas, Mexico and east to New Mexico. Its markings vary widely, but *Lampropeltis getulus* in Arizona usually has a cream-colored belly and a black back with narrow, cream-colored, crossbands.

The king snake is famous for killing rattlesnakes. King snakes are ophiophagous, which means they will eat other snakes, including rattlesnakes, to whose venom they are immune. They will kill other king snakes; they will even try to eat snakes larger than themselves. King snakes will also eat lizards, birds, mice, and even their own shed skin.

A fairly common snake in the Garden as well as throughout southern Arizona is the long-nosed snake, *Rhinocheilus lecontei lecontei*. The markings of this snake are not unlike those of the California or Sonoran mountain king snake; black, yellow, and red bands that are muted by off-color scales, with white scales speckling the black bands and black scales speckling the red bands. The long-nosed snake is found from southwestern Idaho, south to Tamaulipas, Mexico and east into New Mexico.

The long-nosed snake eats reptile eggs, insects, small mammals and lizards, especially the Whiptail Lizard, *Cnemidophorus*. This snake uses his long nose for burrowing in sand to search for reptile eggs or for sleeping lizards.

A unique characteristic of the long-nosed snake is its use of defensive tactics. Other snakes use one or more defensive tactics, but few use such a wide range of tricks. For example, it will hide its vulnerable head and rapidly coil its body while it vibrates its tail. When picked up, it will defecate and discharge a foul smelling musk. This musk is produced in special glands for the purpose of repulsing attackers. Many snakes use this tactic, but the long-nosed snake will also discharge blood through the eye. Only female long-nosed snakes emit blood.

The western ground snake, *Sonora semiannulata*, is a burrowing snake found from Nevada south through Arizona to Nueva Leon, Mexico. It hunts by night, searching for grubs, centipedes, spiders, and insects. A remarkable fact about this snake is the wide variation in its markings. Generally, western ground snakes are buff-colored with either black crossbands, lengthwise stripes in red, orange, or buff with a black stripe down the back; they may have a black neckband. Interestingly, snakes that exhibit these variations have been collected at a single locality.

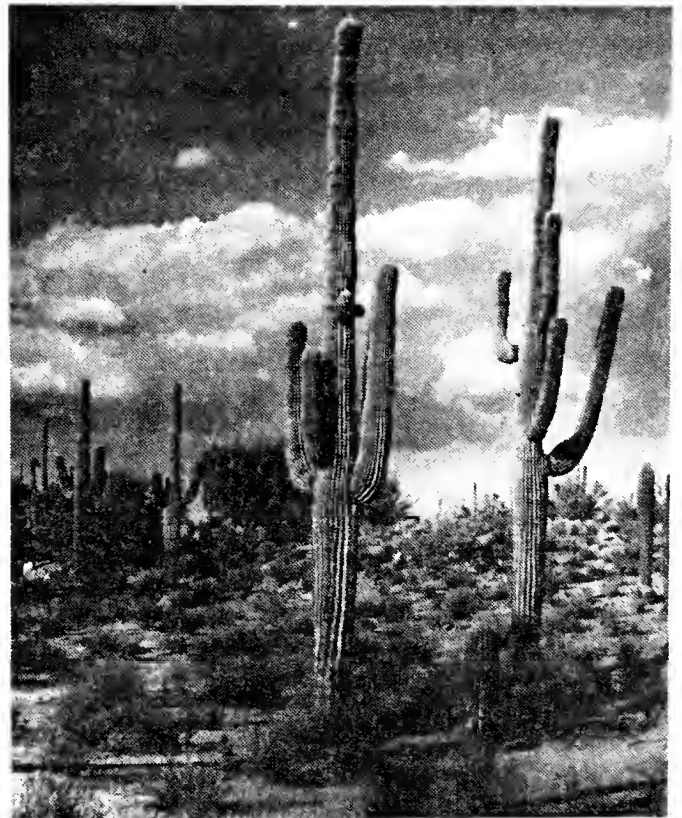
Undoubtedly, there are other kinds of snakes to be found on the grounds of the Desert Botanical Garden, but because of the reclusive nature of snakes, a particular species may not be sighted for years.

REFERENCES

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- Shaw, C. E. and S. Campbell, eds. 1974. Snakes of the American West. New York: Alfred P. Knopf.

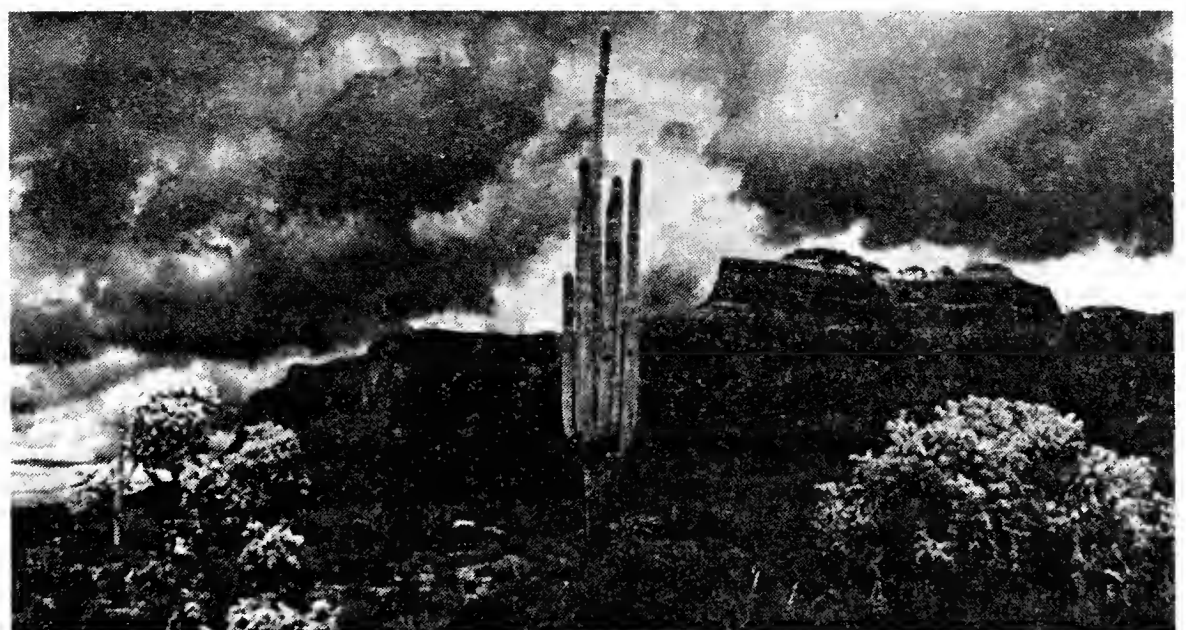
DESERTS OF THE WORLD PHOTO EXHIBITION AWARDS FOR BLACK AND WHITE LANDSCAPES

*First Place and Best of Show,
"Saguaros," by Bill Woodward of
Scottsdale, Arizona.*



*Second Place,
"Storm's Approach," by Will
Turnage of Phoenix.*

*Third Place,
"Winter Storm
Clearing Super-
stition Moun-
tain," by Jody
Forster of Tem-
pe, Arizona.*



IN BRIEF

FRIENDS OF THE GARDEN

The Desert Botanical Garden has a history of solid support from its loyal friends. That loyal support has been very evident in recent months. In January of this year, a gift of \$1,100 was received from Mrs. Denison Kitchel, a member of the Trustees of the Desert Botanical Garden and a true friend of the Garden. Mrs. Kitchel's contribution has been designated for the renovation of the display room in the Cactus House, and to be dedicated to the memory of Mrs. Kitchel's mother, Mrs. Walter Douglas. This new facility at the Garden, the Douglas Display Case, will provide a more consistent manner to display and interpret living desert plants. It is the current site of a special exhibit on "Useful Desert Plants" and the upcoming exhibit on "Plant Propagation." Displays in this new exhibit area are already scheduled for the entire year.

Another generous donation was made by Mrs. W. H. Chester, wife of Board Member W. H. Chester, who has given the Garden \$1,000 to be deposited in a special account to be known as the Martha Lehman Chester Scholarship Fund. With other donations over the years, the Fund will become large enough to yield an amount which will serve as an award to a deserving student of desert plants.

In December, 1979, Diamonds, a division of the Dayton Hudson Corporation presented a \$5,000 grant to the Garden. The money is to be used in the development of a reorganizational and promotional program that will promote more recognition for the Garden within the State of Arizona.

The Phoenix Newspapers, Inc. have generously agreed to match the Diamonds' gift with an additional \$5,000.

Gifts such as these recently received, are coming to the Garden at a time in its development when honest commitment is a vital need, if the goals of the Garden are to be met today and in the future.

PROPAGATION DISPLAY

A special exhibit that focuses on plant propagation will be on display in the Douglas Display Case in the Cactus House and in Webster Auditorium from February 9 until March 9.

Plants reproduce themselves without the assistance of man, but man does assist a wide variety of desirable and useful species for his personal benefit and pleasure. Various methods of assistance will be the topic in this living display, methods that include propagation by seeds and cuttings.

CACTUS SHOW REGISTRATION

Show rules and registration cards for the 33rd Annual Cactus Show, to be held at the Desert Botanical Garden, have been mailed to previous exhibitors and interested parties. The show this year is scheduled for March 22 through 30, with a preview party to be held the evening of Friday, March 21. Two long-time Garden enthusiasts have volunteered to co-chair this year's Cactus Show. They are Emmy La Tempa and Fran Tolleson.

Garden members who are interested in exhibiting their plants in this year's show should contact the Garden office, 941-1217, for a copy of show rules and registration card. Deadline for registration is March 11.

A call is also out for volunteers to help with the numerous committee details before and during the show. Please contact Emmy at 991-9838 or Fran at 943-6729 if you are able to donate your time to this major Garden event.

VOLUNTEERS NEEDED

The Desert Botanical Garden presently stores seed of over 400 taxa, many of which are field collected in the southwestern United States and in Mexico. A new indexing system is being implemented for the purpose of classifying this material taxonomically and geographically. Two volunteers are urgently needed to help with this important work. Researching and typing ability is a must. Those interested, please contact Marc Mittleman at the Garden, 941-1217.



Second Place for Black and White Plant Portraits, "Long Horn Shoots #1," by Will Turnage of Phoenix.



Third Place for Black and White Plant Portraits, "Contrast," by Emilio Binzoni of Carefree, Arizona.

NEW STAFF

The Garden is pleased to welcome two new staff members. Nicole Holler has accepted a position as Horticulturist. Nicole graduated from University of Arizona with a degree in horticulture. Mary Fulton has assumed the position of Educational Assistant. Mary, who will be working half-time, received her Bachelor's degree from State University of New York, Oneota and a Master's degree from University of Maryland. Both Mary and Nicole began their duties at the Garden in November, 1979.

GARDEN GIFT

Visitors to the Garden these days will be able to enjoy the added attraction of the ornithological activity around a new bird dripper that has been placed under the mesquites in the main arroyo. Many thanks to Garden Members Glen Crane of Mesa and Pat Beall of Phoenix for donating their time, materials, and talents for the construction of this new feature. Gifts such as this one serve as an attractive addition to the Garden and as a reminder of the unity between plants and animals and man.

HOLIDAY HIGHLIGHT

Luminaria Night at the Garden was an overwhelming success. Mild weather and good publicity induced more than 2,500 people to visit the candlelit Garden, join in the holiday festivities, and enjoy refreshments in the Auditorium. Even more encouraging than the number of visitors, was the information about where the visitors lived. The results of a survey conducted during Luminaria Night, revealed that most of the visitors that evening were residents of the Valley and that more than one third were visiting the Garden for the first time. This is encouraging news that the Garden is attracting its neighbors in the community for events such as this one.

The evening's activities would not have been possible without the help of the Garden Volunteers. More than 36 workers volunteered over 120 hours of their time to make the evening a success, and that tabulation doesn't begin to include the time required at home to bake over 90 dozen cookies. Many people deserve a warm "Thank You" for making Luminaria Night a highlight of the Phoenix holiday season.



DESERT BOTANICAL GARDEN

P.O. BOX 5415
PHOENIX, AZ. 85010

Garden Events

FEBRUARY

- 9 **Hidden Canyon** — A field trip to a beautiful spot at South Mountain; Saturday, 8 A.M. Limit, 25.
- 11 **Desert Wildflowers** — An introductory class in desert wildflowers; two Monday sessions and one field trip: 7 P.M.
- 21 **Nature Photography** — Hobart Pribbenow presents two Thursday afternoon classes on taking plant photos: 1:30 P.M. Limit, 30.
- 23 **Devil's Canyon** — Rock formations are the focus of this field trip near Superior; Saturday, 8 A.M. Limit 30.
- 25 **Desert Perfumery** — A workshop in making alcohol and oil based perfumes from desert flowers; Monday, 2:30 P.M. Limit 30.

MARCH

- 1 **White Tank Mountains** — Early wildflowers and waterfalls on this field trip west of Phoenix; Saturday, 8 A.M. Limit, 25.
- 1 **Spring Vegetable Gardening** — A one-session workshop on what, when, where, and how to successfully plant your garden; Saturday, 10 A.M.
- 21 **Preview**, for the 33rd Annual Cactus Show; Friday evening, 6 P.M.
- 22 **33rd Annual Cactus Show**; March 22-30, 9 A.M. to 5 P.M.

The Garden is open every day of the year from 9 a.m. to sunset.

DESERT BOTANICAL GARDEN

Calendar of
Events
Spring 1980



Papago Park, Phoenix, Arizona

DESERT BOTANICAL GARDEN SPRING 1980

CLASSES & WORKSHOPS: Daytime and evening classes and workshops are held during the year. Fees include necessary materials. Prepaid reservations are required since enrollment is limited, and any event with fewer than ten registered participants will be cancelled.

FIELD TRIPS: The Garden schedules one all-day field trip every month, open to both Garden Members and the public, except during the spring when two monthly trips are scheduled. Prepaid reservations are required. Meet in the Garden's Webster Auditorium (take the service road). Departure promptly at 8 a.m. unless otherwise specified. Participants travel in their own cars. Car-pooling and sharing of driving expenses are encouraged.

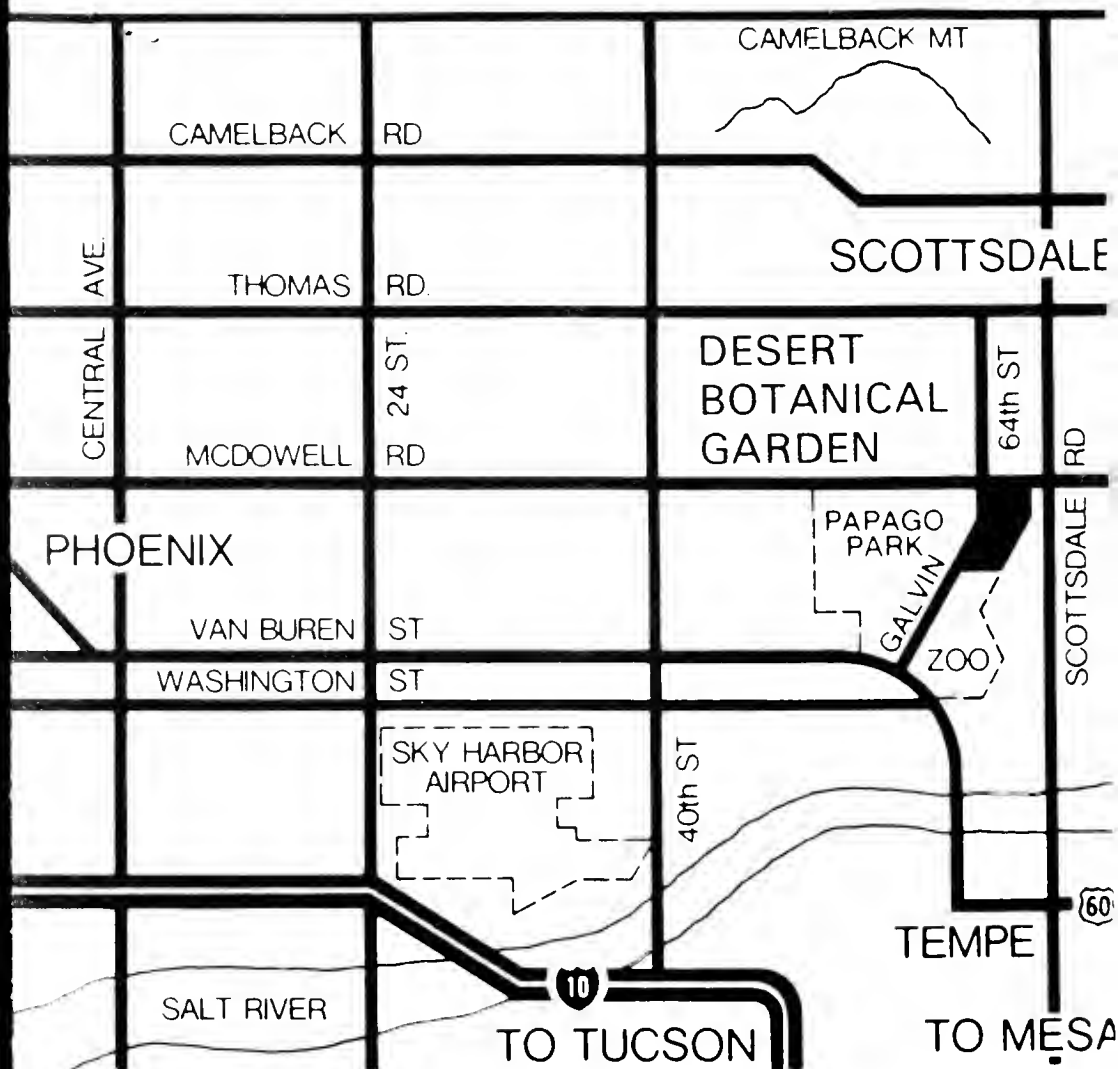
These trips involve easy to moderate hiking. Leaders are familiar with trip sites and will have the authority to disqualify persons unlikely to make the trip in safety.

Wear comfortable, suitable shoes (lug soles recommended), bring water and a lunch that can be carried with you on the hike.

CACTOMANIACS, an informal group interested in desert plants and related subjects, usually meets on the first Tuesday of the month. Visitors are welcome. Telephone 273-1953 for information.

The **CENTRAL ARIZONA CACTUS & SUCCULENT SOCIETY**, an affiliate of the national society, meets at the Garden at 2 p.m. on the last Sunday of the month, except when outside events are planned. Visitors are invited to meetings, but should telephone 944-2594 to check the CAC&SS schedule.

For information on any Garden event, telephone 941-1217.



MEMBERSHIP APPLICATION

Desert Botanical Garden
Box 5415, Phoenix, AZ 85010

Enclosed is my check for \$_____. I wish to become a Member of the Desert Botanical Garden in the category checked below:

Name _____

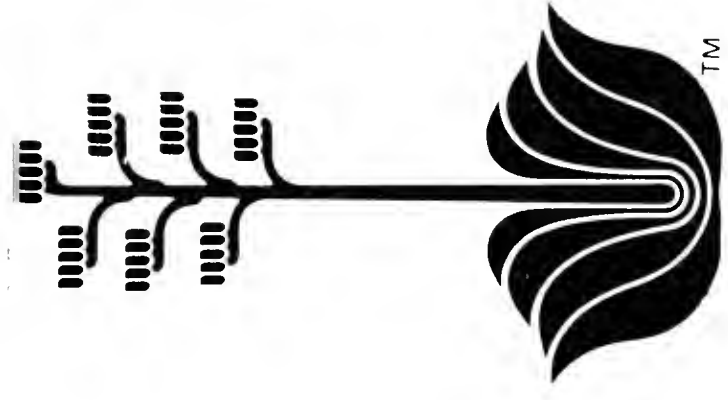
Address _____

City _____ State _____ Zip _____

Annual Memberships: Individual, \$15.00
Subscribing, \$100.00

Family, \$20.00
Supporting, \$250.00 or more

Sustaining, \$50.00



**DESERT
BOTANICAL
GARDEN**

PO BOX 5415
PHOENIX, AZ 85010
(602) 941-1217

**Desert Botanical Garden
REGISTRATION FORM**

Please use this form for Courses and Field trips registration. Check boxes for desired courses, and list the fees in the correct spaces. The fee, minus a \$3.00 non-refundable handling charge, will be returned only if the registration is cancelled at least **two** days prior to the first session.

Courses	Fees
<input type="checkbox"/> Aravaipa Canyon	\$ _____
<input type="checkbox"/> Arizona Rockhounding	\$ _____
<input type="checkbox"/> Basic Botany Flowering Plants	\$ _____
<input type="checkbox"/> Canyon Lake	\$ _____
<input type="checkbox"/> Cooking with Native Plants	\$ _____
<input type="checkbox"/> Desert Landscaping	\$ _____
<input type="checkbox"/> Desert Wildflowers	\$ _____
<input type="checkbox"/> Deserts of North America	\$ _____
<input type="checkbox"/> Deserts of the World	\$ _____
<input type="checkbox"/> Dyeing with Desert Plants	\$ _____
<input type="checkbox"/> Flower Preservation	\$ _____
<input type="checkbox"/> Four Peaks	\$ _____
<input type="checkbox"/> Getting to Know the Birds	\$ _____
<input type="checkbox"/> Growing Native Trees & Shrubs	\$ _____
<input type="checkbox"/> Herbarium Techniques	\$ _____
<input type="checkbox"/> Identification of Arizona Cacti	\$ _____
<input type="checkbox"/> Introduction to the Cactus Family	\$ _____
<input type="checkbox"/> Introduction to the Desert	\$ _____
<input type="checkbox"/> Irrigation Techniques	\$ _____
<input type="checkbox"/> Make Your Own Plant Press	\$ _____
<input type="checkbox"/> Poisonous & Edible Plants	\$ _____
<input type="checkbox"/> Practical Desert Gardening	\$ _____
<input type="checkbox"/> Seven Springs	\$ _____
<input type="checkbox"/> Using Keys for Plant Identification	\$ _____

TOTAL \$ _____

Name _____

Address _____

City _____ State _____ Zip _____

Telephone _____

Member Garden _____ Non-member _____

Mail this form with check to
Desert Botanical Garden
P.O. Box 5415, Phoenix, AZ, 85010

A nonprofit
organization

DESERT BOTANICAL GARDEN CA

SPRING — 1980

APRIL

- 1 Desert Wildflowers** Tuesday, 2 P.M.
A public slide presentation on spring wildflowers of Arizona, held in the Webster Auditorium. Free with Garden admission.
- 2 Introduction to the Desert** Wednesday, 2 P.M.
A basic course about the Arizona deserts, plant and animal life and their adaptations to an arid environment. Three Wednesday sessions.
Fees: Members, \$10.00; Non-members \$12.00
- 3 Desert Landscaping** Thursday, 7 P.M.
The basics of designing a creative desert landscape. (The February class in plant materials, or a knowledge of common desert plants is desirable before taking this class.) Four Thursday sessions.
Fees: Members, \$12.00; Non-members \$15.00
- 5 Canyon Lake** Saturday, 8 A.M.
Limit: 25
A great spot for wildflowers on this field trip east of Phoenix, on the scenic Apache Trail.
Fees: Members \$10.00; Non-members \$12.50
- 7 Basic Botany of Flowering Plants** Monday, 7 P.M.
An introductory course on the structure and function of flowering plants, growth requirements, evolution, and ecology. Four Monday sessions.
Fees: Members, \$12.00; Non-members \$15.00
- 8 Cacti and Succulents of Mexico** Tuesday, 2 P.M.
A public slide presentation, held in the Webster Auditorium. Free with Garden admission.
- 11 Members' Preview of Annual Sale of Unusual Plants** 4 P.M. to Sunset
- 12-13 Annual Sale of Unusual Plants** 9 A.M. to 5 P.M.
Hard-to-find and newly introduced trees and shrubs, cacti, and other succulent plants.
- 14 Using Keys for Plant Identification** Monday, 2 P.M.
Limit: 25
An intermediate course in how to track down a plant's identity by using botanical keys. Six Monday sessions.
Fees: Members \$12.00; Non-Members \$15.00
- 15 Getting to Know the Birds** Tuesday, 7:30 A.M.
Limit: 25
A beginning course in observing and learning to identify the many birds found in our area. Bring binoculars and wear comfortable walking shoes. Four Tuesday sessions.
Fees, including field guide: Members, \$14.00; Non-members, \$16.00
- 15 Botanical Tour of Baja California** Tuesday, 2 P.M.
A public slide presentation, held in the Webster Auditorium. Free with Garden admission.
- 15 Herbarium Techniques** Tuesday, 7 P.M.
A workshop on how to preserve and label plant collections so they will be used for many years. Techniques on pressing cacti, agaves, and bulkier plants, as well as how to press plants in the field. One Tuesday session.
Fees: Members, \$7.00; Non-members \$9.00
- 22 A Closer Look at the Sonoran Desert** Tuesday, 2 P.M.
A public slide presentation, held in the Webster Auditorium. Free with Garden admission.

- 23 Flower Preservation** Wednesday
A beginning course in drying fresh flowers using several techniques. Two Wednesday sessions.
Fees, including materials: Members, \$10.00; Non-members, \$12.00
- 26 Seven Springs** Saturday
A field trip to a riparian environment, with a variety of wildflowers.
Fees: Members, \$5.00; Non-members \$7.00
- 29 South African Succulents** Tuesday
A public slide presentation, held in the Webster Auditorium. Free with Garden admission.
- 30 Irrigation Techniques** Wednesday
A class in how to use today's sophisticated equipment in watering your own garden. Taught by Gaylon Coates, irrigation expert. Two Wednesday sessions.
Fees: Members, \$6.00; Non-members, \$8.00

MAY

- 6 Economic Uses of Desert Plants** Tuesday
A public slide presentation, held in the Webster Auditorium. Free with Garden admission.
- 7 Cooking with Native Plants** Wednesday
A course in preparing unusual edible plants from the desert. Taught by Ruth Greenhouse, author of "Cooking with Native Plants". Four Wednesday sessions.
Fees, including plant materials: Members, \$10.00; Non-members, \$16.00
- 12 Dyeing with Desert Plants** Thursday
A four week course on the best dye plants and dyeing of fibers.
Fees: Members, \$13.00; Non-members, \$16.00
- 13 Desert Ecology** Tuesday
A public slide presentation, held in the Webster Auditorium. Admission free with Garden admission.
- 13 Poisonous and Edible Plants** Tuesday
A class in identification, properties, and uses of desert plants. Tuesday sessions, and one field trip.
Fees: Members, \$13.00; Non-members, \$16.00
- 14 Deserts of North America** Wednesday
A class on the plants and other features of the continent's four very different deserts. Four Wednesday sessions.
Fees: Members, \$10.00; Non-members, \$13.00
- 15 Growing Native Trees and Shrubs from Seed** Thursday
A short course in learning to grow desert plants. Two Thursday sessions.
Fees: including book and seeds: Members, \$10.00; Non-members, \$13.00
- 20 Cacti in Bloom** Tuesday
A public slide presentation, held in the Webster Auditorium. Admission free with Garden admission.

**Desert Botanical Garden
REGISTRATION FORM**

Please use this form for Courses and Field trips registration. Check boxes for desired courses, and list the fees in the correct spaces. The fee, minus a \$3.00 non-refundable handling charge, will be returned only if the registration is cancelled at least **two** days prior to the first session.

Courses	Fees
<input type="checkbox"/> Aravaipa Canyon	\$ _____
<input type="checkbox"/> Arizona Rockhounding	\$ _____
<input type="checkbox"/> Basic Botany Flowering Plants	\$ _____
<input type="checkbox"/> Canyon Lake	\$ _____
<input type="checkbox"/> Cooking with Native Plants	\$ _____
<input type="checkbox"/> Desert Landscaping	\$ _____
<input type="checkbox"/> Desert Wildflowers	\$ _____
<input type="checkbox"/> Deserts of North America	\$ _____
<input type="checkbox"/> Deserts of the World	\$ _____
<input type="checkbox"/> Dyeing with Desert Plants	\$ _____
<input type="checkbox"/> Flower Preservation	\$ _____
<input type="checkbox"/> Four Peaks	\$ _____
<input type="checkbox"/> Getting to Know the Birds	\$ _____
<input type="checkbox"/> Growing Native Trees & Shrubs	\$ _____
<input type="checkbox"/> Herbarium Techniques	\$ _____
<input type="checkbox"/> Identification of Arizona Cacti	\$ _____
<input type="checkbox"/> Introduction to the Cactus Family	\$ _____
<input type="checkbox"/> Introduction to the Desert	\$ _____
<input type="checkbox"/> Irrigation Techniques	\$ _____
<input type="checkbox"/> Make Your Own Plant Press	\$ _____
<input type="checkbox"/> Poisonous & Edible Plants	\$ _____
<input type="checkbox"/> Practical Desert Gardening	\$ _____
<input type="checkbox"/> Seven Springs	\$ _____
<input type="checkbox"/> Using Keys for Plant Identification	\$ _____

TOTAL \$ _____

Name _____

Address _____

City _____ State _____ Zip _____

Telephone _____

Member Garden _____ Non-member _____

Mail this form with check to
Desert Botanical Garden
P.O. Box 5415, Phoenix, AZ, 85010

DESERT BOTANICAL GARDEN CALENDAR OF EVENTS

SPRING — 1980

APRIL

- 1 Desert Wildflowers** Tuesday, 2 P.M.
A public slide presentation on spring wildflowers of Arizona, held in the Webster Auditorium. Free with Garden admission.
- 2 Introduction to the Desert** Wednesday, 2 P.M.
A basic course about the Arizona deserts, plant and animal life and their adaptations to an arid environment. Three Wednesday sessions.
Fees: Members, \$10.00; Non-members \$12.00
- 3 Desert Landscaping** Thursday, 7 P.M.
The basics of designing a creative desert landscape. (The February class in plant materials, or a knowledge of common desert plants is desirable before taking this class.) Four Thursday sessions.
Fees: Members, \$12.00; Non-members \$15.00
- 5 Canyon Lake** Saturday, 8 A.M.
Limit: 25
A great spot for wildflowers on this field trip east of Phoenix, on the scenic Apache Trail.
Fees: Members \$10.00; Non-members \$12.50
- 7 Basic Botany of Flowering Plants** Monday, 7 P.M.
An introductory course on the structure and function of flowering plants, growth requirements, evolution, and ecology. Four Monday sessions.
Fees: Members, \$12.00; Non-members \$15.00
- 8 Cacti and Succulents of Mexico** Tuesday, 2 P.M.
A public slide presentation, held in the Webster Auditorium. Free with Garden admission.
- 11 Members' Preview of Annual Sale of Unusual Plants** 4 P.M. to Sunset
- 12-13 Annual Sale of Unusual Plants** 9 A.M. to 5 P.M.
Hard-to-find and newly introduced trees and shrubs, cacti, and other succulent plants.
- 14 Using Keys for Plant Identification** Monday, 2 P.M.
Limit: 25
An intermediate course in how to track down a plant's identity by using botanical keys. Six Monday sessions.
Fees: Members \$12.00; Non-Members \$15.00
- 15 Getting to Know the Birds** Tuesday, 7:30 A.M.
Limit: 25
A beginning course in observing and learning to identify the many birds found in our area. Bring binoculars and wear comfortable walking shoes. Four Tuesday sessions.
Fees, including field guide: Members, \$14.00; Non-members, \$16.00
- 15 Botanical Tour of Baja California** Tuesday, 2 P.M.
A public slide presentation, held in the Webster Auditorium. Free with Garden admission.
- 15 Herbarium Techniques** Tuesday, 7 P.M.
A workshop on how to preserve and label plant collections so they will be used for many years. Techniques on pressing cacti, agaves, and bulkier plants, as well as how to press plants in the field. One Tuesday session.
Fees: Members, \$7.00; Non-members \$9.00
- 22 A Closer Look at the Sonoran Desert** Tuesday, 2 P.M.
A public slide presentation, held in the Webster Auditorium. Free with Garden admission.

- 23 Flower Preservation** Wednesday, 2 P.M.
Limit: 20
A beginning course in drying fresh flowers, using several techniques. Two Wednesday sessions.
Fees, including materials: Members, \$10.00; Non-members, \$12.00
- 26 Seven Springs** Saturday, 8:00 A.M.
Limit: 25
A field trip to a riparian environment, with an abundant variety of wildflowers.
Fees: Members, \$5.00; Non-members \$7.50
- 29 South African Succulents** Tuesday, 2 P.M.
A public slide presentation, held in the Webster Auditorium. Free with Garden admission.
- 30 Irrigation Techniques** Wednesday, 7 P.M.
A class in how to use today's sophisticated methods and equipment in watering your own yard efficiently. Taught by Gaylon Coates, irrigation specialist. Two Wednesday sessions.
Fees: Members, \$6.00; Non-members, \$8.00

MAY

- 6 Economic Uses of Desert Plants** Tuesday, 2 P.M.
A public slide presentation, held in the Webster Auditorium. Free with Garden admission.
- 7 Cooking with Native Plants** Wednesday, 2 P.M.
Limit: 25
A course in preparing unusual edibles found in our desert. Taught by Ruth Greenhouse, ethnobotanist. Four Wednesday sessions.
Fees, including plant materials: Members, \$14.00; Non-members, \$16.00
- 12 Dyeing with Desert Plants** Monday, 6 P.M.
Limit: 30
A four week course on the best dye plants, processing and dyeing of fibers.
Fees: Members, \$13.00; Non-members, \$15.00
- 13 Desert Ecology** Tuesday, 2 P.M.
A public slide presentation, held in the Webster Auditorium. Admission free with Garden admission.
- 13 Poisonous and Edible Plants** Tuesday, 7 P.M.
A class in identification, properties, and uses. Three Tuesday sessions, and one field trip.
Fees: Members, \$13.00; Non-members, \$15.00
- 14 Deserts of North America** Wednesday, 7 P.M.
A class on the plants and other features of our continent's four very different deserts. Four Wednesday sessions.
Fees: Members, \$10.00; Non-members, \$12.00
- 15 Growing Native Trees and Shrubs from Seed** Thursday, 7 P.M.
A short course in learning to grow desert landscape plants. Two Thursday sessions.
Fees: including book and seeds: Members, \$8.00; Non-members, \$10.00
- 20 Cacti in Bloom** Tuesday, 2 P.M.
A public slide presentation, held in the Webster Auditorium. Admission free with Garden admission.

- 23-24 Aravaipa Canyon** Friday, 5 P.M.
Limit: 30
An overnight camping trip, and an all-day hike through this gorgeous steep canyon in Southwestern Arizona.
Fees: Members, \$15.00; Non-members, \$20.00
- 27 All-over Arizona** Tuesday, 2 P.M.
A public slide presentation, held in the Webster Auditorium. Admission free with Garden admission.

An exhibit, **Cactaceae**, will be on display from May 5 to May 25, in the Webster Auditorium and in the Douglas Display Case. This living plant exhibit shows the diversity of cacti and the special characteristics which make them unique.

JUNE

- 3 An Introduction to the Cactus Family** Tuesday, 2 P.M.
A beginning course in identifying cacti and learning their distinctive characteristics. Three Tuesday sessions.
Fees: Members, \$10.00; Non-members, \$13.00
- 5 Arizona Rockhounding and Lapidary** Thursday, 7 P.M.
A course in learning which rocks polish best and where to find them. Four Thursday sessions.
Fees, including samples: Members, \$12.00; Non-members, \$15.00
- 7 Deserts of the World** Saturday, 10 A.M.
Similarities and differences in vegetation, soils, climate, location, and characteristics are discussed in this one session workshop.
Fees: Members, \$7.00; Non-members, \$9.00
- 11 Practical Desert Gardening** Wednesday, 7 P.M.
A useful course in planting and caring for low-water, low-maintenance ornamentals through the summer. Two Wednesday sessions.
Fees: Members, \$8.00; Non-members, \$10.00
- 14 Four Peaks** Saturday, 8 A.M.
Limit: 25
A field trip to identify some higher elevation flora, along with a beautiful view of Roosevelt Lake.
Fees: Members, \$10.00; Non-members, \$12.50
- 17 Identification of Arizona Cacti** Tuesday, 7 P.M.
Characteristics and identifying features of Arizona cacti will be the focus of this beginning course. Three Tuesday sessions.
Fees: Members, \$10.00; Non-members, \$13.00
- 25 Make Your Own Plant Press** Wednesday, 2 P.M.
A one-session workshop in which participants make their own plant press.
Fees, including materials: Members, \$12.00; Non-members, \$14.00

An exhibit, "**Deserts of the World**," will be on display from June 1 through June 22, in the Webster Auditorium and in the Douglas Display Case. This living plant exhibit will present some of the similarities and differences between deserts located on the world's continents.

THE DESERT BOTANICAL GARDEN

Founded in 1935, the Desert Botanical Garden is a non-profit educational institution located on 150 acres of Arizona desert surrounded by the Phoenix metropolitan area. The founders' aim was to develop "A natural garden of desert plants from the deserts of the world, so arranged that it will be pleasant for the layman to view, and yet can be studied by scientists."

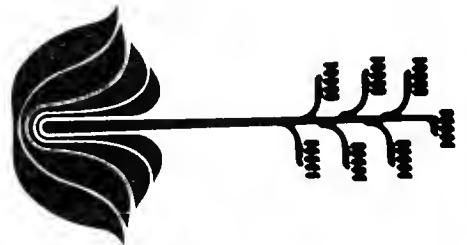
Today the Garden is known worldwide. In a naturalistic setting are more than half of the world's different kinds of cacti and other succulents, trees and shrubs from arid regions of Asia, Africa, Australia, and the Americas.

Research is carried on in the Earle Herbarium, open to scholars and Garden Members by appointment. The Richter Library, another important Garden research resource, is open for reference to the public weekdays from 9 A.M. to 1 P.M. and to the membership at other times by appointment.

Educational programs are varied and open to the public. They include lectures, classes, workshops, and field trips.

The Desert Botanical Garden is supported by memberships, contributions and admissions. Members of the Garden receive the Garden magazine, join classes and field trips at reduced fees, get bonus packets of desert plant seeds, enjoy other benefits including the satisfaction of supporting the Garden's vigorous conservation efforts at a time when destruction of the fragile desert is widespread.

DESERT
BOTANICAL
GARDEN
PO BOX 5415
PHOENIX, AZ 85010
(602) 941-1217





DESERT
BOTANICAL
GARDEN

MEMBER'S BALLOT

10¢

STAMP

Desert Botanical Garden

P.O. Box 5415

Phoenix, Arizona 85010

MEMBER'S BALLOT -- 1980 ELECTION for
BOARD OF TRUSTEES OF THE DESERT BOTANICAL GARDEN

Vote for no more than eight (8).

 ALICE FEFFER

 ERIC MAXWELL

 JOHN GRAHAM

 KAREN MILLER

 FRANK HENNESSEY

 BRUCE D. PINGREE

 MARSHA JACOBS

 WILLIAM L. WINGATE, JR

 EMELIA LATEMPA

Write in:



33rd Annual Cactus Show

March 22 through 30, 1980

9 A.M. to 5 P.M.

In the Garden's Webster Auditorium
Papago Park, Phoenix, Arizona

presented by

THE DESERT BOTANICAL GARDEN

SHOW RULES

Cacti and other succulents and allied material are eligible as listed in this schedule.

All plants must have been grown by the exhibitor for six months or longer. All plants must be labelled with appropriate botanical names.

* The Committee reserves the right to reject plants or other entries if show regulations are violated, or if the exhibit is not up to standard. Rejected entries will not be displayed.

• In Section I, Class A, and in Section II, Class A, entries which cannot be assigned to established divisions will be judged collectively in Division 19 and in Divisions 18 or 19, respectively.

In Section III, seedlings must be under 2 years old and must have been germinated by the exhibitor. Labels must include date of germination in addition to botanical name.

In Section V, all plants must be rooted plants that have been grown in the exhibited container for three months or longer.

In Section VI, accessories are permissible, but exclude artificial foliage, artificial flowers, artificial color. Non-desert plant materials will not be considered as accessories.

In Sections VII and VIII, all blue ribbon winners in all divisions of Sections I and II of the 1979 Cactus Show are eligible. No limit to number of entries.

Exhibitors in Sections IX and X must contact the Garden in advance to reserve space and to verify that exhibits are appropriate.

The Desert Botanical Garden will exercise due caution and care in safeguarding the exhibits, but can assume no responsibility for loss or damage, or for unclaimed exhibits.

CLASSIFICATIONS

SECTION I CACTI

Class A. Individual Specimens. Limited to three entries per person per division.

Division:

1. Ariocarpus, Aztekium, Obregonia
2. Astrophytum, Frailea, Parodia
3. Columnar Cereus (Cereae and Pachycereae)
4. Copiapoa, Neoporteria, Neochilenia
5. Coryphantha, Escobaria
6. Echinocactus, Ferocactus, Homalocephala, Stenocactus
7. Echinocereus, Wilcoxia
8. Echinopsis
9. Espostoa, Haageocereus, Pseudolobivia, Trichocereus
10. Epithelantha, Normanbokea, Pelecyphora, Turbinicarpus
11. Gymnocalycium, Melocactus
12. Lobivia, Chamaecereus, Rebutia, Sulcorebutia
13. Mammillaria, pots up to 6"
14. Mammillaria, pots over 6"
15. Notocactus
16. Opuntia, Pterocactus, Tephrocactus, Grusonia
17. Oreocereus, Cleistocactus, Matucana, Oroya
18. Thelocactus, Echinomastus, Hamatocactus, Neolloydia, Pediocactus
19. All other genera

Class B. Crested or Monstrose

Division 1. Own root

Division 2. Grafted

Class C. Grafted

Class D. Collections, 4 to 6 different species of a genus. Limited to one entry per person.

SECTION II SUCCULENTS OTHER THAN CACTI

Class A. Individual Specimens. Limited to three entries per person per division.

Division:

1. Agavaceae: Agave, etc.
2. Aizoaceae: Lithops
3. Aizoaceae: Miscellaneous Genera, A-G
4. Aizoaceae: Miscellaneous Genera, H-Z
5. Asclepiadaceae: Stapelia
6. Asclepiadaceae: All Other Genera
7. Compositae: Senecio, etc.
8. Crassulaceae: Aeonium
9. Crassulaceae: Cotyledon
10. Crassulaceae: Crassula
11. Crassulaceae: Kalanchoe
12. Crassulaceae: Miscellaneous New World Genera
13. Crassulaceae: Miscellaneous Old World Genera
14. Euphorbiaceae: Euphorbia
15. Liliaceae: Aloe

- 16. Liliaceae: Gasteria
- 17. Liliaceae: Haworthia
- 18. Miscellaneous Families, A-F
- 19. Miscellaneous Families, G-Z

Class B. Crested or Monstrose

Division 1. Own root

Division 2. Grafted

Class C. Grafted

Class D. Collections, 4 to 6 different species of a genus or family. Limited to one entry per person.

SECTION III SEEDLINGS

Limited to 2 entries per class.

Class A. Cacti

Class B. Succulents other than Cacti

Class C. Desert Trees and Shrubs

SECTION IV DESERT TREES AND SHRUBS

Limited to 2 entries per class.

Class A. Trees and Shrubs

Class B. Desert Bonsai

Class C. Caudiciforms

SECTION V PLANTERS, all rooted plants

Limited to 3 entries per class. Divisions applicable to Class A only:

1. Cacti. 2. Other succulents. 3. Cacti and other succulents.

Class A. Dish Gardens — containers to 15" diameter.

Class B. Hanging Planters — cacti, other succulents, or both.

Class C. Patio Planters — cacti, other succulents, or both, containers over 15" diameter.

SECTION VI ARRANGEMENTS, no rooted plants

Limited to one entry per class in Classes A through D, one entry per division in Classes E through G. Divisions applicable to Classes E, F and G: 1. Cacti, other succulents, or both. 2. Dried Arizona desert material.

Class A. Using dried Arizona desert material, accessories permitted.

Class B. Using cacti, suitable for a coffee table.

Class C. Using succulents other than cacti, suitable for mantel.

Class D. Monochrome arrangements featuring cacti, other succulents, or both.

Class E. Button arrangements.

Class F. Miniature arrangements, under 5"

Class G. Corsages.

SECTION VII WINNERS' CIRCLE — CACTI

Individual specimens that received blue ribbons in 1979.

**SECTION VIII WINNERS' CIRCLE — SUCCULENTS
OTHER THAN CACTI**

Individual specimens that received blue ribbons in 1979.

SECTION IX EDUCATION EXHIBITS, non-competitive

Dealing with aspects of desert botany.

SECTION X OPEN, non-competitive

Displays by clubs, societies, commercial growers.

REGISTRATION, ENTRY OF EXHIBITS, JUDGING

Registration Cards (one for each exhibitor) and Exhibit Cards (one for each exhibit) may be obtained from the Garden. Registration Cards must be filled out by March 11. All exhibitors are to fill out exhibit cards in advance and submit completed cards with their exhibits.

Write to Desert Botanical Garden, P.O. Box 5415, Phoenix, AZ 85010 or phone 941-1217 for registration cards and exhibit cards.

Exhibits will be accepted according to the following schedule: Tuesday, March 18, 9 A.M. to 9 P.M.; Wednesday, March 19, 9 A.M. to 9 P.M.

Judging will be held March 20. The decision of the judges will be final. First, Second, Third and Honorable Mention ribbons may be awarded in each class or division. Trophies may be awarded in each class. Sweepstakes awards will be given to exhibitors accumulating the most blue ribbons in Sections I, II and VI.

Exhibits may be removed only after 5 P.M. on March 30.

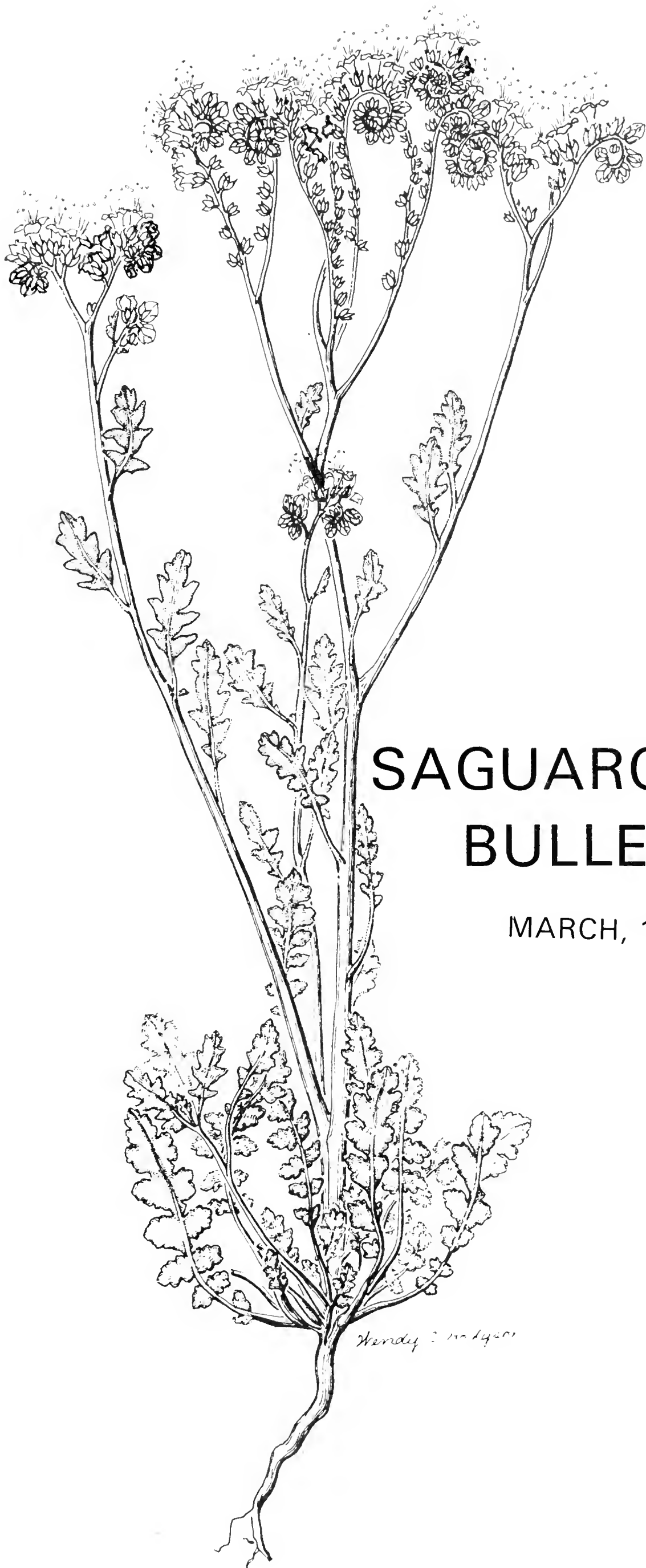
The following scale of points is used in judging these entries:

CACTI & SUCCULENTS SPECIMEN PLANTS		ARRANGEMENTS & PLANTERS	
Condition	50	Design	30
Nomenclature	10	Color	20
Difficulty of culture	10	Identification of material	10
Size or degree of maturity	15	Originality & distinction	30
Staging	15	Condition	10
	<hr/> 100		<hr/> 100
BUTTON & MINIATURES		CORSAGES	
Scale	40	Technique	25
Design	30	Design	35
Color harmony	20	Color	15
Condition	10	Combination of materials	15
	<hr/> 100	Condition	10
			<hr/> 100

Judges for all sections are acknowledged experts.

