

SAGUAROLAND

BULLETIN

DESERT BOTANICAL GARDEN OF ARIZONA

Vol. 4

January 1950

No. 1

Editorial

Here is your Saguaroland Bulletin with a new look. It is less voluminous but contains more reading matter and, best of all, it contains illustrations. It has only a few pages to start but will increase in size with our membership.

We plan a useful future for our little magazine. First, we will begin next month with a description of all of Arizona's Cactuses, with illustrations, and we will continue until you will have a working manual for identification of plants in the field. When this is complete in the Bulletin, the same copy, with additional illustrations and keys, will be issued in book form.

Next month we will give the details on the annual Cactus Show which will be held this year from February 19th. to 26th. inclusive at the Garden in Papago Park. We are inviting Garden Clubs and individuals to enter cactus bowls and arrangements, succulent bowls and arrangements, as well as individual potted plants and collections of potted desert plants, and prizes will be awarded to the best entries.

Photographers are invited to display black and white prints and kodachromes in the competition and prizes will also be awarded for the best entries. For details see the daily papers in Phoenix.

See you at the Cactus Show—better than ever.

The Desert Botanical Garden

Our garden originated in the fertile brain of the late Gustav Starck, who knew that desert plants from all over the world could be successfully grown in the very favorable climate of our Arizona desert for study in one place without the necessity of travel

He was fortunate in interesting the late Gertrude Divine Webster in his project and she was instrumental in financing the building and starting the collection of plants under the supervision of George Lindsay, our first Director.

During the war period the Garden was closed and a caretaker kept plants alive, but in 1946 the present Director assumed charge of the Garden and its activities.

Since then over 5,000 plants have been added to the collection and the following educational services have been established:—

1. Garden is open to the public every day, October first to May first, from 10 A.M. to 5 P.M., closed all day Mondays.
2. Lectures on the flora and fauna of the deserts or related subjects each Sunday at 3 P.M., and 4 P.M., no charge.
3. Classes for adults who desire knowledge of desert plants each Thursday at 3:30 P.M., no charge. Series runs for eight weeks.
4. Instructions on desert plants for pupils of public and private schools and colleges each morning by appointment.
5. Instructions on desert plants for Girl and Boy Scouts each Saturday morning by appointment.
6. An annual Cactus Show in the week that includes Washington's birthday.
7. Lectures at hotels and service clubs, illustrated by kodachrome slides, day or evening by appointment. No charge.
8. Landscaping advice for residents of Arizona who wish to use native material in their plantings. No charge.
9. Garden Clubs are invited to meet in our well equipped auditorium for at least one meeting a year to hear a talk by Garden officials on desert plants. Call Phoenix 5-1815 for appointments. No charge.
10. The Garden is open at night for a week or more in late May or early June so that the public may view the night flowering cactuses at the height of the season. See daily papers for dates and hours.



Main Entrance Administration Building

Photo by R. C. Proctor

In the 1948-49 season over 100,000 visitors were received at the Garden and the paths are arranged so that each visitor can obtain much information by reading the signs posted near the more important plants.

This season we have found it necessary for the protection of our visitors to issue permits for the use of cameras which can be obtained by signing an agreement to remain on the paths while taking pictures. This prevents the visitor from tangling with plants and getting spined and protects our plants from damage. In December alone 193 permits were issued.

During one lecture in December licenses from 24 States were counted in our parking lot at one time.

The Garden is supported by memberships and voluntary contributions. Memberships, which include subscriptions to this Bulletin, are planned to fit any pocketbook so that all may have the opportunity of joining in our educational work. Memberships are as follows:

- Founders contribute \$500.00 or more.
- Life Members contribute \$100.00.
- Benefactors, \$50. annually.
- Sustainers, \$25. annually.
- Sponsors, \$10. annually.
- Builders, \$5. annually.
- Active members, \$2. or \$3. annually.