Sections V and VI will be judged by Judges accredited by the National Council of State Garden Clubs.

A preview for Garden Members, exhibitors, special guests and their families will be held on Friday, March 21 at 6 P.M.



SAGUAROLAND BULLETIN

MARCH, 1980

Wendy J. H. 1980



**DESERT
BOTANICAL
GARDEN**

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ANNUAL MEMBERSHIP:
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 or more

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AEONIUMS ETERNAL

by Vera Gamet

The story of succulents began about fifty million years ago in a time called the Eocene Age when all the world was moist and warm and tropical and life was easy. However this condition was not to last, for the stage of the world was set for drastic changes.

The continental land masses were pulling apart. Tremendous earthquake and volcanic activity thrust up great mountains which rose and fell and rose again, in many parts of the world cutting off moisture laden air from the seas beyond and creating great deserts beyond them.

The climate, once so benign, fluctuated broadly in cycles of intense cold and extreme heat, harsh winds, and sharply diminished rainfall. Plants came under great stress in adapting to this new world with its changing seasons and new climatic belts. Most of the plants died. Those that survived on arid lands did so, over eons of time, by adapting in a thousand ingenious ways. They reduced or almost inhibited the transpiration of water from their tissues by developing tough, waxy outer skins through which no moisture could escape. They shielded and depressed the breathing pores in their leaves with fine hairy coats to prevent the loss of moisture.

Some plants became dormant during droughts and revived only with the advent of rain. Others reached out with greedy, complicated root systems and quickly sucked up every bit of rain that fell around them, storing it within their leaves, stems, or roots.

Plants with the capability to store water within themselves are called "succulents", "leaf succulents" or "stem succulents" as the case may be. They are a very special group of plants with weird and exotic conformations and habits, dear to the heart of the collector.

Aeoniums are leaf succulents. The name aeonium means "eternal" doubtlessly be-



Photo copy of "the tree houseleek with a yellow flower," from the second edition of Bradley's *The History of Succulent Plants*; London, 1739. This volume is shelved in the rare book collection; Richter Library.

cause of the drought resisting properties of these plants. They are a genus of the crassula family and closely related to the sempervivums, meaning "evergreen."

Typically aeoniums are shrubby and woody stemmed with branches that terminate in a compact open rosette of attractive spatulate or strap-shaped leaves, rather swollen in appearance. One leaf overlaps the other like tiles on a roof, and arranged in spiral formation, diminishing in size toward the center. Depending on the species, aeoniums may be diminutive plants or 0.6 meters in diameter as is *Aeonium canariensis* or *A. nobilis*.

The rosette arrangement of the leaves of *Aeonium* permits the photosynthesizing process of the plant to take place in a minimum amount of space. Only the outer layer of cells in the leaves performs the function of food manufacture. The rest of the leaf tissue contains water storage cells. As much as 95 percent of the plant is

water. From the center of each rosette a large inflorescence emerges, a pyramidal panicle composed of many tiny star shaped flowers packed together. Flowers may be red, pink or white, but are usually yellow.

Aeoniums are slow growing and it may be years before a plant blooms. When it does the stem that bore the flower dies, and in cultivation must be removed.

Since aeoniums are native to tropical climates, they are frost tender and need protection in winter when the temperatures fall below fifty degrees. They are the delicate African relatives of the hardy European sempervivums. They usually prefer their ancestral blooming period, flowering from October to May when their genes prompt them to. They require a definite resting period and during that time make no response to watering or cultivation.

Aeoniums are indigenous to the Canary Islands, in the subtropical Atlantic Ocean off the west coast of Africa as you drop down from Spain.

Legend has it that the Canary Islands are remnants of the lost Continent of Atlantis, and it may be tantalizingly near the truth since scientists have determined that these Islands arose from a land form which never was joined to Africa.

The Islands are of volcanic origin. Their mountainous peaks rise directly from great ocean depths to heights of 1,219 to 3,657 meters above sea level.

The steep rocky slopes on the northwest side of Tenerife, the largest island in the archipelago, are home to 31 endemic species of *Aeonium* which cling to the inclines and precipices facing the trade winds blowing in from the northeast.

Tenerife is a miniature world embracing all the varied landscapes of the other islands in the group over its vertical life zones. It is a botanist's paradise with a tremendous variety of vegetation.

Aeoniums have been cultivated since the first century A.D. when the Romans made an expedition to the Canary Islands. It was not until 1840 that Webb and Berthelot described the genus.



Aeoniums prosper in the Succulent House at the Desert Botanical Garden. Photo, Marc Mittleman.

A New Sclerocactus Found in Northern Arizona

By W. Hubert Earle

Director Emeritus, Desert Botanical Garden

Sclerocactus parviflora (D. Woodruff & Lyman Benson 1978) Var.

Blessingiae W. Hubert Earle sp. nov.

**Planta brevis globosa spinis stramineis. Superna spina centralis solitaria recta complanata in dimidio inferiore purpurascens. Infernae spinae centrales 3 complanatae longitudine aequales uncinatae in dimidio inferiore purpurascens. Spinis radiales 16 rectae. Flores atrolavenduli.*

This is a light-colored, low, globose plant whose heavy spination does not completely obscure the light-green body; quite tubercled while young, later forming 13 ribs, 1.3 cm tall, 1.9 cm wide; areoles 1.9 cm apart, round; plant grows 12.7 to 15.2 cm tall, 8.9 cm in diameter; solitary upper central flattened, 3.8 to 4.4 cm long, white to light purple; lower three centrals equal, 5 to 6.9 cm long, hooked, striated, white to brown, spreading; radial spines 12 to 16, 1.6 to 2.5 cm long, pink to brown.

Flowers appear in late March, light to dark lavender, 3.6 cm in diameter, 2.5 cm long; fruit 1.3 cm in diameter, 1 cm long;

seed dull-black, .3 cm long, released through its basal, horizontal, circumscissile opening.

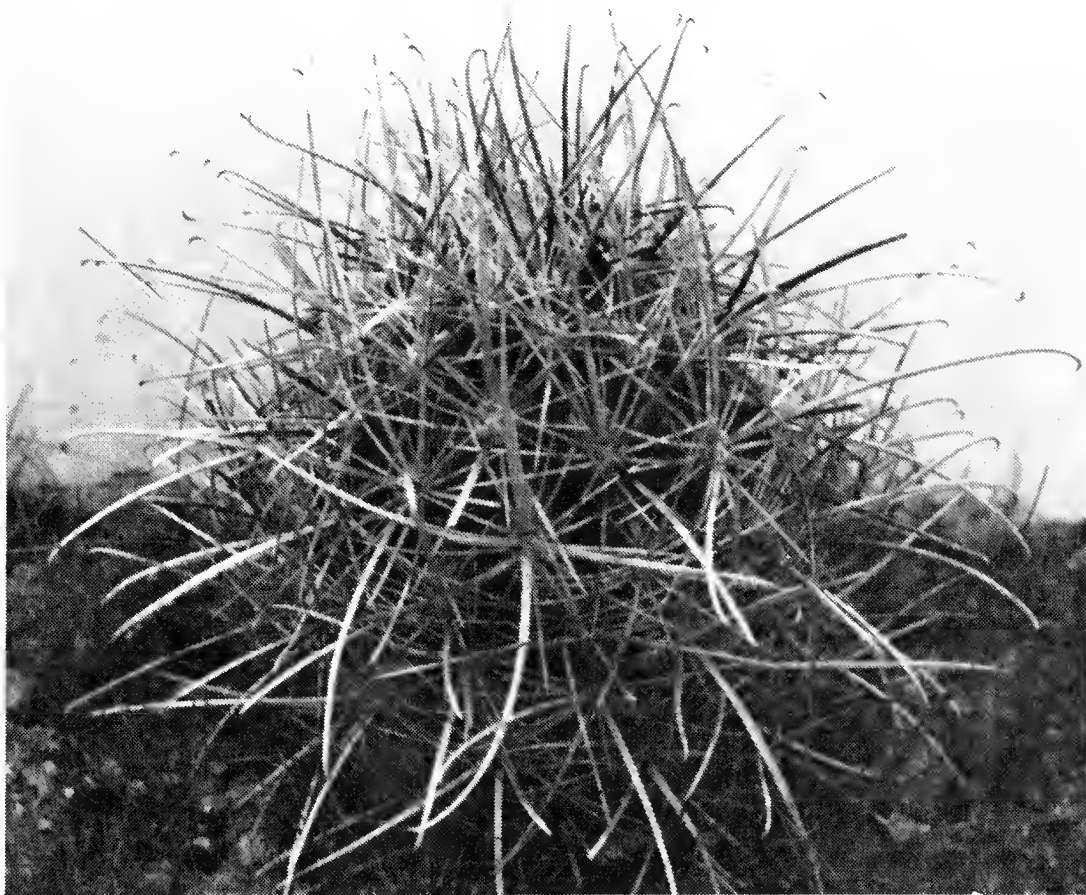
The noticeably light-colored spines, the three equal length hooked central spines, number of radials and light lavender flower, justify this new varietal form, named for the writer's wife's surname — Blessing.

TYPE LOCALITY — East of the community of Cane Beds, Mojave County, Arizona.

DISTRIBUTION — In sandy soils under juniper-pinyon woodlands at 1,453 m to 1,585 m elevation, Mojave County, Arizona.

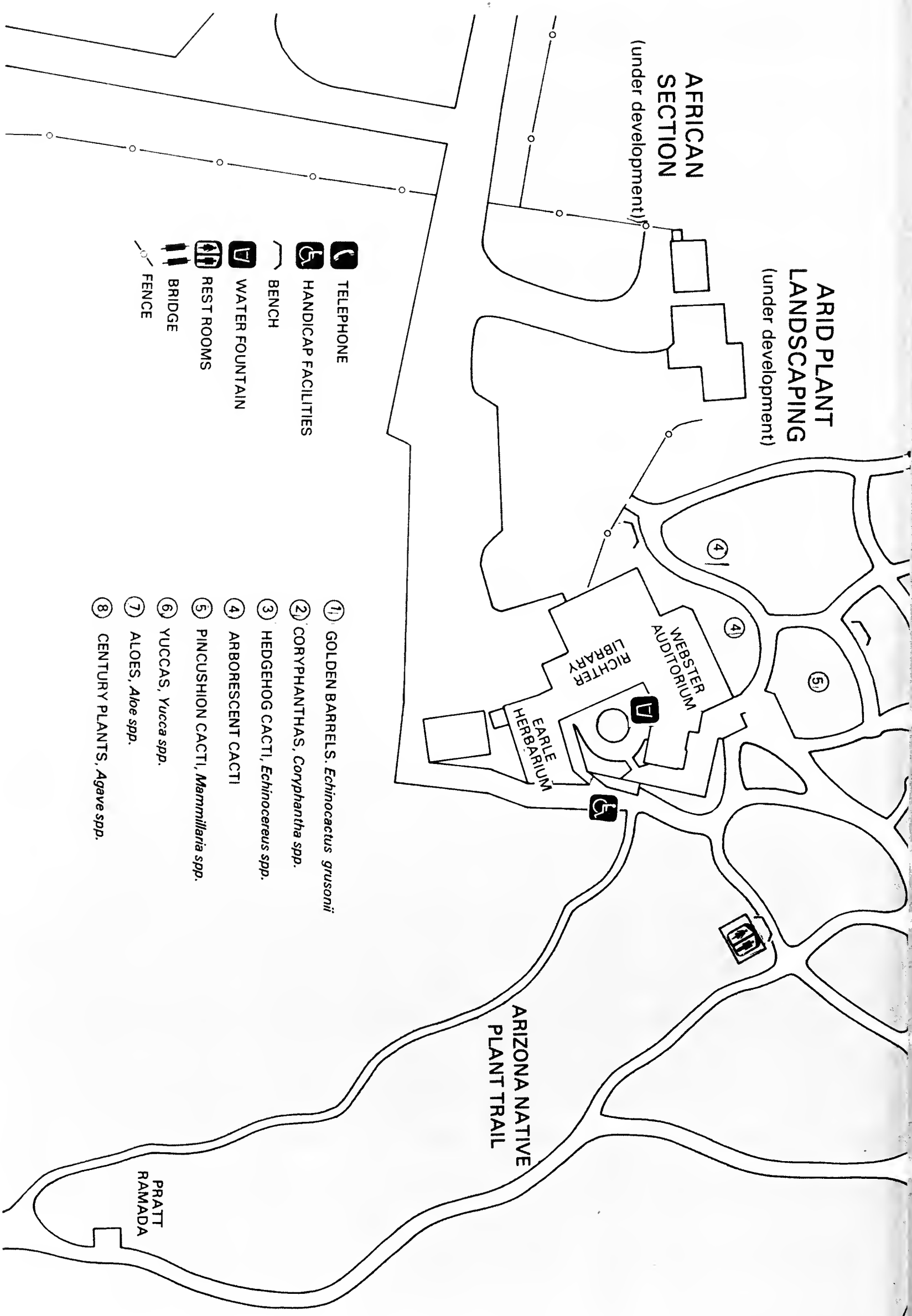
*Latin translation by Dr. David J. Keil, California Polytechnic State University, San Luis Obispo, California.








Holotype sheets of above variety deposited at the Herbarium of Arizona State University, Tempe, Arizona and the Lois Porter Earle Herbarium of the Desert Botanical Garden, Phoenix, Arizona.



**ARID PLANT
LANDSCAPING**
(under development)

**AFRICAN
SECTION**
(under development)



-  TELEPHONE
-  HANDICAP FACILITIES
-  BENCH
-  WATER FOUNTAIN
-  REST ROOMS
-  BRIDGE
-  FENCE

- ① GOLDEN BARRELS, *Echinocactus grusonii*
- ② CORYPHANTHAS, *Coryphantha* spp.
- ③ HEDGEHOG CACTI, *Echinocereus* spp.
- ④ ARBORESCENT CACTI
- ⑤ PINCUSHION CACTI, *Mammillaria* spp.
- ⑥ YUCCAS, *Yucca* spp.
- ⑦ ALOES, *Aloe* spp.
- ⑧ CENTURY PLANTS, *Agave* spp.

**ARIZONA NATIVE
PLANT TRAIL**

**PRATT
RAMADA**

MAIN PARKING LOT

→ TO GALVIN PARKWAY

MAIN ENTRANCE

GIFT SHOP

STUDENT ENTRANCE

11

2

DOUGLAS
DISPLAY CASE

CACTUS
HOUSE

AUXILIARY
PARKING LOT

ECONOMIC PLANTS (6)
(under development)

SUCCULENT
HOUSE

AUSTRALIAN
SECTION (8)
(under development)

QUAIL RUN PATH

3

1

7

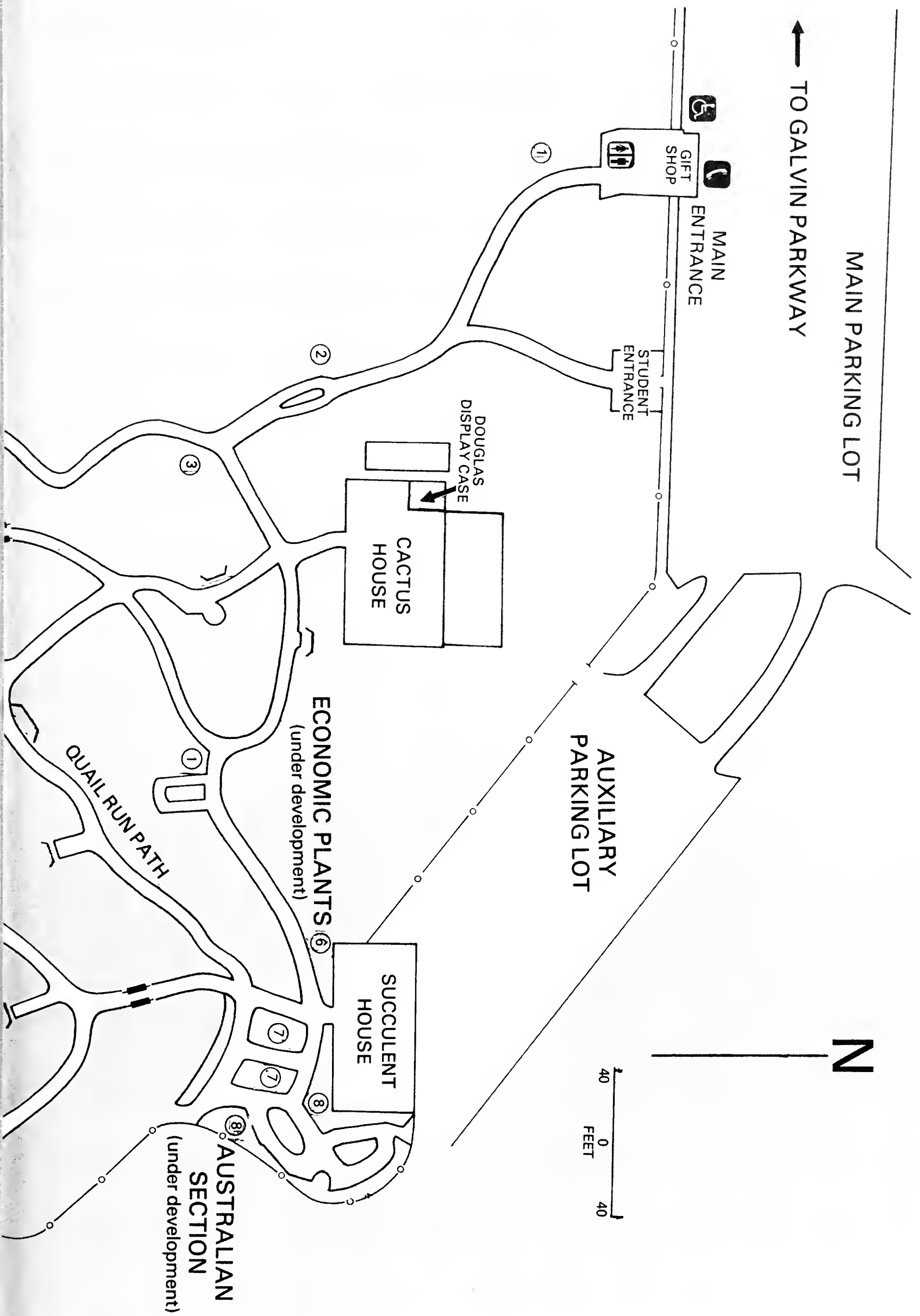
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8

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"SHOWCASE 33"



Emmy La Tempa (left) and Fran Tolleson, co-chairmen for the 33rd Annual Cactus Show, are organizing for this year's big show.

That's the title that has been chosen as the theme for the 33rd Annual Cactus Show at the Desert Botanical Garden. Committees are in the process of being set up by chairmen Emmy La Tempa and Fran Tolleson and plans are well under way. Three outstanding judges have been selected for this year's show. Mrs. Harry Tate of Colton, California is a Representative of the National Cactus and Succulent Society of America. She is the authoress of "The Cactus Cookbook," which is offered for sale in the Gift Shop.

Mr. John Robbins of Sierra Vista, Arizona, is employed at Dan Reed's Nursery and is quite an expert of cacti. He is a recognized show judge. Mr. Alan Blackburn is a member of the Board of Tucson Cactus and Botanical Society and is a veteran exhibitor and winner of many awards for his plants.

If you would like to help out with all the myriad tasks associated with the Cactus Show, please contact the Garden office, 941-1217.

WILDFLOWER NETWORK

Starting March 4, the Desert Botanical Garden will once again sponsor the wildflower network reports. Last year the Garden sponsored a local wildflower report for the Phoenix area news media, to inform the public of the most colorful and accessible wildflower displays within the state. This network helped to answer over 300 phone calls, and dozens of letters from people who requested information on desert blooming. The information was also posted on a wildflower display in Webster Auditorium and included the locations of the areas in bloom on an Arizona map. This display was used by hundreds of Garden visitors.

The wildflower network is quite an operation. It requires a call to various contributing agencies each Tuesday

morning to get a report on the identification, abundance, and exact locality of flowering plants for that specific area. The full report must then be completed by Tuesday evening and on Wednesday sent to each contributor as well as to the news media. Some of the agencies which help with the reporting are the National Forest Service, National Park Service, Bureau of Land Management, Soil Conservation Service, National Wildlife Refuges, U.S. Fish and Wildlife Service, County and State Parks, and many individual botanists.

With the abundant rain and the mild temperatures we have been recording in the state, Spring should once again be a spectacular season of flowering in Arizona.

IN BRIEF

SPECIAL GIFTS

Many Garden visitors will benefit from the kind gift of Mr. and Mrs. L. R. Mullineaux who recently contributed \$1,000 to the Desert Botanical Garden. The funds have been contributed for the benefit of handicapped visitors to the Garden. This thoughtful contribution will add greatly to improving Garden facilities for the handicapped.

There are many ways that the Garden receives help. The Salt River Project has discovered a number of ways to help the Desert Botanical Garden. One way they help, is to serve as co-sponsor for the Arid-Zona Landscaping Contest for the past two years. Recently, SRP became a corporate Donor, contributing \$500 a year to the Garden. In January SRP donated a very different but important kind of resource to the Garden, silt from the Project's Crosscut Canal. Plans for the use of the 40,000 yards of silt given by our neighbors include application to areas where it is scant, in planting areas of the Garden's Australian Section that is presently under development and for general soil enrichment.

JESSIE OWER

The Garden was saddened in January by the death of Jessie Ower, a Docent and loyal volunteer. Both Jessie and her husband John, also a Garden Docent, have contributed to many Garden projects. A request by the family has been made to friends to remember Jessie Ower by making a contribution to the Garden in her memory, and a number of such gifts have already come to the Garden. Jessie will be missed by all her friends and fellow workers at the Garden.

VOLUNTEER STAFF

Volunteers serve as the life force for most nonprofit institutions, and there is no place where their vitality is felt more than at the Desert Botanical Garden. Special

Garden events and projects could not be planned and accomplished without the aid of so many willing and talented people who so pleasantly donate their time. During the recent Photographic Exhibition, Garden Volunteers gave over 200 hours of time, time spent in organizing the exhibition, sorting and categorizing the entries, displaying the pictures, hosting the exhibition, answering questions, and dismantling the show and returning the entries. For the month of January, alone, over 600 hours of volunteer time have been logged in!

Volunteers guide visitors through the Garden, instruct school groups, paint and help fix up dozens of areas where there is a maintenance need. Volunteers this January have transplanted over 200 plants for sale and have also transplanted about 100 accessioned plants. They have also assisted in: (1) the inventory and mapping of the propagation area (2) setting up special displays (3) record keeping.

These tireless workers help get the *Bulletin* out, assist in public relations projects and in all kinds of incidental projects. The Desert Botanical Garden is very lucky to have this hard working team of people on its side! Thanks to you, Volunteers, the Garden continues to grow.

STAFF CHANGES

Wendy Hodgson has become the Garden's Artist, replacing Chris Dezelsky who has taken a leave of absence in order to return to Graduate School at Arizona State University. Wendy will serve as artist half-time and retain her responsibilities as horticulturist half-time. Wendy is a valuable and versatile member of the staff. She is a recognized botanical artist; her collection of floral prints are on sale in the Garden Gift Shop. She has designed *Bulletin* covers (including the one this month), and supplied numerous drawings for books and articles. She is currently contributing artist for Dover Publications' *Southwestern Wildflowers* coloring book series.

BOARD OF TRUSTEES

After many years of association with the Desert Botanical Garden, Board Member, Edward Burrall has submitted his resignation from the Garden Board of Trustees. Mr. Burrall, a Board Member since 1947, donated the resources for the development of the Garden's Aloe Beds and Quail Run Path which weaves delightfully along the Garden's main arroyo. The Garden sincerely appreciates the devoted service, and the loyal support that Mr. Burrall has extended to the Garden.

PLANT COLLECTIONS COMMITTEE

Dr. Charles Huckins, Director of the Garden, has been appointed Chairman of the Plant Collections Committee for the American Association of Botanical Gardens and Arboreta. The Association's President, Francis Ching, Director of Los Angeles State and County Arboretum, describes this two year assignment as an important one for the Association. The work of the Committee will focus on the need of most botanical and horticultural institutions with plant collections to make the purposes of their valuable living resources better understood by the public. Huckins views his assignment as a challenging one because of the diverse and multiple purposes to which plant collections are put. The objective of the Committee will be to draft and obtain support for a plan for the recognition of the importance of plant resources cultivated in this country. Dr. Huckins is currently in the process of selecting his committee.

LIBRARY NOTES

The library has recently added three titles to the current periodicals collection. *Desert Plants*, is a new quarterly publication of the Boyce Thompson Arboretum. *Aloe*, Journal of the South African Aloe and Succulent Society, and *Asclepiadaceae*, Journal of the International Asclepiad Society, are monthly publications.

Recent donations to our book collection include *Wildflowers of Western America*,

by Robert and Margaret Orr and donated by Henry Triesler. The Mesa Public Library has contributed the 1978-79 publication, *Books in Print*, a very useful reference tool. When you think of giving a book to a friend, think of the Richter Library.

1980 PHOTOGRAPHIC EXHIBITION

The Third Annual Photographic Exhibition has been acknowledged as a great success. The work that was entered this year was of exceptional quality. The exhibition, itself, was beautifully displayed in Webster Auditorium. Show attendance was heavy, over 1,900, and most of the slide show presentations were to standing room only. There were 339 entries and 50 of them won awards. More than 150 people attended the preview party, held the night before the show opened, to congratulate the winners, enjoy the photographs and the refreshments.

Plans are already underway for the 1981 show. A sign-up table at this year's show prompted over 75 inquiries about next year's exhibit.

Special credit for this successful exhibition go to the combined efforts of volunteers, staff, and exhibitors and the outstanding direction by chairmen Dottie O'Rourke and Gen Evans.

SPRING QUARTER CALENDAR

Enclosed with this Bulletin is a copy of the Spring Calendar of Events. You will note that once again, it is a very crowded calendar. As you read through it, you will see that the free lecture series has been rescheduled; many fascinating subjects will be covered in this series.

The drawing on the cover of the calendar is the Red-Stemmed Filaree, *Erodium cicutarium*. The plant is found in abundance throughout the state and is considered as one of our most valuable forage plants. This photo copy is taken from the book *Wild Flowers of California*, by Parsons and Buck, 1904. This book is in the collection of the Richter Library at the Garden.

PORTRAIT OF A JUDGE

Read back through your past copies of the *Saguaroland Bulletin*, and you will see the name of Alan Blackburn listed among past winners of the Annual Cactus Show at the Garden. Alan Blackburn has exhibited at the Desert Botanical Garden many times. He has supplied cactus growing information to many classes.



He says that he has been collecting cactus plants since 1938, when he obtained his first plants from Woolworths. This native Ohioan moved to Tucson in 1947 and began to get serious about the study of cactus plants. From 1953 until 1960, he served as Acting Botanist at the Arizona Sonora Desert Museum, and as Director at Ghost Ranch Museum in New Mexico from 1960 until 1963. He returned to work at the Desert Museum until he retired in 1972. He has been collecting, grafting, and growing cacti from seed and now has a collection of 700 species.

When the Tucson Cactus and Botanical Society was organized, Alan was chosen as the first Vice President of the group, and later became President. He has been honored with a lifetime membership to the Society.

PLANT SALES

A series of three plant sales will be held in the month of April which will offer plant collectors and gardeners a unique opportunity to secure unusual, hard-to-obtain plants:

BOYCE THOMPSON SOUTHWESTERN ARBORETUM PLANT SALE — Superior, Arizona; Saturday and Sunday, April 5 and 6. The Arboretum will have a multitude of rare and unusual succulents, especially cacti, on sale.

DESERT BOTANICAL GARDEN — Papago Park, Phoenix, Arizona; Saturday and Sunday, April 12 and 13, with a Members' preview on Friday, April 11. The sale will focus on specimen succulents including many exotics.

ARIZONA SONORA DESERT MUSEUM — Tucson, Arizona; Saturday and Sunday, April 19 and 20. The plant sale will specialize in attractive flowering shrubs and bedding plants adapted to the region's combination of droughts and occasional winter chill.

PLANT PROPAGATION

With concern about buildings, staff, maintenance and all the activities involved in operating a complex institution such as a botanical garden, it is sometimes forgotten that the plants play a key function in the Garden's program. After all, that's what a botanical garden is all about, and that's what people come to the Garden to see.

Victor Gass, Garden plant propagator, reports that he has accessioned 5 new species, planted 35, and propagated 52 species from seed and 4 from cuttings. Plant propagation can be a tricky business. To help the public better understand some of the basics of propagation of desert plants, Victor has constructed an outstanding exhibit of living plant materials which is on display in the Douglas Display Case in the Cactus House. This display has already attracted a great deal of interest from Garden visitors.



DESERT BOTANICAL GARDEN

P.O. BOX 5415
PHOENIX, AZ. 85010

Garden Events

MARCH

- 8 **Superstition Mountains** — A field trip to view spring wildflowers; Saturday, 8 A.M. Limit 25.
- 21 **Preview** of the 33rd Annual Cactus Show; Friday, 6 P.M.
- 22 **33rd Annual Cactus Show** — March 22-30, 9 A.M. to 5 P.M.

APRIL

- 1 **Desert Wildflowers** — The first presentation in a weekly lecture series held at Webster Auditorium during April, May, and June. Check your Calendar for details; Tuesday, 2 P.M. Free with Garden admission.
- 3 **Desert Landscaping** — The basics of designing a creative desert landscape; Four Thursday sessions; 7 P.M.
- 5 **Canyon Lake** — A field trip east of Phoenix to view spring wildflowers on the Apache trail; Saturday, 8 A.M. Limit 25.
- 7 **Basic Botany of Flowering Plants** — An introductory course; four Monday sessions, 7 P.M.
- 11 **Members' Preview of Annual Sale of Unusual Plants** — 4 P.M. until sunset.
- 12 **Annual Sale of Unusual Plants** — Hard to find and newly introduced trees and shrubs, cacti, and other succulent plants. April 12 & 13, Saturday and Sunday, 9 A.M. to 5 P.M.
- 19 **Devil's Canyon** — A rescheduled field trip to view rock formations and desert flora; Saturday, 8 A.M. Limit 25.

The Garden is open every day of the year from 9 a.m. to sunset.

SAGUAROLAND BULLETIN

APRIL, 1980



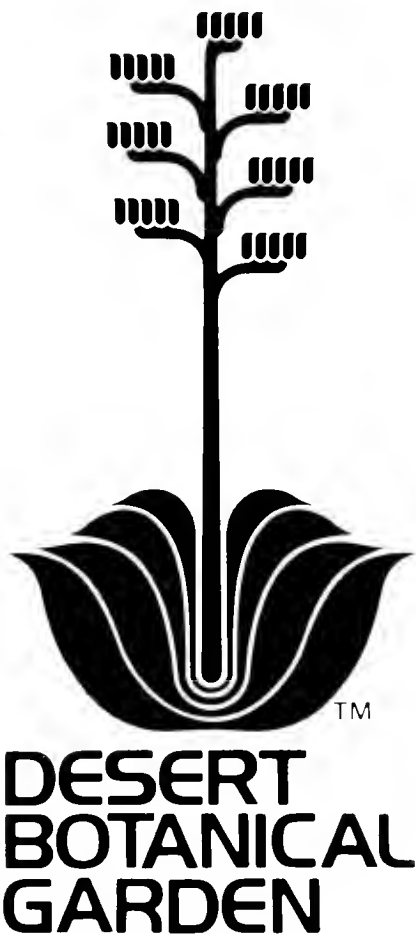


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Cover: *Linaria pinifolia*, toadflax, in bloom this month at the Garden. Photo, John Young.

ANNUAL MEMBERSHIP:
 Individual \$ 15.00
 Family \$ 20.00
 Sustaining. \$ 50.00
 Subscribing. \$100.00
 Supporting \$250.00
 or more

Corporate Memberships available in several categories.

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 Research Botanist Howard S. Gentry, Ph.D.
 Curator of Herbarium J. Harry Lehr
 Superintendent Russell Haughey
 Business Manager Janice Moats
 Education Director. Sylvia Forbes
 Publications Director Shirley Deacon
 Artist Wendy Hodgson
 Plant Propagator Victor Gass
 Gift Shop Manager Lynn Trainum
 Librarian Rebecca Henry
 Director Emeritus. W. Hubert Earle

Horticultural Staff: Ross Berkheimer, Donald Conner, Steven Heslep, Wendy Hodgson, Nichole Holler, Marc Mittleman, Patrick Quirk. Gift Shop Staff: Robyn Moats, Anna Shelstad, Clare Thomson, Lela Turner. Office Staff: Tracy Peterson, Dianne Pitcher. Education Assistant: Mary Fulton.

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TRUSTEES OF THE DESERT BOTANICAL GARDEN. Officers: Chairman of the Board, John Rhuart. President, Henry C. Triesler, Jr. First Vice President, Donald W. Hutton. Second Vice President, Lillian Diven. Secretary, Lillian Mieg. Assistant Secretary, Barbara Kaiser. Treasurer, Alice Feffer. Assistant Treasurer, Margaret Caldwell. Members: W. H. Chester, John Daniels, Frank M. Feffer, Thomas A. Goodnight, Naomi Kitchel, Emelia La Tempa, Mary Lyon, Eric Maxwell, Mildred F. May, Charles F. Merbs, Duncan T. Patten, Bruce D. Pingree, Donald J. Pinkava, Mrs. Paul Singer, John F. Swift.

1980 CACTUS SHOW — SHOWCASE 33!

One of the showiest cactus shows in 33 years opened Saturday, March 22 at the Desert Botanical Garden. Judges and visitors alike praised it as one of the outstanding shows in the history of the Garden's yearly cactus contest and exhibition. A total of 892 entries from 84 exhibitors covered the tables of the auditorium and patio.

Judges spent a full day on Thursday, March 20, contemplating the merits of the entries. Joyce Tate, Alan Blackburn, and John Robbins all concurred that the selection of entries and the condition of the plants were exceptional. They were assisted by Mrs. A. F. Brown, Mrs. C. H. Morris and Mrs. S. R. Stevens, judges for sections V and VI.

The Members Preview Party brought nearly 250 Members, guests and Staff to the Garden to admire the show and greet the winners. Very special refreshments were served on the patio.

Top honors for awards were won by Joan and Stan Skirvin who received the Charles E. Mieg Memorial Trophy award for the most blue ribbons. The Skirvins, Scottsdale residents, also won sweepstakes



Garden Board Members Mrs. Paul Singer and Mr. Frank Feffer at the 33 Annual Cactus Show, Preview Party.



Board Member Lillian Mieg, and Former Director of the Garden, W. Hubert Earle, comparing notes at the Preview Party on this year's Cactus Show.

trophies for the most blue ribbons in the cactus and succulent divisions, a total of 30 in all. Joan Gossman of Phoenix won 7 blue ribbons for arrangements.

Other top winners include Fran Tolleson for the Best Cactus, *Espositoa melanostele*, Ernie Gunnell for Best Succulent, *Ibervillea lindheimeri*, and Eileen Beauregard whose *Notocactus scopa* var. *alba* won a trophy for Best Crested Cactus. Fran Tolleson also won the Best Planter award and a special award for her *Gymnocalycium saglione*, Henry Triesler won Best Caudiciform with his *Pachypodium succulentum*, and Dick Gibbons won Best Mammillaria with his *Mammillaria elongata*. Frank Schively won a special award with his *Turbincarpus pseudopectinatus*.

For the most part, the weather was cooperative for the show, with clear but cool days. The co-sponsor of the show, The Phoenix Gazette gave us excellent support, with several stories, ads, and on Thursday, March 27, a front page, full color photo of the Garden in bloom.

Visitors to the show came from all over the world, and their responses were a joy to hear.

CRESTS, MONSTROSITIES, AND FREAKS

by Vera Gamet

Visitors to Arizona who are unacquainted with the desert forest and its inhabitants find the strange shapes of the plants in the Desert Botanical Garden fascinating, curious, and occasionally repelling. Attracted or repelled, visitors all pause before the cristates and monstrosas.

Nobody really knows why these malformations occur, and no one simple cause can explain them. They occur in the cactus family more frequently than in any other branch of the vegetable kingdom. *Fasciation* is the term applied rather loosely to cover a wide range of growth changes in plants in which normal symmetry is drastically upset. There are two main types of fasciation, the cristate form and the monstrose form, and then there are the freaks.

The most common fasciations are the cristate, or fan-shaped forms, that are found on saguaros and other columnar species, and that also occur on many species of crassulas, mammillarias, opuntias, and echinopsis. In fact, there are few species of cacti that are not subject to fasciation. Speculation on the causes of these distortions include insect damage to the growing center of the cactus, radioactivity in the soil, storm damage (for example, when hail stones hit the vulnerable meristem), disease, over-nourishment, and under-nourishment and an inherited tendency transmitted by the seed.

Crestation occurs when the symmetrical growing point of the stem, for whatever reason, suddenly and abnormally divides and subdivides into multiple growing points that are crowded into something of a strip. These growing points require some place to go, so they spread out into a convoluted fan called a crest, or into a mound of wavy ribbons. Crestations seem to crop up quite unexpectedly. Sometimes they are magnificent and beautiful, for there is a strange beauty in the abnormal. They are always extraordinary and usually enormous. They do not seem to

damage the plant proper which continues to grow.

Plants which are deformed but not crested are given the name, "monstrose." Instead of neat symmetrical columns with orderly fluted ribs tufted with regular spines, monstrose plants, which retain their normal columnar or cylindrical shape, develop multiple growing centers at the meristem, or growing point; irregular knobby protuberances of fleshy plant tissue develop as a result of this growth disorder. Regular ribbing and normal areoles never have a chance to develop because of the miscreation of the meristem.

The meristem is the growth tissue of any plant organ. It is a dome-like mound of undifferentiated nascent cells which have not yet, but will eventually become recognizable forms such as spines, leaves, branches or flowers. The meristem is usually buried under a protective layer of hair, bristles, scales or wool, as observable in the wooly center of a barrel cactus or a young saguaro stem.

The totem pole cactus, *Lophocereus schottii* forma *monstrosus*, is one of the rare instances where meristem cells abnormally develop at a number of points on the column, thereby producing a number of subsidiary growing points from which deformities and irregular growths spring.

Cristate forms upset a plant less if the plant has already reached mature size and has attained some bulk. The malformations, being abnormal, result in a disadvantage to the life process of the plant, and if the plant is immature, it is often eliminated. Monstrosas may produce flowers, but their seed, if any, is not viable. In the wild, cristate and monstrose forms are rare. Only one saguaro in a thousand may form a crest on one of its stems, and it may reach gigantic size.

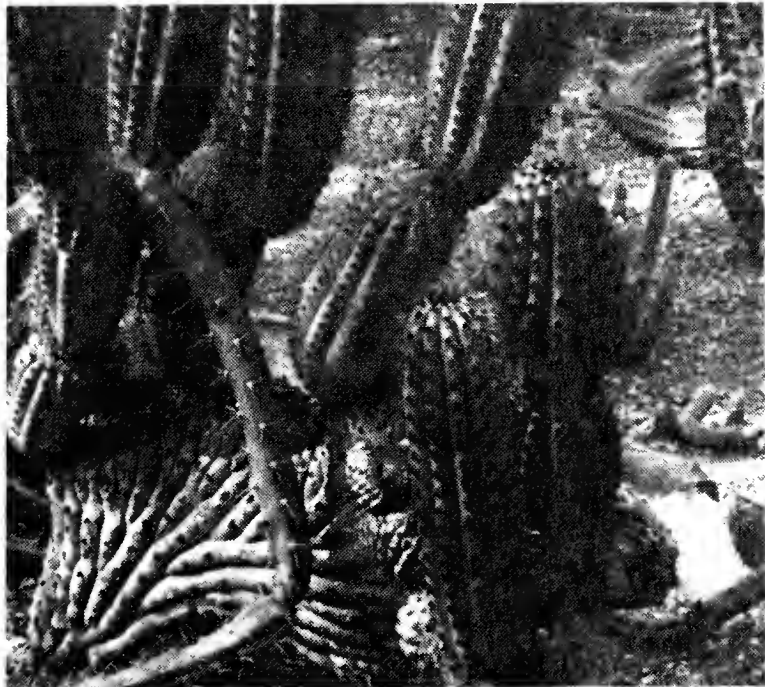
Propagation of abnormalities, apart from chance occurrence in seedlings, is by cuttings or grafting. Cristate or monstrose forms separated from the parent plant



Mammillaria geminispina, a *cristate* form, that is growing in the Garden.

may root on their own and survive very well. The joker is that they may revert to normal growth. Smaller forms of cristates or monstrosas are dear to the heart of collectors. These small, bizarre plants have personality.

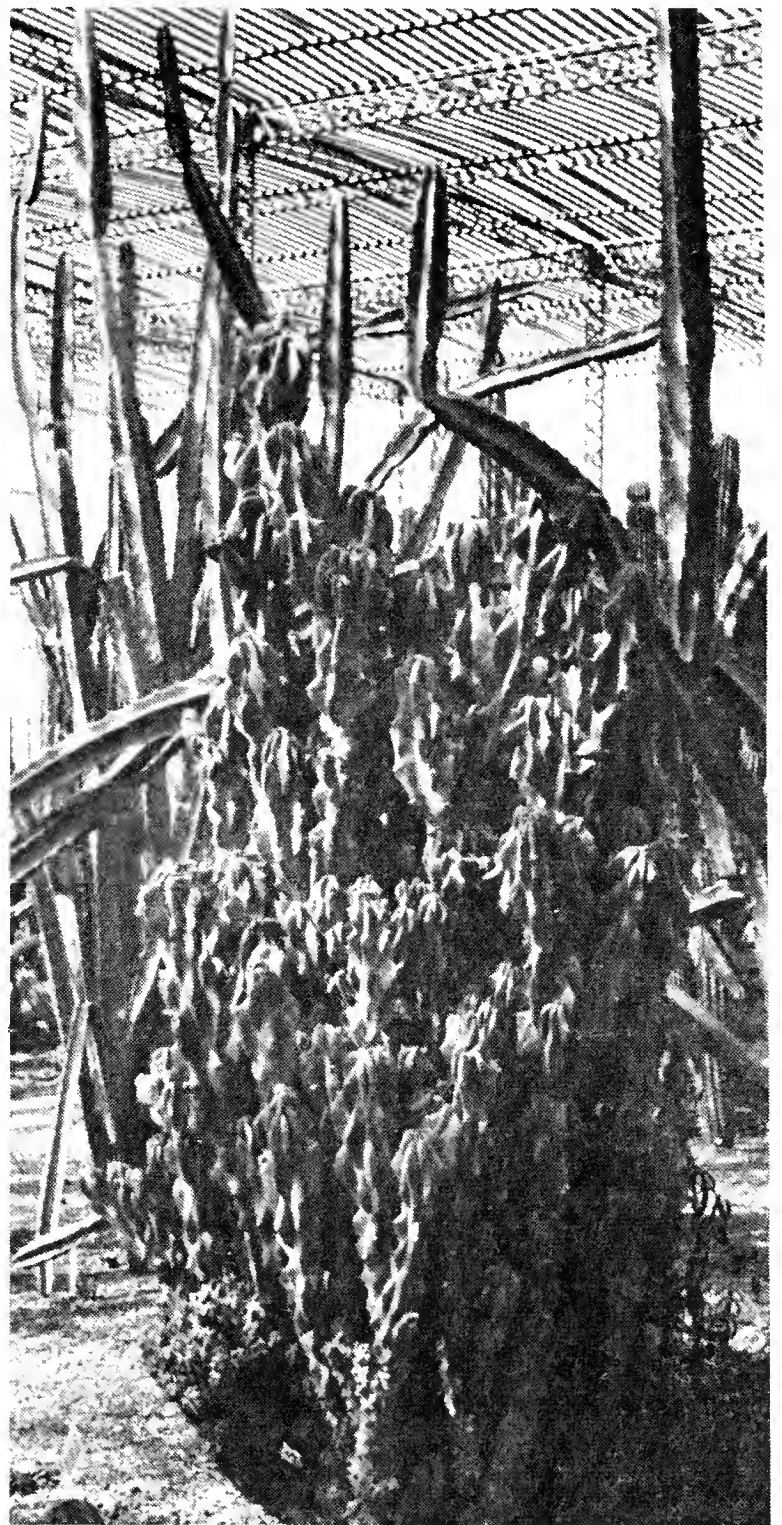
The freaks are the megacephalus forms: *mega* from the Greek word for large, and *cephalus* for head. From time to time in the wild and in cultivation something unusual happens to a cactus, especially a saguaro or a barrel. It may have had its top knocked off, cut off, damaged by insects, by storms or by frost, or have been



Cereus thurberi, organ pipe, in the Cactus House is a living illustration of a crest that is reverting back to normal growth.

distorted by genetic aberration. Quite often the site of the damage is easily visible; around it the plant produces a number of new "heads" or stems, all of them symmetrical and normal in appearance. But it is possible that the heads may be wrinkled into unnatural shapes and ugly, piled upon and against each other in distorted array.

The freak will not reproduce itself, but it may be perpetuated by cutting away the normal parts of the plant and allowing all the energy of the root system to flow into the strangely shaped section.



Cereus peruvianus var. monstrosus, a native of Brazil and Argentina. (Photos, Victor Gass)

A TIME LINE OF THE DESERT BOTANICAL GARDEN CACTUS SHOW

1938—First Cactus Show held at Thompson's Tropical Gardens nursery. Mrs. Gertrude Webster's plants were the outstanding feature. The show was sponsored by the Arizona Cactus and Native Flora Society which in 1979 became the Desert Botanical Garden, Inc. Mrs. Webster was the president of this organization and the founder of the Desert Botanical Garden. She served as chairman of this first show. Tea was served as part of the event.

1939—Desert Botanical Garden was dedicated in February. George Lindsay, first director.

1940—The present Webster Auditorium was built and dedicated January 21.



A 1940 view of the planted area of the Garden, taken from the roof of the Auditorium.

1948—The first Cactus show held at the the Desert Botanical Garden February 22-29, was under the sponsorship of the Arizona Republic. There were 5 sections: Potted Plants; Collections of Potted Plants; Dish Gardens; Arrangements; Rock Gardens. The show brought 20,000 visitors to the Garden in 8 days.

1949—In the second show, space was provided for merchants who wished to display merchandise decorated with desert designs or made with

desert materials. The Arizona Mineralogical Society supplied a display of minerals.

1950—The Third Annual Cactus Show at the Garden, February 19-26.

1951—The Fourth Annual Cactus Show opened on February 19, with the dedication of the Cactus Lath House by Governor Pyle. The most outstanding exhibit was a rockery of cactus and other desert plants in the form of a rough oval and built on the sloping ground of the patio to the south of the auditorium.

1952—Attendance was reported as being up 40 percent over the previous year for this show that was sponsored by the Phoenix Gazette.

1953—The Sixth Annual Cactus Show was co-sponsored by the Phoenix Gazette, February 22 to March 1.

1954—This Seventh Annual Cactus Show was again co-sponsored by the Phoenix Gazette. The paper was praised for the front page coverage of the show. Entries numbered 198. The Arizona Sonora Desert Museum exhibited a model of a "blind" used in photographing animals. There was a special display of the photographic murals of Howard M. Soule.



A high elevation photo of the Garden in 1954.



Mrs. C. Mieg (left) and Dr. Helio Bravo, discuss various cacti in November, 1956.

1955—On the opening day of the 8th Annual Show, 5000 people admired the plants of 28 exhibitors. Ken Fisher of Mesa, won a special sweepstakes.

1956—The 9th Annual Cactus Show presented 7 classes. W. H. Earle served as the show manager.

1957—Four rainy days, but fine exhibits marked the Garden's 10th Annual Cactus Show.

1958—Fine photos in the Gazette by photographer Dick Strauss and daily stories by Lin Brown helped to promote this outstanding show.

1959—Although this show was held February 22-March 1, some visitors objected to the heat. There were 224 entries by 31 exhibitors. A special exhibit on Hay Fever was presented by the Botany Department at Arizona State University.

1960—There were 293 entries in this show, but "this was the first time in the history of the 13 shows that the weather was against us . . ." reported the *Saguaroland Bulletin* for March. The cold and windy weather cut attendance by one-third over previous shows.

1961—The 14th Annual Cactus Show presented over 550 entries by 54 exhibitors, an all-time record. A special exhibit by the newly formed Tucson Cactus Club drew special notice. The Best Cactus Plant category was won by Alan Blackburn, one of the judges for the 1980 Show.

On February 20, the "new Visitor's Building" (Gift Shop) was dedicated. At the ribbon cutting were, Governor Paul F. Fannin; Chairman of the Garden's Board of Trustees, John Eversole; Board Members Reg Manning, Charles Meig, and Mel Hinman; and Garden Director, W. H. Earle.

1962—Three days of rain dampened some of the 11,465 visitors at the 15th Annual Cactus Show. The Show continued to grow, with 57 exhibitors and 663 entries.

1963—Sunshine every day was reported for the '63 Show. There were 486 entries by 67 exhibitors, and 13,229 in attendance.

1965—The 17th Annual Cactus Show included entries in photography and painting. There was a new classification for Patio Planters, and a record 88 exhibitors with 559 entries.



Mayor Graham delivered an address during the Succulent Lath House dedication in April, 1965.

1964—Entries overflowed the auditorium onto the patio and into the Visitor's Entry for this year's show, with 532 entries from 92 exhibitors.

1966—January floods did not discourage the 113 exhibitors who submitted 620 entries.

1967—For the first time in the Show's history, limitations had to be placed on the number of entries that an exhibitor could enter in certain classifications. Mrs. Frank Feffer won Best Dish Garden and Mrs. Charles Meig won the Best Collection of Five Cacti.

—The new Library was a new attraction for this 21st Annual Cactus Show, that displayed 765 entries and drew 11,880 visitors.

1969—Excellent weather and a feature story in the Sunday Travel Section of the Chicago Tribune, helped to make this one of the outstanding shows in Cactus Show history.



Reg Manning and Mayor Driggs were at the Garden for the dedication of the new Library, April, 1970.

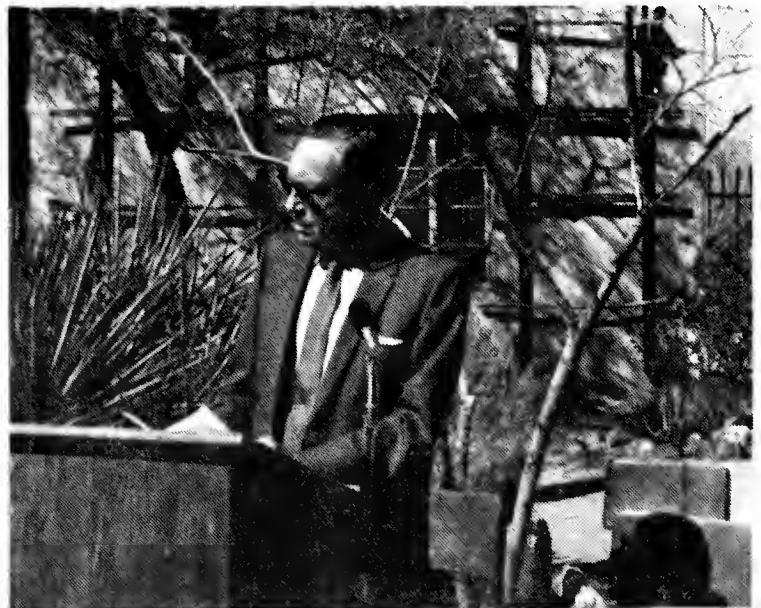
1970—The 23rd Annual Cactus Show was blessed with good weather and outstanding coverage by the Show's co-sponsor, the Phoenix Gazette. There were 1101 exhibits and 112 exhibitors; the Show was an enormous success.

The year also marked the point when the Garden membership exceeded the 1,000 mark. When the Garden reopened in December, 1946, after its wartime shutdown, only 19 members remained from the original 300 Members of 1937-38. The Richter Library was dedicated in April.



The 24th Annual Cactus Show held in February, 1971 drew this young admirer in buckskins.

1971—Despite a January freeze, plants for this Show were praised as being very attractive, but the attendance was lower because of the poor weather. Memberships at the Garden set an all time high, with 1354 members.



The Lois Porter Earle Herbarium was dedicated in April, 1972. The Garden's present Board Chairman, John Rhuart, delivered an address.

1972—The 25th Annual Cactus Show presented 943 entries by 135 exhibitors. This was the year of the big floods, but the floods did not slow down the membership increase as it swelled to 1440. The Lois Porter Earle Herbarium was dedicated this year; some of the dried plants in this collection were collected in 1800.

1973—The Show ran from February 18 through 25. Lela Turner received a special tribute for her dedication to the Show, before — during — after.



Garden Volunteer, John Graham, won a blue ribbon with his Myrtillocactus guatemalensis in this year's show.



Martha Passwater, who estimates that she has about 1,000 plants, took home a blue ribbon with her dish garden entry. Martha is also a Garden Volunteer.

1974—The energy crunch of '74 resulted in a 27 percent drop in attendance, but the Show still thrived with 785 entries by 120 exhibitors.

1975—This was the year of a very big Show. Over 17,000 visitors entered the Garden through the new Charles Meig Memorial Gates.

1976—A January freeze this year did not harm the success of the 29th Annual Cactus Show. Outstanding work by Garden volunteers, new logo T-shirts, and two out-of-town groups, the Las Vegas Cactus Club and the Tucson Cactus and Botanical Club and dozens of outstanding entries made this a remarkable Show. In April of this year, *Arizona Highways* ran an article entitled, "Exploring a New World at the Desert Botanical Garden."

1977—Over 25,000 people visited the Garden during this year's Show. A highlight of the Show was an autograph party by former Board President and long-time friend of the Garden, Reg Manning.

1978—The show opened March 12 and ran through March 19, but the weather was "awful." Opening day progressed from rain in the morning to sleet in the evening. That was the "bad" news. The "good" news was that on one day of the Show 69 of the exhibited plants were in bloom, 90 volunteers helped with the show, and Sadie, the Talking Saguaro was the star of the show.

1979—The 32nd Annual Cactus Show opened to beautiful Spring weather, although there were complaints about miserable growing conditions the previous winter, but it was reported that somebody forgot to tell the plants this bit of news. A new Sweepstakes Trophy for the most blue ribbons awarded for Cacti, Succulents other than cacti, and Arrangements was added to the Show awards. Donated to the Garden by Mr. and Mrs. Liscum Diven the Silver bowl is designated as the Charles E. Meig Memorial Trophy. The bowl is a circulating trophy engraved each year with the name of the sweepstakes winner.

In Honor of Volunteers

The Desert Botanical Garden will honor its volunteer staff at the Garden's Annual Volunteer Luncheon, on April 17, at 12:00 noon. A special program will be presented, and awards will be made to some special people. All volunteers are cordially invited to join the Board of Trustees and the Staff for this special yearly event.

There are many "star" volunteers at the Garden and it is a difficult task to single out any one person. Just one of the Garden's long time friends, and willing volunteers is Lela Turner. Lela has set her own record in terms of service to the

Garden and participation in the Cactus Show. She has been a Garden Member since 1948. In the 33 years of the Cactus Show, Lela has entered 30 years, including this year, and has been a winner every year, including this year!

Lifesavers at this year's Cactus Show include Marge and Bill Rosenbaum. When a staff member fell ill, Marge stepped right in and worked every day in her place; and husband Bill put in plenty of long hours, too. Marge and Bill, and over 80 other Garden Volunteers have helped make this show a beautiful success.

IN BRIEF

APRIL PLANT SALE

The Garden's 5th Annual Sale of Unusual Plants for Desert Gardens will be held April 12 and 13, with a Member's Preview scheduled for April 11 from 4 P.M. until sunset. Plants on sale will be trees, shrubs, perennials, and ground covers for home landscape use. Many of these plants are hard to find, and all of them have low water needs. Selected by the Garden's Superintendent, Russell Haughey, for this special sale, these desert plants are noted for their adaptability to local conditions. Some of the plants are newly introduced and have promising landscape applications. Cuttings, seeds, and the Garden's own special soil mix will also be on sale. The Plant Sale will be open daily from 9 A.M. until 5 P.M. All proceeds from this sale will benefit the Garden's horticultural programs.

NATIVE PLANT CUISINE

A course entitled, "Cooking with Native Plants," will be held at the Garden's Webster Auditorium beginning Wednesday, May 7, from 2 P.M. to 4 P.M. and will continue each Wednesday through May. The course will consider the preparation of unusual edibles that are found in the desert. Ruth Greenhouse,

ethnobiologist, will be the course instructor. All materials will be furnished.

One of the Cactus Show judges this year, was Mrs. Harry Tate, editor of the "Cactus Cookbook," published by the Cactus and Succulent Society of America. While she was in town for the judging, Mrs. Tate appeared on the Rita Davenport television show, "Open House." During her segment of the show, Mrs. Tate prepared several of her cactus recipes and made a major point of telling cactus cooks to either raise their own cactus or to buy this food material already prepared.

LIBRARY GIFT

Recently, Mr. John Ruhart, Chairman of the Board of the Desert Botanical Garden, donated **The New York Botanical Garden Illustrated Encyclopedia of Horticulture** to the Richter Library. This magnificent 10 volume set is a complete, thoroughly modern work, written by T. H. Everett, noted horticulturist. This unique work, the largest reference work of its kind and covering over 3,600 genera of plants, contains over 10,000 photographs with several hundred of them in color. Garden Volunteers, Staff, and Visitors will all find great use and pleasure in this remarkable set of books.

REG MANNING "TOAST" at Camelback Inn Luncheon

Reg Manning, the "laughing cactus" cartoonist, celebrates his 75th birthday in April.

To note this occasion and his close association with the Garden for 42 years, the Board of Trustees is hosting a luncheon in his honor on Monday, April 28, at the Camelback Inn.

The Arizona Republic is contributing the luncheon expenses so that the entire cost of a luncheon ticket directly benefits the Garden.

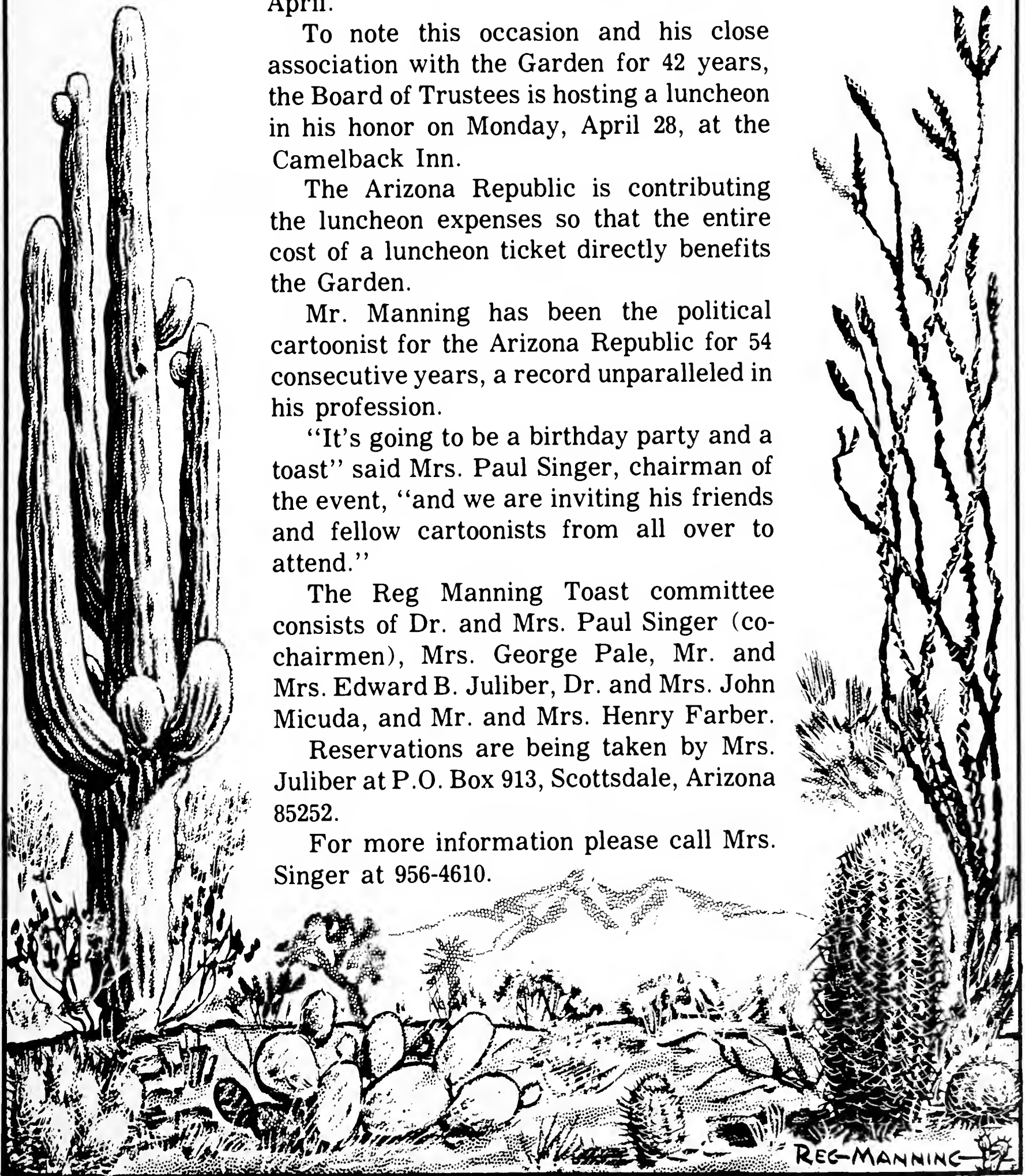
Mr. Manning has been the political cartoonist for the Arizona Republic for 54 consecutive years, a record unparalleled in his profession.

"It's going to be a birthday party and a toast" said Mrs. Paul Singer, chairman of the event, "and we are inviting his friends and fellow cartoonists from all over to attend."

The Reg Manning Toast committee consists of Dr. and Mrs. Paul Singer (co-chairmen), Mrs. George Pale, Mr. and Mrs. Edward B. Juliber, Dr. and Mrs. John Micuda, and Mr. and Mrs. Henry Farber.

Reservations are being taken by Mrs. Juliber at P.O. Box 913, Scottsdale, Arizona 85252.

For more information please call Mrs. Singer at 956-4610.





DESERT BOTANICAL GARDEN

P.O. BOX 5415
PHOENIX, AZ. 85010

Garden Events

APRIL

- 23 **Flower Preservation** — An introductory course in drying fresh flowers. Two Wednesday sessions; 2 P.M.
- 26 **Seven Springs** — A field trip to a riparian environment, with an abundant variety of wildflowers. Saturday; 8 A.M.
- 29 **South African Succulents** — A public slide presentation in Webster Auditorium; Tuesday, 2 P.M. Free with Garden admission.
- 30 **Irrigation Techniques** — A class in how to use today's sophisticated watering methods and equipment in your own yard. Taught by Gaylon Coates, irrigation specialist. Two Wednesday sessions; 7 P.M.

MAY

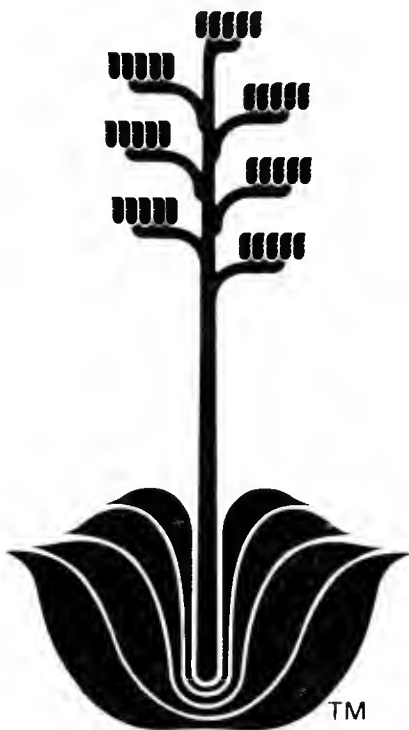
- 7 **Cooking with Native Plants** — A course in preparing unusual edibles found in our desert. Taught by Ruth Greenhouse, ethnobiologist. Four Wednesday sessions; 2 P.M.
- 12 **Dyeing with Desert Plants** — A course on the best dye plants, processing and dyeing fabric. Four Monday sessions. 6 P.M.
- 13 **Poisonous and Edible Plants** — A class in identification, properties, and uses. Three Tuesday sessions and one field trip; 7 P.M.
- 23 **Aravipa Canyon** — An overnight camping trip and all-day hike through this gorgeous steep canyon in eastern Pinal County, Arizona. Friday; 5 P.M.
- 27 **All-over Arizona** — A public slide presentation held in the Webster Auditorium. Tuesday; 2 P.M. Free with Garden admission. Check your Calendar for other titles in this weekly series.

The Garden is open every day of the year from 9 a.m. to sunset.

SAGUAROLAND BULLETIN

MAY, 1980





**DESERT
BOTANICAL
GARDEN**

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THE VEGETATION OF BARNES BUTTE, PHOENIX, ARIZONA

By Wendy Hodgson, Horticulturist, Desert Botanical Garden



Barnes Butte (el. 440 meters), was named in 1937 for Will C. Barnes (b. 1859; d. 1936), a noted Arizona pioneer and historian. Photo V. Gass.

Barnes Butte is a large, double, red rock formation that straddles McDowell Road west of 68th Street in Phoenix. The butte is composed of gila and coarse conglomerate rock tilted to various angles and cut by faults.

In 1940-1941, Charles B. Fleming, the Garden's second Director, compiled a list of plants he collected on the south butte. In 1973-1974, Rodney Engard, the Garden's fifth Director, and John Weber, former Garden Superintendent, also collected and listed a number of plant species. The two lists were similar but with some additions, deletions, and name changes. Fleming listed 53 species representing 31 families, while Engard and Weber listed 75 species representing 30 families.

In February 1980, the author and Marc Mittleman, Garden Horticulturist, made a collecting trip to the north butte and listed 43 species representing 23 families. The following report is a summary of the findings of this most recent investigation

of Barnes Butte. As a result of relatively late winter rains, the spring annuals were just beginning to come up, thus making identification of many species difficult, if not impossible.

On the north side of McDowell Road, the butte and the area immediately surrounding it is occupied by the Arizona Department of Emergency and Military Affairs. The area is encompassed by a six foot fence, constructed in 1950. The amount of human disturbance appears not great, although there is occasional ricocheting of fire from the nearby small arms range. An experimental radar station operated by the Motorola Corporation is situated at the top of the north butte. At the base of the butte on the northeast side are two water tanks. Steep, protected washes are common, particularly on the northeast-facing side. Washes that are less steep cut down the southwest-facing slope. The base of the butte on the west side has open cover and has been slightly disturbed by off-road

vehicles. It gently slopes upward toward the steep rock formation, much like a small bajada. The upper part of the butte is devoid of vegetation except for scattered barrel cacti and vegetation in the washes.

The scarcity of trash and the overall good condition of the plants indicated relatively little recent human disturbance. However, many old saguaros, particularly those on exposed sites are damaged and in poor condition. Young saguaros, mostly .6 to 1.2 meters, growing in more protected and isolated areas, are in a healthier state.

The washes are favorable sites for plant habitation, providing partial shade, protection, and more available moisture. A greater number of trees and shrubs in good condition occur here. Of common occurrence are desert lavender, *Hyptis emoryi*, tomatillo, *Lycium* spp., and little-leaf palo verde, *Cercidium microphyllum*. Less frequent are desert hackberry, *Celtis pallida* and gray-thorn, *Zizyphus obtusifolia*. Gray-thorn is not found on the south butte at all.

The common shrub, brittlebush, *Encelia farinosa* is flourishing on the north butte, and a number of very young plants are growing there. However, many of the older plants have suffered from rabbit damage. Young palo verdes have also suffered, their tender, green branches nibbled down to mere stubs.

Ironwood, *Olneya tesota*, is fairly common on the lower slopes of the north butte, primarily confined to washes, but is scarce on the south butte. Two species of *Acacia*, *A. constricta*, the white-thorn acacia, and *A. greggii*, cat-claw acacia, occur on the north butte, although only one individual of each was found. These species were not found on the south butte.

Two individuals of the yellow felt plant, *Horsfordia newberryi*, were found growing in protected washes. This species was listed by Fleming, but its identity was questioned. Interestingly, this species is stated to occur in south-southwestern Arizona, south to central Baja California, and in central Sonora, Mexico. It has been

collected in South Mountain, Sierra Estrella, White Tank, Lake Pleasant, and McDowell Mountain Regional Parks, recorded by the collectors as occurring "rare."

As previously stated, the spring annuals had just begun to come up. London sky-rocket, *Sisymbrium irio*, and the borages, *Amsinckia intermedia* and *Cryptantha* spp. were abundant, growing under trees and shrubs; Filaree, *Erodium cicutarium* and *E. texanum*, and Indian-wheat, *Plantago insularis* are also abundant, primarily growing on the more open, loose-gravelly slopes. The phacelias, *Phacelia crenulata* and *P. distans* were not found on the north butte although they were found on the south butte. The three-day grass, *Schismus arabicus* and little-seed muhly, *Muhlenbergia microsperma*, carpet the shadier, less rocky slopes on the northeast facing side of the north butte. The lupines, *Lupinus arizonicus* and *L. concinnus* were not found on the February, 1980 survey, although Engard and Weber noted their occurrence on the south butte as "infrequent." It may have been too early for the appearance of these species. No doubt, more species will be added to the list in another month.

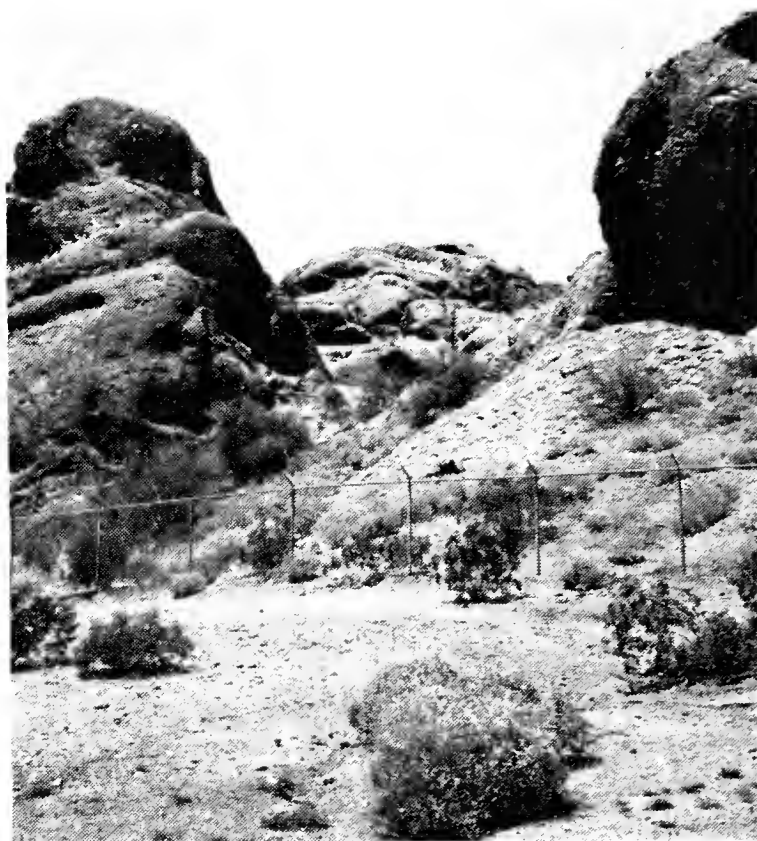
Erosion is minimal on the north butte, in contrast to the highly eroded areas on the south butte, where the plants are in poor condition and not abundant because of damage to the soil as well as to the plants, incurred by people climbing up the narrow washes (Engard, pers. comm.). Hiking, climbing, horseback riding, and illegal off-road vehicles have all intensified the degree of erosion here.

The cloak fern, *Notholaena standleyi* is fairly abundant on the north butte, growing amongst rocks and shrubs. This species is not listed as occurring on the south butte, although the goldenback fern, *Pityrogramma triangularis* var. *maxonii*, was found by Engard and Weber. Fleming also listed a lip fern *Cheilanthes* sp. (*Notholaena* sp.).

Barrel cacti, *Ferocactus wislizenii* and

F. acanthodes, were planted by the Youth Conservation Corps on the north butte on relatively exposed, unprotected areas on the upper rocky slides. Surprisingly, there is no apparent damage by rabbits to them and they are in good condition. The composite shrub, *Dyssodia porophylloides* is fairly abundant on the north butte. This species was listed by Engard and Weber but it occurred "infrequently." It was not listed by Fleming.

To summarize this most recent review of the vegetation of Barnes Butte, the greatest diversity of plant species and the healthiest plants occur in the more protected, inaccessible areas, primarily washes that cut down the slopes on the north butte. Here, injury to the plants by human activity does not appear to be great. This contrasts with the situation found on the south butte which is more accessible to the general public.



Vegetation thrives in one of the washes that cuts through Barnes Butte. Photo V. Gass.

GARDEN VISITORS

From March 15 through April 15 of this year, nearly 26,000 visitors enjoyed the spring beauty of the Desert Botanical Garden. The Annual Cactus Show certainly helped to swell the number of visitors, but that was not the motivation for this visiting group of Japanese of the Himeji Shibudo Union of Himeji, Japan,

pictured above and on the cover, who toured the Garden in March.

Visitors to the Garden during the first quarter of this year, came from all over the world: Alaska, Australia, Canada, Denmark, England, Germany, Guam, Holland, India, Israel, Italy, Japan, Korea, Philippines, Puerto Rico, and South Africa.



Members of the Himeji Shibudo Union pause in their tour of the Garden for a formal portrait at the Ramada.

ACACIA TREES

By Vera Gamet

Nearly three-fourths of the world's six hundred or so species of Acacia grow in the deserts and semi-arid parts of Australia. The tropical deserts of Africa and India harbor most of the rest, with fewer but thriving species indigenous to the deserts of the Western Hemisphere.

At least half, and probably more than half of the Australian continent is arid, almost barren. Outside of the continent of Antarctica, Australia is the driest continent on earth. But around the margins of the great desolate central plateau, the "Outback," are more fertile fringes, first of scrubby grasslands and then savannahs of dwarf eucalyptus and acacias.

The Sahara Desert, south of the Mediterranean floral zone, bears little plant life except in areas broken by oases from which have been recorded about three hundred species of flowering plants. Two of these are trees, the date palm and the acacia.

In Africa, all acacias are called "thorn trees" for good reason. The Australian use of the word "wattles" for acacias arose from the early settlers' habit of building their homes, corrals, and barns by constructing a wattle, a woven wall, of the branches of the ubiquitous acacias and daubing it with mud.

The species of Acacia in Australia present a different appearance from their relatives elsewhere. Striking features of much of the vegetation of Australia are the xerophytic characteristics of many shrubs and trees, the modifications of foliage becoming extreme with the aridity of the environment.

In the driest deserts the feathery bipinnate leaves one associates with acacias are dropped almost as soon as they appear, and the green petioles (leaf stems) expand and flatten and become greatly elongated, up to twenty times their width, so the leaves look like long tough blades of grass. The petioles may also be short and look like pine needles or even

spines. These reduced leaves are called "phyllodes" and carry on photosynthesis (food production) in the face of chronic drought.



Acacia victoriae, in bloom at the Garden in April. Photo, V. Gass.

Massed displays of acacia flowers in bright yellow cascades of catkin-like spikes or terminal panicles of bright yellow or white balls appear every spring wherever acacias grow. The spikes or tiny balls are formed from tufts of hundreds of pollen-bearing stamens massed together, creating a brush-or powder puff-like effect. The brief flowering season is pervaded by their soft, elegant perfume, never rich or heavy, that leaves a lingering ambience of fragrance. Under the feathery bipinnate leaves, or the phyllodes, are thorns. Many acacias have thorns. Some thorns are long and straight and some are short and curved. Some acacias have both types of thorns.

Acacias tolerate poor, sandy soil and high temperatures but grow quicker and reach fuller development where the soil has been improved and water is available until the trees are well established. Shallow roots are situated to take advantage of rainfall and to insure quick absorption of water. Since they are perennial, acacias also have roots that penetrate the soil deeply.

Acacias are easy to start from seed, if boiling water is poured over the seed and allowed to stand for twenty-four hours. In less than a week a little root appears and the cotyledons (embryonic leaves) push off the brown seed coating. The big "if" is if the young plants survive their first year.

The Southwest's *Acacia greggii*, the well known desert cat's-claw with its flattened and hooked talons, is avoided by most people and animals, but the little ground creatures love it for the sanctuary it provides from hawks, owls, coyotes and hunters. The bees patronize it for the lavish amounts of protein-rich pollen they must gather to feed their young and the future queen. The flowers have a special, soft fragrance.

From northern Chile, northward through Central America, abundantly in Texas but more rarely in Arizona, grows *Acacia farnesiana* which was introduced to the gardens of Mediterranean Europe, probably from Mexico, long before the white man reached Arizona or Texas. From the flowers of this member of the thorn forest, the French distill some of their costliest perfumes. Improvements in the strain of "cassie" provide two flower crops a year; the best essence is derived from the flowers that come into bloom in September and October, gathered two or three times a week early in the morning before the dew has passed away.

Acacias are used for animal forage, timber, gums and resins. Tanbark, used as a source of the chemical tannin and also shredded to cover circus arenas and race tracks, is derived from acacia trees. An olive drab dye derived from acacias has been standard for military uniforms since

the middle of the 19th century. Acacias are popular ornamental shrubs, and are used for erosion control in the reclamation of sand dunes.

Many human cultures have been concerned with family planning and population control since way back in time. Four thousand years ago the early Egyptians prepared a contraceptive jelly using honey, dates and the finely ground spikes of acacia flowers. Lactic acid, a component in present day contraceptive formulae, was the effective ingredient in the gum of the flowers which was released when dissolved in fluid. Not until many millennia later was the West to learn of this.



Acacia puce, sometimes known as "Alice Springs Ironwood" in the Garden in April. Photo V. Gass.

The five dozen or more acacias that grow in the Desert Botanical Garden represent a great diversification of the species. *Acacia rigens* from southeast Australia is a spreading shrub, mounding at about 1.5 meters and has slender short phyllodes that look like pine needles. *Acacia victoriae* has green bark, richer and darker than a palo verde. The leaflets are 3.8 cm long and 0.6 cm wide and a good desert, gray-green color. Straight, little paired spones 0.9 cm long appear at an axis with the leaves and little yellow globular flowers.

The trunk of *Acacia stenophylla* has sheddy bark with rich cinnamon showing between the fissures. It is sparsely branched with tough phyllodes, 12 to 60 cm. long. *Acacia craspedocarpa* has compound leaves with the oval leaflets alternating on the midrib. The mature leaflets, 1.8 cm long and less than half as wide, are prominently veined. This veining habit is accentuated in the light tan seed pods which are tough and hard, in the form of a brilliant, pure yellow spike 2.5 cm long.



Acacia greggii, a native variety of Arizona, referred to commonly as "catclaw." One of several of this species in the Garden collection. Photo V. Gass.

IN BRIEF

MOTHER'S DAY GIFT

On Mother's Day, May 11, the Garden hosted the employees of The Phoenix Newspapers, Inc. and their immediate families. This Open House for our friends at the two major Phoenix newspapers, The Arizona Republic and The Phoenix Gazette was in recognition of their tremendous support of the Garden over the past year. Not only is Phoenix Newspapers a Corporate Sponsor of the Garden, but the Gazette has long been a co-sponsor of the Garden's Cactus Show.

The Newspapers recently provided the Garden with an important matching grant for long-range planning purposes and underwrote the luncheon honoring Reg Manning on his 75th birthday. All of this support, amounting to more than \$11,000 in the past year alone, demonstrates the strong commitment of this city's newspapers in assisting one of the Valley's important cultural treasures. All those associated with the Garden greatly appreciate this help. The Garden welcomes all of its friends at the Phoenix Newspapers to this special Mother's Day treat.

ANONYMOUS GIFT

In mid-March, an anonymous, unrestricted contribution of \$5,000 was received by the Garden and will be used for general operational purposes. Such generous support, whether given with or without thought of recognition, is invaluable to the well-being of the Garden, helping to offset the ravages of inflation which affect institutions as well as individuals. Assuming a ten percent annual rate of inflation, at least eight similar-sized donations would be needed each year just to enable the Garden to continue providing programs to its members and services to the public at its present level.

CORPORATE MEMBERSHIPS

Over the past several months, new corporate memberships continue to increase, thanks to the vigorous efforts of the Garden's Growth Committee chaired by Mr. Frank Feffer. New Corporate Donors, contributing \$500 each to the Garden's support, include Arizona Bank, Great Western Bank and Trust, Sperry Flight Systems, Talley Industries, and Western Savings.

A new Corporate Sponsor of the Garden, contributing \$1,000, is Petley Studios, of Phoenix. Renewing their Corporate Sponsorships at \$1,000 each are the Garden's first Corporate Members, Arizona Public Service and the Phoenix Newspapers, Inc.

To date, the Garden has six Corporate Donors and eight Corporate Sponsors which support it. All of these organizations and other major contributors are now proudly acknowledged on the east wall of the Webster Auditorium. The Garden is most pleased and proud to be supported by such community-minded individuals and organizations.

GARDEN BENCHES

Other donations in recent months have enabled the Garden to install two more benches along its Quail Run Path. Making these much needed additions possible were William L. Jones of Mesa and Mr. and Mrs. L. Sasselle of San Francisco, California.

NEW BOARD MEMBER

The Board of Trustees of The Desert Botanical Garden is pleased to announce the appointment of Mrs. Paul Singer to the Board. Mrs. Singer brings to this new responsibility an outstanding record of community service leadership. Her most recent activities include Chairman of Special Gifts for UNITED WAY, and Emergency Disaster Fund Raising for the Red Cross. At the present time her other Board responsibilities include: Chairman for Special Events COMPAS VII, Special Events Chairman Recording for the Blind,

Valley Forward, Red Cross Special Events, Family Service Executive Board and Phoenix Little Theater. In addition to the numerous boards she has served on, and the many committees she has chaired, Mrs. Singer served as Chairman for the City of Phoenix Centennial and Chairman of the Bicentennial Festivals. In 1974, Mrs. Singer was named Woman of the Year. On the Desert Botanical Garden Board, Mrs. Singer will be serving on the Growth Committee. She was also the Chairman of the Reg Manning "Toast," held April 28th.

STAFF ACHIEVEMENTS

In March, the Garden's Research Botanist, Dr. Howard Scott Gentry, was appointed Associate Program Director of NEWCAST (Center for Arid and Tropical New Crop Applied Science and Technology). His part-time responsibilities with the Center will involve planning programs for the introduction and evaluation of potential economic crops. Dr. Gentry continues to devote half-time to his responsibilities as Research Botanist for the Garden and is nearing completion of his classical monographic study of the genus *Agave*. This monumental work will be published shortly by the University of Arizona Press. Recently, Dr. Gentry was elected to the Board of Directors of the Arizona Native Plant Society. The Garden's man-of-many-talents deserves well earned accolades for his lifetime devotion to the conservation, study and encouragement of the balanced utilization of arid land plants.

Earlier this year, the Garden's Superintendent, Russell Haughey was elected the first President of the newly formed Phoenix Chapter of the Arizona Native Plant Society. Also elected to serve this new chapter as Program Director is Garden Horticulturist, Marc Mittleman. The Garden is fortunate to have these two members of the Staff supporting the efforts of the Society. It is hoped that good cooperation between the two organizations will be strengthened by these recent appointments.

THE CACTUS SHOW WRAP-UP

Attendance at the 1980 Cactus Show hit 11,554, which was down slightly over the previous year's count, but admissions and sales were up, making this year's show one of the most rewarding for the Garden. The Cactus Show is of key importance in the Garden's program of self-support, accounting for 8-10 percent of the Garden's yearly attendance and income. This year's Show was an outstanding one from the perspective of the superior quality of the exhibits, the beauty of the Garden, the support of the Show's co-sponsor, The Phoenix Gazette, plus the assistance of Staff, Volunteers and participants. A survey conducted during three days of the Show, although not yet completely tabulated, does indicate that a very large number of attendees came from the Phoenix area. A prize of a Family Membership to the Garden was awarded to the 10,000th Visitor to the Show, and was received by Mr. and Mrs. Philip Wood of Katonah, New York. The Garden welcomes these new Members.

A wrap-up meeting has been held by Staff and Committee, at which time special congratulations were extended to Emmy LaTempa and Fran Tolleson for their work in chairing this important Garden event.

HUNTINGTON TRIP SCHEDULED

This year's Huntington trip has been scheduled for the weekend of September 26 through September 28. A special treat will be in store for plant enthusiasts this year, in the form of a scheduled visit on Friday to the Vista area. A highlight will be a stop at Grigsby's Nursery. On Saturday, September 27, the group is scheduled to go on to Pasadena to the Huntington Gardens Presale. Sunday will include stops of other growers, as well as a return to the Huntington Sale. Seating for the trip is limited. Those interested in this excursion should contact Mr. Earle Passwater at the Southwest Convention Service, Phone, 944-2594.



Dr. Charles Huckins, Director of the Garden, presents special awards at the Volunteer luncheon in April. Photo M. Mittleman.

ANNUAL VOLUNTEER LUNCHEON

The Annual Volunteer Luncheon, held at the Garden on Thursday, April 17, afforded Garden Members and Staff the opportunity to thank the many Garden Volunteers for the help that they have so generously given in support of the Garden's many projects. Sylvia Forbes, Garden Education Director, was in charge of the arrangements. After a delicious luncheon and a special dessert of cake decorated with buttes and cactus, Mary Fulton, Education Assistant, reviewed the Volunteer program at the Garden. Dr. Huckins thanked the Volunteers and in his remarks stated that he considers Volunteer service paramount in the health of the Garden and in its future development. Awards of silver pins and tie backs in the form of the Garden's agave logo, were awarded to the following Volunteers for 500-plus hours of Garden service: Khrybel Amberg, Josselyn Bebee, Elizabeth Cargill, Dorothy Carson, Ollie Belle Case, Jean Cordts, Lillian Diven, Gen Evans, Muriel Freeman, Elizabeth Fritz, Vera Gamet, Frank Hennessey, Mildred Hunt, Margaret Jenkins, Alice Lemmon, Dottie O'Rourke, Nancy Rheinlander, Andy Romanyak, Bill Rosenbaum, Marge

Rosenbaum, Vera Starbuck, Virginia Spangler, and Lela Turner. All Volunteers received certificates.

A Special Award went to the Volunteer who worked the most hours for the Cactus Show, Dan Evans. Other Special Awards included awards to Chairmen of the Photo Show, Dottie O'Rourke and Gen Evans; Awards to Chairmen of the Cactus Show, Emmy LaTempa and Fran Tolleson; Special Awards for Outstanding Service and Long-Term Dedication to the Garden were presented to Lillian Diven and Elizabeth Fritz. The program concluded with remarks by Mr. Henry Triesler, President of the Board of Trustees of the Garden.

SPEAKING OF VOLUNTEERS

Marc Mittleman, Garden Horticulturist, would like volunteers to help collect, clean, and package seed for the upcoming Fall Seed Sale. This is a good opportunity to learn the plants of the Garden and to help out in this fund raising project. Contact Mark if you are able to assist in this activity.



DESERT BOTANICAL GARDEN

P.O. BOX 5415
PHOENIX, AZ. 85010

Garden Events

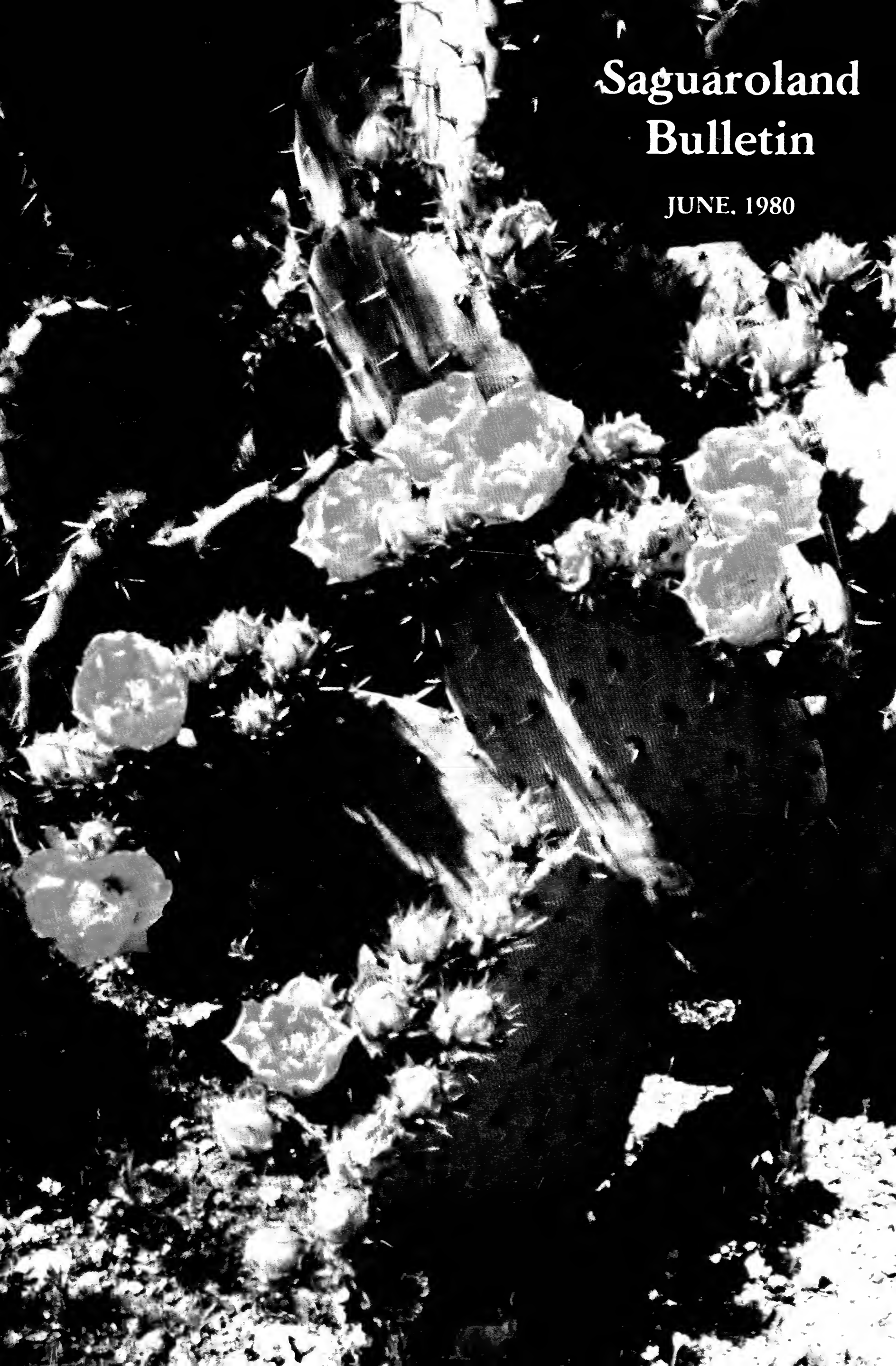
MAY.

- 23- **Aravipa Canyon** — An overnight camping trip and all-day hike through this gorgeous steep canyon in eastern Pinal County, Arizona. Friday; 5 P.M.
- 27 **All-over Arizona** — A public slide presentation held in the Webster Auditorium. Tuesday; 2 P.M. Free with Garden admission. Check your Calendar for other titles in this weekly series.

JUNE

- 7 **Deserts of the World** — A workshop in similarities and differences in vegetation, soils, climate, location, and characteristics. One Saturday session; 10 A.M.
- 11 **Practical Desert Gardening** — A course in planting and caring for low-maintenance, low-water ornamentals. Two Wednesday sessions; 7 P.M.
- 14 **Four Peaks** — A field trip to identify some higher elevation flora and a beautiful view of Roosevelt Lake. Saturday; 8 A.M.
- 17 **Identification of Arizona Cacti** — An introductory course in the characteristics and identifying features of Arizona cacti. Three Tuesday sessions; 7 P.M.

The Garden is open every day of the year from 9 a.m. to sunset



**Saguaroland
Bulletin**

JUNE, 1980



**DESERT
BOTANICAL
GARDEN**

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Cover: *Opuntia phaeacantha*, blossoming in the Garden in May. Cover photo this month and in May by V. Gass.

ANNUAL MEMBERSHIP:

- Individual \$ 15.00
- Family \$ 20.00
- Sustaining \$ 50.00
- Subscribing \$100.00
- Supporting \$250.00
or more

Corporate Memberships available in several categories.