Over 200 memberships are required by the terms of Mrs. Webster's will in order for us to obtain the interest from her Trust Fund which can partially support the Garden, but your membership is needed to assure that condition and to supplement the endowment sufficiently to carry on the work of the Garden.

As soon as possible we plan to erect a 40 by 120 foot lath house to care for frost tender plants and to house those species of cacti and other succulents which prefer shade and a protected location. Plans for the new building have been prepared by Lescher and Mahoney and work will commence as soon as funds are available.

You can help in this project by a contribution to the Lath House Fund.

A new monograph of the Cactus family, in which the taxonomy has been greatly simplified and in which most of the new species of Cactus described since 1922 are listed with descriptions, will be published in the spring as scientific paper No. 1 of the Desert Botanical Garden and the book form of Arizona's Cactuses, first offered serially in this Bulletin will be issued as paper No. 2.

From May 1st. to October 1st. the Garden is closed to visitors except on Saturday and Sunday, when it is open from 10 A.M. to 6 P.M. On other days members of the Society, botanists, students and photographers who have first secured permits may enter the garden during daylight hours through the West Gate.

Saguaroland Bulletin is issued ten times a year by the Arizona Cactus and Native Flora Society Inc., sponsors of the Desert Botanical Garden of Arizona in Papago Park. Editor, W. Taylor Marshall, P. O. Box 647, Tempe, Arizona.

Subscription rate, \$1.00 per year or 10c per copy. The first \$1.00 of any membership in the Arizona Cactus and Native Flora Society Inc. shall be considered as payment for a year's subscription to Saguaroland Bulletin. Box 647, Tempe, Ariz. Volume 4, Number 1. January 1950.

The January issue of "Family Circle" shows Ted De Grazia cutting off the tip of a Saguaro Cactus to use in making a form for pottery bowls. The Law of Arizona prohibits the destruction or mutilation of desert plants and provides a penalty for violations. We strongly urge our readers to express to Safeway Stores their disapproval of the article "Make your own Pottery" because it is an invitation to violation of Arizona's Plant Conservation Laws.



Planting on North Side of Building.
Photo by Homer Rush

Phoenix Camera Club Exhibit

The Phoenix Camera Club and the Phoenix Gazette cordially invite you to submit prints and slides to the exhibit at the Desert Botanical Garden, February 19th. to 26th. inclusive.

The competition is open to residents of Arizona and to members of the Arizona Cactus and Native Flora Society living outside the State. Subject matter is limited to cactus and other desert plants, their blossoms and desert landscapes.

Four prints in any photographic medium, four color prints and/or four color transparencies, may be submitted by any contributor. No entry fee is charged and all possible care will be taken in the handling of prints and transparencies but no responsibility will be assumed for loss in transit or during the Salon. All entries will be returned in the original wrappings.

Any number from one to a maximum of four color transparencies (2 x 2) may be submitted for the consideration of the jury. Slides must be marked with the title, maker's name and address and must be spotted in the lower left hand corner. It is recommended that all slides be mounted in glass of standard size. Monochrome and color prints must be mounted on light colored mounts not exceeding 16" x 20".

All prints, mounting excepted, must be the work of the contributor, except that in the case of color prints, the processing of the transparency may be done by the manufacturer. All color transparencies must have been exposed by the entrant.

Prints will be received up to and including February 14th. Entries may be mailed or delivered personally to Desert Botanical Garden, Photo Exhibit Committee, Box 647, Tempe and should be called for after February 26th, unless you prefer to have them returned by mail or express.

A catalogue of the Salon will be sent to each exhibitor and two prizes will be awarded, one to the selected slide and one to the selected print. Selection to be by popular vote of the visitors to the exhibit.

Sunday afternoon, February 26th. will be photographer's day at the exhibit and all photographers are invited to attend that afternoon to meet fellow hobbyists and to compare notes on the entries.

The committee in charge of the Photo exhibit for this year consists of three members of the Desert Botanical Garden, two of whom are also members of the Phoenix Camera Club.