- Director Charles A. Huckins, Ph.D.
- Research Botanist Howard S. Gentry, Ph.D.
- Curator of Herbarium J. Harry Lehr
- Curator of Living Collections Victor Gass
- Business Manager Janice Moats
- Education Director Sylvia Forbes
- Publications Director Shirley Deacon
- Artist Wendy Hodgson
- Plant Propagator Marc Mittleman
- Gift Shop Manager Lynn Trainum
- Maintenance Superintendent Ross Berkheimer
- Librarian Rebecca Henry
- Director Emeritus W. Hubert Earle

Horticultural Staff: Donald Conner, Steven Heslep, Wendy Hodgson, Nichole Holler, Patrick Quirk. Gift Shop Staff: Robyn Moats, Anna Shelstad, Clare Thomson, Lela Turner. Office Staff: Tracy Peterson, Diane Pitcher. Education Assistant: Mary Fulton.

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TRUSTEES OF THE DESERT BOTANICAL GARDEN. Officers: Chairman of the Board, John Rhuart. President, Henry C. Triesler, Jr. First Vice President, Donald W. Hutton. Second Vice President, Lillian Diven. Secretary, Lillian Mieg. Assistant Secretary, Emelia LaTempa. Treasurer, Alice Feffer. Assistant Treasurer, John Daniels. Members: Frank M. Feffer, Thomas A. Goodnight, John Graham, Frank Hennessey, Marsha Jacobs, Naomi Kitchel, Mary Lyon, Eric Maxwell, Mildred May, Charles F. Merbs, Duncan T. Patten, Bruce D. Pingree, Donald J. Pinkhava, Mrs. Paul Singer, John F. Swift, William L. Wingate, Jr.

ANNUAL MEETINGS

Members' Meeting:

The annual meeting of the Members of the Desert Botanical Garden was held on Sunday, May 18 at 2 P.M. in Webster Auditorium. Mr. John Rhuart, Chairman of the Board, conducted the meeting. Mr. Henry Triesler, Board President, introduced the Board Members and special guests. He reported that 208 ballots were cast in the election for eight seats on the board: Alice Feffer, John Graham, Frank Hennessey, Marsha Jacobs, Emelia LaTempa, Eric Maxwell, Bruce D. Pingree, and William Wingate, Jr. were elected to serve three year terms. Director, Dr. Charles Huckins reported on the Garden's activities for the year. The meeting adjourned at 3 P.M., at which time members were invited to tour the new Douglas Display Case in the Cactus Lath House.

Board Meeting

The electoral meeting of the Board of Trustees was called to order by Board President, Henry Triesler, on Wednesday, May 21 at 2:30 P.M. The following members were elected as officers for the 1980-81 year: Chairman, John Rhuart; President, Henry Triesler; First Vice President, Donald Hutton; Second Vice President, Lillian Diven; Secretary, Lillian Mieg; Assistant Secretary, Emelia LaTempa; Treasurer, Alice Feffer; Assistant Treasurer, John Daniels.

DIRECTOR'S REPORT

Fiscal year 1979-80 for the Desert Botanical Garden may best be characterized as one of transition, reflection and projection. The Garden's fifth Director, Rodney Engard, resigned on August 9, 1979 and was replaced by your present Director on September 7, 1979. This change at the helm has resulted in other changes in the operation of the Garden and the philosophy of its management, all of which necessarily slowed the Garden's forward momentum temporarily.

Paid attendance at the Garden for the year was 96,058, amounting to a disappointing 9.7% decrease over the previous year because of a severe combination of events, including: unfavorable weather during the Garden's peak visitor season, flood waters and bridge closings, which reduced access to the Garden during the same period, and a general decline in tourism throughout the state. The increase in the charge for general admission from \$1.00 to \$1.50, vigilant monitoring of expenditures and firm restraint in spending, however, produced a \$56,195 surplus at year end, ensuring the Garden's continued good health in the year to come.

During the year a broad strategy to reduce the Garden's reliance on tourism was initiated on a number of fronts. A corporate membership drive, several grant applications for support from outside agencies, and a public relations program to increase the Garden's local visibility have all been effective.

Within one year, the corporate membership drive effectively doubled the membership contribution to the Garden. At year end, corporate memberships numbered 12, represented by 7 corporate sponsors — Arizona Public Service, Combined Communications Corporation, First National Bank, O'Malley Lumber Company, Phoenix Newspapers, Inc., Ray Lumber Company, and Valley National Bank — contributing \$1,000 each and 5 corporate donors — The Arizona Bank, Mountain Bell, Salt River Project, Sperry Flight Systems, and Western Savings — contributing \$500 each. Personal memberships have also increased, with two Supporting members, 17 Subscribing, 32 Sustaining, 431 Family, and 503 Individual members at year end.

To expand benefits to members, the Garden has increased the number of preview offerings preceding major Garden events. Members' discounts at special sales will also be continued in the future.

A substantial increase in general contributions, more than four fold over last year, is another indication of the continued support from Members. Generous donations were received from Martha Lehman Chester, Diamonds, Geraldine Eliot, Naomi Kitchell, Michael LeBeau, Mr. and Mrs. Mullineaux and the Phoenix Newspapers, as well as anonymous friends of the Garden. To all contributors, we extend grateful appreciation.

To bring the Garden more effectively to the attention of the local community, a more aggressive public relations campaign was initiated. The success of the Garden's public relations program is evidenced by the Garden's relatively favorable attendance figures, compared to other Arizona attractions.

The need to improve the Garden's attractiveness and usefulness is as important as that of projecting its favorable image among the community. Major physical improvements to the Garden this year have been the paving of the William C. Eliot Memorial Patio, south of the Webster Auditorium, and the renovation of the Mrs. Walter Douglas Memorial Display Case in the Cactus Lath House. Both of these projects have increased considerably the Garden's ability to provide more programs in an attractive and functional setting. The Garden's appearance was further enhanced this year by the adoption of an official uniform for the grounds, maintenance and security staffs, thereby providing the Garden with a more professional image.

Garden programs in education and research continued to expand in spite of a \$47,920 reduction in overall expenditures from the previous year. During fiscal year 1979-80, the Garden offered more educational opportunities than ever before in its history. It is unfortunate that unfavorable weather and the increasing cost of transportation forced the cancellation of a number of these informative offerings. In January, 1980, the Garden also initiated a new series of temporary exhibits in the newly renovated Douglas Display Case, incorporating living plants and improved graphics designed to inform the public more effectively about plants and to enhance the Garden's overall programmatic potential.

As the Garden's long-term research project on the systematics of the genus *Agave* nears completion, plans are underway for expanding the Garden's research into the study of other arid land plants and their economic potential. In addition, the Garden continues to add to its herbarium and library collections, further increasing its ability to undertake both basic and applied research into arid land plants.

Finally, greater emphasis has been placed on improving administrative policies, management techniques and operational procedures at the Garden. An employee policy manual has been drafted, administrative forms have been revised and an active Safety Committee has been established.

In the coming year, the Garden plans to pursue many of its present programs with renewed vigor and initiate a number of new programs with even greater imagination. High in priority among these programs will be:

1. To continue work on a long-term master plan for the total development of the Garden;
2. To finalize a short-term, five year plan of development for the Garden's more immediate needs;

3. To broaden the Garden's research program to include applied as well as basic research into arid land plants of economic potential;

4. To improve the attractiveness of the Garden, notably by installing night lighting;

5. To encourage visitation by arranging for alternate and mass-transit forms of transportation to the Garden;

6. To improve the Garden's financial procedures by initiating audits by an independent certified public accountant;

7. To improve the Garden's operational efficiency by selecting a fiscal year which coincides with its natural business cycle;

8. To expand the Garden's increasingly successful publications program;

9. To improve the selection of merchandise in the Gift Shop in order to enhance the Garden's image without jeopardizing the substantial contribution of this Garden operation; and

10. To establish a more active Friends-of-the-Garden support group from among the Garden's Members and Volunteers.

As the Garden enters a new fiscal year fraught with uncertain economic prospects, many new and challenging opportunities will present themselves. With as much effort, enthusiasm and imagination as has been displayed by the Board, Membership, Staff and Volunteers over the past year, the Garden cannot help but improve its usefulness to the public in the coming year.

*Charles A. Huckins
Director*

**DESERT BOTANICAL GARDEN
FINANCIAL REPORT
4-1-79 thru 3-31-80**

ASSETS:

Accounts Receivable	\$	32.27
Inventory, Sale Items		34,295.16
A. CASH		
V.N.B. General Checking		36,069.79
V.N.B. Payroll Checking		11,033.20
Petty Cash, Pop Machines & Registers		955.50
B. SAVINGS		
V.N.B. Development Fund		253.42
V.N.B. Library Fund		72.20
Sue Jones Educational Fund		5,000.00
V.N.B. Greenhouse Fund		5,000.00
First Federal — Life		290.33
First Federal — C.D.		6,600.00
Martha Lehman Chester Scholarship Fund		1,000.00
V.N.B. — C.D. — Reserve		11,000.00
Arizona Bank — Notes — Reserve		10,000.00
		<u>\$121,601.87</u>

LIABILITIES:

Accounts Payable	\$ 10,526.93
Arizona State Compensation Fund	515.52
Arizona State W/H Tax	742.23
Arizona Unemployment Tax.	691.08
	<hr/>
	\$ 12,475.76

INCOME:

Sales Receipts.	\$219,550.28
Admissions	131,190.71
Mail — Seed & Books.	304.57
Memberships	33,550.00
Contributions	11,447.49
Interest	1,611.61
Reimbursement & Misc.	7,739.22
	<hr/>
	\$405,393.88
From Trust	19,000.00
From Reserve	33,000.00
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	\$457,393.88
Photo Show	261.25
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	\$457,655.13

EXPENDITURES:

Purchases for Resale	\$114,334.78
Payroll.	179,637.01
Payroll Burden.	19,605.74
General & Administrative.	31,860.24
Public Relations.	22,430.99
Saguaroland Bulletin	2,946.82
Members	2,395.00
Cactus Show	841.47
Professional Services.	1,315.87
Taxes & Licenses.	160.18
Gardent Improvement & Maint.	11,386.61
Building Improvement & Maint.	2,725.89
Fleet	4,666.52
Furniture.	1,662.11
Library	2,154.06
Herbarium	275.07
Education Dept.	3,061.92
	<hr/>
	\$401,460.28

DEPARTMENT REPORTS

HORTICULTURE DEPARTMENT

The Horticulture Department continued to prepare new display sections of the Garden for public visitation. Forty-seven plants of fifteen species were added to the African section in order to provide shade for the more tender, smaller plants that will eventually be planted there. Thousands of cubic yards of silt and sand were donated by Salt River Project for use as fill for the Australian Section. Fifteen plants of ten species were planted in this section for evaluation in the coming year. Over 200 plants were planted throughout the Garden during fiscal year 1979-1980.

On October 6, 1979 the Garden held its first annual seed sale at which seed and soil amendments were sold and demonstrations of seed and sowing techniques were given. The Garden filled 64 requests for seed from its international seed exchange during the year. More than 500 different species are now represented in the Garden's seed bank.

During fiscal year 1979-1980, over 360 plants were labelled with new, engraved plastic signs. Work was initiated on a four-foot fence reinforced with poultry netting which will enclose the cultivated part of the Garden in order to prevent rabbit access.

The Garden's motor fleet was expanded with the donation of a 1972 Dodge van by Mountain Bell; the van has been partially converted for use as a field vehicle with funds donated by Valley National Bank.

The department provided support for all special events held at the Garden, in addition to maintaining the permanent plantings and wildflower beds, and collecting seed of many unusual plants cultivated at the Garden.

*Russell A. Haughey
Superintendent*

PROPAGATION DEPARTMENT

The propagation program has achieved a stable level of activity this year, only one year after the completion and modernization of the Garden's propagation facilities. Plants propagated at the Garden are not only used to supplement the Garden's permanent plantings, but also to provide a containerized collection for use in temporary exhibits in the Douglas Display Case of the Cactus Lath House. Extra plants started in the propagation area will be available at plant sales.

This year, 374 plant species were sown from seed. Information obtained on germination of this seed has been helpful in determining the shelf life of different species in the Garden's storage facilities.

The mist bench was used in the propagation of 25 species desired for display at the Garden. This area was also used for instruction in the vegetative reproduction of woody and herbaceous materials. The soil medium in the succulent rooting bench was changed from sand to pumice after tests demonstrated the desirability of the latter material. This alteration proved to be quite successful; most species have responded well by rooting in less time.

Since May of 1979, a total of 459 plants representing over 70 genera and 230 species have been accessioned. The Garden acquired 76 species on the Huntington Safari to California, 50 species were grown from seed at the Garden, 30 species were field collected, and 30 species were donated by Mountain States Wholesale Nursery.

The Garden has started a comprehensive mapping and inventory program this year. This will be a long term project which, when completed, will provide easier ac-

cess to information about the Garden's plants. On balance, the year was very successful from the standpoint of increasing and maintaining the living collection of plants at the Garden.

*Victor Gass
Plant Propagator*

MAINTENANCE DEPARTMENT

The accomplishments of the Maintenance Department were several and diverse over the past year. Routine work consisted of the maintenance and repair of the electrical and water systems of the Garden. Contracted work supervised by the Department included the resurfacing of all Garden paths, repairing the roof of the Archer House, and reroofing the restroom facilities east of Webster Auditorium.

Projects completed were the construction of the brick floor for the William C. Eliot Memorial Patio, and renovation of the Mrs. Walter Douglas Memorial Display Case in the Cactus Lath House.

The department designed a new parking system for peak load periods of visitation, and handled parking for the Cactus Show, Luminaria Night, Photo Show, Plant Sale and other Garden functions.

Estimates and plans were prepared for path lighting, auditorium air conditioning, bridges and many small projects.

*Ross Berkheimer
Maintenance Superintendent*

RESEARCH

The principal ongoing research project at the Desert Botanical Garden for the past decade has been a systematic revision of the genus *Agave*. The manuscript of this work, "The Agaves of Continental North America," was virtually completed last year. The University of Arizona Press has accepted the manuscript which is now undergoing a final author-editing in preparation for publication. The Garden's former Director, Rodney Engard, is assisting the author in this final chore.

Recent planning for research at the Garden has been in the area of economic plants. Cooperation with the New Crops Research Center at Arizona State University, "NEWCAST," has potential for several research grants for the study of local and exotic desert plants with good economic prospects. Among these new crop prospects are guayule, gum tragacanth, canaigre, and red squill. The Garden's horticultural research efforts for developing desert trees and shrubs for ornamental and landscaping uses will continue. Wider ranging trips after germ plasm should continue to bring many new seeds in for trials within the Garden.

We should not overlook the regular and seasonal field research carried on by the Garden's regular staff and docents. Their scouting and assessments of various plant communities for regular educational excursions is also an important form of research.

*Howard S. Gentry
Research Botanist*

HERBARIUM

Progress and growth continued in the Lois Porter Earle Herbarium with the addition of approximately 1400 specimens to the Garden's collections during the past year. The assistance of Garden Horticulturists Wendy Hodgson and Marc Mittleman in the field collection of over 600 specimens this spring is gratefully acknowledged. There is a balance of 900 specimens in the Garden's favor with the institutions with

which it has exchange commitments, and upon our receipt of this material, the collections will approach a total of 21,000 specimens.

In 1979, the Association of Systematic Collections conducted a survey of herbarium activities which indicated an average of 9 visitors a year to smaller herbaria and 99 visitors a year to larger herbaria in this country. It is gratifying to note a better than average attendance at the Garden's herbarium, with 36 visitors in the six month period ending March 15, 1980.

Your Curator, as an extra curatorial activity, has completed the first Supplement to his "Catalogue of the Flora of Arizona," which will be published in the **Journal of the Arizona-Nevada Academy of Science**. This supplement, and all future supplements to the "Catalogue" will be co-authored with Dr. Donald J. Pinkava of Arizona State University in order to insure the continuity of this project.

J. Harry Lehr
Curator of the Herbarium

ART DEPARTMENT

During the past year, the artistic and graphic activities of the Garden were formally organized as a separate departmental operation. Christina Dezelsky served as artist in charge until the end of January 1980, when she resigned to return to graduate work at Arizona State University and was replaced by the Garden's present staff artist.

Projects completed during the year included art work for the cover of the December 1979 issue of the *Bulletin*, which also served as the first of a series of Christmas cards, the cover of the 1980 seed catalogue, handlettered signs for the Cactus Show and Plant Sales, the design of exhibits in the Webster Auditorium and Douglas Display Case, the illustration for the cover of the March *Bulletin*, as well as several bulletin articles during the year. Also completed was a guide map of the Garden which appeared in the March issue of the *Bulletin*.

Future projects include the continuation of Webster Auditorium and Douglas Display Case displays, co-chairing the 1980 Botanical Print Show, illustrating concepts for proposed Garden sections, designing additional greeting cards for gift shop sales, and new book plates for the Richter Library collection.

Wendy Hodgson
Staff Artist

LIBRARY

The Richter Memorial Library has undergone two major changes during the last year. The first was the addition of a librarian on a permanent part-time basis in September 1979, replacing Elizabeth Fritz who had capably administered the library as a volunteer for three years, and the second change, instituted January 1980, was the opening of the library to Garden Members and visitors during weekday mornings from 9 A.M. to 1 P.M.

We continued through the year to have excellent volunteer assistance. Dorothy Carson and Muriel Freeman are nearing the end of a major project, retyping and expanding the library card catalog. In addition, Lillian Diven has given numerous hours to the task of cataloging the botanical print collection, now being readied for the Botanical Print Show planned for November 1980.

The librarian has undertaken several projects in addition to ordering and processing new books and journals. These include: revision of the list of periodical

holdings; inventory and revision of the list of duplicate books; recataloging selected areas of the collection; inventory of rare books; reorganization of the vertical file. Also, the rare books have been relocated in two locked cabinets and the Volunteer Library collection has been moved to the Richter Library.

During the last year, the library accessioned 152 books; 64 of these were library purchases. We have received numerous gifts and are always thankful that Garden members and friends remember the library with contributions. The current library holdings are: Books and bound periodicals, 3550 volumes; Periodical subscriptions (including gifts and exchanges), 76; Vertical file material, 650 items. Since the opening in January, we have had 173 visitors, plus Garden staff members and volunteers who continue regularly to make use of our library resources.

One major project which we hope to complete this summer is a book-by-book inventory of the Richter Memorial Library collection. This inventory will enable us to have an accurate assessment of our holdings and will help to define acquisition needs for future years.

Rebecca Henry
Librarian

PUBLICATIONS DEPARTMENT

The Publications Department, formally created in November, 1979, includes the following areas of responsibility: the editorship of the Garden's monthly publication, *The Saguaroland Bulletin*; design and production of the Garden's numerous publications that are distributed free, as well as publications offered for sale in the Gift Shop; and coordination of the Garden's public relations projects and publicity.

The goal of the Publications Department, which coordinates closely with the Garden's Public Relations Consultant, Catherine Wueste, is to support the mission of the Garden — the study of desert plants — and to make this mission known to the public in order to win its support. To accomplish this goal three major programs have been developed:

- (1) A comprehensive, quality printing program;
- (2) A photographic file record of Garden facilities and plants;
- (3) A public relations program that includes but extends beyond the area of publicity.

The Garden's capability of producing quality printed material has increased, and a system for tracking and filing all printing projects has been instituted. The Garden's number of suppliers for printing projects has been enlarged. Since the organization of the Publications Department, over 40 printing projects, exclusive of the *Bulletin*, have been delivered. Other projects include production of note cards and holiday cards under the Garden's logo, 50,000 Self-Guided Tour booklets, and a three-fold quarterly Calendar of Events.

The photographic needs of the Garden for print media and public relations purposes are many. To meet these needs, a photo file for current projects and for historical purposes has been established.

The Garden's Public Relations Program consists of many elements, including the presentation of positive, informative facts about the Garden. Projects that have served to carry out this program include: developing material to support the corporate donor program, distributing promotional brochures to hundreds of locations

throughout the Valley, literature packets to over 800 prospective convention tour groups throughout the country, publicizing all major Garden events and educational offerings in area newspapers, TV and radio, and developing and tabulating visitor surveys for the purpose of gaining information from the public about special events programs at the Garden.

Shirley Deacon
Publications Director

EDUCATION DEPARTMENT

With the help of dedicated Volunteers and loyal friends, the Education Department has greatly expanded its programs and activities this year.

A major addition to the Department this year has been the part-time position of Education Assistant, filled by Mary Fulton. Mary's major responsibility is with the Volunteer program, but she assists in all Department activities.

Volunteers have been active in all phases of the Garden's functions, contributing a recorded total of 5,621 hours of service. Volunteers numbered over 150, which is an increase over any previous year. One active part of the Volunteer corps is the Garden's Docent group. The fall Docent class had eight graduates, resulting in a total of 26 qualified tour guides this year. Docents gave 116 tours to school children, conventions, tour groups, garden clubs, and other interested groups. Over 5,000 visitors benefited from the knowledge of these guides. In addition to guided tours, there were 205 self-guided tours for groups, amounting to a total of 321 tours last year. Many unscheduled tours were also given.

Class and workshop offerings were greatly expanded, from 28 last year to 49 this year. Course offerings covered a wide range of topics from house plants to landscaping; and for interest levels from beginning to advanced.

Two new, successful programs offered this year were workshops for junior and cadette Girl Scouts, and Sunrise Tours. A two-hour workshop for junior level Girl Scouts covers the subject of dyeing with native plants; a six-hour workshop for cadettes takes up the topic of the care and identification of desert plants. Eventually, these workshops will be offered to other groups of students. Sunrise tours were given weekly through the summer, so that visitors could enjoy the Garden in the cool, early morning hours. Eleven tours were given and were so well-received that the program will be continued this summer.

Field trips continue to be a very popular way to learn about desert plants. In the past year, the Garden offered 15 trips which averaged 19 participants per trip.

The Wildflower Network expanded greatly this year with the participation of many more reporters. The Garden answered numerous letters and over 1,000 phone calls on the location of wildflowers in bloom in the state. The Wildflower Network display in the Auditorium was used by a great many Garden visitors. Excellent media coverage of the weekly wildflower report indicated the demand for wildflower information and the success of this service to the public.

With the help of the Art and the Horticulture Departments, six new displays were designed and installed in the past year, and included such topics as Grasses, Useful Desert Plants, Propagation, Lithops, Christmas Crafts, and Wildflowers.

Sylvia Forbes
Education Director



DESERT BOTANICAL GARDEN

PO. BOX 5415
PHOENIX, AZ. 85010

Garden Events

JUNE

- 14 **Four Peaks** — A field trip to identify some higher elevation flora and a beautiful view of Roosevelt Lake. Saturday; 8 A.M.
- 17 **Identification of Arizona Cacti** — An introductory course in the characteristics and identifying features of Arizona cacti. Three Tuesday sessions; 7 P.M.

JULY

- 1 **Sunrise Tour** — The Garden opens early for public viewing during the cool, early morning hours. Guided tours available. Every Tuesday during July and August; 6:45 A.M.
- 12 & 13 **Canyon Creek** — An overnight field trip to the cool pines northeast of Payson. Saturday; 8 A.M.
- 28 **Children's Nature Workshop** — A week-long workshop that gives children an opportunity to get a close look at the desert environment, through nature walks, games and crafts. Monday through Friday; 8:30 - noon.

The Garden is open every day of the year from 9 a.m. to sunset



Saguaroland Bulletin

JULY, 1980



**DESERT
BOTANICAL
GARDEN**

ANNUAL MEMBERSHIP:

Individual	\$ 15.00
Family	\$ 20.00
Sustaining	\$ 50.00
Subscribing	\$100.00
Supporting	\$250.00
	or more

Corporate Memberships available in several categories.

Director	Charles A. Huckins, Ph.D.
Research Botanist	Howard S. Gentry, Ph.D.
Curator of Herbarium	J. Harry Lehr
Curator of Living Collections	Victor Gass
Business Manager	Janice Moats
Education Director	Sylvia Forbes
Publications Director	Shirley Deacon
Artist	Wendy Hodgson
Plant Propagator	Marc Mittleman
Gift Shop Manager	Lynn Trainum
Maintenance Superintendent	Ross Berkheimer
Librarian	Rebecca Henry
Director Emeritus	W. Hubert Earle

Horticultural Staff: Donald Conner, Steven Heslep, Wendy Hodgson, Nichole Holler, Patrick Quirk. Gift Shop Staff: Robyn Moats, Anna Shelstad, Clare Thomson, Lela Turner. Office Staff: Tracy Peterson, Diane Pitcher. Education Assistant: Mary Fulton.

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TRUSTEES OF THE DESERT BOTANICAL GARDEN. Officers: Chairman of the Board, John Rhuart. President, Henry C. Triesler, Jr. First Vice President, Donald W. Hutton. Second Vice President, Lillian Diven. Secretary, Lillian Mieg. Assistant Secretary, Emelia LaTempa. Treasurer, Alice Feffer. Assistant Treasurer, John Daniels. Members: Frank M. Feffer, Thomas A. Goodnight, John Graham, Frank Hennessey, Marsha Jacobs, Naomi Kitchel, Mary Lyon, Eric Maxwell, Mildred May, Charles F. Merbs, Duncan T. Patten, Bruce D. Pingree, Donald J. Pinkhava, Mrs. Paul Singer, John F. Swift, William L. Wingate, Jr.

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Cover: The Lois Porter Earle Herbarium, at the Desert Botanical Garden. Photo, V. Gass.

The Lois Porter Earle Herbarium And Its Staff

The July issue of the *Saguaroland Bulletin* is devoted to the Herbarium at the Desert Botanical Garden, and to the people whose daily work and talents have contributed to its achievements.

Ten years ago marked the beginning of a new cycle for the Herbarium, for on June 29, 1970, Mr. J. Harry Lehr, a retired banker from the East, joined the Garden Staff as Curator of Herbarium. During Mr. Lehr's ten years as Curator, he has increased the size of the collection from an assortment of 2,265 specimens to the current total of over 20,000 systematically identified and catalogued specimens. The results of Mr. Lehr's dedicated efforts have contributed to the development of a unique facility within the Garden, as well as to national recognition of its collections.

Ten years ago in September, Mr. W. Hubert Earle, then Director of the Garden, received from his friend and colleague, a rough sketch of a 48 by 25 foot building. That friend was Dr. Howard Scott Gentry, a renowned botanist and plant explorer with the United States Department of Agriculture. Mr. Earle had told Dr. Gentry that the Desert Botanical Garden had hopes of building an herbarium to house the Garden's growing collection of preserved plants and to provide space for plant scientists. He asked Dr. Gentry to make suggestions. Dr. Gentry knew the Garden well and knew the people associated with it, for during his work on the genus *Agave*, he had visited the Garden occasionally. Dr. Gentry had spoken to his friends at the Garden about retiring from the Department of Agriculture in order to complete his research on the agaves of North America. With the encouragement of Garden friends, Dr. Gentry was persuaded to continue his

work on agaves at the Desert Botanical Garden. He took up residence at the Garden as Research Botanist in January of 1972. It is the Garden's good fortune to have the world's leading authority on the genus *Agave* affiliated with it. Dr. Gentry has now completed his research, and his manuscript will be published by the University of Arizona Press in 1980.

The varied talents of Wendy C. Hodgson mesh perfectly with the varied needs of the Herbarium. Wendy, a horticulturist as well as a botanical artist, joined the Garden staff in May, 1978. She is a skilled plant collector; her sojourns into the field contribute to the stacks of filled plant presses one frequently sees adjacent to the Herbarium entrance. Several *Bulletin* covers are testimony to her sharp hand and eye; her articles about plants are a pleasure. Guests at the Garden's Botanical Print Exhibition this November will have an opportunity to examine and enjoy Wendy's work.

Since the Herbarium is not open to the general public, it is possible to overlook its significance respective to the Garden's permanent collections. It is the intention of this issue of the *Bulletin* to heighten the reader's awareness of the botanical significance of this facility and the value and beauty of its collections. As Walter Deane writes in *The Standard Cyclopedia of Horticulture*:

“An Herbarium was called ‘Hortus siccus,’ or dry garden, by the ancients, but, although in one sense true, it does not convey the correct idea. To the true scientific lover of plants, whether botanist, horticulturist, florist, or nurseryman, a carefully equipped collection of dried plants is not only a great and necessary aid, but a true delight...”

—Editor

Commitment To The Concept Of A Garden Herbarium

The idea for an herbarium at the Desert Botanical Garden began to materialize in 1950 with the efforts of the Garden's Assistant Botanist, E. R. Jim Blakely. In a small room adjacent to the Webster Auditorium that now serves as the Education Office, Blakely assembled over 2,000 herbarium specimens before he left Phoenix in 1956 to become Superintendent of the Santa Barbara Botanical Garden. The George B. Hinton collection made from 1932 to 1936 had been donated to the Garden by Mrs. Walter Douglas in 1953. A collection of over 700 sheets collected by Mrs. Rose Collum of Rye, Arizona from 1930 to 1938 was given to the Garden by her estate in 1953. The idea of establishing an herbarium at the Garden was not left on the shelf.

The concept of a Garden herbarium received further impetus with the arrival in Phoenix of Mr. J. Harry Lehr. A firm commitment to the development of this facility was made when Mr. Lehr joined the Garden staff as Curator of Herbarium; Mr. Lehr began his duties in a small room filled with a random assortment of specimen sheets.

Despite the inadequacies of the herbarium quarters, there was earnest support from the Garden's Board of Trustees, the Director, W. Hubert Earle, and the Staff for the preservation and systematic cataloguing of Arizona flora and the flora of other regions, for appropriate shelter for the collection, and for the enlargement of the Garden's botanical facility.

In May, 1971, the Garden's Board of Trustees approved the building of an herbarium for the combined purpose of housing the Garden's rapidly grow-



*J. Harry Lehr, Curator of Herbarium,
Desert Botanical Garden.*

ing collection of specimens and for office space for the Curator and for the Research Botanist, Dr. Howard Scott Gentry who had agreed to continue his work on the genus *Agave* in the Garden's facility. The April, 1971 *Bulletin* noted that "There is a definite need for more space, and when Dr. Howard Gentry arrives at the Garden with his own herbarium sheets and books, our new herbarium will be a beehive of activity."

The invitation for bids for constructing the herbarium building opened on October 12, 1971, and on October 20, the contract of agreement was signed, naming Lescher and Mahoney of Phoenix as architects, and Dean Coffman Contractors as builders. This Scottsdale firm also built the Garden's Gift Shop building in 1960 and the Richter Memorial Library building in 1968.

Erecting the new herbarium building was complicated by the necessity of moving an existing workshop and storage building that occupied the site. These buildings were moved to their present location, adjacent to the Archer house where Dr. Gentry and his wife, Marie, reside. The footings for the herbarium building were poured in November of 1971. By this date, Dr. Gentry had arrived from Washington, D.C., and had set up a temporary office in the Archer House.

At the January, 1972 meeting, the Board of Trustees recommended that the new herbarium be dedicated to the memory of Lois Porter Earle, the late wife of Garden Director, W. Hubert Earle. Mrs. Earle had passed away in 1968, and a memorial fund had been established in her name. Lois Earle had taken a profound interest in the Garden and in Garden activities. In 1957, she had set up the Garden's first bookkeeping system. She loved the desert, hiking and exploring it often. The dedication of



Lois Porter Earle.

the Herbarium to Mrs. Earle's memory was a fitting tribute and met with the approval of the Members and all those friends of the Garden who had contributed to her memorial fund.

In March of 1972, the move into the new herbarium building was in full swing. On Sunday, April 16, 1972, at a formal dedication, the Lois Porter Earle Herbarium was opened.



Interior, the Herbarium at the Desert Botanical Garden. Photo, V. Gass.

The Herbarium, The Botanist's Reference Library

An herbarium is a collection of dried and pressed plants which have been mounted for the purpose of serving as a ready reference to basic information about plants. These mounted specimens are often referred to as "sheets."

The term "herbarium" should not be confused with the word "herbal" which properly denotes a printed book that describes and illustrates plants. Herbals were produced between the 14th and mid 18th centuries. Early herbals focused on the medicinal properties of plants, but through the centuries, as world travel increased, the focus began to shift to new plants and to details about them. This change in focus necessitated careful observation of plants. By the middle of the 16th century, herbaria became realities in order to satisfy this interest.

The herbarium can be a teaching aid, even an absorbing hobby; but of greater scientific consequence, it serves as a reference library for plant research. Without herbaria (pl.), the systematic study of plants would be nearly impossible. The herbarium constitutes the most essential tool for research in plant classification, distribution, ecology and identification. It is the result of tens of thousands of hours of field and laboratory work; and it represents a potentially similar savings of effort to a research botanist or field worker who uses its resources. An herbarium is the stuff of which most floristic and monographic works in botany are made.

Herbarium sheets are generally prepared in the following manner: The specimen is placed between alternating sheets of heavy blotting paper and corrugated cardboard and inserted into a wooden or metallic press; after it is properly dried, the specimen is mounted on



A specimen sheet.

an 11½ by 16½ inch sheet of heavy paper with a high rag content (this size of mounting paper is standard in the United States); other plants of the same kind, collected at the same time and place may be mounted on the same sheet; specimens are mounted with gummed cloth tape; a label is prepared that identifies the plant and notes the locality and habitat in which it was collected, the date of collection, the collector's name, and any other pertinent data relating to the plant or its collection; later, another accession number is added to the label to reference the specimen within the herbarium collection.

Mounted specimens are arranged according to species, genus and family, and then placed in folders of heavy paper. The folders are filed on shelves in airtight cabinets or cases. With the passage of time, flower color may fade but the mounted specimens can last indefinitely. Some have lasted over 300 years.

At the Garden, each specimen is accessioned in a book. Each entry contains the name of the collector, the collection date, and the name of the plant and

other data when it is available. This two volume set housed in the Library at the Desert Botanical Garden, reads like a botanical atlas of the world.

DES, A National Resource Collection

During the past decade, the nation has increased its awareness of the need for more accurate and complete information about plants. Unfortunately, public awareness about the importance of plants to mankind has far exceeded public support for the study of plants. Indeed, this is a critical issue to be faced in future decades.

Two years after its formal opening in 1972, the Lois Porter Earle Herbarium at the Desert Botanical Garden, "DES," as the name abbreviation appears in the national listing of herbaria, was designated as a National Resource Collection, one of only 105 herbaria in the nation to be so distinguished. In *The Report to the National Science Foundation and to the Botanical Systematics Collection Community*, entitled "Systematic Botany Resources in America, Part I," compiled by the Advisory Committee for Systematic Resources in Botany, the listing of the 105 institutions designated as National Resource Collections was given. A total of 1,127 herbaria in the United States was surveyed, 623 surveys were analyzed, and of these 623, 105 herbaria earned enough quality points to qualify for the award.

The Committee's rating system was based on the accumulation of quality points that were awarded for: (1) Total number of specimens; (2) Number of type specimens; (3) Number of volumes in associated library; (4) Number of

specimens loaned annually; (5) Number of professional visitors; (6) Garden facilities; (7) Number of persons on the professional staff; (8) Number of M.S. or M.A. and Ph.D. degrees directed by staff, last five years; (9) Number of staff papers, last five years; (10) Number of specimens exchanged annually; (11) Associated electronic data processing capability; (12) Number of specimens added annually. To qualify as a National Resource Collection, institutions were required to score 12 or more points out of a total 40 points. This survey included the largest and most active herbaria in the nation, affiliated with established institutions like the University of Illinois with its total number of specimens in excess of 4½ million.

Of the four herbaria in the State of Arizona that were designated National Resource Collections, the Herbarium at the Desert Botanical Garden is unique in that it is the only one supported by a private, nonprofit institution. The other herbaria designated as National Resource Collections in Arizona, are located at the University of Arizona (224,000 specimens), Arizona State University (99,300), and Northern Arizona University (26,250); all receive state support.

Housed in its tile-roofed adobe building, the Herbarium collection at the Desert Botanical Garden has been built with the interest, determination and support of some very special people.

Building The Collection

Mr. J. Harry Lehr, the Garden's Curator of Herbarium, moved to Phoenix from New York State in March, 1969. For many years, Mr. Lehr had pursued his interest in plant collection and identification as a hobby. In May, 1969, Lehr, a retired banker, visited the Garden and became a Member. His "membership" was one that involved him completely for the next decade.

Mr. Lehr introduced himself to the Garden's Director, Mr. Earle, and was shown the facilities, including an assortment of 2,265 plant specimens filed in three standard metal cases and one wooden replica case which were tucked away in a former bedroom adjacent to the Webster Auditorium. This herbarium collection had lain dormant since 1956, when Jim Blakely, the Garden's Assistant Botanist, departed for Santa Barbara to become Superintendent of the botanical garden there. Mr. Lehr offered to contribute one day a week of his time, starting in October, 1969, for the purpose of reorganizing the herbarium. An agreement with the Director was reached whereby, if his work was satisfactory, Mr. Lehr would become a member of the Staff, with a stipend.

Challenging was the word for the work that began that October. The George B. Hinton collection of 1,072 specimens had been mounted entirely with scotch tape. Mr. Lehr began the task of replacing the cracking tape with linen strips on this valuable collection. Mr. Lehr also went to work on six drawers of unmounted specimens, the bulk of the Rose Collom collection, which, with the exception of some collection numbers, lacked all other data. The new curator assumed the investigative task of corresponding with other herbaria for data

to complete the Collom labels.

The following year, on June 29, Mr. Lehr joined the Garden Staff as Curator of the Herbarium. His duties involved sorting and assembling unmounted specimens, and with the assistance of Dr. Donald Pinkhava and Mrs. Lehto at Arizona State University, the identification of plants. The new Curator instituted the practice of recording all specimens and, with the assistance of Dr. ly part of the Library collection.

In September of 1970, Harry Lehr made his first addition to the state flora, with a species of *Carex*, grass-like perennials, which he discovered growing near the herbarium building. Mr. Lehr considers himself a specialist in the identification of these plants, many of which grow in dry areas, although the largest species of *Carices* grow in low ground and cover great areas of marsh land. There are 40 or more of the species found in Arizona, mainly in the northern portion of the state.

By 1971, when Board approval was given for the construction of an herbarium building, the herbarium collection had increased to 4,300 specimens. After the move into the new building in March of 1972, Mr. Lehr began working at the Garden two days a week. He had then managed to build the total number of specimens in the collection to over 6,000 and had initiated the first exchange program with another institution, the University of California at Riverside. The following year, 10 herbarium cases were purchased to contain the growing collection that totaled 9,000 by the year's end.

The collection continued to increase from 13,000 total specimens in 1975, to 15,000 in 1976. The exchange program

grew with the addition of cooperating herbaria. The Garden Herbarium received over 800 general collections from Texas, Oklahoma, and Louisiana in one year alone.

A taxonomic file was initiated by the Curator in 1977, for the purpose of reducing the handling of herbarium sheets. The same year, the Garden Herbarium became a member of Botaniska Mussett of Lund, Sweden, an international specimen exchange. Total specimens then, had grown to 17,000.

In 1978, Mr. Lehr published his "opus magnus," as he refers to it, "A Catalogue of the Flora of Arizona." This 203 page listing was published with the purpose of satisfying "the need for a current checklist of Arizona flora." During the same year, the Curator initiated an exchange program with the National Herbarium of Mexico. Total count at the end

of 1978 stood at 19,000 specimens.

A supplement to the "Catalogue," was prepared in 1979. Since his first addition to the flora of Arizona in 1970, Mr. Lehr has discovered 11 new species of Arizona flora. By year end, the herbarium collection at the Garden was approaching 20,000 specimens.

Today, as the total specimen number approaches 22,000, excluding duplicates, Mr. Lehr continues to be the driving force behind the Garden's outstanding collection, a collection that focuses basically on arid-land plants and includes temperate zone plants native to the State of Arizona. In his 10 very productive years on the Garden's Staff, Mr. Lehr has put the Garden Herbarium collection on the scientific map, so to speak. The usefulness of the Garden Herbarium is a testimony to the dedication of its Curator.

Research Botanist, Dr. Howard Scott Gentry

"In Sonora, agaves are scattered like gems in an arborescent matrix."

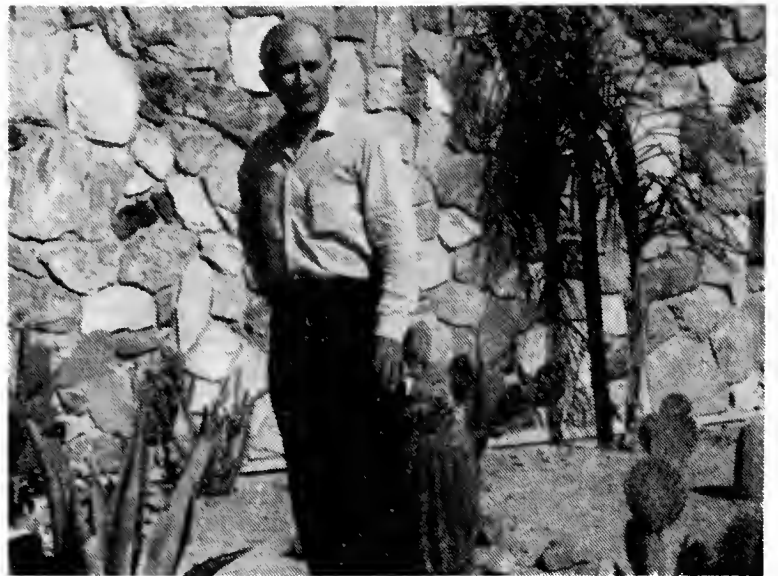
So wrote the Garden's Research Botanist, Dr. Gentry, in his 1972 publication, "The Agave Family in Sonora," a book issued by the United States Department of Agriculture. This book documents Dr. Gentry's quarter of a century involvement with the genus *Agave*, an involvement that will culminate with the release later this year of his definitive work, "The Agaves of Continental North America." Already, Dr. Gentry is widely regarded as the world's leading authority on agaves. Presently, he is concentrating his efforts on final preparation of his 1300 page manuscript. Rodney Engard, former Garden Director, is assisting Dr. Gentry in this task.

The actual research for the new work began in October 1957, when Dr. Gentry says, he began to look at the agave critically. This is when the Garden's Research Botanist began to recognize the need to study the natural relationships and economic uses of these plants. Over the past 12 years, Dr. Gentry has devoted considerable time to this study, much of which has been carried on in the Herbarium at the Desert Botanical Garden, his headquarters for the past eight years.

During his first four years of residence at the Desert Botanical Garden, Dr. Gentry, supported by a National Science Foundation Grant, undertook extensive field work in Mexico, Guatemala, Honduras, and Arizona, collecting living plants as well as plant specimens. Since

these plants had not been studied extensively in the past, Gentry had to develop his own techniques for pressing field collected materials. Today, specimens of pickled agave blossoms and leaf sections line the walls of the Herbarium. Plant materials of 135 agave species belonging to 20 subgenera are housed in the Herbarium and constitute only one tangible product of Dr. Gentry's research.

Dr. Gentry considers the 135 essays in his soon-to-be-published book as the "culmination of his work on agaves." With the publication by the University of Arizona Press of this major work on agaves, Dr. Gentry will turn his attention to another botanical topic, economic plants. As Associate Program Director of NEWCAST, New Crops



Dr. Howard Scott Gentry, taken during a 1967 visit to the Phoenix area.

Research Center at Arizona State University, Dr. Gentry will be deeply involved with a subject on which he is eminently qualified to speak.

IN BRIEF

RETIRING GARDEN BOARD MEMBERS

The Board of Trustees has accepted the resignation of three Board Members, Margaret Caldwell, William Chester, and Barbara Kaiser.

Margaret Caldwell has served on the Board for 7 years, but her interest in the Garden has been an active one for 10 years, and, she states, "It will continue in the future." Her duties on the Board included serving as Assistant Treasurer and helping to draft the Garden's new bylaws. Mrs. Caldwell feels that "new blood" will be beneficial for the Board and for the Garden. She does, however plan to continue her involvement with the Garden as a member of the Development Committee and in other capacities, perhaps in Plant Propagation or with the Garden's historical records.

Mr. William H. Chester, a recently retired attorney, is presently finishing some cases before starting to enjoy his leisure. In addition to being an active

member on the Garden Board of Trustees for 7 years, Mr. Chester is a past president of the Lion's Club in Scottsdale and served in the Arizona State Legislature in 1942. Mr. and Mrs. Chester, who have resided in Phoenix since 1935, are both charter members of The Arizona Cactus and Succulent Society, founder of the Desert Botanical Garden.

Barbara Kaiser is leaving the Board after a three year tenure. She has been an active member of the Junior League for 9 years, and brought her business expertise to the Garden, serving as Secretary for the Board and assisting in the rewriting of the Garden's bylaws. She is married to Dr. Malcolm Kaiser, a dentist, and is the mother of four active children. Barbara plans to continue her work at the Garden as a Docent.

NEWLY ELECTED BOARD MEMBERS

The results of the Board of Trustees election in May were announced at the Annual Members' Meeting on May 24,

1980. The four new Board Members are: John Graham, Frank Hennessey, Marsha Jacobs, and William L. Wingate, Jr.

JOHN GRAHAM, a Volunteer at the Garden for the past five years and a Member for one year, works for Maricopa County in the Purchasing Department. He enters plants in the Annual Desert Botanical Garden Cactus Show and is a consistent award winner. He is Vice President of the Central Arizona Cactus and Succulent Society, a member of Cactus and Succulent Society of America since 1968 and in years past has grown plants in California for the International Succulent Institute. Prior to moving to Arizona he was in store management with W.T. Grant Co. in several western states for 14 years. John and his wife have one son who is in training in the Marine Corps.

FRANK HENNESSEY, has been a member of the Garden for 16 years and an active Volunteer for the past two years. Prior to retirement he was Credit Manager for the Contract Division of O'Malley Lumber Co., and he also owned his own lumber business. He is currently President of the Central Arizona Cactus and Succulent Society. He and his wife grow and tend over 1,000 cacti in their own garden at home.

MARSHA JACOBS, a resident of Phoenix for 20 years, is active in the Junior League. She is a Member of the Garden, with desert plants as her major hobby. She is a retired first grade schoolteacher and is interested in educational programs for children. She and her husband, an attorney, are the parents of two school-aged boys.

WILLIAM L. WINGATE, JR., earned his B.S. at Florida State University and his M.B.A. at Georgia State University. He is Executive Vice President of the

Great Western Bank and Trust Company. He is also a member of the Kiwanis, Arizona Chamber of Commerce, Phoenix Chamber of Commerce, Phoenix Country Club, and Capital City Club, Atlanta. He serves on the Board of the Florence Crittendon Services of Arizona. He and his wife are the parents of two children. His hobbies include piano playing, jogging, and gardening.

STAFF CHANGES

Victor Gass has been promoted to the position of Curator of Living Collections at the Garden, and has assumed outgoing Superintendent Russ Haughey's responsibilities for the supervision of all Garden horticultural activities. After five years of service to the Garden, Russ is returning to Arizona State University for a degree in Wildlife Management.

Victor, a graduate of Arizona State University in geography, has been on the Garden Staff for three years and had held the position as Plant Propagator for two years.

Marc Mittleman has been promoted to Plant Propagator, replacing Victor Gass in that position. Marc received his degree in horticulture from Kansas State University. He has been employed at the Garden for two and one-half years.

Ross Berkheimer has been appointed Maintenance Superintendent for the Garden. Ross, who was appointed Chairman of the Garden's Safety Committee in November, 1979, has been active in compiling a Safety Action Plan for the Garden. Ross is a retired Lt. Colonel in the Army having served 6 years on active duty plus 33 years in the Army Reserve. He was employed by Motorola in Phoenix for 18 years. Ross has worked at the Garden for three years, and is a graduate of the Garden's first Docent class.



DESERT BOTANICAL GARDEN

P.O. BOX 5415
PHOENIX, AZ. 85010

Garden Events

AUGUST

- 2 **Flowing Springs** — A field trip to an area north of Payson along the Verde River. Saturday: 8 a.m.
- 12 **Conifers of Arizona** — A two-session course and one field trip to explore the many different conifers of Arizona. Tuesday: 7 p.m.

SEPTEMBER

- 3 **Cooking With Native Plants** — A course taught by ethnobotanist, Ruth Greenhouse, in preparing unusual edibles of plants of the desert and arid regions. Four Wednesday sessions: 2 p.m.
- 6 **Fall Vegetable Gardening** — Where, when, how, to plant a successful fall vegetable garden. One Saturday session: 10 a.m.
- 13 **Vulture Mountains** — A field trip to the mountains just outside Wickenburg to view the flora of a high desert area. Saturday: 8 a.m.
- 18 **Beginning Birding** — A beginning course in observing and learning to identify area birds. Four Thursday sessions: 7:30 a.m.
- 18 **Desert Wildflowers** — An introductory course in learning about and growing desert wildflowers. Two Thursday sessions and one field trip: 2 p.m.
- 26 **Huntington Botanical Gardens** — A three day tour by chartered bus to visit these outstanding gardens and go to its annual plant sale. Other stops of interest. Call 941-1217 for reservations and additional information.
- 28

The Garden is open every day of the year from 9 a.m. to sunset

Saguaroland Bulletin

AUGUST, 1980





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Cover: *Chilopsis linearis*, or desert willow, one of the many drought-tolerant trees at the Garden, with outstanding desert landscaping characteristics. Photo V. Gass.

ANNUAL MEMBERSHIP:

Individual	\$ 15.00
Family	\$ 20.00
Sustaining	\$ 50.00
Subscribing	\$100.00
Supporting	\$250.00
	or more

Corporate Memberships available in several categories.

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Research Botanist	Howard S. Gentry, Ph.D.
Curator of Herbarium	J. Harry Lehr
Curator of Living Collections	Victor Gass
Business Manager	Janice Moats
Education Director	Sylvia Forbes
Publications Director	Shirley Deacon
Artist	Wendy Hodgson
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CARING FOR DROUGHT-TOLERANT TREES AND SHRUBS

By Nicole Holler,
Horticulturist,
Desert Botanical Garden

After watching many of the Phoenix area's most popular landscape plants staunchly survive another harsh desert summer, one wonders why native and other drought-tolerant plants have not been more extensively employed. Drought-tolerant plants require less water and care than most ornamental plants from non-arid regions, and in many instances are more visually congruent with the local environment. Even if a desert home is no longer surrounded by the open desert, a great deal of maintenance time and effort can be saved by planting drought-tolerant plants, thereby enhancing the beauty and individuality of a yard.

Fall is an excellent planting time, not only for spring flowering annuals, vegetable gardens and perennial groundcovers, but also for frost-hardy trees and shrubs. As temperatures diminish, plants are under less stress and require less water. Natural winter rains provide ex-

cellent conditions for establishment of new plantings.

Although drought-tolerant plants generally require less maintenance than other plants, there are some fundamental practices which, when followed, will provide optimum results for these landscape plants. In general, desert plants grow more slowly than other landscape plants. There are, however, a number of things that can be done to encourage drought-tolerant plants. *Proper planting* is the best beginning for quick establishment.

(1) Prepare the planting area by digging a hole that is at least twice as wide and one and one-half times as deep as the undisturbed root ball of the plant. Fill the hole with water and let it soak in.

(2) Mix one-third to one-half part organic matter with the backfill. Any well decomposed organic matter is suitable. Bark is inexpensive and works very well. Avoid using manure; it has a high



Prosopis chilensis, is a superior, fast-growing landscape tree.



The rich, evergreen foliage and small, white flowers of Vauquelinia californica make this handsome native a striking specimen or accent shrub.

salt content and can burn new plantings. Center the plant in the hole, and fill in enough of the mixture so the original soil level is flush with the new soil level. Soak the plant slowly and deeply.

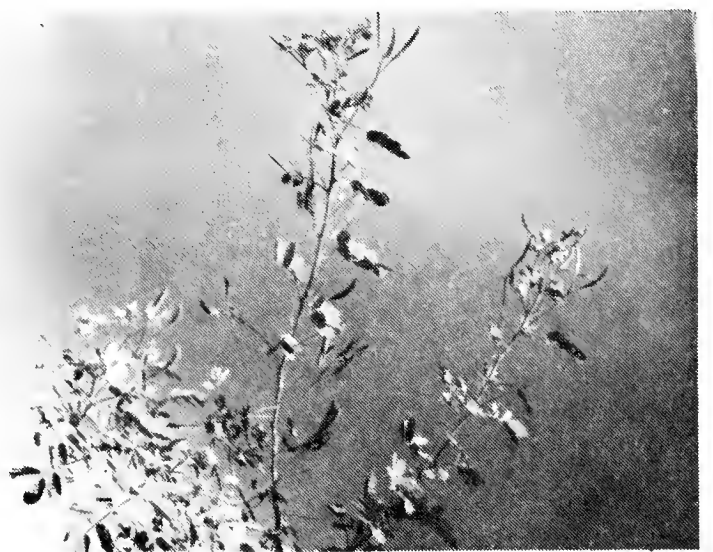
Most drought-tolerant plants prefer an area with good drainage. One should test the infiltration rate of different areas before deciding what and where to plant.

Watering is probably the most misunderstood and abused aspect of plant maintenance. One rule should always be followed: When watering, water deeply. Allow the water to run slowly and penetrate deeply, well below the root zone. This practice not only leaches out the harmful salts, but encourages the plant to root deeply, and increase its drought tolerance. New plantings require frequent water. Water every few days at first. After new growth emerges and hardens, watering can be delayed a week or more. Strict watering schedules should be avoided; watering should vary with varying conditions. Avoid continual saturation of the soil, even with new plantings. Allow the soil to dry out somewhat between drenchings so as not to deprive the roots of oxygen.

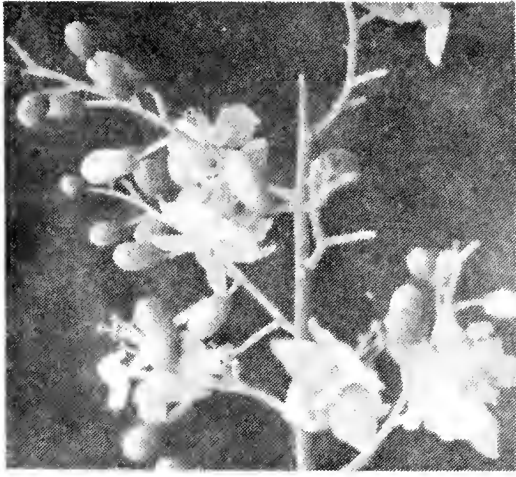
Once a drought-tolerant plant is established, it may survive without any supplemental water. However, most such plants perform better with a few deep soakings through the growing season. Determine the natural origin of your plant if possible; plants from moister or cooler climates generally need more water. Regardless of origin, most plants which can be established in the desert may be maintained adequately with a deep monthly soaking.

Fertilizer should be applied with great care. Excess applications of fertilizer may encourage unnatural growth. Withhold fertilizing a new planting for one to two months; winter fertilization may encourage new top growth which is highly frost sensitive. By mid-summer, an application can be made. Nitrogen is the nutrient which most plants that are cultivated in adobe soils need in quantity. Iron, zinc, and manganese also may be unavailable in alkaline soil. Desert plants are usually well adapted to local soil conditions in Arizona.

Plan carefully before doing any major *pruning*. Desert plants have a unique and subtle beauty, and a special elegance if they are allowed to assume their natural size and shape. Crossing branches should be removed; spindly or otherwise undesirable growth can be cut



The shrub, Cassia covesii produces showy yellow flowers in spring.



Cercidium microphyllum creates an airy silhouette against the Arizona landscape. Inset: the delicate spring blossoms of *C. microphyllum*.

out or pinched back. Redirecting growth by selective pruning of irregular or lengthening shoots will encourage bushiness.

Although few problems with *disease and pests* occur in plants which are cultivated for desert landscaping situations, some problems are inevitable. Before trying to solve a problem, become familiar with the disease or insect which is causing it. Learn about the type of damage the pest does and the degree of damage it causes before taking action. Even if a pest damages a plant, the damage may be of short duration and of minor significance to the long term health of the plant. Pesticides can destroy valuable predatory insects as well as insect pests. Avoid indiscriminate spraying, especially in seasons when few pests appear.

Physical controls such as a forceful spray of water for aphids and mites, or the use of predatory insects such as lace wings and lady bugs may provide the necessary control.

The following chart lists a number of drought-tolerant trees and shrubs which have been found to perform well at the Desert Botanical Garden. The reward for the gardener who follows a few good basic practices, will be a yard of beautiful plants that in time will just about care for themselves.

Editor's Note: In October, 1980, the Garden will offer three courses on desert gardening: Practical Desert Gardening, Plants for Desert Landscapes, and Desert Landscaping. Consult the Fall Calendar of Events for full details or call the Garden, 941-1217.

DROUGHT-TOLERANT

TREES	<i>Mature Size (HT x W)</i>	<i>Growth Rate After Establishment</i>	
<i>Acacia farnesiana</i> , Sweet Acacia	7.6m x 7.6m	Moderate	Drought tender
<i>Acacia salicina</i> , Willow Acacia	9.1m x 6.1m	Fast	Hardy,
<i>Cercidium floridum</i> , <i>C. microphyllum</i> , <i>C. praecox</i> Palo Verde, Palo Brea	4.6-9.1m x 4.6-9.1m	Moderate	Hardy,
<i>Chilopsis linearis</i> Desert Willow	3.1-7.6m x 3.1-4.6m	Moderate	Hardy,
<i>Lysiloma thornberi</i> , Desert Fern Tree	4.6m x 3.1-4.6m	Moderate	Hardy
<i>Prosopis sp.</i> , Mesquite	4.6-9.1m x 12.2m	Fast	Varies -12°C
<i>Rhus lancea</i> , African Sumac	10.7m x 12.2m	Moderate	Hardy heat; h
SHRUBS			
<i>Cassia sp.</i> , Desert Senna	depends on species; up to 2.4m x 3.1m	Moderate to Fast	Tolerant species forman
<i>Fouquieria splendens</i> , Ocotillo	4.8m x 1.8m	Fast	Tolerant little ca
<i>Hesperaloe parviflora</i>	1.2m x 1.5m	Medium	Drought to -17.8
<i>Simmondsia chinensis</i> Jojoba	2.4m x 2.4m	Slow	Drought water in
<i>Stenolobium stans</i> Yellow Bells	3.1m x 1.8m	Fast	Hardy frosted
<i>Vauquelinia californica</i> Arizona Rosewood	3.1-9.1m x 1.5-4.6m	Medium	Best in tal water

DROUGHT-TOLERANT TREES AND SHRUBS

TREES	Mature Size (HT x W)	Growth Rate After Establishment	Tolerances	Other Characteristics
<i>Acacia farnesiana</i> , Sweet Acacia	7.6m x 7.6m	Moderate	Drought and heat tolerant; slightly frost-tender	Beautiful, yellow, ball-shaped flowers in spring
<i>Acacia salicina</i> , Willow Acacia	9.1m x 6.1m	Fast	Hardy, drought-tolerant	Tall, graceful tree with drooping willow-like leaves
<i>Cercidium floridum</i> , <i>C. microphyllum</i> , <i>C. praecox</i> Palo Verde, Palo Brea	4.6-9.1m x 4.6-9.1m	Moderate	Hardy, drought and heat tolerant	Attractive green bark; yellow flowers in spring
<i>Chilopsis linearis</i> Desert Willow	3.1-7.6m x 3.1-4.6m	Moderate	Hardy, drought-tolerant	Lavendar, trumpet-shaped flowers in spring; willow-like foliage
<i>Lysiloma thornberi</i> , Desert Fern Tree	4.6m x 3.1-4.6m	Moderate	Hardy to 0° C; drought-tolerant	Fine-textured, fern-like foliage; white, ball-like flowers in spring
<i>Prosopis sp.</i> , Mesquite	4.6-9.1m x 12.2m	Fast	Varies with species; usually hardy to -12° C to -15° C	Distinctive, reddish-brown bark; fine-textured, light green foliage
<i>Rhus lancea</i> , African Sumac	10.7m x 12.2m	Moderate	Hardy to -11° C; takes high summer heat; high or low water requirement	Dark red, rough bark; dark green willowy foliage.
SHRUBS				
<i>Cassia sp.</i> , Desert Senna	depends on species; up to 2.4m x 3.1m	Moderate to Fast	Tolerant of desert conditions; some species frost-tender; for best performance, deep infrequent watering	Showy, yellow flowers in spring; attractive, fine-textured foliage
<i>Fouquieria splendens</i> , Ocotillo	4.8m x 1.8m	Fast	Tolerant of harsh desert conditions with little care	Thorny, whip-like, grey stems with drought-deciduous leaves and tubular, orange-red flowers in spring and summer
<i>Hesperaloe parviflora</i>	1.2m x 1.5m	Medium	Drought-tolerant with little care; hardy to -17.8° C	Clumping plant with long, narrow, sword-like leaves; coral-pink flower clusters on stalk in summer.
<i>Simmondsia chinensis</i> Jojoba	2.4m x 2.4m	Slow	Drought tolerant; faster growth with water in summer; some cold sensitivity	Tolerant, leathery leaves and densely branched mounding habit
<i>Stenolobium stans</i> Yellow Bells	3.1m x 1.8m	Fast	Hardy to 0° C, wood dies back when frosted but plant recovers quickly	Beautiful yellow, trumpet-shaped flowers in summer; bright green foliage
<i>Vauquelinia californica</i> Arizona Rosewood	3.1-9.1m x 1.5-4.6m	Medium	Best in deep soil with some supplemental water	Good for use as hedge or specimen; evergreen, leathery leaves

THE EUCALYPTUS COMMUNITY

By Vera Gamet

The eucalypts belong to a large genus of trees of the Myrtle family indigenous with few exceptions to Australia and Tasmania.

Fossilized leaf remains indicate that several species of eucalypts were represented in the post sub-tropical jungle of the Eocene some 50,000,000 years ago. Even the flat and featureless Red Center of the Australian Outback, before Australia finally broke away from the Great Earth Continent, Gondwana Land, was a fertile region with plants remarkably modern, forerunners of those we know today.

During millions of years, through a series of geological events that changed the character of the continent, the Australian Center became drier and drier, one of the driest places on earth. The eucalypts retreated, adapting to and forming a bordering savannah which received from 17 to 38 cm of rainfall a year, separated from the central desert by the even more drought resistant mulga, a shrubby acacia.

These eucalypts became known as "mallees." Like Arizona desert trees they were tall shrubs, or short trees up to 9 to 12 meters high, adapted to long periods of drought, ephemeral rains and smashing cloudbursts, able to withstand wide fluctuations of temperature, this side of freezing. Only a few species can survive hard frosts.

Dwarf eucalypts are not considered plants of the desert but are a transitional form adapted to a semi-arid habitat. They cover 7% of the Australian continent, especially the broad zone that extends along the southwestern coast.

Eucalypts are well foliaged, evergreen trees, with long tapered leaves that hang downward a little off center to receive

the sun on both sides. Their internal structure has adapted to this arrangement by developing photosynthetic cells on both sides of the leaf, as well as stomata to facilitate the exchange of gases. The leaves are the soft gray-green we associate with the desert, but tough and leathery in texture. They are pungent smelling and studded with oil glands that contain a fragrant volatile oil that atomizes the air. In sufficient quantity the leaves produce a fine haze that clings to the air about the plant.

The trees grow rapidly. After becoming established they do not require much water. In fact, many of them will die from too much water. This characteristic makes them especially desirable as shade trees and ornamental plantings in the sub-tropical desert of the Phoenix area. Many of the trees are very beautiful and gracefully enhance, but do not dominate, single dwellings or poolside patios or condominiums.

Size is the greatest variable among the species of *Eucalyptus*. They may be shrubs with a maximum growth of only 3 meters or they may range up to a height of 99 meters, with a trunk of 1.8 to 2.7 meters in diameter, (*E. regnans*); but the latter is a montane species, the tallest hardwood tree in the world, and requires a high annual rainfall.

Unlike most plants, eucalypts shed their petals before they put out their flowers. It takes a little credence to recognize the petals for they are fused and form a protective cap called an operculum, (Latin for covered), a little dome, over the maturing bud. When the flower is ready to expand, the cap slips off and drops away like a lid, which it is. What is left is a bunch of stamens

protruding from the receptacle, giving a sort of brush-like look.

The flowers appear on rich mahogany-colored young branches, with three to twelve flowers in an umbel located at a juncture with a leaf. The staminal filaments of each flower may be colorful in pink, red or even green, but most often are a dull yellowish-buff or off-white.

The developing Australian Section of the Desert Botanical Garden has many desirable species of *Eucalyptus* for landscape planting. *E. microtheca* is one of the best species. The gray trunk melds upward to a rich reddish-brown. The alternately placed silver-blue leaves are slender and graceful, about 10 cm long. It is one of the toughest eucalypts and can withstand frosts and temperatures as high as 50c. It also tolerates salt, alkali and caliche. A tree for all seasons, *E. spathulata* is a small tree with russet-red bark, roundly spreading, about 7.6 meters high at maturity. Delicate narrow leaves only .3 cm wide and about 7.6 cm long curve like miniature scimitars and cast a lacy ambience over swimming pool or patio.

E. pyriformis is a shrub 2.4 to 3.7 meters high with broad ovate leaves sharply tipped, rarely longer than 7.6 cm. The stamens which are the showy part of the flower are red when fresh and sometimes 1.9 cm long. One to three flowers appear on each peduncle.

E. torquata is a slender little tree exhibiting little mahogany floral cups with short reddish stamens exerted 1.3 cm. The yellow pistil is rigid to the touch. Young mahogany-colored branches dangle sharply tapered leaves 12.7 cm long. The peeling, smooth outer bark discloses a rich reddish, inner bark which is most attractive.



Eucalyptus spathulata, a beautiful specimen plant in the Garden's Australian section.

Australia's fascinating eucalypts may not be the best trees in the world, but they are the best all-around, all purpose trees, and are more widely propagated by more countries over the temperate zones of the earth than any other kind of tree. Over fifty countries cultivate them for their economic value in timber and oils and, possibly, to rectify our profligacy with the world's hardwood forests in the past.

Additional reading: Engard R G 1976
For desert gardens, *Eucalyptus spathulata*. Sagaroland Bulletin 2:22-24.

IN BRIEF

ARIZONA NATIVE PLANT SOCIETY MEETING

On Monday, September 8, at 8:00 p.m., the speaker for the Arizona Native Plant Society meeting will be Mr. Terry Johnson, Coordinator of the Arizona Nature Conservancy in Tucson, Arizona. The program, scheduled in Webster Auditorium, will detail the Arizona projects that are coordinated by the Nature Conservancy. Mr. Johnson addressed The Central Arizona Cactus and Succulent Society at its July meeting.

Arizona Nature Conservancy, a chapter of The Nature Conservancy, is a state-wide organization of volunteer members which manages three preserves: Patagonia, Canelo, and Ramsey Canyon. Other Arizona projects have included involvement in the acquisition of Arivaipa Canyon, Phoenix Mountain Park, an addition to Lake Havasu National Wildlife Refuge, and Thomas Canyon.

The Nature Conservancy is a national conservation organization committed to the preservation of natural diversity by protecting lands containing the best examples of all components of our natural world. The primary objective and function of The Nature Conservancy is to acquire, preserve and protect such lands, indefinitely.

To date the Conservancy and its members have been responsible for the preservation of 1,591,503 acres of forests, marshes, prairies, mountains, and islands: home to rare and endangered species of wildlife and plants.

A membership, nonprofit organization, the Conservancy was incorporated in 1951 in the District of Columbia for scientific and educational purposes.

Garden Members are cordially invited to attend the September 8 meeting of the Phoenix Chapter of the Arizona Native Plant Society. For information about the meeting, about the Arizona Nature Conservancy or the Arizona Native Plant Society, call the Garden, 941-1217.

ARIZONA NATIVE PLANT SOCIETY OFFICERS

At a recent election of the Phoenix Chapter of the Arizona Native Plant Society, the following officers were elected: Marc Mittleman, President; Sylvia Forbes, Vice-President; Nicole Holler, Secretary-Treasurer. Wendy Hodgson was appointed Program Director. All of the new officers and Ms. Hodgson are Garden Staff Members.

THE GARDEN LOSES A FRIEND

The Garden was saddened to learn of the passing of Mr. L. R. Mullineaux of Scottsdale, Arizona. Mr. Mullineaux was a Life Member of the Garden and a loyal friend and helper. He donated the bandage boxes for the Gift Shop packaging operation, and took a special interest in handicapped veterans. He was instrumental in assisting the Garden in improving its accessibility to the handicapped. Mr. Mullineaux served in World War I as an aviator.

ARID-ZONA LANDSCAPING CONTEST

Inserted in last month's *Bulletin* was a flyer on the Arid-Zona Landscaping Contest, co-sponsored by Salt River Project and Desert Botanical Garden. Copies of this flyer will be available at SRP Branch Offices and at garden and landscape centers. Additional copies may be obtained at the Garden Office.

THE DESERT BOTANICAL GARDEN

PUBLIC EVENTS

SEPTEMBER 1980-APRIL 1981

SEPTEMBER 1980

- Monday, September 1 Family Day at The Garden
Monday, September 22 Deadline on entries to the Garden's Botanical Print Exhibition
Monday, September 29 Deadline on entries to the Garden's Arid-Zona Landscaping Contest, co-sponsored by Salt River Project
-

OCTOBER 1980

- Saturday, October 4 Fall Seed Sale, Student Entrance, 9 a.m. to 5 p.m.
-

NOVEMBER 1980

- Saturday, November 22 through Sunday, November 30 "Delight and Truth: Botanical Artists Through Four Centuries"
Botanical Print Exhibition, Webster Auditorium, 9a.m. to 5 p.m.
-

DECEMBER 1980

- Tuesday, December 9 Luminaria Night, 7 p.m.
Saturday, December 13 Starts activities, special weekend events, and exhibits in celebration of
CHRISTMAS ON THE DESERT
through Wednesday, December 24, 1980
-

JANUARY 1981

- Wednesday, January 7 Deadline on entries to the Garden's 4th Annual Photography Exhibition — "Deserts of the World"
Saturday, January 24 through Sunday, February 1 4th Annual Photography Exhibition, Webster Auditorium, 9 a.m. to 5 p.m.
-

FEBRUARY 1981

- Tuesday, February 10 Deadline on entries to the Garden's 34th Annual Cactus Show, co-sponsored by The Phoenix Gazette
Saturday, February 21 through Sunday, March 1 34th Annual Cactus Show, Webster Auditorium and Eliot Patio, 9 a.m. to 5 p.m.
-

MARCH 1981

- Saturday, March 28 and Sunday, March 29 Spring Plant Sale, Garden's Auxiliary Parking Lot, 9 a.m. to 5 p.m.
-

APRIL

Wildflower month at the Desert Botanical Garden

The Garden is open every day of the year from 9 a.m. to sunset

The Gift Shop is open every day 9 a.m. to 5 p.m.

AUGUST, 1980

95



DESERT BOTANICAL GARDEN

P.O. BOX 5415
PHOENIX, AZ. 85010

Garden Events

SEPTEMBER

- 18 **Beginning Birding** — A beginning course in observing and learning to identify area birds. Four Thursday sessions: 7:30 a.m.
- 18 **Desert Wildflowers** — An introductory course in learning about and growing desert wildflowers. Two Thursday sessions and one field trip: 2 p.m.
- 26-28 **Huntington Botanical Gardens** — A three day tour by chartered bus to visit these outstanding gardens and go to the annual plant sale. Other stops of interest. Call 941-1217 for reservations and additional information.

OCTOBER

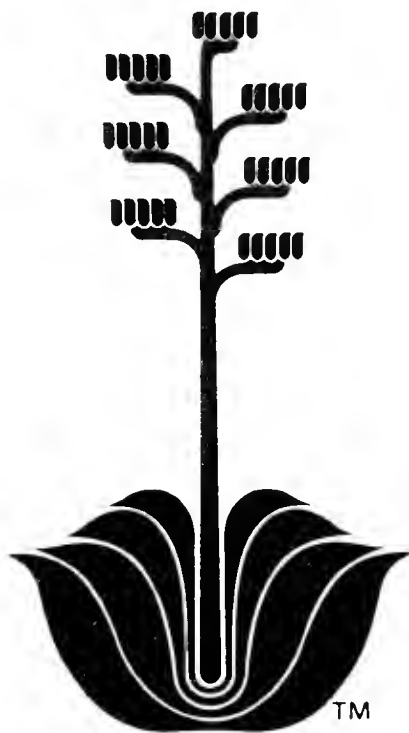
- 4 **Fall Seed Sale at the student entrance** — Wildflowers, shrubs, trees and more. Both seeds and plants. Demonstrations on planting techniques. Free admission to sale. Saturday: 9 a.m. to 5 p.m.
- 6 **Docent Class** — 10 sessions of intensive study of the desert plants, Desert Botanical Garden history, and special displays. Monday and Wednesday: 9:30 a.m. to 12 noon, through November 6, 1980. No fee.
- 8 **Practical Desert Gardening** — A course in planting and maintaining desert trees, shrubs, and cacti. Two Wednesday sessions: 7 p.m.
- 11 **Oak Creek Canyon** — A scenic trip to view the golds and rusts of fall, red rocks, and abundant riparian flora along the west fork of Oak Creek. Saturday: 8 a.m.
- 18 **Plants for Desert Landscapes** — A one session workshop that introduces the wide range of plant materials available for desert landscaping. Saturday: 8 a.m. to noon.

The Garden is open every day of the year from 9 a.m. to sunset



Saguaro land
Bulletin

SEPTEMBER, 1980



**DESERT
BOTANICAL
GARDEN**

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Supporting	\$250.00
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Cover: The Desert Botanical Garden offers outstanding examples of superb landscapes that feature arid land plants, for example, *Harrisia martinii* in bloom near Webster Auditorium. Photo, V. Gass.

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THE KALANCHOES OF MADAGASCAR

By Vera Gamet

Madagascar has always been different.

It is an island 1600 kilometers long and 580 kilometers wide at the widest point, a little smaller than Texas, almost a subcontinent. Lying in the Indian Ocean only 400 kilometers off the west coast of Africa, it is separated from Africa by the Mozambique Channel 4830 meters deep. If it ever was a part of Africa, the split was very ancient. There has been no land connection in 60,000,000 years.

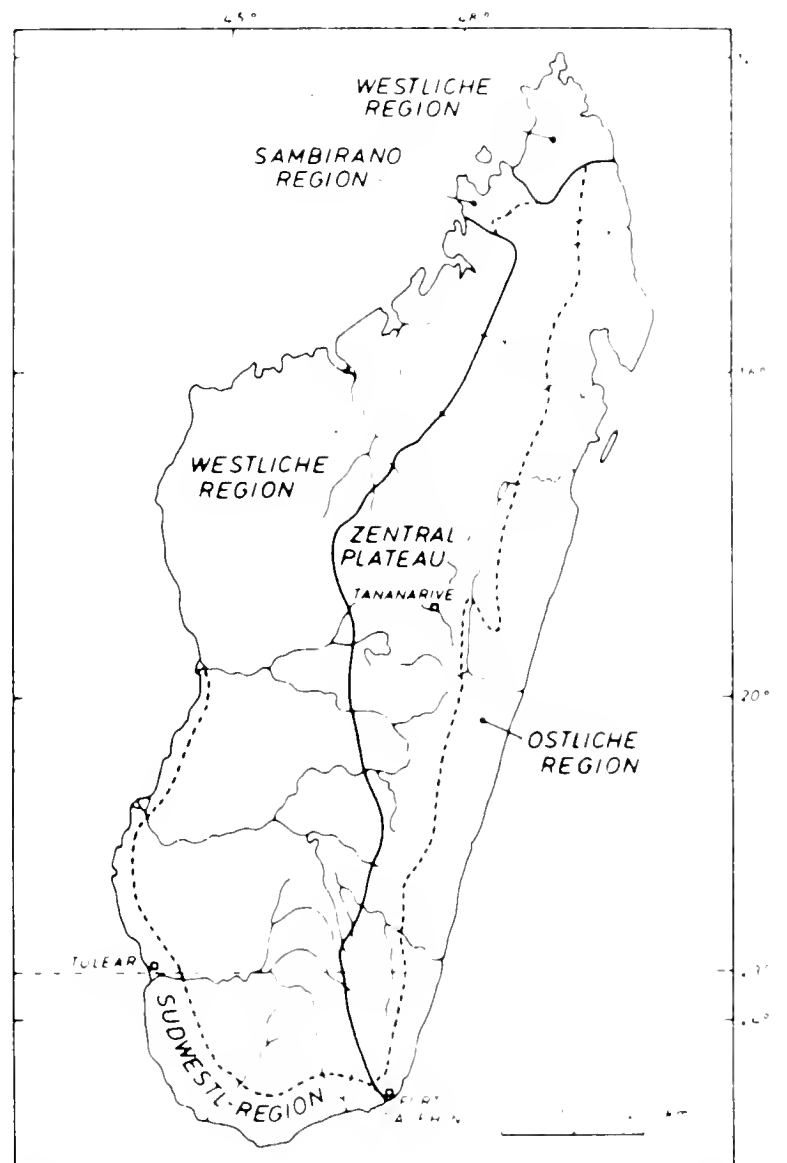
In its isolation Madagascar has produced many weird living things, like a flightless bird as big as a horse, a bird thought to have survived late enough through the ages to have been around when the earliest human inhabitants arrived. Its eggs were as large as footballs, and shell fragments still lie around like pot sherds for Smithsonian scientists to collect.

The island is the home of many species of primitive lemurs, shy, amiable creatures with great round staring eyes, whose place in the evolutionary scheme of things marks a juncture, a point in theory where the monkeys and apes went one way and man went the other. Few other places on earth surpass Madagascar in the strangeness of its birds, beasts, butterflies and plants. Many of them are found nowhere else.

Much interest attaches to the flora of the island. Many curious garden and greenhouse plants originated there and have since gone on around the world, among them the group of plants we know in the genus *Kalanchoe*, one of the important genera of the *Crassulaceae* family. Kalanchoes are succulents, adapted to arid conditions, and it is from the coastal desert of Madagascar they come.

While it is true that much of Madagascar has a tropical climate with heavy rainfall and lush vegetation, the west and southwestern coastal districts are desert and semi-desert with scanty rainfall, parched river beds, the usual eroded mountains and dry flats associated with desert conditions.

One common feature of most of the deserts of the world is their location in the western portions of the continents in which they occur. Typically, warm dry winds robbed of their moisture over coastal mountain barriers carry little rainfall inland. A hot sun dissipates whatever cloudcover there is and burns its way

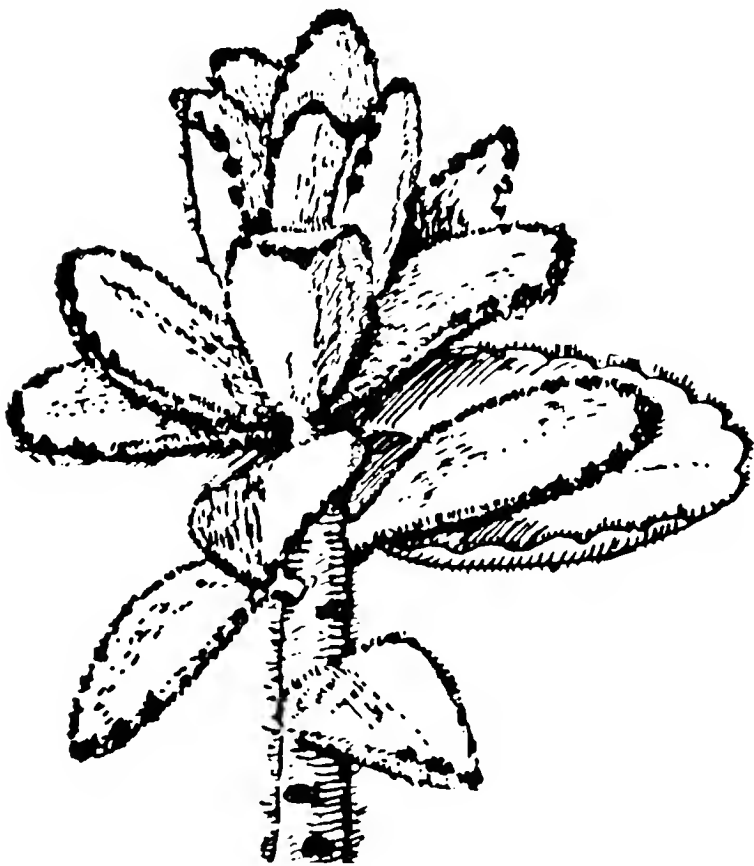


Map showing the four plant geographical regions of Madagascar. (*Cactus and Succulent Journal*, Vol XLIX, 1972, p. 99.)

unhampered across the thirsty earth.

The Madagascar desert is scrub country supporting drought-resistant aloes, several species of spiny euphorbias such as *Euphorbia splendens* var. *milii*, represented in the Succulent House of the Desert Botanical Garden, introduced cacti and many fleshy succulents, including the large genus *Kalanchoe* which has from 130 to 200 species, depending on who is counting. The Kalanchoes are usually small, erect, shrubby plants, from .35 to .9 meters, all with fleshy leaves. Several species produce masses of small, brightly colored red, yellow, or orange flowers during the winter, for they are "short day" plants and bloom best when the nights are longer than the days.

The extraordinary variety of their leaf patterns is the main attraction of the members of this genus. *Kalanchoe* leaves are always fleshy but they may be simple,



Kalanchoe tomentosa, found in Central Madagascar, is a densely leafed shrub that grows up to 50 cm. (from *Succulent Plants Illustrated*, V. Higgins, plate 6, 1949.)

entire, dentate, lobed, pinnate or pinnatifid, alternate, together in whorls or opposite in pairs, each pair at a right angle to the pairs immediately above and below, and often with an amplexicaul petiole clasping the stem.

The Maternity Plant, *Kalanchoe daigremontiana*, also called "Mother of Thousands," or to many, "The Devil's Backbone," is the most commonly cultivated species, and part of the collection in the Garden's Succulent House. *K. daigremontiana* is an erect, robust plant about 50 cm tall and comes from the Madagascar desert.

The showy, dark green leaves are paired, mottled with purplish splotches and lines below and shaped like elegant arrowheads from 3 to 20 cm in length. Each leaf has a curious cup-shaped protuberance across the base and evenly crenulated edges. It is the generative action along the edges of the leaves that gives the plant its name — Maternity Plant.

Between the notches, small spoon-shaped spurs appear, and on these spurs develop tiny "adventitious buds" which are really tiny plantlets. Soon they will drop off, send down their own roots, and new "daughter plants" will appear all around the parent plant in something like mass propagation.

The small flowers are yellow and pink, campanulate and appear in clusters at the top of a tall stem, a popular and attractive addition to the Christmas blooming season.

The Pewter Plant, *Kalanchoe fedtschenkoi*, also in the Garden's Succulent House, is a much branched, dense bush which in winter produces many tubular flowers 17 to 20 mm long with a suffused reddish-pink coloring which shifts to greyish-brown, somewhat resembling polished pewter that is held under



Left: *Kalanchoe daigremontiana*, a robust plant from 50 cm to 1 m high and a native of Southwestern Madagascar, is easy to cultivate. Right: *Kalanchoe tubiflorum* is widely distributed in Southern Madagascar; it grows to 1 m high. (from *Sukkulenten*, H. Krainz and P. Roshardt, p. 57, 1958.)

colored lights. The leaves are compact, small, only 5 cm long, and are rounded with lightly scalloped edges and adventitious progeny.

The nomenclature concerning these plants is quite confusing. The genus was

formerly called *Bryophyllum*, but that has been changed and it is now known as *Kalanchoe* with subdivisions *Kalanchoe*, *Bryophyllum* and *Kitchingia*. Actually the terms are used almost interchangeably, but now they are all generally found under *Kalanchoe*.

LANDSCAPING WITH ARID-LAND PLANTS

"The natural beauty of the arid southwest, and especially the Sonoran Desert, inspires many people to try to capture or in some way express the unique charm and subtle moods of the desert in man-made landscapes. When these gardens are carefully planned and planted, they provide an outdoor setting of unusual beauty and one that requires little upkeep."*

This year's Arid-Zona Landscaping Contest, co-sponsored for the third year by the Desert Botanical Garden and the Salt River Project, is receiving an extra boost from the current nervousness about the "water subject" in the Valley of the Sun.

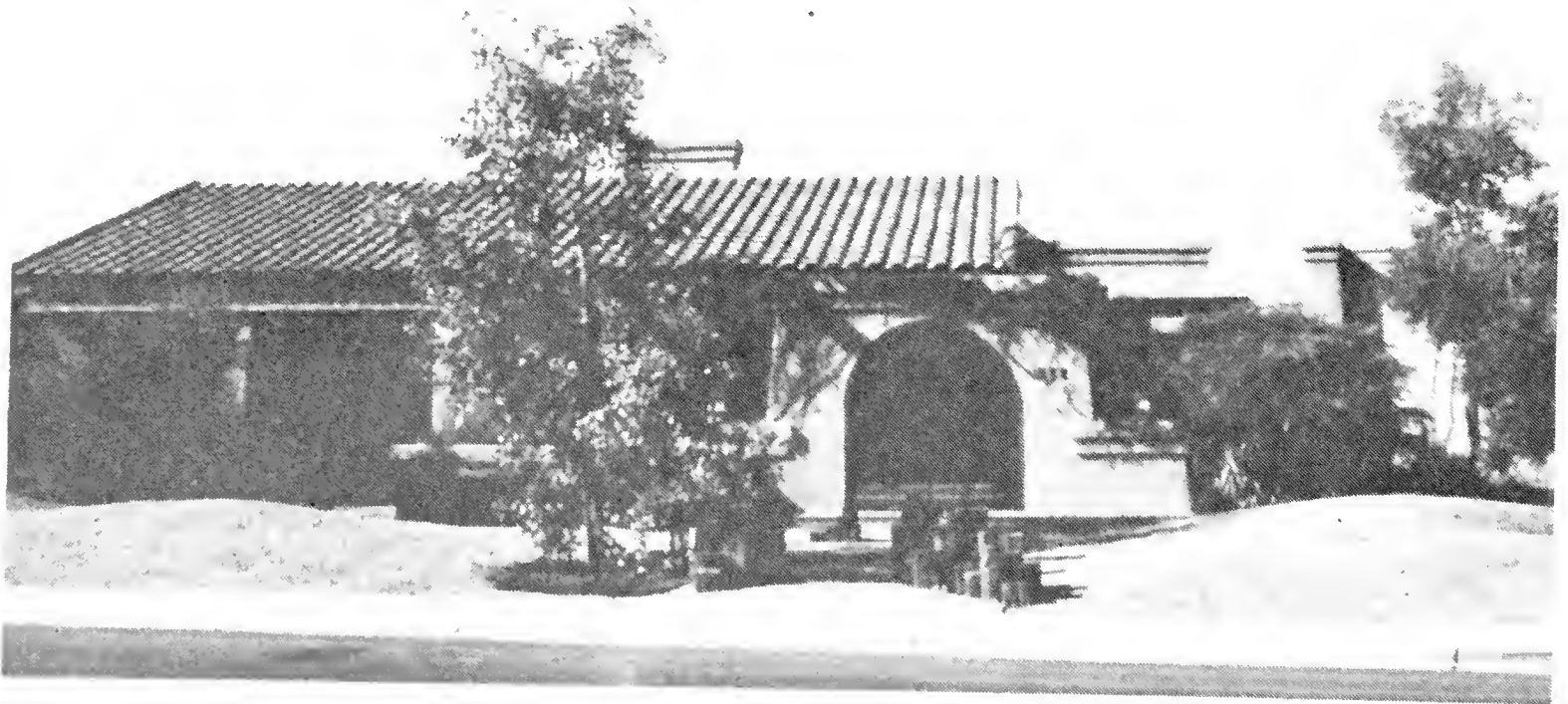
This yearly landscaping event is promoted to commend area residential, commercial, industrial and governmental sites that best use drought-tolerant plants for water conserving landscaping. The philosophy of the Arid-Zona Landscaping Contest, i.e. to promote the concept of desert landscaping in the Valley

of the Sun, is consistent with the mission of the Desert Botanical Garden, the study of plants of arid-regions of the world and the education of the public about the importance of these plants to man.

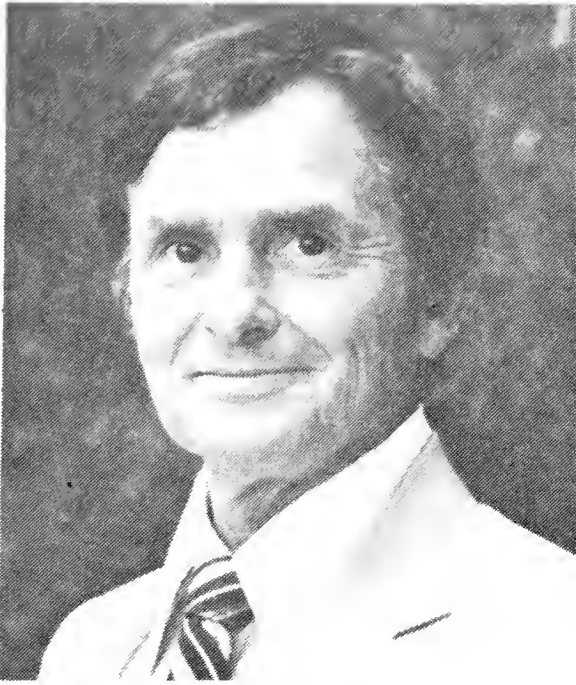
Desert landscaping is defined as the use of hardy, drought-tolerant plants in well-designed settings and which require no supplementary watering or which incorporate water-saving techniques.

Desert landscaping makes sound economic sense as well as a logical concept for the creation of a beautiful landscape that is congruent with the striking originality of desert environs of the Phoenix area. Arid landscapes can survive chilly winters and searing summers with as little as 50% of the water needs of non-arid landscapes.

* Sacamano, C. and Jones, W. 1976 Native Trees and Shrubs for Landscape Use in the Desert Southwest. University of Arizona, Tucson.



The Tidwell landscape in Mesa, won a first place award in last year's Arid-Zona Landscaping Contest.



Roy Krell, Sunset's Outdoor Living Editor, is the major field scout and writer for articles dealing with all aspects of landscape architecture.

Appreciation for the beauty of desert landscaping is heightened by a view of one of last year's first place Arid-Zona Contest winners, the Tidwell landscape in Mesa, Arizona. This attractive entry, in the total landscape division, was designed by Mesa landscape architect Darryl McConaghie. The effect this landscape creates is one of serenity. Last year's winners of the small garden category, Jim and Beth Kidwell, created an imaginative display by incorporating 62 kinds of cacti from South America, Mexico and Australia. The collection is sheltered by palo verde trees, African sumac and acacias. Watering is accomplished with the aid of underground plastic piping that delivers water every 10 days during the driest seasons of the year, and once a month during the winter. Such a system not only puts water where it is needed to support the plants, but also reduces the likelihood of weeds becoming established elsewhere in the garden.

Judges for this year's event include four notable persons in the world of landscaping. Gaylon Coates is a well-

known irrigation consultant in the Valley. Coates has won several awards for his projects and has taught courses in irrigation techniques at the Garden. Warren Jones, Professor of Landscape Architecture and Plant Science at the University of Arizona, Tucson, is also well known in the Phoenix area. His publication, *Native Trees and Shrubs*, which he co-authored with Charles M. Sacamano, is a valuable reference for amateur desert landscapers. Roy Krell is a familiar name to area gardeners; Roy is the Outdoor Living Editor of *Sunset Magazine*. Morgie Rayburn, Editor-Publisher of *Que Paso*, the bi-monthly publication of the Arizona Landscape Nursery Industry, is a local authority on desert plants, whose articles frequently appear in magazines and newspapers.



The Desert Botanical Garden is a showplace for beautiful desert landscaping.

Judging of entries will be held at the Garden on October 3, and will include a review of the submitted entry photos and slides in the morning and then on-site inspection of semi-final entries in the afternoon.

It is the hope of the Garden that activities such as the Arid-Zona Landscaping Contest will encourage Valley residents to consider using a wide variety of arid-land plants that are becoming more available each year on the Phoenix landscape scene.

FALL SEED SALE BECOMES FALL PLANT AND SEED SALE

In the low desert region of the Phoenix area, fall is an optimum time for planting many native plants and other drought-tolerant trees, shrubs, and ground covers. Cooler air and soil temperatures reduce heat and water stress. Wildflower seed in the low deserts must be planted in the fall if a showy display of color is desired in late winter and early spring. In terms of planting, fall in Phoenix is really spring.

Since fall is such a good planting time, the Garden has decided to expand its current Fall Seed Sale into a general plant sale, and to make available to the public a wide selection of choice plants of exceptional landscape value. Many of these plants are not easily obtained from local retail sources. Shoppers at this year's Fall Sale at the Garden will find just about any item needed to fill a particular desert landscape requirement.

The Sale will be held on October 4, from 9 a.m. until 5 p.m. in the Student Entrance. Offered for sale will be several hundred plants in one to five gallon containers. These plants represent over 60 species. The majority of these trees, shrubs, and ground covers are drought-tolerant and many of them are natives of Arizona and the desert southwest.