The chairman is Frank Proctor whose work in the December issue of Arizona Highways has attracted most favorable comment. His "Cholla and Snow" a desert vignette, and the full page "Four Peaks—Winter" are both beautiful studies and both of them are used in the lectures of the Director as Frank presented the Garden with original 35mm. kodachromes of both subjects.

Miss Blanche H. Adams, the second member of the committee, is also a master of both monochrome and color photography and several of her fine 35 mm. slides are included in the Garden's library of slides. Her prints and slides have been exhibited in our last year exhibit and she has many firsts from Salons throughout the country.

Joseph Prophet modestly claims to be the rankest amateur but 18 of his subjects are included in our slide library and find frequent use in our lecture work.

Arizona's Cactuses

In 1935 the University of Arizona issued Biological Bulletin No. 1, "Arizona Cacti" by Stockwell and Breazeale, in which the species then known to be indigenous to the State were described and illustrated and a set of keys, illustrated by line drawings, made identification of species relatively easy.

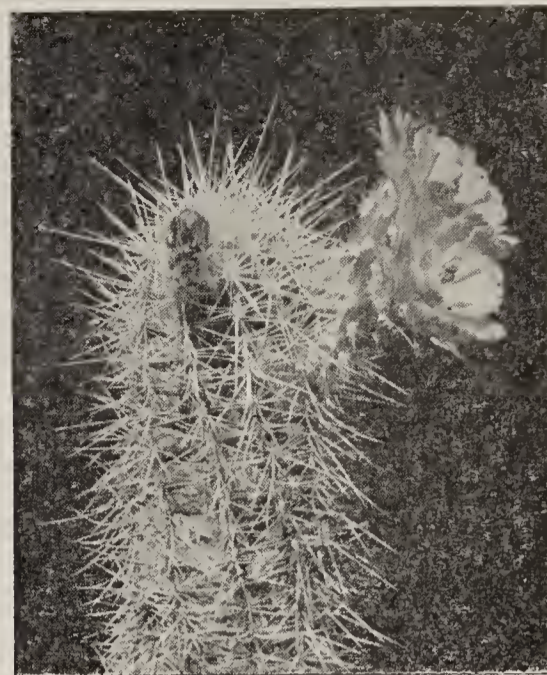
In 1940 the University issued Biological Bulletin No. 5, "The Cacti of Arizona" by Lyman Benson, a more pretentious effort by a man who had made an intensive study of the subject and was well qualified for the work. Unfortunately Dr. Benson had to retain the very outmoded system of nomenclature favored by the University and this to some extent detracted from the value of the work.

Both of these bulletins are now out of print and the second edition of Dr. Benson's work has been delayed or abandoned. Dr. Benson has meanwhile gone to Pomona College and in "Proceedings of the California Academy of Sciences" Nov. 1944 published "A Revision of some Arizona Cactaceae" in which the results of extensive field work is used as the basis for a revision of species in the best of accepted usage. This scholarly article is, unfortunately, not available to most students.

Therefore the Desert Botanical Garden has decided to publish serially in our Saguaroland Bulletin a complete text covering all species of cactus native to the State and later to assemble all of the sections into a book for field use.

One variety native to Arizona is both interesting in form and flower and but little known. This is *ECHINOCEREUS TRIGLOCHIDIATUS* variety *POLYACANTHUS* (Engelmann) Benson, commonly called the many spined claret cup cactus. It is found in the Pinal Mountains, the Galliuero Mountains and in Santa Cruz and Cochise Counties of southeastern Arizona in grasslands and Oak woodlands.

It is a cylindrical plant, simple or in small clumps, the stems 6 to 20 inches high and 2 to 4 inches in diameter with 9 or 10 prominent ribs. In each spine cluster there are about 10, needle-like spines flattened against the stem and 2 to 4, heavier, spines in the center, these turned downward or perpendicular to the stems and from 1 to 2 inches long. In May and June the plant bears a number of scarlet to crimson flowers, funnel-shaped and about 1 3/4 inches long, each flower remaining open for three to five days both day and night.