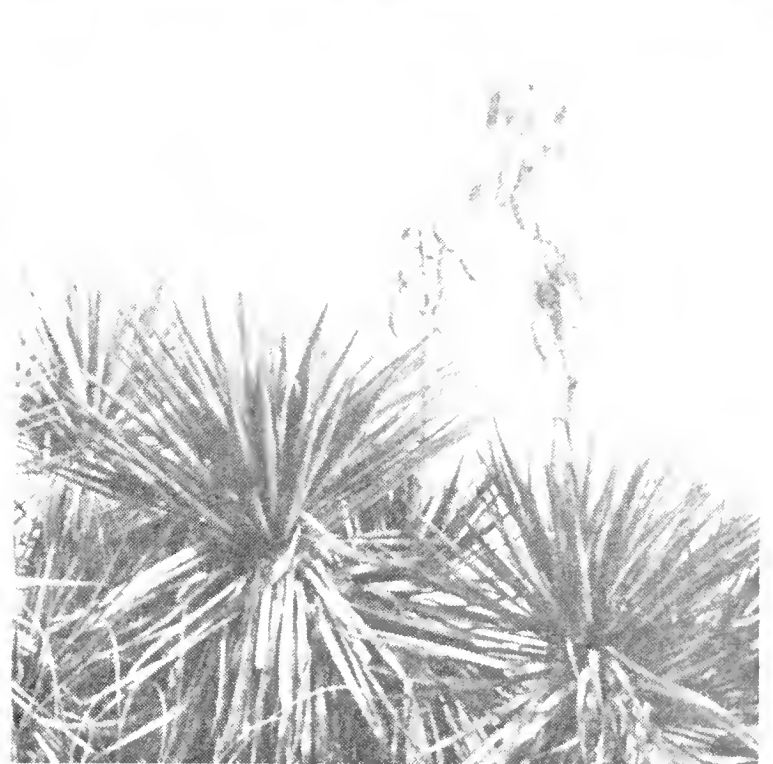
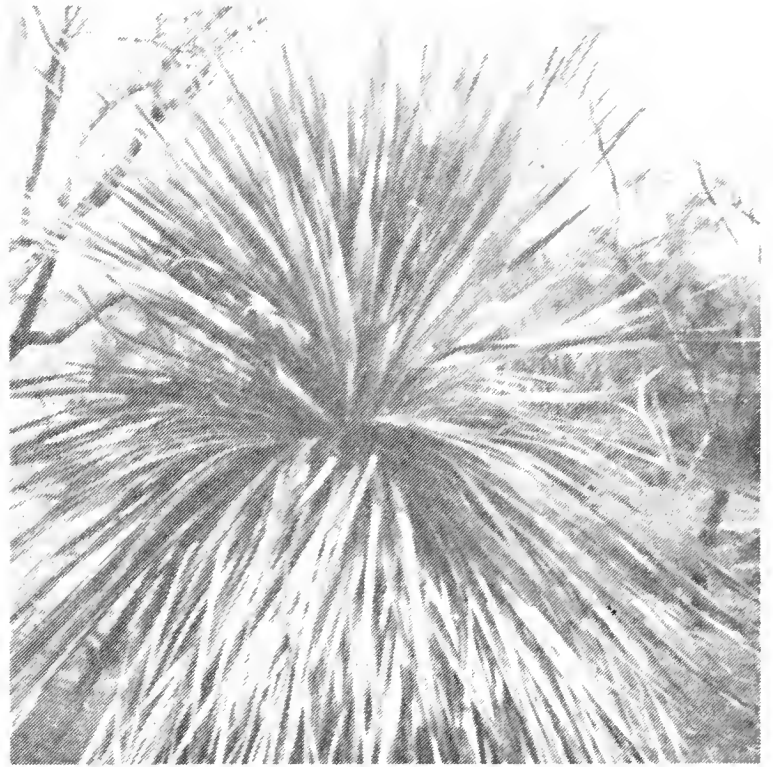
The trees offered for sale have been selected for their landscape value for the Phoenix area. Seven kinds of *Acacia* will be available including *Acacia aneura*, a small tree; *A. farnesiana*, sweet acacia; *A. greggii*, or cat-claw; *A. schaffneri*; *A. constricta*; *A. salicina* and *A. stenophylla*. Two species of *Cercidium* will be available: *Cercidium floridum*, or blue palo verde, and *C. praecox*, the Sonoran palo verde, or palo brea, a tree introduced in the area by the Garden. *Cercid-*

ium praecox is distinguishable from other palo verdes in that it is the last of the group to bloom in the spring, with bright yellow flowers that grow all along the branch in forsythia-like fashion. This tree is smaller than other palo verdes and leafier.

Other desert-loving trees on sale will be *Chilopsis linearis*, desert willow, and ironwood, *Olneya tesota*. *Sophora secundiflora*, sometimes called Texas mountain laurel, or mescal bean, is a tree that attains a height of 3 m and is well-suited for screening or defining outdoor areas; its spring display of fragrant, violet flowers is impressive. Few of these trees exceed a mature height of 8 meters.

Shrubs include specimen plants such as *Agave vilmoriniana*, an accent plant with light green to yellowish green rosettes of broad toothless, arching and deeply guttered leaves; a cliff-dweller by habit, this plant lends itself well to rock gardens, patio and planter locations. In the yucca group, *Yucca brevifolia*, or Joshua tree; *Y. baccata*, banana yucca; *Y. schottii*, a tree-like yucca; and *Y. rigida* will be available. Other shrubs, to name only a few, will include *Salvia greggii*, *Encelia farinosa* and *Melampodium leucanthum*; the latter plant is a showy, herbaceous perennial with tightly packed, deep yellow flowers with white rays.

Hundreds of plants including trees, shrubs, cacti, succulents and wildflowers will be available in seed form. Seed has been Garden collected from a number of varieties of newly cultivated wildflowers at the Garden, and the selection includes tricolor daisy, Namaqualand daisy, Arizona poppy, desert bells and blue gilia.



Representative plants in the Garden of four of the many trees and shrubs that will be for sale at the Fall Plant and Seed Sale: Top left, Olneya tesota; top right, Dasylirion wheeleri; bottom left, Acacia constricta; bottom right, Yucca schottii.

During the sale, demonstrations will be presented on planting and growing techniques, and cultural information on the plants offered for sale will be available. A full list of plants offered for sale may be obtained from the Garden two weeks before the sale and on the day of the sale. And remember, the Desert Botanical Garden is the best place to get a preview of what these young plants and seeds will look like when they mature.

With the expansion of the Fall Seed Sale to include container plants, the Garden will now be offering living plants to the public during three major sales each year: the Fall Sale, the plant sale at the Annual Cactus Show, and the Spring Plant Sale. These sales offer Members and public alike a good opportunity to purchase plants that are frequently difficult to locate.

IN BRIEF

COOLER, HOT-WEATHER CLASSES

From now on, Webster Auditorium will be a much more pleasant place for teachers and participants during hot weather classes and lectures. A new refrigeration unit and heat pump consisting of two, three-ton units was installed in June by Clyde Alexander of Scottsdale, under the supervision of Garden Maintenance Superintendent, Ross Berkeheimer. Shields' Electric, also of Scottsdale, completed the electric hookup, increasing the main entrance amperage from 200 to 400 amps.

The new, thermostatically-controlled refrigeration unit, which utilizes existing duct work, will serve as an auxiliary system for the evaporative coolers, which will continue to provide the daily cooling for the auditorium. Refrigerated cooling will be used routinely, however, for courses and workshops during the hot summer weather and will enable the Garden to expand its educational activities under cooler and quieter circumstances in the future.

GARDEN BUS STOP

A City of Phoenix Transit System bus stop, installed in late May in front of the Garden entrance on Galvin Parkway, now enables the public to visit the Garden via public transportation on a regular basis. Thanks to the Transit System, Bus Number 3 currently makes daily stops at the Garden entrance from 9:17 a.m. through 3:41 p.m., Monday through Friday, and Saturday stops from 9:20 a.m. until 5:20 p.m. Check the bus schedule for exact times and stops.

NEW HORTICULTURIST

Victor Gass, Curator of Collections, has announced that a vacancy in the Garden's horticultural staff was filled during August. Elaine Averitt, the newly hired horticulturist, is a graduate of Northern Arizona University and holds a degree in botany with minors in chemistry and environmental science. Elaine, a native Arizonan, has worked at the Museum of Northern Arizona as a research technician and has participated in various research projects. Her responsibilities at the Garden include care of the Succulent House, Australian Section and a portion of the main Garden arroyo.

HONOR FOR EDUCATION DIRECTOR

Sylvia Forbes, the Garden's Education Director, was awarded a Certificate of Appreciation by the Arizona Cactus Pima Girl Scout Council of Phoenix in May, for her service in developing the Junior Dye Workshop for 4th and 5th grade girls.

Twenty dye workshops, 12 girls in a group, were held weekly at the Garden from October 1979 through June 1980. In the Workshop, the girls learned how to prepare, spin and dye yarn with native plant materials. The techniques were taught by Chris Dezelsky and Jan Johnson.

Sylvia also organized a Cadette program for Girls Scouts in 5th through 7th grade. This series of 6 workshops was held 4 times at the Garden and offered the Girl Scouts the opportunity to complete the requirements for the Scout Plant Badge.



Martha Smith, at work on the Garden's historical picture file.

STUDENT INTERN PROGRAM

A new program to provide an opportunity for practical, on-the-job training in a botanical garden setting to college-level students in horticulture, botany, education, landscape design, art or other applied disciplines has been initiated this summer at the Garden. Martha Smith of Wellesley College, Wellesley, Massachusetts, is the first participant in the program.

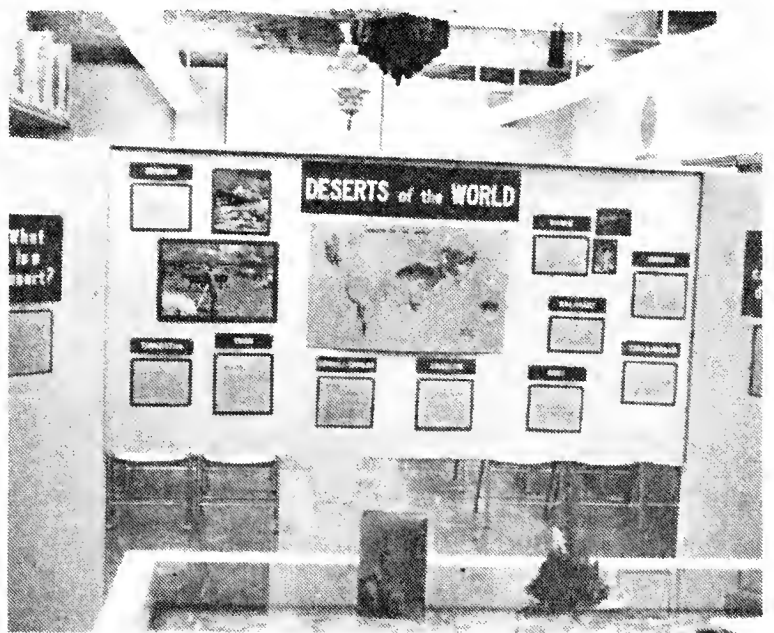
This new program provides opportunities for *Horticultural Training* and for *General Training*. In the Horticultural Training Program, students are assigned to each of the major areas of the Garden under the supervision of a permanent Staff Member. In the General Training Program, opportunities are offered for experience in support areas of Garden operations such as art, education, library, and publications.

Summer programs are a minimum of 8 weeks duration, and consist of at least 20 hours of participation per week. Fall and spring programs are a minimum of 12 weeks duration and consist of at least 15 hours of participation per week. The Garden does not provide participants with housing or stipends. Anyone who wishes further information on this program may contact the Garden.

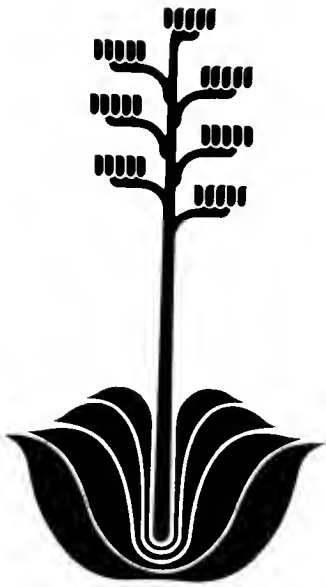
DISPLAYS

Three displays at the Garden are being held over through October. *Deserts of the World*, a colorful treatment of the various arid-land regions and the plant life of these regions, is on exhibit in Webster Auditorium. *Convergent Evolution*, a living plant display in the Douglas Display Case, illustrates how plants of different continents have evolved in similar ways to similar desert climates. Representative plants include aloes, euphorbias and cacti.

The exhibit, *Plant Adaptations*, on display in Webster Auditorium, illustrates some of the desert plant adaptations in roots, stems, flowers, and leaves which, it is believed, have enhanced the ability of desert plants to survive in arid environments. These adaptations may be physical, such as that of the ribbed stem of the saguaro, *Carnegiea gigantea*. Ribbed stems can expand, providing room to store water. Some plants have altered their life-styles to conform to the time of year when growing conditions are most favorable. The palo verde, *Cercidium sp.*, is a drought-deciduous tree that loses its leaves when the soil is dry and grows new ones after sufficient rain.



The exhibit, Deserts of the World, has drawn many interested Garden visitors this summer.



DESERT BOTANICAL GARDEN

P.O. BOX 5415
PHOENIX, AZ. 85010

Garden Events

OCTOBER

- 4 **Fall Seed Sale at the student entrance** — Wildflowers, shrubs, trees and more. Both seeds and plants. Demonstrations on planting techniques. Free admission to sale. Saturday: 9 a.m. to 5 p.m.
- 6 **Docent Class** — 10 sessions of intensive study of the desert plants, Desert Botanical Garden history, and special displays. Monday and Wednesday: 9:30 a.m. to 12 noon, through November 6, 1980. No fee.
- 8 **Practical Desert Gardening** — A course in planting and maintaining desert trees, shrubs, and cacti. Two Wednesday sessions: 7 p.m.
- 11 **Oak Creek Canyon** — A scenic trip to view the golds and rusts of fall, red rocks, and abundant riparian flora along the west fork of Oak Creek. Saturday: 8 a.m.
- 18 **Plants for Desert Landscapes** — A one session workshop that introduces the wide range of plant materials available for desert landscaping. Saturday: 8 a.m. to noon.

NOVEMBER

- 1 **Castle Hot Springs** — A field trip to view native plants and other flora in the foothills of the Bradshaw Mountains. Saturday: 8 a.m.
- 14-16 **Superstition Mountains** — A two-day backpacking trip through the Superstition Mountains. Friday, 5 p.m. through Sunday p.m.
- 22-30 **"Delight and Truth: Botanical Artists Through Four Centuries"** — An exhibition of botanical prints and originals from the 17th century to the present. Daily: 9 a.m. to 5 p.m.

The Garden is open every day of the year from 9 a.m. to sunset

Saguaroland Bulletin

OCTOBER, 1980





**DESERT
BOTANICAL
GARDEN**

ANNUAL MEMBERSHIP:

Individual	\$ 15.00
Family	\$ 20.00
Sustaining	\$ 50.00
Subscribing	\$100.00
Supporting	\$250.00
	or more

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Cover: *Kallstroemia grandiflora*, often called Arizona poppy, as drawn by Garden Artist, Wendy Hodgson.

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Research Botanist	Howard S. Gentry
Curator of Herbarium	J. Harry Lehr
Curator of Living Collections.	Victor Gass
Business Manager	Janice Moats
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GARDEN RECEIVES GOVERNOR'S AWARD

Governor Bruce Babbitt presented to the Desert Botanical Garden an award, "in recognition and appreciation of outstanding efforts and contributions to the protection and enhancement of Arizona's environment," on August 8, 1980, at a luncheon held in Sedona, Arizona. Governor Babbitt presented the award at the recommendation of The Governor's Commission on Arizona Environment. Dr. Charles Huckins, Gar-

den Director, accepted the award for the Garden. Also attending the luncheon, the climax of the 9th Annual Summer Conference of the Commission, were Garden Board Members Alice Feffer, Lillian Meig, and Duncan Patten.

Prior to the actual presentation, Roy P. Drachman, Chairman of the Executive Board of the Governor's Commission on Arizona Environment, read the following citation:

The Desert Botanical Garden in Papago Park is recognized internationally for its dedication to the study and enjoyment of arid plant life.

From the desert walks on the slopes of Papago Park to the exceptional library of literature on desert environments around the world and the laboratory where plant specimens are classified and preserved for research, this unique garden dramatizes the values of growing things which make our desert livable.

Visitors from every state and many foreign countries come to the Botanical Garden each year — more than 120,000. Workshops and guided tours help people to learn more about the desert ecology. Plants from the Garden are provided to people who want to utilize natural desert growth in their own landscaping. Rare and threatened species of desert plants are propagated here along with plants that have horticultural potential. The staff conducts field trips for needed specimens and participates in world-wide programs of assistance and exchange with other botanical institutions and scholars throughout the world. Except for exotic species which require special shelter, most of the plants are grown outside naturally to maintain their true characteristics.

Since 1935, when the Desert Botanical Garden was founded, its staff and volunteers have worked to provide an attractive natural area within which the plants congenial to arid lands may be conserved and studied.

In recognition of its contributions to science and a better understanding of our environment, this Certificate of Appreciation is given to the Desert Botanical Garden by the Governor's Commission on Arizona Environment.

A Certificate of Appreciation was also presented to the Palo Christi School in Kingman, Arizona and was accepted by Mrs. Sharon Mackley.

Governor Babbitt's luncheon speech dealt with the environmental issues of a groundwater code, state lands, and the problems of hazardous waste.

The Governor's Commission, established by Governor Samuel P. Goddard in 1965, started with 27 members; today it stands at 133 volunteer members. The Commission is chartered by Executive Order 75-2 to act as a clearinghouse and means of exchange of opinion and information relating to the problems of Arizona environment and the solution of those problems.

The Certificate of Appreciation, the Commission's highest award, is on display in Webster Auditorium.



Governor Bruce Babbitt presents Dr. Charles Huckins with the 1980 Governor's Award for "outstanding efforts and contributions to the protection and enhancement of Arizona's environment." Photo, David Perry Public Relations.

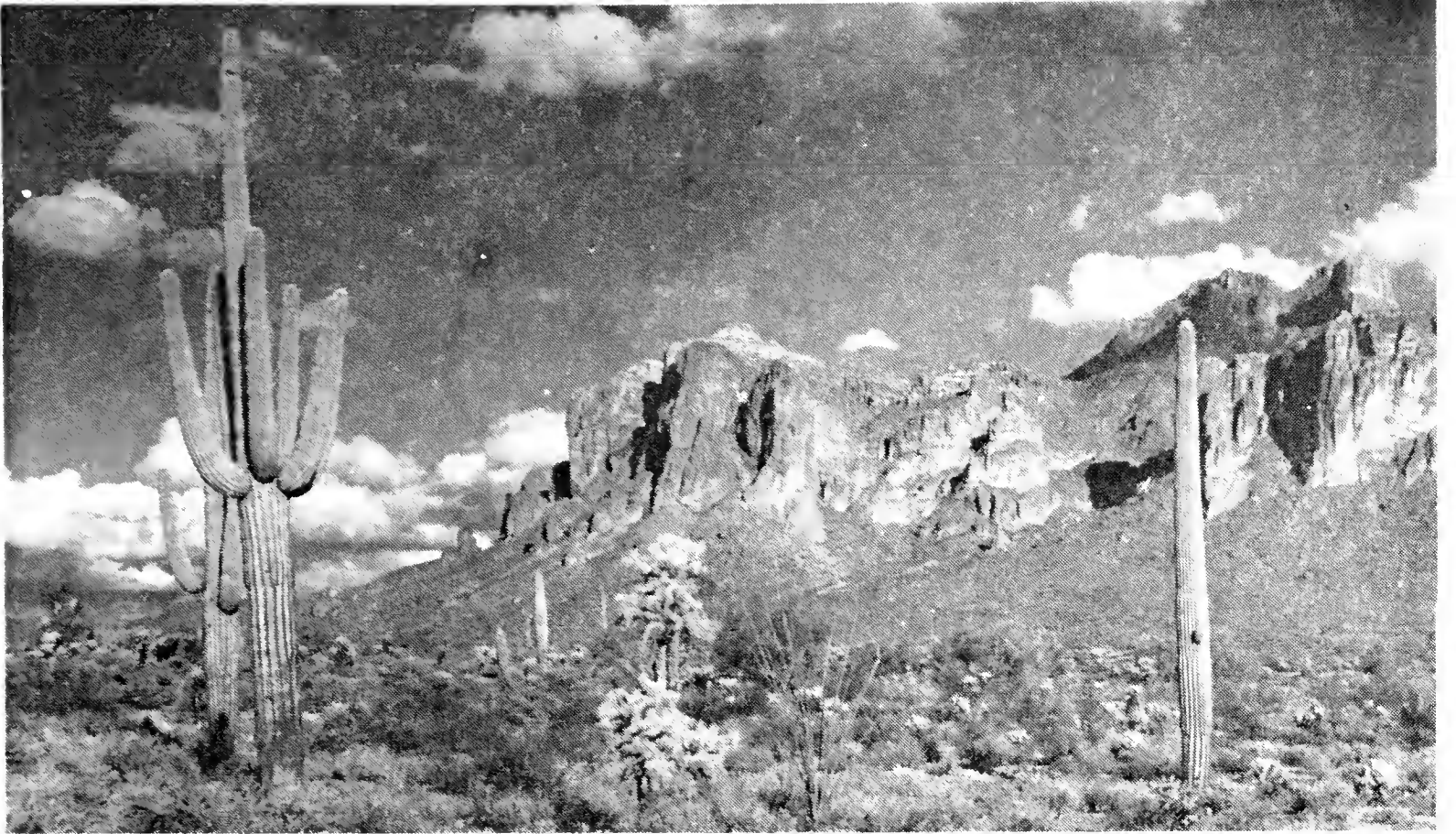
ON PROTECTING NATIVE PLANTS

From time to time, the Garden issues statements on its position regarding the collection of native plants; these statements have been published in the Saguaroland Bulletin. The illegal collection of Arizona's protected plants continues to be a serious problem. Seventeen cacti in Arizona, New Mexico, Texas and Oklahoma are listed as threatened or endangered under the Federal Endangered Species Act and more cacti will undoubtedly be added in the future. Federal laws are tough on violators and call for fines of up to \$20,000 and possible jail terms for those who disregard the laws that protect endangered species of plants. Arizona has tough laws, also, to protect its 212 protected plants. The first offense carries a maximum sentence of \$500 and 90 days in jail — with every plant in

possession a violation. The penalties on second offenses are much more severe. The Arizona Commission of Agriculture and Horticulture has jurisdiction over private, state and federal land, about 90,000 square miles.

It has been reported by Division Director, Richard Countryman, of the Arizona Commission, that 250,000 cacti are stolen from Arizona land each year, and that last year, an estimated \$1.8 million worth of protected plants were removed from Arizona soil and shipped out of the state. Statistics such as these are, indeed, distressing for individuals who value the natural beauty of Arizona's deserts.

Copies of the Arizona Native Plant Law or information relating to the law, may be obtained by visiting, writing or calling any Commission Office.



The desert, near Apache Junction, Arizona. Photo, Hobart Pribbenow

DESERT BOTANICAL GARDEN
STATEMENT OF POLICY
ON
COLLECTING NATIVE PLANTS

Indiscriminate removal of cacti and other plants from their native habitats to provide articles of food, landscape plants or collectors' items could lead to their extinction. The vast majority of plants so taken are removed carelessly and have little chance of reestablishment in an often totally different environment. The Garden recommends, instead, that people buy nursery-grown cacti, grow their own cacti from seed, or legally obtain plants from land development sites.

As an institution dedicated to the conservation of the flora of the arid regions of the world, the Desert Botanical Garden does not sell field-collected plants, i. e., plants removed from their native habitats.

The Garden also discourages the practice of collecting desert plants for food. In the past, Indians of the area relied on the desert flora and fauna for their subsistence. Today, the desert's food supply cannot support the vast number of people moving into desert areas. Instead, the Garden encourages consumers either to grow desert plants at home for use as food, or to buy desert plant products available commercially.

To obtain seed of desert plants to grow as food sources, contact the Desert Botanical Garden or a nursery specializing in desert plants. It is also permissible to collect seed of native plants in their habitat without a collecting permit; permission from the appropriate landowner is necessary. Check with the Arizona Commission of Agriculture and Horticulture for more details on these procedures.

FIELD COLLECTING IN THE HUALAPAI AND BLACK MOUNTAINS

By Wendy Hodgson, Horticulturist
Desert Botanical Garden

From June 6 to June 9, 1980, the author and Mary Butterwick, botanist with the Bureau of Land Management, and Debbi Hillyard, her assistant, participated in a field collecting trip to the Hualapai and Black Mountains. Mary and Debbi are working on an inventory of the plants of particular localities, such as the Hualapai, Vulture, and Aquarius Mountains of northwestern Arizona. The author was collecting for the Desert Botanical Garden Earle Herbarium.

Collections of plants were made and a list of the species collected was prepared. The status of each species was determined (i.e., if it was considered (1) sensitive, (2) threatened, or (3) endangered) based on collections and observations. The status of particular species of plants has been published in various reports (Ayensu and DeFilipps, 1978; Arizona Commission of Agriculture and Horticulture, 1977). After this most recent reevaluation, changes in status of particular species which occur in the localities that we inventoried, have been recommended.

The century plant, *Agave mckelveyana* Gentry, was previously declared as endangered (Ayensu and DeFilipps, 1978). Although its distribution is not extensive, we found populations of this plant that consist of many healthy individuals of different age classes. Therefore, this agave has been recommended for removal from the endangered list, based on our recent observations. Other species also appear now to be in no immediate danger. There is need, however, for further studies con-

cerning the distribution, critical habitat, phenology, and impacts (such as mining, grazing, and road construction) upon the populations of all species under critical observation by the BLM. Recommendations for the management of habitats, for the conservation, and recovery of a species or its populations are made on the basis of these studies.

The Hualapai Mountains are located about eight km southeast of Kingman in Mohave County and extend about 32 km in a north-south orientation. Relatively few botanists have studied the flora of these mountains extensively. Those who have include Jack Whitehead, E.R. Blakely, Bruce Parfitt, and Mary Butterwick.

Over 400 collections representing more than 100 taxa were made on this latest expedition and include cuttings and flowering or fruiting specimens for the Desert Botanical Garden and its herbarium, as well as for herbaria of other institutions. A prostrate cinquefoil, belonging to the genus *Potentilla* (Rosaceae) was collected and relocated by Mary and may prove to be a previously undescribed species. Other collections made on this trip include *Opuntia littoralis* (Engelm.) Ckll. var. *martiniana* (L. Benson) L. Benson, and *Opuntia whipplei* Engelm., the Whipple cholla. The type locality of the former species is in the Hualapai Mountains.

Collections of other species on the trip have extended their documented distribution. For example, the groundsel, *Senecio quercetorum* Greene, a species known only from Arizona, cited

as occurring only in western and southern Coconino County and in the mountains of Graham, Gila, and Pima Counties, is now known to occur in Mohave County.

Another collection made by Butterwick and Hillyard on this trip is a newly described variety of coryphantha, *Coryphantha vivipara* (Nutt.) B. & R. var., *buoflama* Fisch. & Butterw., found near Bagdad, Arizona, its type locality. Plants of this variety were given to the Garden and have been planted there recently.

The Black Mountains are extensive, ranging from south of Lake Mead, south to the Mohave Mountains, northeast of Lake Havasu City. Upon arriving at Fig Spring, we encountered its permanent spring-fed pond surrounded by cattails

and two large fig trees, the latter we thought to have been planted forty or more years ago. Steep canyons, streams, and occasional waterfalls occur in this very rugged but beautiful area. For hikers and collectors, it is slow going up the canyons; it took us twelve hours to cover only four miles.

The Black Mountains (specifically Sitgreaves Pass, four km west of Oatman) is the type locality of *Agave mckelveyana* Gentry. Here, this agave is fairly abundant and grows on dry slopes and along steep canyons; its flower buds were just beginning to open at the time of our visit.

Two notable collections that we made were a composite, *Dyssodia copperi* Gray, and a mint, *Monardella arizonica*



A volcanic plug located at the outskirts of canyons in the Black Mountains, Mohave County, Arizona. Photo, Wendy Hodgson.



Hualapai Peak, elevation 2520 m, Hualapai Mountains, Mohave County, Arizona. Photo, Wendy Hodgson.

Epling. The dyssochia is an attractive plant with large heads of yellow-orange ray florets. The species ranges from Hackberry to the Colorado River in Arizona, into southern Nevada and southeastern California.

Collections of the white-flowered mint, *Monardella arizonica* Epling, have been relatively few. It is known only from Arizona and occurs near the Santa Maria River, Sierra Estrella Mountains (type locality), the Silver Bell and Quijotoa Mountains, the Kofa Mountains, and the Black Mountains. The author has collected this species in the Kofas where plants of it were small and depauperate, and clung close to the rocks. Here in the Black Mountains very large, robust plants (up to one meter in height), with many ascending branches terminated by white-flowered heads, grow among rocks in large washes.

On the return trip to Phoenix, we visited a population of an interesting prickly pear species, *Opuntia curvospina* Griffiths. Cuttings of flowering pads were taken for propagation at the Garden. This species was originally described by Griffiths in 1916. Of interest, is that it has been included in *Opuntia chlorotica* by Britton and Rose (1919-1923) and in the *Opuntia phaeacantha* complex by Benson (1969). In 1973, Pinkava, et. al. suggested that *Opuntia curvospina* is of hybrid origin that involves a cross between *O. phaeacantha* Engelm. and *O. chlorotica* Engelm. & Bigel. It has a relatively limited distribution, ranging from Searchlight to Nipton, Nevada (type locality); in isolated populations, including the population that we examined northwest of Aguila, Yavapi County, *Opuntia curvospina* is found growing with *O. chlorotica*.

IN BRIEF

NEW EDUCATION DIRECTOR

Sue Hakala has been appointed the new Education Director for the Desert Botanical Garden. Sue holds a B.A. in Art Education and an M.A. in Art, with special emphasis in pottery, from Governors State University in Illinois. Prior to joining the Garden Staff, her most recent position was with the City of Mesa Performing and Visual Arts Department where she served as the Chairman of the Fiber Department. Sue's teaching experience includes five years with the suburban public schools in Chicago, Illinois.

The use of fibers in weaving, spinning, basketry, natural dyeing, and papermaking has intrigued Sue Hakala for the three years that she has lived in Arizona. Her work appears in galleries and in private collections; she took first place honors for handspun silk at the Arizona State Fair in 1979.

In her position at the Garden as Education Director, Sue replaces Sylvia Forbes who has returned to Arizona State University as a full-time student in the Master's Degree Program in botany.

GARDEN CREATES POSITION OF RESEARCH ASSOCIATE

The Desert Botanical Garden has extended the newly-created position of Research Associate to Ruth Greenhouse of Tempe, Arizona. The responsibilities of the position include technical assistance with the development of an ethnobotanical display area at the Garden and with related interpretive materials on the ethnobotany of the world's arid regions, particularly southwestern United States. The position does not include a stipend, but it does include

benefits and privileges of a part-time member of the Staff.

Ruth Greenhouse is well-known at the Garden for her presentation of the popular courses on the subject of cooking with native plants. She has an extensive education in nutrition and holds a B.S. degree in Food and Dietetics from Arizona State University, and an M.S. in Human Nutrition, also from Arizona State. Ruth's work experiences include serving as Biographical Research Assistant on dry-farming and American Indian usage of Sonoran Desert plants, for Dr. Merbs, Department of Anthropology, A.S.U., and teaching at the Desert Botanical Garden. The topic of Ruth's Master's thesis is traditional Pima and Papago foods.

ANPS EVENTS

Marc Mittleman, President of the Phoenix Chapter of the Arizona Native Plant Society, has announced the following program for the next three meetings:

October 13, 7:30 p.m. — *Navajo Plant Medicine*, Barbara Lacy, speaker.

November 8, 8:00 a.m. — A trip to one of the Valley wholesale growers who stocks drought-tolerant and native plants.

November 10, 7:30 p.m. — *New Crops Applied Science and Technology*, Lyle McGill, speaker.

The two lectures will be held in Webster Auditorium. Those attending the trip to the nursery on Saturday, November 8 will meet at the Garden, or join the group at V & P Nursery at 8:30 a.m. For further information on these events or on the ANPS, contact Marc Mittleman at the Garden.

EAGLE SCOUT PROJECTS

This past summer, the Garden was fortunate to have been the site for two Eagle Scout service projects, the installation of a rabbit-proof fence and the rock border on a section of the Quail Run Path. Matt Reed, Eagle Scout candidate from Troop 442, coordinated the efforts of six Scouts in the installation of one-fourth mile of fence. The newly completed section constitutes a major barrier against rabbit-entry into the Australian Section of the Garden. The volunteer work of the Scouts on this project totaled 101 hours.

The installation of rock border on a section of the Quail Run Path was coordinated by John Norling, Eagle Scout candidate from Troop 6. The 75 hours of volunteer time that the six Scouts totaled on this project has helped the Garden complete a major trail extension project. In their work at the Garden this summer, the Scouts not only completed the various required phases for their projects, but they also volunteered an additional 100 hours beyond their badge requirements.

CHILDREN'S NATURE WORKSHOP

A Children's Nature Workshop was held at the Garden during the week of July 28 through August 1. Fifteen children from ages 7 through 9 arrived at the Garden at 8:30 for a learning experience that included dyeing yarn, identifying poisonous and edible plants, and learning about desert animals, minerals and rocks.

The children participated in games and crafts, enjoyed slide shows and a trip to the Arizona section of the Phoenix Zoo. During these activities that lasted until noon each day, the children had the opportunity to take nature walks through the Garden.

The Workshop was coordinated by Mary Fulton, Education Assistant, who was assisted by Garden Volunteers Ginny Coltman, Beau Amberg, and Ross Berkeimer who is also on the Garden Staff. Also assisting Mary was Sylvia Forbs, Staff; Khrybel Amberg, Dorothy Shouse, Ruth Thurber and Josselyn Bebee helped serve daily refreshments to the children.

A NEW GARDEN EVENT

Family Day at Desert Botanical Garden, held on Monday, September 1, Labor Day, proved to be a very successful "new event" for the Garden. Children 12 and under were admitted free of charge when accompanied by an adult, and were treated to a variety of special activities such as an appearance of Sammy Saguaro, a free cactus per child, a drawing and writing contest on "What I Liked Best About The Desert Botanical Garden," an opportunity to construct seed and pod pictures, and a seed potting experience. Girl Scout Troops 20, 27, 625, and 1221 conducted special guided tours under the direction of Garden Volunteers Nancy Rheinlander and Jean Cordts. The event was coordinated by Garden Education Assistant, Mary Fulton.

Ed Bradford of *Good Morning Phoenix* on KTVK-TV, Channel 3, served as judge for the drawing and writing competition. Prizes of potted cactus were awarded to the top five winners in each category. Over 250 children visited the Garden to enjoy their last holiday before they returned to school.

NEW RICHTER MEMORIAL LIBRARY HOURS

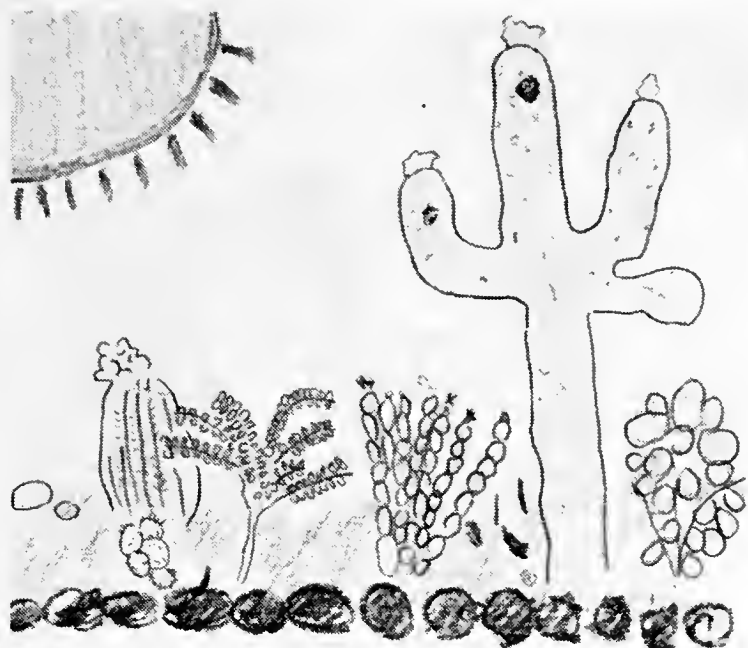
Monday, Wednesday, Friday: 9 a.m. to 1 p.m.

Tuesday, Friday: 1 p.m. to 5 p.m.

Other hours by appointment.

WHAT I LIKED BEST AT THE DESERT BOTANICAL GARDEN

Family Day, September, 1980



*Drawing by Emily Flanagan, Grade Five,
Hobokam Elementary School, Scot-
tsdale, Arizona.*



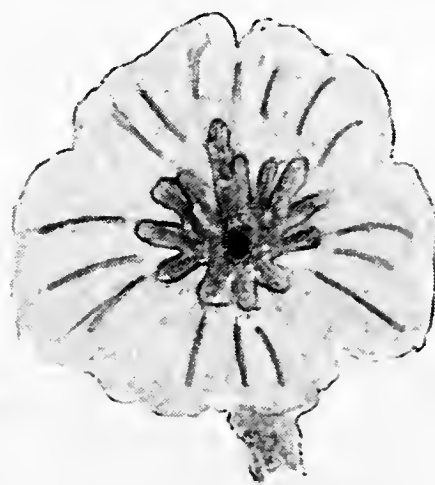
The best thing I liked about the garden is I got to meet Sammy Saguaro. He told me that he took off his roots and put on his feet. He said he took off his spines so he would not prick anyone. He was nice.

*Mindy Greeley, Grade Four, Tempe,
Arizona.*



I liked seeing the different kinds of cactus and plants, and seeing all the green things. I had fun modeling clay, planting seeds, and making seed pictures, and drawing a picture of what I liked about the garden. I like my plant that they gave me and I liked meeting Sammy Saguaro and seeing Ed Bradford. I'm very glad I came.

*Merrie Lisa Greeley, Grade Seven, Fees
School, Tempe, Arizona.*



*Brian McKay, Grade Eight, Phoenix,
Arizona.*



DESERT BOTANICAL GARDEN

PO. BOX 5415
PHOENIX, AZ. 85010

Garden Events

OCTOBER

- 18 **Plants for Desert Landscapes** — A one session workshop that introduces the wide range of plant materials available for desert landscaping. Saturday; 8 a.m. to noon.
- 21 **The Deserts of Arizona** — Basic course on the plants and animals of the Arizona deserts. Three Tuesday sessions: 7 p.m.
- 23 **Desert Landscaping** — The fundamentals of designing a creative desert landscape. Knowledge of desert plants is recommended prior to taking this course. Four Thursday sessions: 7 p.m.
- 25 **Growing Plants from Bulbs** — A one-session workshop of planting, growing, and caring for bulbs, both indoors and outdoors. Saturday: 9 a.m. until noon.

NOVEMBER

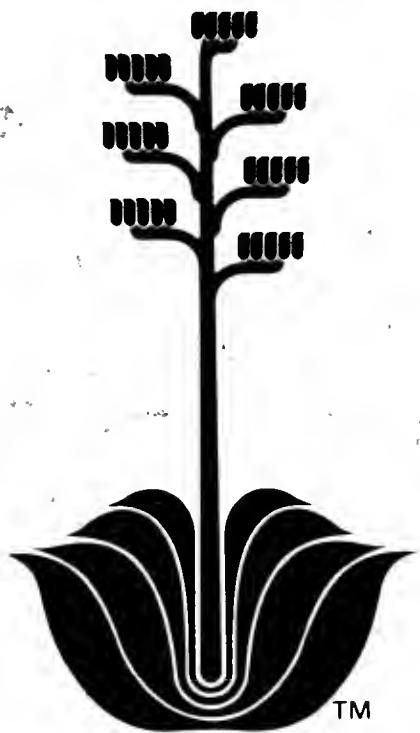
- 1 **Castle Hot Springs** — A field trip to view native plants and other flora in the foothills of the Bradshaw Mountains. Saturday: 8 a.m.
- 14- **Superstition Mountains** — A two-day backpacking trip through the Superstition Mountains.
16 Friday, 5 p.m. through Sunday p.m.
- 21 **Members' Preview, "Delight and Truth: Botanical Artists Through Four Centuries"** — An Opportunity For Members to Preview the Garden's Third Botanical Illustration Exhibition. Friday: 6 p.m. to 8 p.m.
- 22- **"Delight and Truth: Botanical Artists Through Four Centuries"** — An exhibition of botanical prints and originals from the 17th century to the present. Daily: 9 a.m. to 5 p.m.
30

The Garden is open every day of the year from 9 a.m. to sunset



Saguaroland Bulletin

NOVEMBER, 1980



**DESERT
BOTANICAL
GARDEN**

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Realistic Manner 125

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drawing of *Cactus grandiflora* (*Cereus sp.*),
from the Garden's botanical print collection.
See page 124.

ANNUAL MEMBERSHIP:

Individual	\$ 15.00
Family	\$ 20.00
Sustaining	\$ 50.00
Subscribing	\$100.00
Supporting	\$250.00 or more

Corporate Memberships available in several categories.

Director	Charles A. Huckins, Ph.D.
Research Botanist	Howard S. Gentry, Ph.D.
Curator of Herbarium	J. Harry Lehr
Curator of Living Collections	Victor Gass
Business Manager	Janice Moats
Education Director	Sue Hakala
Publications Director	Shirley Deacon
Artist	Wendy Hodgson
Plant Propagator	Marc Mittelman
Gift Shop Manager	Lynn Trainum
Maintenance Superintendent	Ross Berkheimer
Librarian	Jan Loechell
Research Associate	Ruth Greenhouse

Horticultural Staff: Donald Conner, Steven Heslep, Wendy Hodgson, Nichole Holler, James McEnaney, Patrick Quirk. Gift Shop Staff: Robyn Moats, Anna Shelstad, Clare Thomson, Lela Turner. Office Staff: Tracy Peterson, Diane Pitcher. Education Assistant: Mary Fulton.

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TRUSTEES OF THE DESERT BOTANICAL GARDEN. Officers: Chairman of the Board, John Rhuart. President, Henry C. Triesler, Jr. First Vice President, Donald W. Hutton. Second Vice President, Lillian Diven. Secretary, Lillian Mieg. Assistant Secretary, Emelia La Tempa. Treasurer, Alice Feffer. Assistant Treasurer, John Daniels. Members: Frank M. Feffer, Thomas A. Goodnight, John Graham, Frank Hennessey, Marsha Jacobs, Naomi Kitchel, Mary Lyon, Eric Maxwell, Mildred F. May, Charles F. Merbs, Duncan T. Patten, Bruce D. Pingree, Donald J. Pinkava, Mrs. Paul Singer, John F. Swift, William L. Wingate, Jr.

THE BOTANICAL PRINT COLLECTION AT THE DESERT BOTANICAL GARDEN

An Interview with Lillian Diven

Q. The Desert Botanical Garden has a collection of original botanical art and botanical prints that numbers over 500 works. How did the Garden acquire such a collection?

A. Most of the collection came to the Garden during 1970-71, from the late Max Clemens Richter. The Garden also received works from the late Alexander Moir, the estate of William Bright, and the estate of Rose Collum, among others. The Garden has no record of the dates of the Moir and Bright gifts, but we do know that the books and prints from the Collum estate were presented to the Garden in March, 1958.

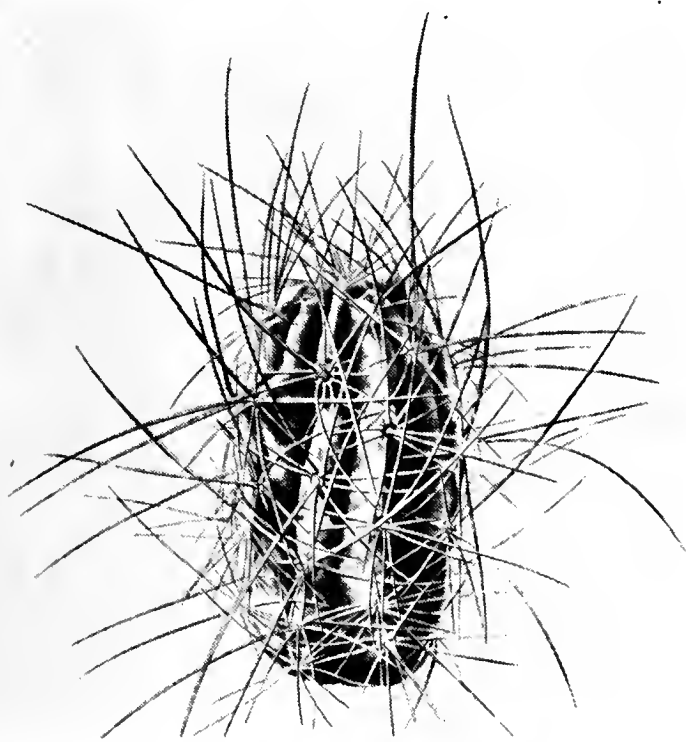


Plate No. 46, *Cereus stramineus*, from *The Botanical Works of the Late George Engelmann, 1887. From The Richter Memorial Library, Desert Botanical Garden.*

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The works of Pierre-Joseph Redoute (1759-1848) are beautiful in the technique of pure watercolor subtly graded, but with sparing use of body-color to suggest sheen. The Garden has a number of Redoute's prints from Candolle's *Histoire des plants grasses*, a historic work on succulents.

Q. What is important about the Garden's collection of botanical art?

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A great variety of techniques was used to produce these prints, which in-

clude woodcuts, etchings, copper engravings, steel engravings, mezzotints, lithographs, and some examples represent a combination of techniques. A large number of prints in the Garden's collection are hand-colored.

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One of the prints from the Garden's collection that will be on display is entitled Sedum Spurium Album.

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By Wendy Hodgson, Artist
Desert Botanical Garden

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THE SUBJECT: The botanical models for plant illustrations are prepared primarily from dried, usually mounted plant specimens, or, less often, from fresh plant material, photographs, and slides. Although fresh material is easier to illustrate, these specimens, with the exception of succulents, dry out and change shape and size in a relatively short time. When illustrating from the mounted, dried herbarium specimens, it is important not to damage the specimen. With herbarium material one must be able to produce an accurate three-dimensional representative of that species from a two-dimensional, dried plant specimen. Dried flowers are boiled in dishwashing detergent and water to soften the tissue and "relax" them,

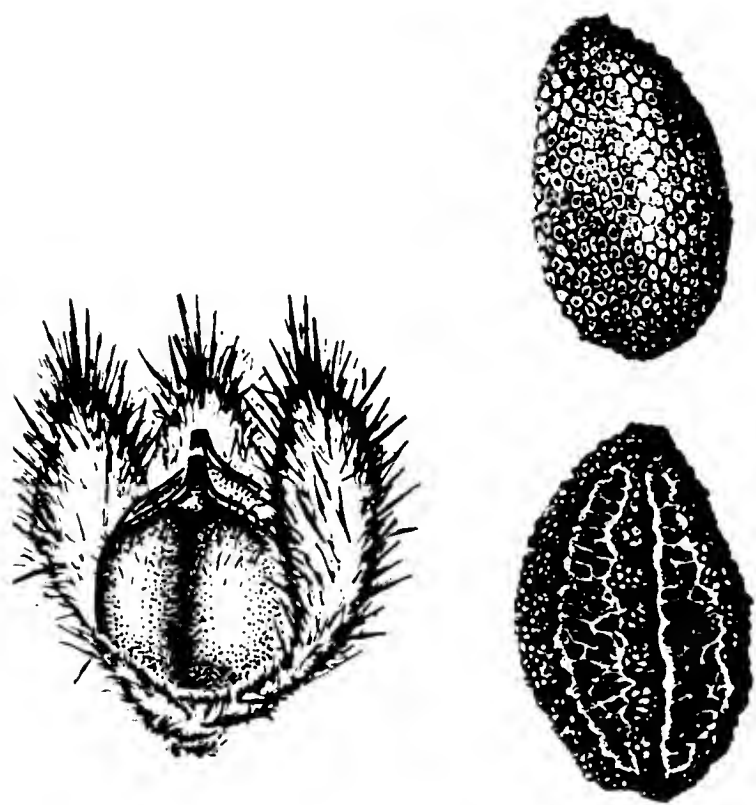
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Before beginning a drawing, I consider the type and quality of the method in which it will be reproduced for publication. It has been my experience to spend hours of work on very fine shading, only to see the finished plant reproduced in such a manner that the original quality was lost.

Planning the layout of an illustration by utilizing the space on the paper in an effective, esthetically pleasing and clear manner is an early consideration in producing a drawing. It is important to group related plant parts. For example, seed should be drawn near fruit; if a portion of the seed is enlarged to show surface texture, it should accompany a rendering of the whole seed.



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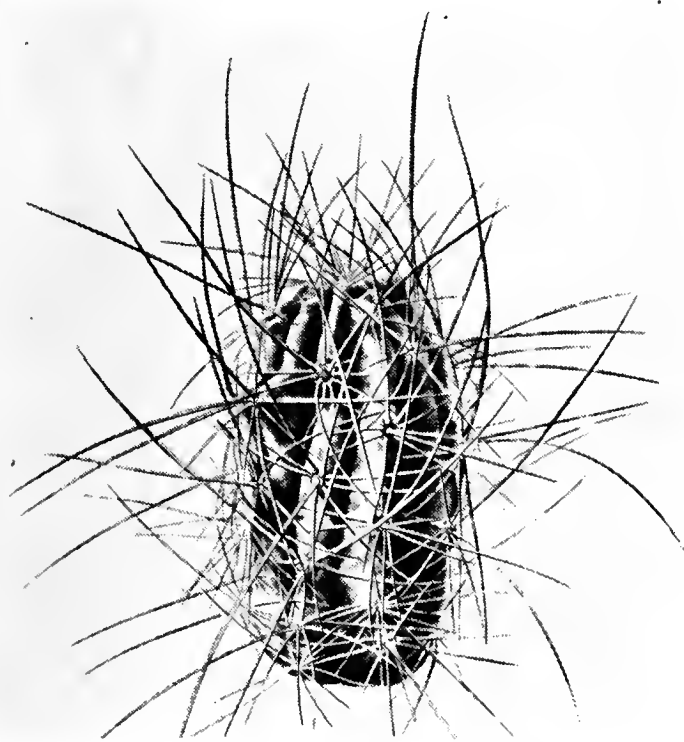


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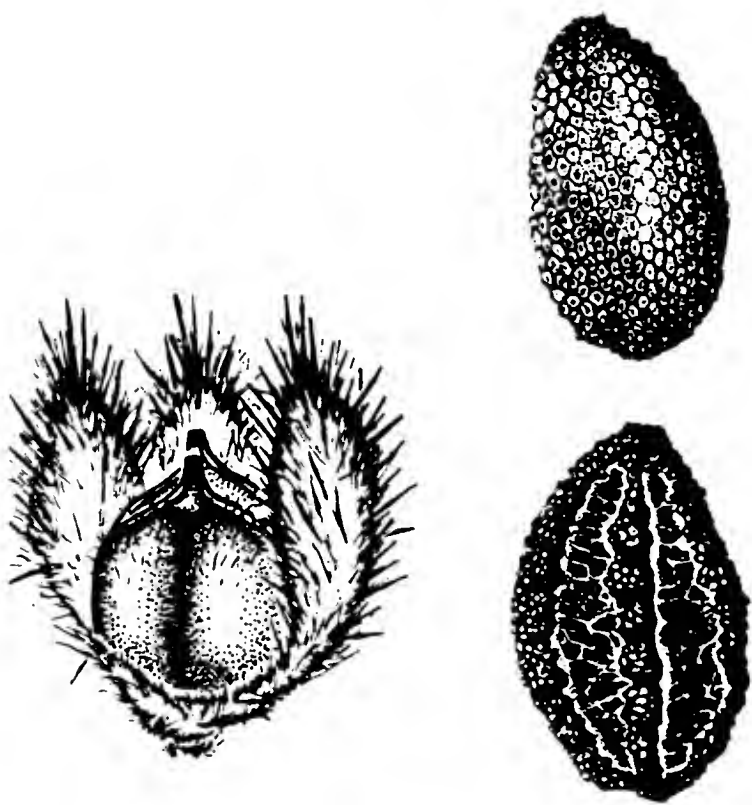
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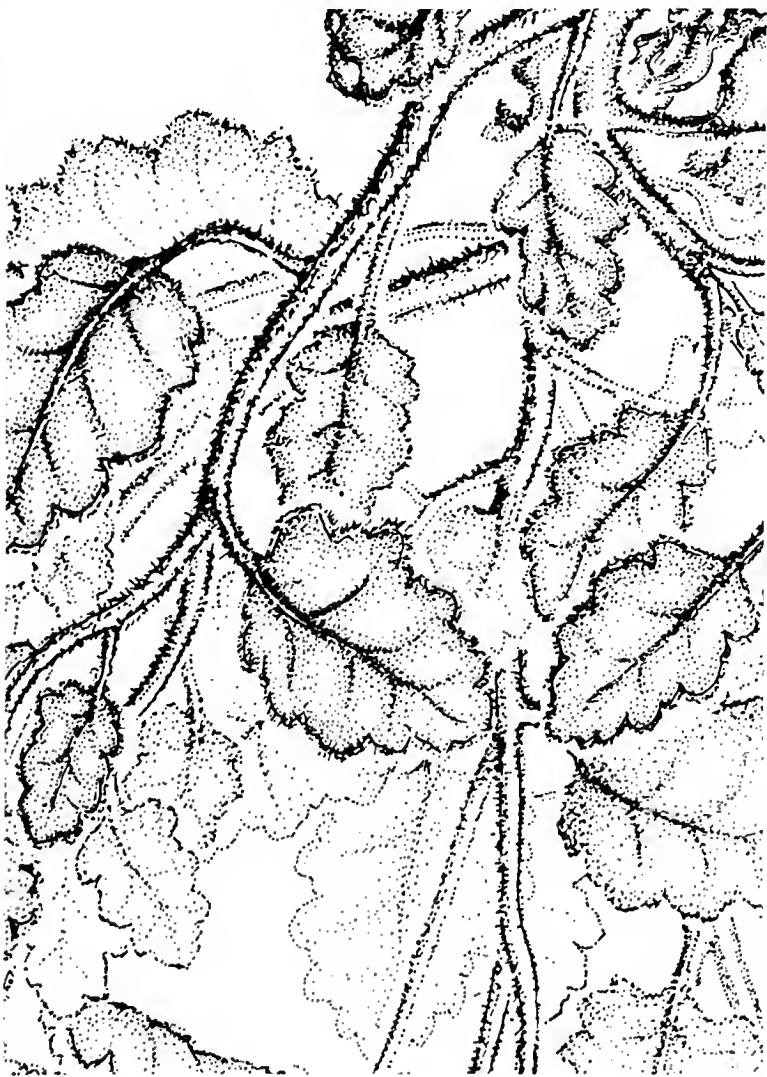
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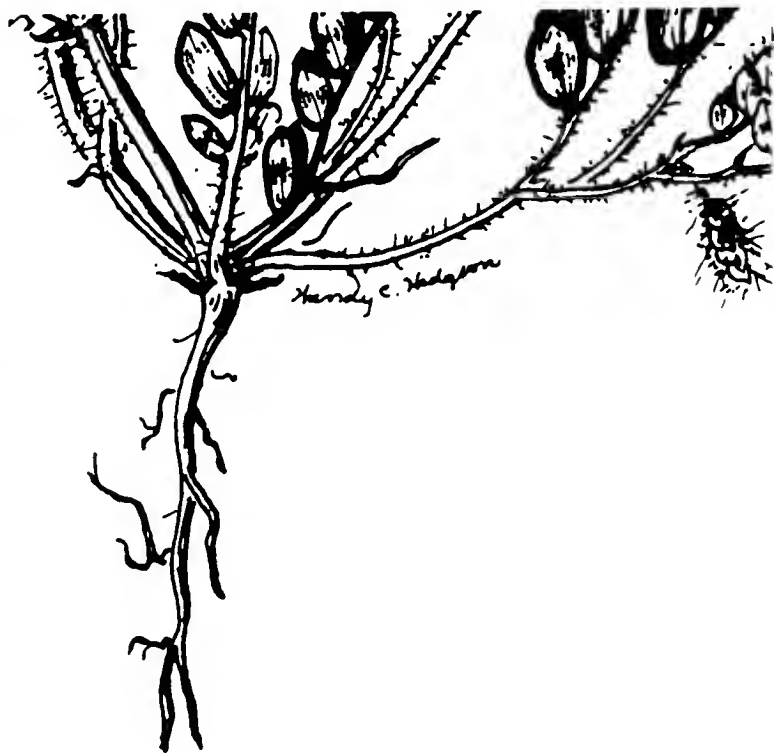
For most shading, I use a size 0x3 or 0x4 rapidograph point, a 0x5 size point for showing pubescence, and points ranging in size from 0x2 to 2 for outlines. Different degrees of shading may be accomplished by altering the number, size, and spacing of stipples or lines. To avoid smearing and bleeding of the ink as a result of skin oil and perspiration, I use a piece of tracing paper placed under my drawing hand.

There are additional ways to give a plant specimen a three-dimensional look. For instance, if one stem or leaf is behind another, I show the relative distance between the two leaves by the amount of break in the line. In other words, the outline of one leaf behind should not meet the outline of the leaf in front. When possible, shadows are included but they must be used consistently.



After the illustration is complete, a simple scale is drawn on each portion of

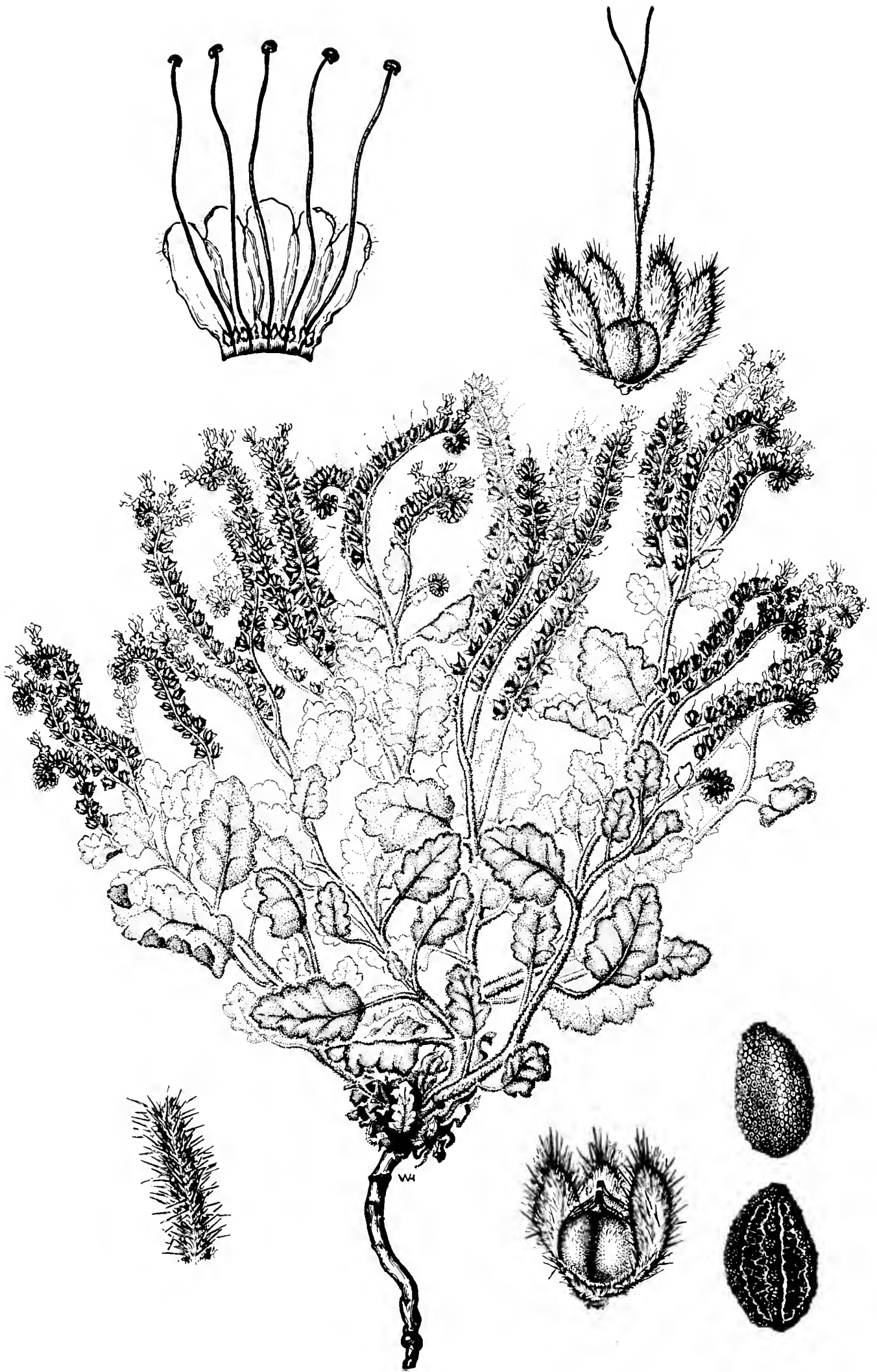
the illustrated plate. Some botanical journals require a standard scale, so a check of the journal style is recommended. A final touch is to remove all pencil lines with a kneaded eraser. The client's collection number and date of completion are added in pencil; the artist's signature is inscribed in ink.



A botanical artist constantly needs to refer to the client's description of the plant. Notes need to be kept when measuring and drawing the plant, and noteworthy observations or discrepancies brought to the client's attention.

If the illustration is of a newly described species, the original art or a good reproduction becomes part of the type collection, i.e. the formal documentation for the name and description of a species new to science, and is recorded as such. As a rule, I always have a slide made of my art work for a personal portfolio.

Botanical illustration demands a good eye, illustrating ability, knowledge of taxonomy, and a great deal of patience and perseverance. It is both a science and an art, perfectly meshed, and creates both a taxonomically accurate and artistic rendering of the plant.



Wendy Hodgson's drawing, Phacelia Marshall-Johnstonii Pinkava & Atwood, a new gypsophilous species from Coahuila, Mexico. Reproduced with permission from Dr. Donald J. Pinkava, Arizona State University.

CASSIAS

By Vera Gamet

Cassias range all the way from dry little roadside plants to handsome flowering shrubs and trees. They belong to the vast Leguminosae, or Pea Family with 13,000 species, the second largest of 300 families of the flowering plants. Specifically cassias belong to one of the three great subfamilies of legumes, the Caesalpinioideae, or senna subfamily:

The handsome *Caesalpinia cacalaco* standing outside the wall of the Desert Botanical Garden patio, is included in this family. It stops all visitors even in its declining bloom. Also included are the flowering palo verdes, *Cercidium floridum* and *C. microphyllum*, the Mexican palo verde, *Parkinsonia aculeata*, the bird of paradise shrub, *Caesalpinia gilliesii*, and the many, yellow-blooming cassia bushes (*Cassia* spp.) which herald the beginning of the spring succession of desert flowers, even as early as December.

Cassias are a large genus in themselves, mostly tropical and subtropical, widely distributed in both the Old and New Worlds, particularly in North America. Over 450 species are distributed over the arid and semiarid deserts of Australia, New Zealand, South Africa and North America. Kearney and Peebles in "Arizona Flora," list nine native species in Arizona at altitudes from 300m to 1500m.

Australia is an increasingly important source for supplying attractive shrubs and trees well-adapted to arid-land horticulture.

Silvery Cassia, *Cassia artemisioides* (aromatic, grayish in color like European wormwood), is one of our most beautiful imports displaying masses of sulphur-yellow flowers, which have contrasting

chocolate colored stamens, commencing early in December, in full bloom by February and lasting into April. *C. artemisioides* is a bushy shrub with feathery leaves of dusty silvery-green, an excellent color that promises survival on the desert. The alternate leaves are compound with three pairs of opposite leaflets, so slender they look like pine needles. The leaflets are channeled on top, fairly rigid to the touch and covered with minute, silky gray hairs that perform their desert duty of retarding transpired moisture from the plant.



A Caesalpinia cacalaco, in bloom outside the wall of the Desert Botanical Garden Patio.

The evergreen silvery cassia is one of our more heat-resistant shrubs. It is native to eastern and central Australia, from the Eyre Peninsula, which juts into the Indian Ocean, to the far north of the continent. Over this vast range it coexists with four or five other cassia species, with mulga (shrub acacia) of which *Acacia aneura* (in the Australian section of the Garden) is a dominant species. The habitat is hot and dry, characterized by long droughts and occasional brief, torrential cloudbursts with rapid runoff.

The five-petalled yellow flowers of *C. artemisioides* are 2.5cm wide, they appear in racemes or panicles, but sometimes are solitary in the leaf axil. They are moderately irregular with spreading, nearly equal petals, somewhat overlapping, with the uppermost petal on a slightly longer claw and positioned inside the remainder of the petals of the corolla, much in the manner of the "flag" or "banner" petals of the related palo verdes. There are ten stamens, three of which may be without anthers. The shiny brown seed pods form thickly and are 5cm to 7.5cm long, flat, and thin tissued. They are highly attractive in dried arrangements. *Cassia artemisioides* is altogether a satisfactory garden plant.

Cassia eremophila, or desert cassia, is found in the "Little Desert" section of Australia, near Kista, Victoria. It is a shrub that grows to about 2m and has finely divided leaves. It resembles *C. artemisioides*, but has green leaves instead of gray.

Cassia sturtii, another native of the Australian deserts, is sometimes preferred for its larger inflorescence, its longer blooming period and its neater appearance. *C. sturtii* is a bushy shrub, frequently glaucous-hoary or whitish in ap-



Flower of Cassia covesii, a popular landscape plant for desert gardeners.

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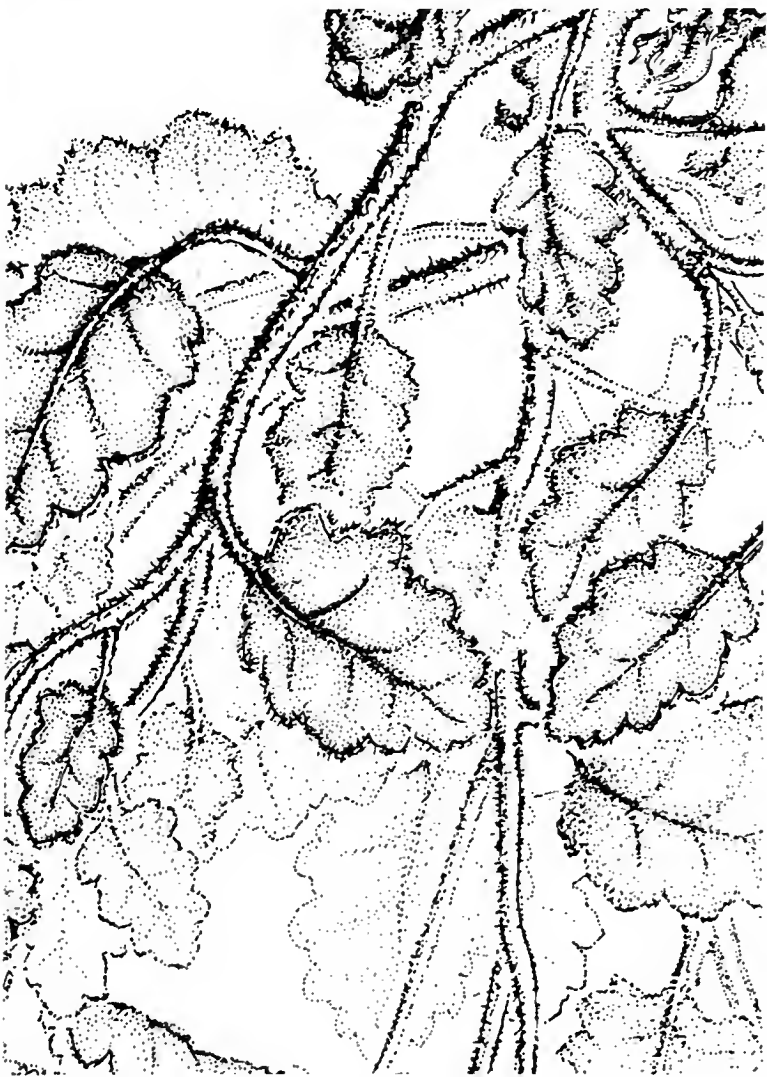
The plant was named to honor an early explorer of the uncharted center of Australia. The names of the men who in the early nineteenth century explored central Australia are not largely known outside the continent, but they were heroes in their own time and in their own place. Their accomplishments in spite of pain, thirst, exhaustion, hunger and harrassment caught the public imagination. Today their names persist primarily because of the plants and animals they found, and in the names of mountains, rivers, deserts which often swallowed up their hopes and lives.

Captain Charles Sturt especially captured the public imagination. There is the Sturt Desert, the Sturt Pea, *Cassia sturtii*, and so on.

● Although certain floristic relationships exist with the flora of South Africa, the flora of Australia can be compared with no other in the world.

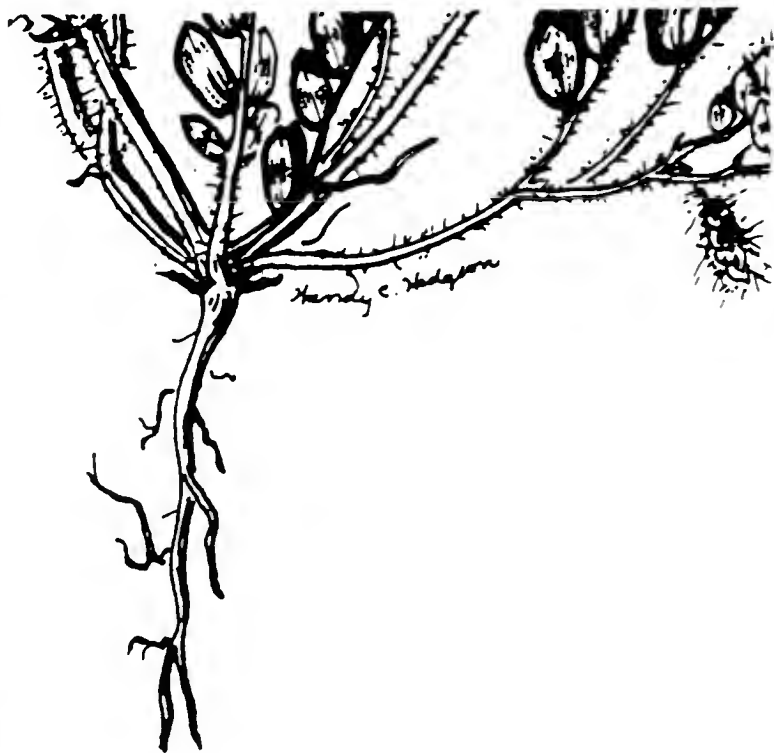
For most shading, I use a size 0x3 or 0x4 rapidograph point, a 0x5 size point for showing pubescence, and points ranging in size from 0x2 to 2 for outlines. Different degrees of shading may be accomplished by altering the number, size, and spacing of stipples or lines. To avoid smearing and bleeding of the ink as a result of skin oil and perspiration, I use a piece of tracing paper placed under my drawing hand.

There are additional ways to give a plant specimen a three-dimensional look. For instance, if one stem or leaf is behind another, I show the relative distance between the two leaves by the amount of break in the line. In other words, the outline of one leaf behind should not meet the outline of the leaf in front. When possible, shadows are included but they must be used consistently.



After the illustration is complete, a simple scale is drawn on each portion of

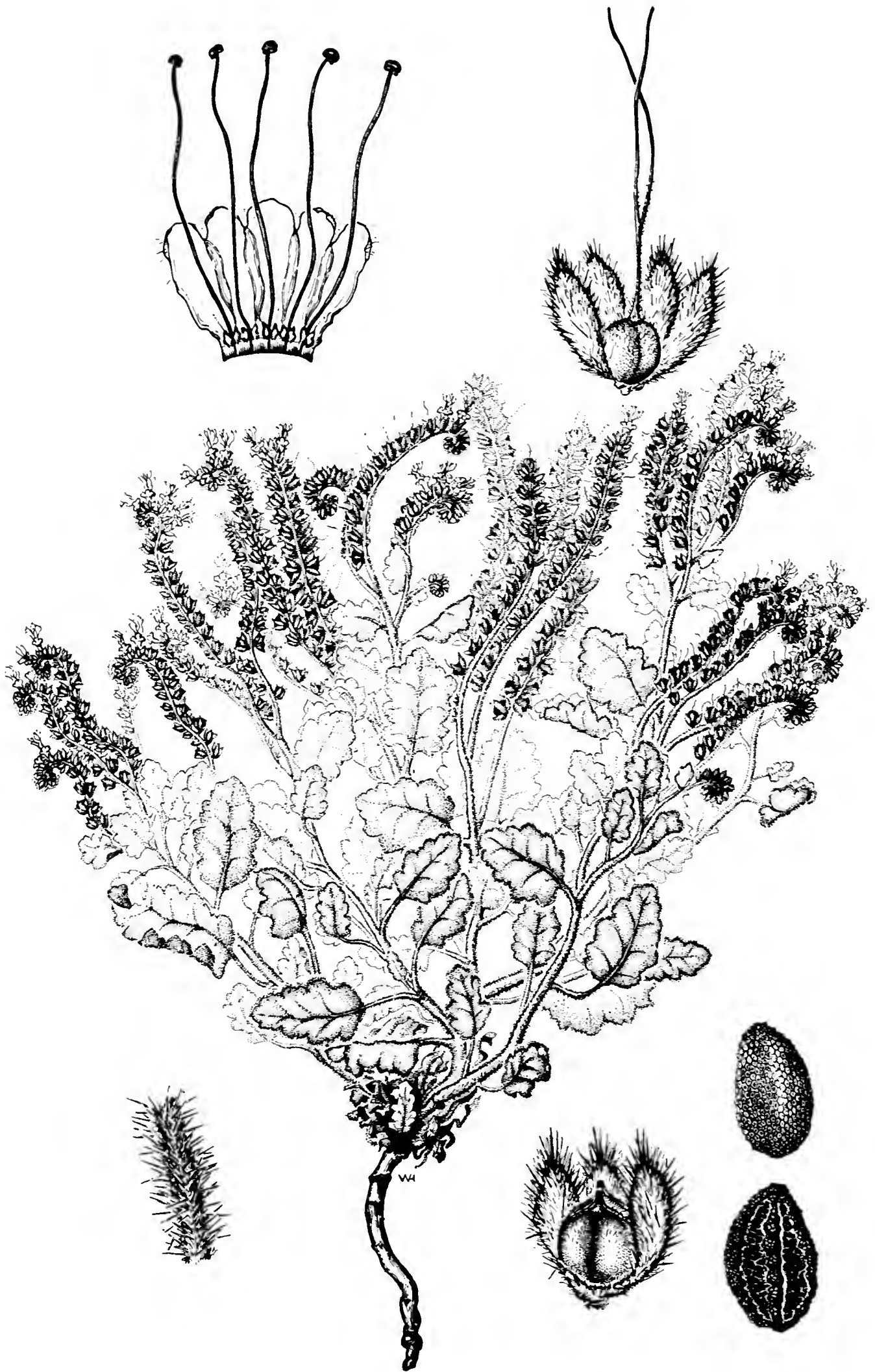
the illustrated plate. Some botanical journals require a standard scale, so a check of the journal style is recommended. A final touch is to remove all pencil lines with a kneaded eraser. The client's collection number and date of completion are added in pencil; the artist's signature is inscribed in ink.



A botanical artist constantly needs to refer to the client's description of the plant. Notes need to be kept when measuring and drawing the plant, and noteworthy observations or discrepancies brought to the client's attention.

If the illustration is of a newly described species, the original art or a good reproduction becomes part of the type collection, i.e. the formal documentation for the name and description of a species new to science, and is recorded as such. As a rule, I always have a slide made of my art work for a personal portfolio.

Botanical illustration demands a good eye, illustrating ability, knowledge of taxonomy, and a great deal of patience and perseverance. It is both a science and an art, perfectly meshed, and creates both a taxonomically accurate and artistic rendering of the plant.



Wendy Hodgson's drawing, Phacelia Marshall-Johnstonii Pinkava & Atwood, a new gypsophilous species from Coahuila, Mexico. Reproduced with permission from Dr. Donald J. Pinkava, Arizona State University.

CASSIAS

By Vera Gamet

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IN BRIEF

NEW GARDEN LIBRARIAN

Jan Loechell has assumed the duties of Librarian at Desert Botanical Garden. Jan holds a Master of Arts degree in Librarianship from the University of Denver, and a Bachelor of Arts degree in Physical Anthropology with a minor in biology from the University of Colorado at Boulder. Her previous library work experience includes Hayden Library at Arizona State University, the Medical Library at Arizona State Hospital, Penrose Library at the University of Denver, and as a volunteer at the Phoenix Public Library. Jan, a native of Glen Ellyn, Illinois, is presently taking biology courses at ASU.

Jan's hours at the Garden will coincide with the new library hours of 9 a.m. to 1 p.m. on Monday, Wednesday and Friday, and from 1 p.m. to 5 p.m. on Tuesday and Thursday.

Becky Henry resigned her position as Librarian at the Garden in September in order to start a family. The Garden extends best wishes to Becky and her husband on the event of the birth of their first child.

PLANT SALE A SELL-OUT

The Garden's Fall Plant and Seed Sale was a success by the most conservative evaluation. By the time the sale opened at 9 a.m., a line of plant buyers had already queued up at the gate. By noon, most of the container plants had been sold out and orders taken for additional plants. Sales in seeds, however, continued to be brisk throughout the day. There were many reasons for the success of the sale: weather, increased awareness that fall is a great time to plant

seeds and plants, publicity, increased interest in arid land plants, and the hard work of the horticultural staff.

Buyers who were able to select plants of their choice were rewarded with beautiful, quality specimens.

GARDEN PARTICIPATES IN ALL-AMERICA CITY AWARD

Phoenix Mayor Margaret Hance declared the week of September 21 through September 26 as a special week to celebrate the city's receipt of the All-America City Award. To climax the week-long activities a special luncheon to acknowledge the award was held at Civic Plaza on Friday, September 26. On Thursday, the Desert Botanical Garden joined other area museums and organizations in Patriot's Park in setting up special exhibits that represented each organization's activities. Garden volunteers Mary Bess Mulhollan and Doris and Dixon Nichols answered questions about assorted kinds of cacti and succulents displayed in pots and distributed literature about the Garden and about Garden programs. At the Friday luncheon, attended by civic leaders and guests, small cacti, provided by the Garden, made up a portion of the table centerpieces.

ARID-ZONA LANDSCAPING CONTEST

Judging for the Arid-zona Landscaping Contest has been completed and winners have been notified. This year's contest was a success with over 40 entries, many of which exemplify the concept of desert landscaping. Full details of the contest will appear in next month's *Saguaroland Bulletin*.



DESERT BOTANICAL GARDEN

PO. BOX 5415
PHOENIX, AZ. 85010

Garden Events

NOVEMBER

- 14 **Superstition Mountains** – A two-day backpacking trip through the Superstition Mountains.
16 Friday, 5 p.m. through Sunday p.m.
21 **Members' Preview, "Delight and Truth: Botanical Artists Through Four Centuries"** – An Opportunity for Members to preview the Garden's Third Botanical Illustration Exhibition. Friday: 6 p.m. to 8 p.m.
22 **"Delight and Truth: Botanical Artists Through Four Centuries"** – An exhibition of botanical
30 prints and originals from the 17th century to the present. Daily: 9 a.m. to 5 p.m.

DECEMBER

- 3 **Holiday Decorations** – Construct holiday decorations of dried, native, and easily collected plant materials at the morning or afternoon workshop. Morning, 9 a.m.; afternoon, 1 p.m.
4 **Deluxe Holiday Decorations** – Elaborate holiday decorations of some less common dried, native plant materials can be constructed at the morning or afternoon session. Morning, 9 a.m.; afternoon, 1 p.m.
9 **Luminaria Night** – See the Garden lighted with hundreds of traditional Southwest luminaries. Holiday music and refreshments. Tuesday, 6 p.m.-9 p.m.
10 **Christmas on the Desert** – Activities, special weekend events and holiday displays, Daily, 9 a.m. 5 p.m. through Wednesday, December 24.
13 **Box Canyon** – A field trip to an area southeast of Florence to explore the flora of a deep desert canyon. Saturday, 8 a.m.

The Garden is open every day of the year from 9 a.m. to sunset.



Saguaroland Bulletin

DECEMBER, 1980



**DESERT
BOTANICAL
GARDEN**

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Cover: Luminarias light Garden paths and buildings for Luminaria Night celebration at the Desert Botanical Garden in December.

ANNUAL MEMBERSHIP:

Individual	\$ 15.00
Family	\$ 20.00
Sustaining	\$ 50.00
Subscribing	\$100.00
Supporting	\$250.00 or more

Corporate Memberships available in several categories.

Director	Charles A. Huckins, Ph.D.
Research Botanist	Howard S. Gentry, Ph.D.
Curator of Herbarium	J. Harry Lehr
Curator of Living Collections	Victor Gass
Business Manager	Janice Moats
Education Director	Sue Hakala
Publications Director	Shirley Deacon
Artist	Wendy Hodgson
Plant Propagator	Marc Mittelman
Gift Shop Manager	Lynn Trainum
Maintenance Superintendent	Ross Berkheimer
Librarian	Jan Loechell
Research Associate	Ruth Greenhouse

Horticultural Staff: Donald Conner, Steven Heslep, Wendy Hodgson, Nichole Holler, James McEnaney, Patrick Quirk. Gift Shop Staff: Robyn Moats, Anna Shelstad, Clare Thomson, Lela Turner. Office Staff: Tracy Peterson, Diane Pitcher. Education Assistant: Ginny Coltman.

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HOLIDAY PLANTS OF THE DESERT

By Mary Fulton
Education Assistant
Desert Botanical Garden

Many plants have names and legends connected with the winter holiday season. The fir tree, poinsettia, mistletoe, and holly are familiar symbols of Christmas to people all over the United States and the world. Some native and cultivated plants of the deserts of the Western Hemisphere also have associations with Christmas. These associations may not be as well known to the public as those of the more common Christmas plants.

The poinsettia, *Euphorbia pulcherrima*, is probably one of the most colorful and familiar of the plants associated with Christmas. Poinsettias were cultivated by the Aztecs before Cortez landed in Mexico in 1519. The first plants to be brought to this country were imported in the 1820's by Joel Poinsett, the first United States ambassador to Mexico. They were exhibited by the Pennsylvania Horticultural Society in 1829 and became a horticultural sensation. Every year, throughout the nation, thousands of these plants are sold as seasonal decorations.

There is a Mexican legend that links the poinsettia with Christmas. The legend tells of the custom in certain villages of placing gifts before the creche. One little boy had nothing to give, and knelt in the snow to pray. Immediately, a plant with scarlet leaves grew there, and he gave it as his gift. The plant is called "Flor de la Noche Buena," or Flower of the Holy Night. The pattern of colored bracts is thought to resemble the Star of Bethlehem.

Opuntia leptocaulis, Christmas cholla or desert Christmas cactus, is native to



Generally a low, shrubby plant, but sometimes attaining a height of 1.8 meters, *Opuntia leptocaulis*, or desert Christmas cholla, is native to Arizona. Photo taken in the Garden by V. Gass.

southern Arizona. Its small scarlet fruits persist through the winter and are responsible for the common name of this cactus.

Schlumbergera bridgesii is the Christmas cactus common to houseplant fanciers. It is an epiphytic cactus and is native to Brazil. It flowers freely around Christmas time, hence the name. There has been much hybridization between the genera *Schlumbergera* and *Zygocactus*. Many varied flower colors and flowering times have resulted, and so Thanksgiving cacti and Easter cacti are also common to window gardens and are similar in appearance to the Christmas cactus.

Rosemary, *Rosmarinus officinalis*, a commonly cultivated plant in the Phoenix area, also has Christmas associations. According to legend, its flowers were originally white. During the flight to Egypt, Mary spread the Christ Child's garments over one of the plants to dry, and the flowers turned blue and acquired their sweet scent. Another association rosemary has with Christmas is that it is supposed to burst into flower on Old Christmas Eve, January 5. Rosemary is native to the Mediterranean region.

Rheo spathacea, a succulent perennial herb that is native to the West Indies, Mexico, and Guatemala, is familiar to many as Moses-in-a-cradle. It is also called Christ-in-a-manger. A boat-shaped envelope of two bracts nearly conceals the paired coiled inflorescences, and the common name results from this feature.

A living exhibit "Holiday Plants" in the Douglas Display Case in the Cactus



Atriplex hymenelytra, or desert holly, is a compact shrub to 1 meter that inhabits the deserts from California to northern Mexico. Photo taken in the Garden by V. Gass.

Lath House, from December 6 through January 4, will feature some of the commonly used and cultivated plants with winter holiday significance.

AN EVENING OF LIGHTS



A young Luminaria Night guest waits to be served refreshments of hot chocolate and homemade Christmas cookies.

Over two thousand candle-lighted luminarias will outline Garden buildings and illuminate Garden paths and plants on Tuesday evening, December 9 when the Desert Botanical Garden presents Luminaria Night.

Visitors that evening can stroll softly-lighted Garden paths from 6 p.m. until 9 p.m., enjoy mariachi music, and refreshments in the holiday-decorated Webster Auditorium. Special events for children include pinatas and an appearance by Sammy Saguaro, the great walking cactus, who will be specially outfitted for the holiday season. Admission for this special event is \$1.00 for non-member adults and free for children.

LICHENS

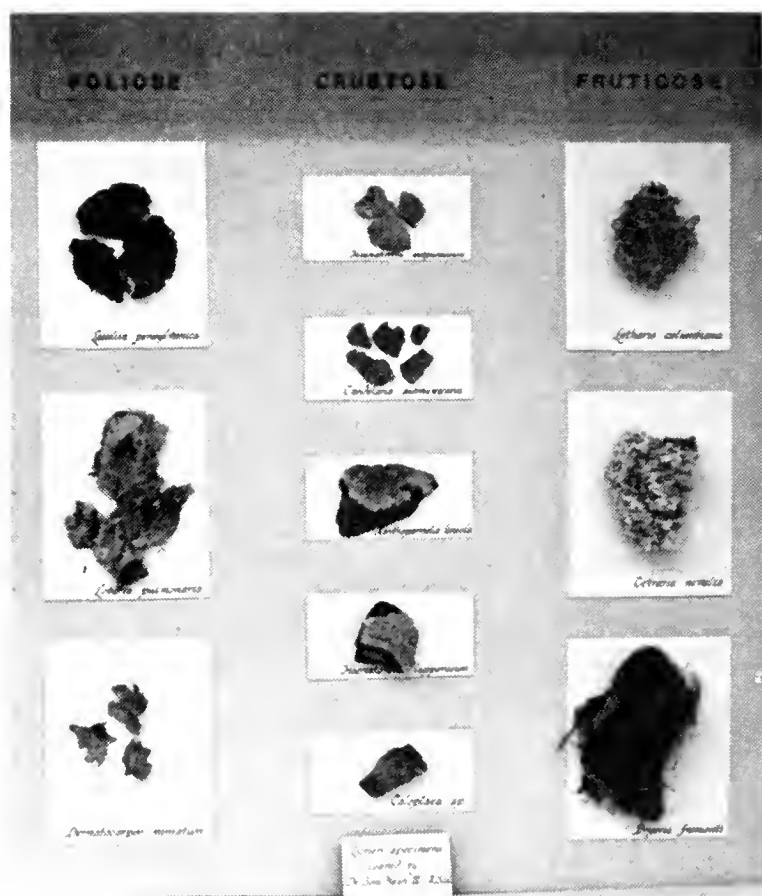
By Vera Gamet

Lichens have baffled man as long as he has known them. To the unscientific eye they obviously had no relation to animal life. Neither did they look much like plants. There were no roots visible, no stems, no leaves, no flowers ever. The colors gray-green, bright-green, soft-yellow and chrome yellow, even rust, were beautiful, but they were unusual plant colors. The dry, brittle, granular surface of the platelets was not common to plant tissue. In fact, these plants hardly looked alive at all. They were found in the most improbable places.

Lichens cover boulders large and small with crusts or scaly surfaces so tightly adherent as to be embedded into the rock itself. They grow on trunks of old trees, time-forgotten gravestones, abandoned farm buildings, burned over acid soils; they carry on, oblivious to extremes of hot and cold.

Early scientists, wide of the mark, explained lichens as probably exudations from the rocks, or thin secretions discharged from the pores of affected trees. Others looked for divine clues but there were none. Even Thoreau was embarrassed to betray his interest in lichens and Linnaeus, who attempted to classify everything in his time, did not know what to do with them. He pigeonholed lichens with a lot of other miscellany, although he recognized and wrote that they were not trifling plants, but were of great importance in the first stage of nature's economy.

Revelation of the dual nature of lichens awaited the perfection of the microscope. In 1867 a Swiss scientist, Simon Schwendener, published his theory that lichens were indeed a composite plant, a partnership of two plants, one in appearance and function. He



Lichen specimens that represent the three main categories are featured in the Garden's lichen exhibit in Webster Auditorium. Right: Lichen covered rocks, taken from the butte adjacent to the Earle Herbarium. Photo, V. Gass.



Lichens are usually categorized by form. "Crustose" lichens, those with a crust-like body, are the most common type. *Lecanora dispersa*, is a crustose lichen. Drawing, W. Hodgson.

believed that true algae were imprisoned within and were parasitised upon by fungal hyphae. Schwendener's statements were convincing to some and scornfully rejected by others. Many years went by before the controversy was settled and his theory accepted.

Subsequent research has proven that the relationship between algae and fungi is mutually symbiotic rather than parasitic. Since lichens do not fossilize, there is no historical or geological record of the centuries-old, teaming-up process between algae and fungi which resulted in the formation of lichens. Scientists believe that they are one of the most ancient organisms on earth. These two primitive forms of life, possibly fragile, certainly specialized, in need of each other and depending on each other (symbiosis) together became a form of life entirely different from anything they could have become alone.

There are 16,000 known kinds of lichens in the world, 2000 in North America, but only three main types:

1. CRUSTOSE, which are granular crusts growing on rocks.

2. FOLIOSE, dry flaky platelets that look like little lettuce heads, and grow mainly on the branches of trees.

3. FRUTICOSE, which resemble diminutive shrubs or miniature branched staghorns with spongy stalks. These are chiefly associated with the Arctic.

In the composite lichen mixture, green algae cells (sometimes blue-green) are intermingled or layered between tangled masses of colorless fungal filament, similar to the fuzzy thread-like filaments of bread mold.

The fungus is the larger and dominant partner of the two. It provides moist shelter and an anchor for the alga, protecting it from intense sunlight which would kill it, and from mechanical injury and drought. The spongy fibers of the fungus are just right for trapping and holding water, and for capturing wind-borne debris from the excreta of birds and animals, insect remains and so on which are absorbed into the water supply.

Crustose lichens absorb more water than other lichen forms. Their weight varies from 10% of dry weight on hot, dry days to over 300% on rainy days, when the lichens are as soft and cushiony to the hand as rich velvet. In time, the outer fungal layers will shrink to a tough, leathery coat that will minimize loss of moisture.



Hypogymnia physodes, a foliose lichen, has a leafy body that attaches loosely to surfaces. Drawing, W. Hodgson.

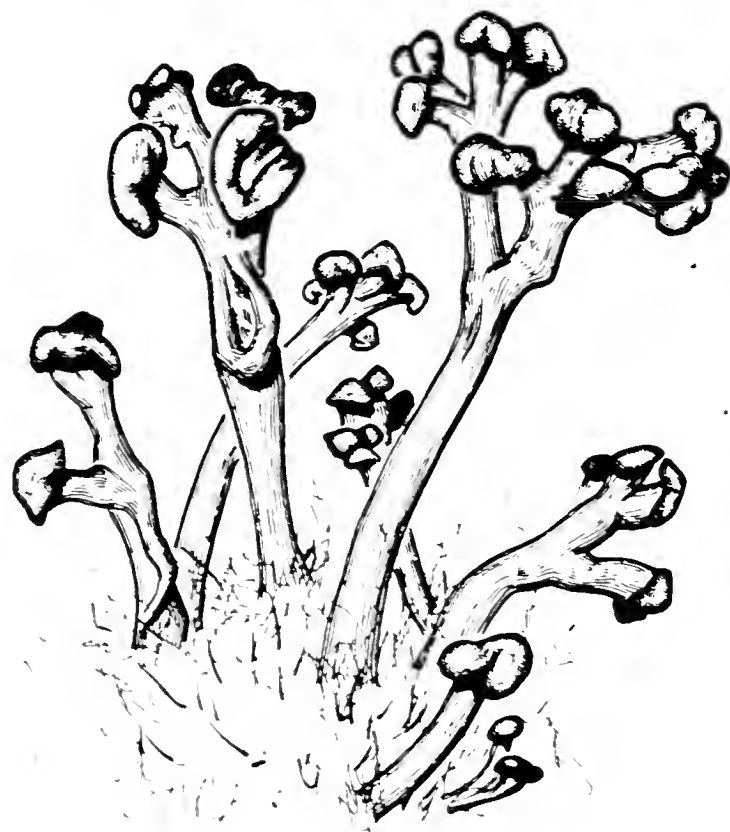
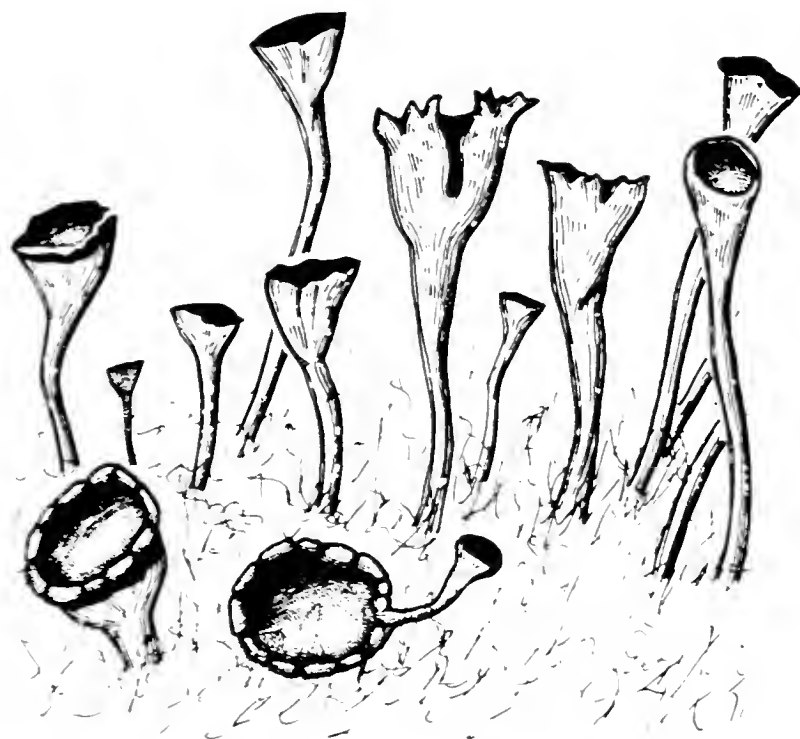
The fungus has no chlorophyll, as no fungus ever has, so it cannot manufacture its own food. The alga is the food producing machine for the two. The alga takes moisture which the fungus has absorbed and with carbon dioxide from the air, energy from the sun, and its own good green chlorophyll, manufactures food, a simple glucose, for both of them.

It is thought that fungus produces mild acids which dissolve from the rock atoms of mineral nutrients used by the alga in the production of food, and in doing so provides delicately etched paths for growth and expansion, only a few millimeters a decade. Lichens grow slowly and appear to live almost forever.

Lichens reproduce by fragments, which break off the parent plant, that contain algae that is well wrapped in the protective filaments of the fungus. These bundles are called *soredia*, but more commonly are known as "brood buds" or "brood balls." Some few out of many, blown by the wind, will find a suitable place to establish a new colony.