Echinocereus triglochidiatus var. *polyacanthus* (Engelmann) Benson. Photo by Geo. Olan.

The Aloes

January is a drab month in most gardens, but the addition of Aloes to the flora assures color in the winter months because these African species of Lilies produce their yellow, orange, or red flowers on long scapes above the rosette arrangement of the leaves at this period.

Aloes are not only valuable flowers, but also have great medicinal value. One species, Aloe Vera, has been in medical use since the fourth century B. C., when the Greeks imported it from the Island of Socotra to extract its resinous juice called "bitter Aloes," which they used as a laxative.

Aloe Vera forms rosettes of long, narrow, very succulent leaves which are olive-green in color with a hint of reddish color in winter. The margins of the leaves are toothed, each tooth tipped with a hard black, minute spine. The tips of the leaves are not crowned by long spines as are the Agaves.

Aloe Vera, the true Aloe, a native of the Mediterranean countries, has been introduced into most tropical countries, especially the West Indies, where it is now referred to as the Barbados Aloe. In Baja California, near the Tropic of Cancer, I have seen a wide valley completely overrun by this species which escaped from cultivation at the early mission stations. This Aloe is illustrated on the cover page.

The flower scape arises from the axils of the newer leaves and is about two or more feet tall, and bears numerous lemon-yellow, tubular flowers which open in succession with the lowest flowers opening first. Several varieties are known, some of which have orange colored flowers.

The leaves are very thick, the center composed of storage tissue of thin-walled cells which resemble a mass of lemon jello; and this tissue is efficient as a relief in case of sunburn or other burns. A direct application of the split leaf can bring very quick results. Modern science has found that this tissue, or derivatives from it, is an efficient relief in cases of X-ray burns.

During the war our armed forces used two forms of Aloe preparations. One for external use on burns, called "Collin's Certified Aloe Vera Ointment", was prepared by the General and Marine Laboratories of Crispfield, Maryland. For internal use, a liquid preparation called "Alvedal" is compounded by the Picker X-ray Corporation of Cleveland, Ohio. All this information was obtained for us by Mr. R. M. Odom of Phoenix, himself a victim of internal X-ray burns.

Some of the Aloes become trees in age, as do some of the Agaves. In fact, all of the forms found in one genus are duplicated in the other, although the Aloes are all Old World plants and the Agaves are found only on the American continents and the adjacent islands.



West End of Auditorium. Photo by R. C. Proctor

Layout of Plantings

Courtesy of Arizona Guide



Among the plants particularly interesting to visitors are the following—(see corresponding letters on Map):

(A) Just below the front steps of the Administration Building is a demonstration planting of seedling cactus. Here also is a large shrub with good sized leaves and long yellow blossoms. This is Tree Tobacco or San Juan Tree (*Nicotiana glauca*)—originally from Argentina, now naturalized in the Southwest.

The plots nearest the main building are nearly all exotic; from Mexico, Central and South America. To the right of the path leading west along the main building is the funny Boogum Tree (B) which seems to be growing upside down, looking like an inverted white radish.

Opposite, on the other side of the same path, is the Senita or Old Man Cactus with its long white, hair-like spines, and an Organ Pipe Cactus. Over toward the Webster Collection you can see a living fence made with Organ Pipes.

Similar to the Organ Pipe and along the same path is a good specimen of the Totem Pole Cactus (D).

Along the western border of the Gardens are the Agaves or Century Plants and in the northwest corner the Opuntias or Prickly Pear.

One of the first plants one notices in the Webster Collection is the great Golden Barrel Cacti from Mexico (G). Along the path thru the middle of the collection, one will note a consecu-

tive planting of small Saguaros (H) clearly demonstrating the slow growth of this mammoth cactus. Here are specimens ranging from a tiny seedling only a couple of years old up to one 30 years old, foot-high plant.

Under the ramada at (E) are many plants of the African Milkweed family, commonly called Carrion Plants because of their unpleasant odor. It is this odor, however, which attracts the flies and other insects so necessary to pollination.

Most of the night blooming types are in the rear patio behind the buildings. These will be blooming late in May or early in June.

Typewritten labels are placed beside each plant which has a common name.



CHILOPSIS LINEARIS (Cav.) Sweet.

Photo by Geo. Olan.

The so-called desert willow is cultivated for the beauty of its catalpa-like flowers. It can be propagated by seeds or by cuttings.

CHILOPSIS LINEARIS is common throughout the central and southern parts of Arizona, near stream beds. The best specimens known to us are found in the Oak Creek district and near Willcox.

Saguaroland Bulletin

Box 647, Tempe, Ariz.

To

SAGUAROWAND

BULLETIN

DESERT BOTANICAL GARDEN OF ARIZONA

Vol. 4

February 1950

No. 2

Editorial

The "Cactomaniacs of Scottsdale" are a group of collectors of desert plants formed within the membership of the Desert Botanical Garden, to encourage the use of desert plants in landscaping and to boost the hobby of cactus collecting in general. Two meetings have been held with 38 members of the group, mostly from the Scottsdale district, but membership is open to any of our members who are interested and should enough members from other districts become interested we will form other groups for each locality well represented.

A field trip was made on Sunday, February fifth to the Pinnacle Peak district by the Cactomaniacs to study the plants in the field, to enjoy a picnic lunch and to get well acquainted.

Meetings are scheduled for the first Tuesday of each month at the Auditorium of the Garden at 8 P. M. There are no dues and coffee and cake will be served by several of the members at each meeting. See Charlie Mieg, the Chief Maniac, in Scottsdale or contact the Garden if you would like to join this group.

This Bulletin will be in the mails just a week before the opening of the Third Annual Cactus Show, sponsored by the Phoenix Gazette, at the Garden from February 19 to 26, inclusive. There will be a photographic Salon sponsored by the Phoenix Camera Club, with black and white and color prints and color transparencies on display all during the show. Final day for entries is February 14th.

Entries in the floral show can be made up to the morning of the show, Feb. 19th, at 10 A. M. We solicit entries of cactus bowls, succulent bowls, individual potted desert plants or collections of them and arrangements for corsages or for table decorations. Commercial displays of plants or products of the desert can also be entered in the show and are solicited.

Advance entries indicate that this will be our best show and we hope that everyone in Arizona will find the opportunity to attend. Last year we had 18,000 visitors in the week of the show and we expect a larger attendance this year. As in the past, many guides will be needed to aid visitors and to see that no plants are destroyed or removed and we ask that any member who can spare the time contact the Garden and arrange

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Little Known Desert Lily

Most desert travellers are familiar with the Mariposa Lilies (*Calochortus* spp.) which flower from hidden bulbs in the spring and early summer, and many



Fig. 7. *Nolina Bigelovii* (Torr.) Watson 1879.
photo by J. Fleming.

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Little Known Desert Lily

(Continued from Page One)

of them know that the *Yuccas* of our deserts are also lilies, although many of them make large trees, but few know of another tree-like lily of the higher altitudes of the Bill Williams River drainage.

We refer to *Nolina Bigelovii*, a plant that can be seen at its best near Burro Creek on the new Congress Junction-Kingman highway, where thousands of the plants occupy rocky locations on steep hill-sides.

It does not have a common name that we know of, but another, stemless species of the genus, *Nolina microcarpa*, is referred to as "beargrass".

N. Bigelovii forms a woody trunk of 3 to 6 feet in height which is topped by a rosette of long, narrow leaves which are slightly concave, spine-tipped and with a rough margin which later shreds away in brown fibres. The flowers are borne on long stalks which branch to form compound-panicked inflorescences, the male inflorescence, shown clearly in the accompanying photo on the two plants in the foreground, are open and feathery in appearance while the female inflorescence is more compact, as can be noted on several plants in the background.