To grow, lichens do not need soil. Instead, they start soil. The chemical action of the gentle acids that they produce causes hard rock to crumble into flakes and grains, probably only in enough quantity to mark their own imprint, but it is the first step in soil making. With death and decay of the plants, their remains are mixed with the rock flour that they produced in life; productive soil has thus come into being.

Mosses then appear, live and die. Their remains enrich the first soil. Then, possibly, thin ferns begin to grow, and so on in a long line of plant succession, the larger forms crowding out the smaller ones, adding their remains to the compost, and in turn being crowded out. Thus, the sequence is established of one generation preparing the ground for one to follow, until eventually a forest, a



Fruticose lichens have stalks. Top: the stalks of Caladonia chlorophaea, resemble small goblets. Bottom, the stalks of Caladonia cristatella emerge from a primary thallus. Drawing, W. Hodgson.

climax growth, stands in proud, self-renewing stability until such time when some disaster destroys it. This is the great importance of lichens.

(LICHENS, an exhibit of a group of strange and colorful plants is on display in Webster Auditorium.)

ARID-ZONA LANDSCAPING CONTEST AWARD WINNERS



The planting plan of the Andrews residence in Tucson, a first place winner in the Arid-Zona Landscaping Contest, emphasizes and supplements the surrounding vegetation of the Catalina foothills. Trees and shrubs include Prosopis chilensis, Simmondsia chinensis, Encelia farinosa, and Hesperaloe parviflora.

The awards to the winners of this year's Arid-Zona Landscaping Contest, cosponsored by the Desert Botanical Garden and Salt River Project, were presented at the Garden's Webster Auditorium on Friday evening, October 17. The presentation of plaques to first place winners and certificates for other winning places was made by Dr. Charles Huckins, Garden Director, and Mr. Henry C. Triesler, Jr., President of the Board of Trustees of the Garden. Over 70 award winners and guests attended the reception and awards presentation.

The first place winners of the five major categories were as follows:

Residential — Amateur Division, "Large Garden," Mr. and Mrs. Vincent DiVito, Paradise Valley; "Total Landscape," Paul and Lois Banks, Phoenix.

Residential — Professional Division,

"Large Garden," Associates in Landscape Architecture, Tucson, for the Andrews residence, Tucson; "Total Landscape," Landscaping by Andre, Inc., Phoenix, for the Stuart residence at Pinnacle Peak.

Community — Professional Division, "Established Residential Complex," Associates in Landscape Architecture, Tucson, for Desert Glen Townhomes in Tucson; "New Tract Development," Landscaping by Andre Inc., for Pinnacle Peak Shadows.

Commercial — Professional Division, "Total Landscape," Desert Gardens Nursery, Phoenix, for its Oriental Cactus Garden.

Industrial — Professional Division, City of Scottsdale for the Scottsdale Airport.

Public Works — Professional

Division, Pima County Parks and Recreation, Tucson, for the Gilbert Ray Campground Visitor Center, Tucson.

Dr. Huckins noted that the superior quality of this year's entries exemplifies the concept of landscaping with arid land plants. In this era of conservation of natural resources, activities such as the Arid-Zona Landscaping Contest encourage the utilization of drought-tolerant plantings as well as the enhancement of the beautiful desert environment of the Valley of the Sun. Dr. Huckins complimented the Judges, Gaylon Coates, Roy Krell, Mary Rose Duffield and Morgie Rayburn for their conscientiousness and expertise in evaluating all the entries this year.

Additional winning entries included the following:

Residential — Amateur, "Large Garden," Joseph K. Davidson, James W. Reith, Rollin L. Stark, Mr. and Mrs. Loren Shaw; "Total Landscape," Lucille B. Earle's Rancho Arroyo, and John Loquidis Jr.



The Bennet landscape in Ahwatukee incorporates acacia trees Caesalpinia pulcherrima, cassia, Melampodium leucanthum, and Atriplex semibaccata.



The Oriental Cactus Garden at Desert Garden Nursery, Phoenix, was designed and built for the purpose of demonstrating to the public a water conserving landscape.

Residential — Professional, "Large Garden," Landscape Design Co. of Tempe for the Bennett residence in Ahwatukee, Steve Martino and Associates of Scottsdale for the Steinmetz residence in Phoenix, Beau Terre Landscaping of Phoenix for the Blakney residence in Phoenix, and Weinberg Landscape and Designs of Mesa for the Page residence of Mesa; "Total Landscape," Steve Martino and Associates of Scottsdale for the Nutley residence of Paradise Valley.

Commercial — "Total Landscape," Pinnacle Paradise Inc. of Pinnacle Peak for the Desert Garden at Pinnacle Peak, and Henry H. Haws and Associates of Mesa for Marriott's Camelback Inn, Phoenix.

Public Works — City of Scottsdale, City of Scottsdale Corporation Yard, and the City of Scottsdale for the Chapparral Park Parking Lot.

—EDITOR

GARDEN RECEIVES FEDERAL GRANT

The Desert Botanical Garden has received notification of the award of a \$35,000 grant from the Institute of Museum Services, a Federal agency in the Department of Education. IMS awards are designed to assist museums with their general operating costs. General Operating Support grants are a valuable type of grant for museums, since they are applied at a museum's discretion towards basic museum services such as conservation, security, exhibitions, and outreach programs.

The Desert Botanical Garden was one of the 405 museums in the United States to be designated as a recipient of the 1980 IMS award. More than 1500 museums applied for grants this year. The \$35,000 grant was the maximum amount awarded to any single museum; the total amount of Federal grants in the IMS program was \$10.4 million.

Other Arizona museums that received grants from IMS were Casa Grande Valley Historical Society; Flandrau Planetarium, University of Arizona, Tucson; Navajo Zoo and Botanical Park, Window Rock; Tempe Historical Society.

The Institute, now in its third year, is the first Federal agency authorized to provide general operating support, as well as project support to museums. It is located within the Department of Education. The institute provides grant funds to a wide range of museums including art, history, and natural history museums, zoos, botanical gardens, science-technology centers, aquariums, planetariums, general museums and historic houses.

Dr. Charles Huckins, Director of Desert Botanical Garden, says that the grant will be used to disseminate in-

formation to school-age audiences more effectively by increasing staffing and by producing audio-visual programs and traveling exhibits for schools and libraries; to improve supporting services to the general public by increasing maintenance staffing; to provide more adequate protection for the herbarium and library collections; to make the Garden's living plant collections more useful by improving information access through computerization of plant records; to make the Garden's major attractions more accessible to the unsighted; and to enhance the Garden's ability to solicit support by improving its financial accountability.

The Institute's grants are uniquely designed to help both developing and established museums cope with the financial pressures caused by inflation, energy shortages and the demands made by the more than 350 million visitors to the nation's 5,500 museums.

—EDITOR

GARDEN LECTURE SERIES

Included with the December Bulletin is the Winter 1981 Calendar of Events at the Garden, and also, a special brochure that announces the Garden's monthly Lecture Series that will be presented at 7:30 p.m. on the second Wednesday of each month in Webster Auditorium from January through June. The Garden encourages Members to take part in this important series of talks on the theme of Plants of the Desert and Their Importance to Man; each presentation will be made by a noted authority in the field. The lectures are free and open to the public.

IN BRIEF

CACTUS SHOW

The 34th Annual Cactus Show will be presented at the Desert Botanical Garden from February 21 through March 1 from 9 a.m. to 5 p.m. daily. As in past years cacti and succulents will be exhibited in Webster Auditorium and on Eliot Patio. The 1981 show will be co-sponsored by The Phoenix Gazette and the Central Arizona Cactus and Succulent Society. A preview of the show for Garden Members, exhibitors, special guests and their families will be held on Friday, February 20 at 6 p.m.

Cactus show visitors will have an opportunity to buy cacti and succulents during show hours. Plants will be sold at the Student Entrance.

Cactus Show Rules and Registration cards are included in the December *Saguaroland Bulletin*; registration materials will also be available by December 1, and may be picked up at the office at the Garden after that date or will be sent, by writing to Cactus Show Registration Committee, Desert Botanical Garden, P.O. Box 5415, Phoenix, Arizona 85010.

With the cooperation of the Central Arizona Cactus and Succulent Society, the Garden has established several committees to assist in planning and implementing Cactus Show activities. Persons who are interested in assisting with particular aspects of the Show are encouraged to contact the following Garden Staff members:

Ross Berkheimer — *Operations*: Design of show, plant sale layout, installing and dismantling the show, troubleshooting.

Victor Gass — *Plant Sales*: Selection, preparation, purchasing, and sale of plants and other merchandise during the show.

Shirley Deacon and Catherine Wueste — *Public Relations*: Invitations, publicity, show information.

Charles Huckins — *Registration*: Show rules, registration of entries, judging, clerking, awards.

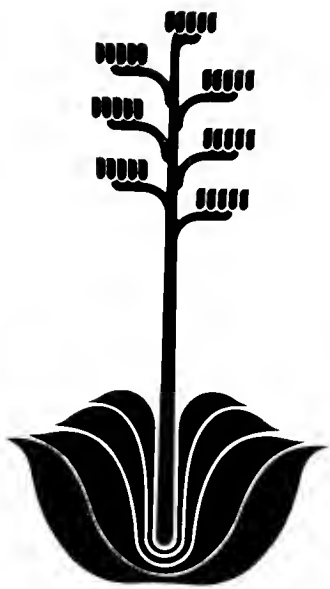
Sue Hakala — *Orientation*: Hosts and hostesses, membership information, plant information, relief support, signs.

If any of the above Staff coordinators cannot be reached, please contact the Garden's Volunteer coordinator in the Education Department and leave your name and a number where you can be reached.

PHOTOGRAPHY EXHIBITION

The Fourth Photography Exhibition at the Desert Botanical Garden will be displayed in Webster Auditorium from January 24 through February 1. Co-chairmen once again this year are Garden Volunteers Gen Evans and Dottie O'Rourke. The theme of the exhibition, "Deserts of the World," offers photographers an opportunity to submit *landscapes* and *plant portraits* that depict regions of scarce rainfall. A special trophy will be awarded for the picture that best depicts the Desert Botanical Garden.

"Deserts of the World" is a juried exhibition with trophies and ribbons awarded for classes of Black and White photographs, Color Prints, and Color Slides. Deadline for entries is Wednesday, January 7. Judges for this year's exhibition include: John Cacheris, Phoenix; Eulice F. Burnett, Tucson; and Lillian Kramer, Sun City. Photographers who are interested in participating in the exhibition and who have not received official entry forms, may call the Garden (602) 941-1217 for exhibition materials.



DESERT BOTANICAL GARDEN

1000 N. GILBERT ROAD
PHOENIX, ARIZONA, 85010



P.O. BOX 5415
PHOENIX, AZ. 85010

Garden Events

DECEMBER

- 9 Luminaria Night** — See the Garden lighted with hundreds of traditional Southwest luminaries. Holiday music and refreshments. Tuesday, 6 p.m.-9 p.m.
- 10 Christmas on the Desert** — Activities, special weekend events and holiday displays, Daily, 9 a.m. - 5 p.m. through Wednesday, December 24.
- 13 Box Canyon** — A field trip to an area southeast of Florence to explore the flora of a deep desert canyon. Saturday, 8 a.m.

JANUARY

- 8 Spring Vegetable Gardening** — A one session evening workshop on how, what, when and where to plant your spring garden, Thursday, 7 p.m.
- 14 Getting Ready for the Cactus Show** — A morning workshop on the preparation of cacti and succulents for exhibition, and an afternoon workshop on how to use dried Arizona desert materials to create arrangements for exhibit, Wednesday, 10 a.m. and 1 p.m.
- 14 Desert Botanical Garden Lecture Series** — Economic Plants of Arid Lands — A Historical Perspective. Speaker: Dr. Howard S. Gentry. Wednesday in Webster Auditorium, 7:30 p.m.
- 17 Pruning** — A workshop on techniques for keeping trees and shrubs looking their best. Saturday, 9 a.m.
- 23 Preview** — **Fourth Annual Desert Photography Exhibition.** Friday, 7 p.m.
- 24 Fourth Annual Desert Photography Exhibition.** Daily, 9 a.m. to 5 p.m., through February 1.

The Garden is open every day of the year from 9 a.m. to sunset.



34rd Annual Cactus Show

February 21 through March 1, 1981
9 a.m. to 5 p.m.

In the Garden's
Webster Auditorium and Eliot Patio
Papago Park, Phoenix, Arizona

Presented by
The Desert Botanical Garden

Cosponsored by
The Phoenix Gazette
and the
Central Arizona Cactus and Succulent Society

SHOW RULES

Cacti, other succulents and allied material are eligible as listed in the classifications which follow.

All plants must have been grown by the exhibitor for six months or longer. All plants must be labelled with appropriate scientific names.

The Registration Committee reserves the right to reject plants or other entries if show rules are violated, or if the exhibit is not up to standard. Rejected entries will not be displayed.

All entries will be left with the Registration Committee which shall be responsible for the placement of all accepted entries. All arrangements shall be completely assembled and capable of being transported intact prior to entry. No exhibitors will be allowed in display areas prior to the opening of the Show.

In Sections I through III, highly decorated containers and ornamental objects, including artificial top dressings, are not allowed. Decorative or otherwise unusual containers are allowed in Section IV. Natural (e.g., clay) or artificial (e.g., plastic) containers are allowed in all sections. Containers and top dressings in Sections I through IV should enhance rather than detract from the natural beauty of the plant being displayed.

In Section I, Class A, and in Section II, Class A, entries which cannot be assigned to established divisions will be judged collectively in Division 22 and in Divisions 18 and 19, respectively.

In Section III, seedlings must be no more than one year old and must have been germinated by the exhibitor. Labels must include date of germination in addition to scientific name. Ribbon points awarded for seedling exhibits count twice as much as those in other sections toward the award of The Phoenix Gazette Sweepstakes Trophy.

All individual specimens in containers greater than 14" in width will be judged in Section IV.

In Section V, all plants must be well rooted and have been grown in the exhibited container for at least six weeks.

In Sections V and VI, accessories are permissible, but exclude artificial color, artificial flowers and artificial foliage. Non-desert (i.e., not native to a desert area) materials will not be allowed as accessories. Identification of plants and plant

(Continued on following page)

materials in decorative planters and arrangements may be accomplished with either scientific or common names.

In Section VII, two or more exhibits are required before the Cactus and Succulent Society of America Award may be presented. Ribbon points awarded for educational exhibits count three times as much as those in other sections toward the award of The Phoenix Gazette Sweepstakes Trophy.

Exhibitors in Section VII and VIII should contact the Registration Committee at the Garden in advance to reserve space and to verify that exhibits are appropriate.

The Desert Botanical Garden will exercise due caution and care in safeguarding the exhibits, but can assume no responsibility for loss or damage, or for unclaimed exhibits. The care of plants entered in the Show is the personal responsibility of their owners.

CLASSIFICATIONS

Section I. Cacti

Class A. Individual specimens. Limited to three entries per household per division.

Division:

1. *Hatiora*, *Rhipsalis*, *Zygocactus*
2. *Opuntia*, *Pterocactus*, *Tephrocactus*
3. *Arrojadoa*, *Cereus*, *Cleistocactus*, *Espostoa*, *Eulychnia*, *Haageocereus*, *Mila*, *Pilosocereus*, *Stetsonia*, *Thrixanthocereus*, *Weberbauerocereus*
4. *Borzicactus* (incl. *Arequipa*, *Matucana*, *Oreocereus*, *Seticereus*)
5. *Backebergia*, *Bergerocactus*, *Carnegiea*, *Cephalocereus*, *Lophocereus*, *Macherocereus*, *Myrtillocactus*, *Neobuxbaumia*, *Nyctocereus*, *Pachycereus*, *Rathbunia*, *Stenocereus* (syn. *Lemaireocereus*)
6. *Echinocereus*, *Neoevansia*, *Peniocereus*, *Wilcoxia*
7. *Echinopsis* (incl. *Trichocereus*)
8. *Acanthocalycium*, *Lobivia*, *Rebutia*
9. *Astrophytum*
10. *Echinocactus*, *Echinofossulocactus* (syn. *Stenocactus*), *Ferocactus*, *Hamatocactus*, *Homalocephala*, *Leuchtenbergia*, *Pediocactus*, *Sclerocactus*
11. *Ariocarpus*, *Aztekium*, *Obregonia*, *Strombocactus*
12. *Epithelantha*, *Gymnocactus*, *Pelecyphora* (incl. *Encephalocarpus*), *Turbincarpus* (incl. *Normanbokea*)
13. *Blossfeldia*, *Denmoza*, *Frailea*, *Oroya*, *Parodia*, *Sulcorebutia*, *Uebelmannia*, *Weingartia*, *Wigginsia* (syn. *Malacocarpus*)
14. *Gymnocalycium*
15. *Notocactus*
16. *Copiapoa*, *Neoporteria* (incl. *Islaya*, *Neochilenia*, *Pyrrhocactus*)
17. *Discocactus*, *Melocactus*
18. *Mammillaria* (incl. *Cochemia*, *Dolicothele*, *Mamilloopsis*). Pot size under 4".
19. *Mammillaria* (incl. *Cochemia*, *Dolicothele*, *Mamilloopsis*). Pot size from 4" to 10".
20. *Mammillaria* (incl. *Cochemia*, *Dolicothele*, *Mamilloopsis*). Pot size over 10".
21. *Ancistrocactus*, *Coryphantha*, *Echinomastus*, *Escobaria*, *Neobesseya*, *Neolloydia*, *Thelocactus*
22. Miscellaneous genera not closely related to those listed in the above divisions

Class B. Crested or Monstrose Cacti

Division 1. Own root

Division 2. Grafted

Class C. Grafted Cacti

Class D. Cactus Collections. Four to six species or varieties of a genus. Limited to one entry per household.

Section II. Succulents other than Cacti

Class A. Individual specimens. Limited to three entries per household per division.

Division:

1. Agavaceae: Agave
2. Agavaceae: All other genera (e.g., Beaucarnea, Calibanus, Dasylirion, Furcraea, Sansevieria, Yucca)
3. Aizoaceae: Lithops
4. Aizoaceae: All other genera (e.g., Conophytum, Faucaria, Pleiospilos, Titanopsis, etc.)
5. Asclepiadaceae (e.g., Ceropegia, Hoya, Huernia, Stapelia, etc.)
6. Apocynaceae (e.g., Adenium, Pachypodium, etc.)
7. Compositae (e.g., Othonna, Senecio, etc.)
8. Crassulaceae: Adromischus, Cotyledon
9. Crassulaceae: Aeonium, Greenovia, Sempervivum
10. Crassulaceae: Bryophyllum, Kalanchoe, Kitchingia
11. Crassulaceae: Crassula, Rochea
12. Crassulaceae: Dudleya, Echeveria, Graptopetalum, Pachyphytum, Sedum
13. Euphorbiaceae: Euphorbia. Pot size 6'' and under.
14. Euphorbiaceae: Euphorbia. Pot size over 6''.
15. Liliaceae: Aloe
16. Liliaceae: All other genera (e.g., Gasteria, Haworthia, etc.)
17. Portulacaceae (e.g., Anacampseros, Portulacaria, Talinum, etc.)
18. Miscellaneous families, A - F (e.g., Anacardiaceae, Bombacaceae, Burseraceae, Cucurbitaceae, Didiereaceae, Dioscoreaceae, Fouquieriaceae, etc.)
19. Miscellaneous families G - Z (e.g., Geraniaceae, Gnetaceae, Moraceae, Passifloraceae, Pedaliaceae, Phytolaccaceae, Vitaceae, etc.)

Class B. Crested or Monstrose Succulents

Division 1. Own root

Division 2. Grafted

Class C. Grafted Succulents

Class D. Succulent Collections. Four to six species or varieties of a genus.

Limited to one entry per household.

SECTION III. SEEDLINGS

Limited to two entries per household per class

Class A. Cacti

Class B. Succulents other than Cacti

Class C. Desert Trees and Shrubs

SECTION IV. SPECIMEN PLANTERS

Limited to three entries per household per class. Individual specimens in containers over 14'' diameter.

Class A. Cacti

Class B. Succulents other than Cacti

Class C. Caudiciform or sarcorhizus (fleshy rooted) desert trees and shrubs

SECTION V. DECORATIVE PLANTERS

Limited to three entries per household per class. All rooted plants. Decorative containers and ornamental, desert-related objects are allowed.

Class A. Desert Dwarfs

Division 1. Bonsai — Individual dwarfed desert plant specimens

Division 2. Miniature Landscapes — Groups of dwarfed desert plants arranged in a miniature landscape setting

Class B. Dish Gardens — Containers to 14'' diameter

Division 1. Cacti

Division 2. Succulents

Division 3. Cacti and other succulents

Class C. Hanging Planters — Cacti, other succulents, or both

Class D. Patio Planters — Cacti, other succulents, or both; containers over 14'' diameter

SECTION VI. ARRANGEMENTS

No rooted plants. Limited to one entry per class in Classes A through D, one entry per division in Classes E through G. Divisions applicable to Classes E, F and G: 1. Cacti, other succulents, or both. 2. Dried Arizona desert material.

- Class A. Using dried Arizona desert material, accessories permitted
- Class B. Using cacti, suitable for a coffee table
- Class C. Using succulents other than cacti, suitable for mantel
- Class D. Monochrome arrangements featuring cacti, other succulents or both
- Class E. Button arrangements
- Class F. Miniature arrangements, under 5''
- Class G. Corsages

SECTION VII. EDUCATION EXHIBITS

Competitive. Dealing with any aspect of desert botany or horticulture

SECTION VIII. OPEN

Non-competitive. Displays by clubs, commercial growers, societies, etc.

REGISTRATION, EXHIBITION PROCEDURES, JUDGING AND AWARDS

Registration cards (one for each exhibitor) and exhibit cards (one for each exhibit) may be obtained from the Garden. Registration cards must be completed and returned by February 10. All exhibitors are to fill out exhibit cards in advance and submit them with their exhibits.

Write to Cactus Show Registration Committee, Desert Botanical Garden, P.O. Box 5415, Phoenix, AZ 85010 or telephone 941-1217 for registration and exhibit cards.

Exhibits will be accepted on Wednesday, February 18 from 9 a.m. to 9 p.m. and Thursday, February 19 from 9 a.m. to 9 p.m.

Judging will take place on Friday, February 20. Judges for all sections are acknowledged experts. Sections V and VI will be judged by judges accredited by the National Council of State Garden Clubs.

The following scale of points will be used in judging entries:

CACTI & SUCCULENTS SPECIMEN PLANTS		ARRANGEMENTS & PLANTERS	
Condition	50	Design	30
Nomenclature	10	Color	20
Difficulty of culture	10	Identification of material	10
Size or degree of maturity	15	Originality & distinction	30
Staging	15	Condition	10
	<hr/> 100		<hr/> 100
BUTTON & MINIATURES		CORSAGES	
Scale	40	Technique	25
Design	30	Design	35
Color harmony	20	Color	15
Condition	10	Combination of materials	15
	<hr/> 100	Condition	10
			<hr/> 100

The decision of the judges will be final. First, second, third and honorable mention ribbons may be awarded in each class or division. Trophies may be awarded in each class. Sweepstakes awards will be given to exhibitors accumulating the most blue ribbons in the Show, the most blue ribbons in each of Sections I, II and VI, and the most ribbon points in Sections I, II, III, IV and VII.

A preview for Garden Members, exhibitors, special guests and their families will be held on Friday, February 20 at 6 p.m.

Exhibits may be removed only after 5 p.m. and until 7 p.m. on March 1. Exhibits not claimed by 10 a.m. on March 2 will be removed from the display area to a staging area behind the Richter Library. The Garden will assume no responsibility whatsoever for unclaimed exhibits.

An invitation to the

DESERT BOTANICAL GARDEN

**Wednesday Evening
Lecture Series**

*Plants of the
Desert and Their
Importance to Man*

January through June, 1981

at 7:30 p.m.

in

Webster Auditorium

at the

Desert Botanical Garden

Papago Park, Phoenix, Arizona

From January through June of 1981, on the second Wednesday of each month at 7:30 p.m. the Desert Botanical Garden will host a free public lecture on the theme of **Plants of the Desert and Their Importance to Man**. The purpose of this series is to promote public awareness of desert plants and their usefulness to man, through direct contact with acknowledged experts in the study of desert plants. All of the lectures will be held in the Garden's Webster Auditorium.

The public is invited to attend. For more information about the series please call (602) 941-1217.

WEDNESDAY EVENING LECTURE SERIES SCHEDULE

January 14 ***"Economic Plants of Arid Lands
— A Historical Perspective."***

Speaker: Dr. Howard Scott Gentry,
Research Botanist, Desert Botanical
Garden.

February 11 ***"Succulent Plants and Their
Uses."***

Speaker: Joyce L. Tate,
Chairman, Plant Uses Committee,
Cactus and Succulent Society of
America.

March 11 ***"Desert Plants and Your Diet."***

Speaker: Ruth Greenhouse,
Research Associate,
Desert Botanical Garden.

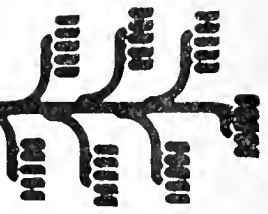
- April 8** ***"Ancient Desert Crops for the Twenty First Century."***
Speaker: Dr. Richard Felger,
Senior Research Scientist, Arizona
Sonora Desert Museum and the
Environmental Research Laboratory,
University of Arizona.
- May 13** ***"Cacti and Their Uses."***
Speaker: Dr. Donald Pinkava,
Professor of Botany, Arizona State
University.
- June 10** ***"Plants of Our Deserts in Tomorrow's World — Their Economic Potential Today."***
Speaker: Dr. Howard Scott Gentry,
Research Botanist, Desert Botanical
Garden.

DESERT BOTANICAL GARDEN

The Desert Botanical Garden, a nonprofit incorporated educational institution for the study of desert plants, is recognized as the only botanical garden dedicated from its beginning to the study of the plant life of deserts and other arid lands. Each year over 100,000 people from every state and many foreign countries visit the Garden.

From the time the Garden was founded in 1935, its threefold purpose has been to study, conserve and educate. The Garden participates in worldwide programs of assistance and exchange with other botanical institutions, scholars and scientists. It is the center for the definitive study of agaves. Rare and threatened species of desert plants, as well as plants with horticultural potential, are propagated here.

The Desert Botanical Garden is open every day of the year from 9 a.m. to sunset.



**DESERT
BOTANICAL
GARDEN**
PO BOX 5415
PHOENIX, AZ. 85010

A nonprofit Incorporated
Educational Institution for
the Study of Desert Plants

DESERT BOTANICAL GARDEN

Calendar of Events
Winter,
1981



THE DESERT BOTANICAL GARDEN

Founded in 1935, the Desert Botanical Garden is a non-profit educational institution located on 150 acres of Arizona desert surrounded by the Phoenix metropolitan area. The founders' aim was to develop "A natural garden of desert plants from the deserts of the world, so arranged that it will be pleasant for the layman to view, and yet can be studied by scientists."

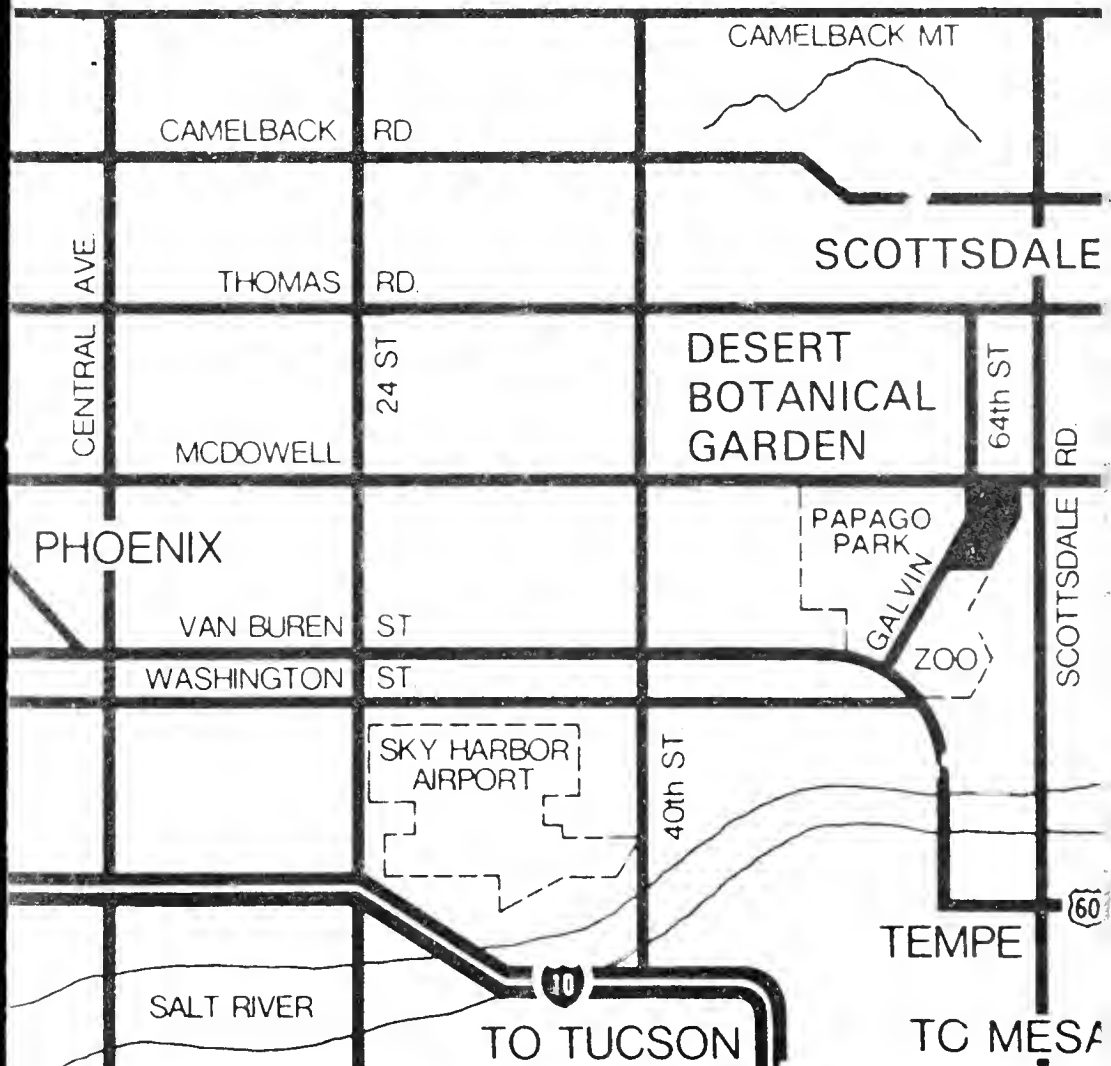
Today the Garden is known worldwide. In a naturalistic setting are more than half of the world's different kinds of cacti and other succulents, trees and shrubs from arid regions of Asia, Africa, Australia, and the Americas.

Research is carried on in the Earle Herbarium, open to scholars and Garden Members by appointment. The Richter Library, another important Garden research resource, is open for reference to the public Monday, Wednesday, Friday from 9 a.m. to 1 p.m. and Tuesday and Thursday from 1 p.m. to 5 p.m., and to the membership at other times by appointment.

Educational programs are varied and open to the public. They include lectures, classes, workshops, and field trips.

The Desert Botanical Garden is supported by memberships, contributions and admissions. Members of the Garden receive the Garden magazine, join classes and field trips at reduced fees, get bonus packets of desert plant seeds, enjoy other benefits including the satisfaction of supporting the Garden's vigorous conservation efforts at a time when destruction of the fragile desert is widespread.

Cover: *Simmondsia chinensis*, or jojoba, a native shrub of Arizona with a potential for economic use as a source of oil. Drawing by Wendy Hodgson, Garden Artist.



MEMBERSHIP APPLICATION
Desert Botanical Garden
Box 5415, Phoenix, AZ 85010

Enclosed is my check for \$ _____. I wish to become a Member of the Desert Botanical Garden in the category checked below:

Name _____

Address _____

City _____ State _____ Zip _____

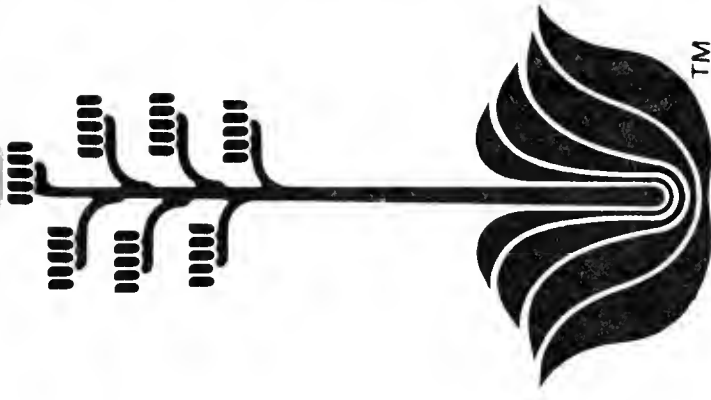
Annual Membership: Individual, \$15.00

Subscribing, \$100.00

Family, \$20.00

Supporting, \$250.00 or more

Sustaining, \$50.00



**DESERT
BOTANICAL
GARDEN**

PO BOX 5415
PHOENIX, AZ 85010
(602) 941-1217

**Desert Botanical Garden
REGISTRATION FORM**

Please use this form for Courses and Field trips registration. Check boxes for desired courses, and list the fees in the correct spaces. The fee, minus a \$3.00 non-refundable handling charge, will be returned only if the registration is cancelled at least **two** days prior to the first session.

Courses	Fees
<input type="checkbox"/> Basketry	\$ _____
Getting Ready for the Cactus Show	
<input type="checkbox"/> Wed. AM	\$ _____
<input type="checkbox"/> Wed. PM	\$ _____
<input type="checkbox"/> Hidden Valley	\$ _____
<input type="checkbox"/> McDowell Mountains	\$ _____
Organpipe Cactus	
<input type="checkbox"/> National Monument.	\$ _____
<input type="checkbox"/> Poisonous and Edible Plants	\$ _____
<input type="checkbox"/> Pruning	\$ _____
<input type="checkbox"/> Rock Gardens	\$ _____
<input type="checkbox"/> Saguaro National Monument.	\$ _____
<input type="checkbox"/> Spring Crafts Workshop	\$ _____
<input type="checkbox"/> Spring Vegetable Gardening	\$ _____
<input type="checkbox"/> Superstition Mountains	\$ _____
<input type="checkbox"/> White Tank Mountains	\$ _____
TOTAL	\$ _____

Name _____

Address _____

City _____ State _____ Zip _____

Telephone _____

Member Garden _____ Non-member _____

Mail this form with check to
Desert Botanical Garden
P.O. Box 5415, Phoenix, AZ, 85010

CLASSES & WORKSHOPS: Fees include necessary materials. Prepaid reservations are required since enrollment is limited, and any event with fewer than five registered participants may be cancelled.

FIELD TRIPS: Prepaid reservations are required. Meet in the Garden's Webster Auditorium (take the service road). Departure promptly at 8 a.m. unless otherwise specified. Participants travel in their own cars. Car-pooling and sharing of driving expenses are encouraged.

These trips involve easy to moderate hiking. Leaders are familiar with trip sites and will have the authority to disqualify persons unlikely to make the trip in safety.

Wear comfortable, suitable shoes (lug soles recommended), bring water and a lunch that can be carried with you on the hike.

For information on any Garden event, telephone 941-1217.

**Desert Botanical Garden
REGISTRATION FORM**

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<input type="checkbox"/> Rock Gardens	\$ _____
<input type="checkbox"/> Saguaro National Monument	\$ _____
<input type="checkbox"/> Spring Crafts Workshop	\$ _____
<input type="checkbox"/> Spring Vegetable Gardening	\$ _____
<input type="checkbox"/> Superstition Mountains	\$ _____
<input type="checkbox"/> White Tank Mountains	\$ _____
TOTAL	\$ _____

Name _____

Address _____

City _____ State _____ Zip _____

Telephone _____

Member Garden _____ Non-member _____

Mail this form with check to
Desert Botanical Garden
P.O. Box 5415, Phoenix, AZ, 85010

CLASSES & WORKSHOPS: Fees include necessary materials. Prepaid reservations are required since enrollment is limited, and any event with fewer than five registered participants may be cancelled.

FIELD TRIPS: Prepaid reservations are required. Meet in the Garden's Webster Auditorium (take the service road). Departure promptly at 8 a.m. unless otherwise specified. Participants travel in their own cars. Car-pooling and sharing of driving expenses are encouraged.

These trips involve easy to moderate hiking. Leaders are familiar with trip sites and will have the authority to disqualify persons unlikely to make the trip in safety.

Wear comfortable, suitable shoes (lug soles recommended), bring water and a lunch that can be carried with you on the hike.

For information on any Garden event, telephone 941-1217.

**Desert Botanical Garden
REGISTRATION FORM**

Please use this form for Courses and Field trips registration. Check boxes for desired courses, and list the fees in the correct spaces. The fee, minus a \$3.00 non-refundable handling charge, will be returned only if the registration is cancelled at least **two** days prior to the first session.

Courses	Fees
<input type="checkbox"/> Basketry	\$ _____
Getting Ready for the Cactus Show	
<input type="checkbox"/> Wed. AM	\$ _____
<input type="checkbox"/> Wed. PM	\$ _____
<input type="checkbox"/> Hidden Valley	\$ _____
<input type="checkbox"/> McDowell Mountains	\$ _____
Organpipe Cactus	
<input type="checkbox"/> National Monument	\$ _____
<input type="checkbox"/> Poisonous and Edible Plants	\$ _____
<input type="checkbox"/> Pruning	\$ _____
<input type="checkbox"/> Rock Gardens	\$ _____
<input type="checkbox"/> Saguaro National Monument	\$ _____
<input type="checkbox"/> Spring Crafts Workshop	\$ _____
<input type="checkbox"/> Spring Vegetable Gardening	\$ _____
<input type="checkbox"/> Superstition Mountains	\$ _____
<input type="checkbox"/> White Tank Mountains	\$ _____
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A nonprofit organization

**DESERT BOTANICAL GARDEN CALENDAR OF EVENTS
WINTER — 1981**

Open every day of the year
9 A.M. to sunset

JANUARY

- 3 Poisonous and Edible Plants** Daily, 9:00 a.m. - 5:00 p.m.
An exhibit of poisonous and edible plants that are commonly cultivated in the Phoenix area and some that are native to the Sonoran Desert. On display in Webster Auditorium, through January 20.
- 8 Spring Vegetable Gardening** Thursday, 7:00 p.m.
Tips on how, what, when, and where to plant your spring garden are given at this one session evening workshop.
Fees: Members \$7.00, Non-members \$9.00.
- 10 Poisonous Plants** Daily, 9:00 a.m. - 5:00 p.m.
A living exhibit of common landscape plants that possess poisonous properties. On display in the Douglas Display Case in the Cactus Lath House, through February 1.
- 14 Getting Ready for the Cactus Show** Wednesday, 10:00 a.m. - noon
Experts will demonstrate how to prepare cacti and succulent specimen plants for exhibition.
Fees: Members \$5.00, Non-members \$7.50.
- 14 Getting Ready for the Cactus Show** Wednesday, 1:00 p.m. - 3:00 p.m.
Experts will demonstrate how to use dried and living Arizona desert materials to create arrangements for exhibition.
Fees: Members \$5.00, Non-members \$7.50.
- 14 Desert Botanical Garden Lecture Series** Wednesday, 7:30 p.m.
Economic Plants of Arid Lands — A Historical Perspective. Speaker: Dr. Howard Scott Gentry, Research Botanist, Desert Botanical Garden.
In Webster Auditorium; public invited free of charge.
- 17 Pruning** Saturday, 9:00 a.m. - noon
A workshop on techniques and tools for keeping trees and shrubs looking their best.
Fees, including book: Members \$8.00, Non-members \$10.00
- 23 Preview of the Fourth Annual Desert Photography Exhibition** Friday, 7:00 p.m.
Garden Members and Exhibitors have an opportunity to preview the show.
- 24-1 Fourth Annual Desert Photography Exhibition** Daily, 9:00 a.m. - 5:00 p.m.
Desert plants and landscapes are captured by skilled photographers. A juried show of black and white prints, color prints, and slides. Through February 1.
Free with Garden admission.
- 24 McDowell Mountains** Saturday, 8:00 a.m. Limit: 25
A field trip northeast of Phoenix to view a good representation of Sonoran Desert and Arizona Upland vegetation.
Fees: Members \$5.00, Non-members \$7.50.

FEBRUARY

- 4 Basketry** Wednesday, 1:00 p.m. Limit: 12
A workshop that utilizes natural materials to complete a melon-shaped Indian basket. Two Wednesday sessions.
Fees, including materials: Members \$5.00, Non-members \$7.50.
- 5 Rock Gardens** Thursday, 7:00 p.m.
A class on how to build a rock garden. Learn construction techniques, plants for rock garden use, and the philosophy of rock gardens. Two Thursday sessions.
Fees: Members \$10.00, Non-members \$12.50.
- 7 Hidden Valley** Saturday, 8:00 a.m. Limit: 25
A field trip to a beautiful, isolated spot at South Mountain, bursera trees and abundant desert flora.
Fees: Members \$5.00, Non-members \$7.50.
- 11 Desert Botanical Garden Lecture Series** Wednesday, 7:30 p.m.
Succulent Plants and Their Uses. Speaker: Joyce L. Tate, Chairman, Plant Uses Committee, Cactus and Succulent Society of America.
In Webster Auditorium; public invited free of charge.
- 14 White Tank Mountains** Saturday, 8:00 a.m. Limit: 25
Enjoy early wildflowers and waterfalls on this field trip west of Phoenix.
Fees: Members \$5.00, Non-members \$7.50.
- 14 Cactaceae** Daily, 9:00 a.m. - 5:00 p.m.
A living exhibit that presents the members of the Cactus family and their diverse and unique structures. On display in the Douglas Display Case in the Cactus Lath House, through March 8.
- 21-1 34th Annual Cactus Show** Daily, 9:00 a.m. - 5:00 p.m.
A major Phoenix event since 1947, this show presents the best cacti and other succulents, as well as dish gardens, planters, and arrangements. A nationally famous show in which exhibitors compete for awards and honors. Through March 1.
Free with Garden admission.
- 5 Fouquieriaceae (Ocotillo family)** Thursday, 2:00 p.m.
A public slide presentation, held in the Webster Auditorium.
Free with Garden admission.
- 7 Superstition Mountains** Saturday, 8:00 a.m. Limit: 25
A beautiful place for a field trip to view spring wildflowers.
Fees: Members \$5.00, Non-members \$7.50.
- 11 Desert Botanical Garden Lecture Series** Wednesday, 7:30 p.m.
Desert Plants and Your Diet. Speaker: Ruth Greenhouse, Research Associate, Desert Botanical Garden.
In Webster Auditorium; public invited free of charge.

MARCH

- 12 Economic Plants** Thursday, 2:00 p.m.
A public slide presentation, held in Webster Auditorium.
Free with Garden admission.
- 14 Plant Propagation** Daily, 9:00 a.m. - 5:00 p.m.
An exhibit that presents the techniques and tools of propagating desert plants from seeds, cuttings, and graftings. On display in the Douglas Display Case in the Cactus Lath House, through April 19.
- 14 Saguaro National Monument** Saturday, 6:30 a.m. Limit: 25
View spring wildflowers and take a side trip to Mt. Lemmon to view four vegetation zones, from desert through ponderosa pine — spruce — fir forests.
Fees: Members \$10.00, Non-members \$12.50.
- 17 Poisonous and Edible Plants** Tuesday, 7:00 p.m.
A class in the identification, properties, and uses of poisonous and edible plants that are commonly cultivated in Phoenix and that are native to the Sonoran Desert. Four Tuesday sessions, and one field trip.
Fees: Members \$8.00, Non-members \$10.00.
- 18 Spring Crafts Workshop** Wednesday, 9:00 a.m. or 1:00 p.m.
A half-day workshop in crafts and projects that require native and commonly cultivated desert plants for construction.
Fees, including materials: Members \$8.00, Non-members \$10.00.
- 19 Cacti in Bloom** Thursday, 2:00 p.m.
A public slide presentation, held in the Webster Auditorium.
Free with Garden admission.
- 20-21 Organpipe Cactus National Monument** Friday, 5:00 p.m. - Saturday p.m. Limit: 25
An overnight field trip to this national monument near Ajo; excellent display of spring wildflowers and the only place in the United States to see organpipe and senita cacti growing in their native habitat.
Fees: Members \$14.00, Non-members \$18.00.
- 21 Wildflower Display** Daily, 9:00 a.m. - 5:00 p.m.
A colorful graphic exhibit that presents some of the desert's most common and beautiful wildflowers in bloom. On display in the Webster Auditorium. Through April 19.
- 26 Desert Wildflowers** Thursday, 2:00 p.m.
A public slide presentation, held in the Webster Auditorium.
Free with Garden admission.
- 28-29 Annual Spring Plant Sale** Saturday and Sunday, 9:00 a.m. - 5:00 p.m.
Hard to find and newly introduced trees and shrubs, cacti and other succulent plants.

DESERT BOTANICAL GARDEN LECTURE SERIES

PLANTS OF THE DESERT AND THEIR IMPORTANCE TO MAN

All lectures are held in Webster Auditorium at 7:30 p.m.
The public is invited to attend free of charge.

January

- 14** ECONOMIC PLANTS OF ARID LANDS —
A HISTORICAL PERSPECTIVE
Dr. Howard Scott Gentry, Research Botanist, Desert
Botanical Garden

February

- 11** SUCCULENT PLANTS AND THEIR USES
Joyce L. Tate, Fellow, C·S·S·A· and Chairman, Plant
Uses Committee, Cactus and Succulent Society of
America

March

- 11** DESERT PLANTS AND YOUR DIET
Ruth Greenhouse, Research Associate, Desert
Botanical Garden

SPECIAL EXHIBITS

POISONOUS AND EDIBLE PLANTS

An exhibit of poisonous and edible plants that are commonly cultivated in the Phoenix area and some that are native to the Sonoran Desert. On display in the Webster Auditorium, January 3-20.

POISONOUS PLANTS

A living exhibit of common landscape plants possessing poisonous properties. On display in the Douglas Display Case in the Cactus Lath House, January 10 - February 1.

CACTACEAE

A living exhibit illustrating the members of the Cactus family and their diversity and unique structures. On display in the Douglas Display Case in the Cactus Lath House, February 14 - March 8.

PLANT PROPAGATION

An exhibit presenting the techniques and tools of propagating desert plants from seeds, cuttings, and graftings. On display in the Douglas Display Case in the Cactus Lath House, March 14 - April 19.

WILDFLOWER DISPLAY

A colorful graphic display that presents some of the most common and beautiful wildflowers of the desert, and the desert areas in which they can be found. On display in Webster Auditorium, March 21 - April 19.



DESERT
BOTANICAL
GARDEN



Desert Botanical Garden

P.O. Box 5415

Phoenix, Arizona 85010

1981 Cactus Show

REGISTRATION CARD — 1981 CACTUS SHOW

Name _____ Phone _____

Address _____ City _____ Zip _____

READ instructions BEFORE filing card

Section	No. of entries
I	_____
II	_____
III	_____
IV	_____
V	_____
VI	_____
VII	_____
VIII	_____

Check all applicable:

- DBG Member
- Past Exhibitor
- Show Volunteer
- Plant Sale Donor

PLEASE MAIL BEFORE FEBRUARY 10, 1981