Nolinas are useful only as ornaments. The leaves are browsed by cattle and sheep in times of extreme drought but this sometimes results in poisoning of the animals. As ornamentals they are worthy of an honored place in any desert garden.

Flower and Spine Color

On January 22 the Mineralogical Society of Arizona visited the Garden and remained for the 3 o'clock lecture. In their honor, the director attempted to assemble information on the effect of mineral content of soil on flower and spine color but found that there was no accurate information available.

We know that cactus plants inhabiting soil with high lime content have very white spines, cactus plants in the vicinity of copper mines have deeper color in their flowers than does the same species in other locations and all species with an extensive range have flowers of various shades and even of different colors.

In 1930 the University of Arizona issued a bulletin "Color Schemes of Cacti" by John M. Breazeale but this article offered the theory that flower color was complimentary to stem color but did not consider the cause of varying stem and flower color.

We have therefore suggested to the Mineralogical Society that they work with the Garden to assemble facts on which a conclusion could be based as to the exact effect of mineral content of soil on flower and spine color.

Horticulturists have long realized that flower color can be changed by the addition of minerals to the soil. An example is found in the hybrid *Hyderangeas* with, normally, pink flowers which turn bluish when iron filings or alum is added to the soil.

This whole subject needs study and we welcome cooperation from our membership in our observations.

Editorial

(Continued from Page One)

to be on hand for certain days or parts of days. Saturday and Sunday attract the biggest crowd and more guides are needed for those days.

Under our by-laws, three directors' terms will expire in April and their successors must be elected at the April meeting of the Society, this year on April 19th, at 3 P.M., and ballots for this election will be mailed with the March Bulletin. If it will not be possible for you to attend this meeting please sign the proxy that will accompany the ballot.

An Important Lecture

Mr. Ed. Kurtz, a graduate of University of Arizona, now a post graduate student at California Institute of Technology will speak on Sunday afternoon, March 19th, on pollens as a possible determinant of taxonomic and genetic problems.



Fig. 8. Two views of habitat plantings in the Garden. Photo by J. Fleming.

Arizona's Cactuses

1. *OPUNTIA RAMOSISSIMA*¹ Engelm. 1852.

Sometimes referred to as *Opuntia tessellata*² Engelm. 1856.

A shrubby cholla,³ usually less than 3 feet high but attaining a height of 6 feet in some localities; much branched, as the name indicates, the branches criss-crossing intricately; branches cylindrical, woody, not very succulent, the surface covered with inverse egg-shaped or diamond-shaped shields or plates, each of which bears an enlarged pore, called an areole⁴ in its upper portion.

Spines are sometimes absent entirely, (variety *denudata*) but there are usually one, and occasionally two, spines at each enlarged pore (areole), one spine is placed vertically to the stem and is 1½ to 2 inches long, reddish when young but becoming gray in age, always covered by a papery sheath which is pale yellow or pale tan and completely conceals the spine. Each pore (areole) also contains white or tawny wool and a number of very short, barbed bristles called glochids.⁵

The flowers are small, about ½ inch in diameter, the petals yellowish-green, slightly tinged with red; stamens greenish-yellow; anthers orange colored; style and stigma-lobes cream colored. The fruit is slightly conical but almost cylindrical, about 1 inch long, dry and very spiny and appears on the ends of short, lateral branches, as did the flowers.



Fig. 9. *Opuntia ramosissima* Engelm. Habitat photo by Homer Rush.

The "much branched cholla" is found on alluvial soil of the desert floor and in washes from the 90 to 3000 foot level in Yuma and Mojave Counties, along the watershed of the Bill Williams River and eastward through Gila Bend to within 20 miles west of Casa Grande in Arizona. It is also found in southern Nevada, eastern California and northern Sonora.

Easily distinguished from the other Arizona chollas by its woody stems and the diamond-shaped shields which cause the stems to appear as though protected by chain-armor.

Because of the woody stems, this species is difficult to propagate from cuttings and seedlings or small plants

should be selected for garden culture. This species frequently crests but the fasciated stems seldom root in cultivation.

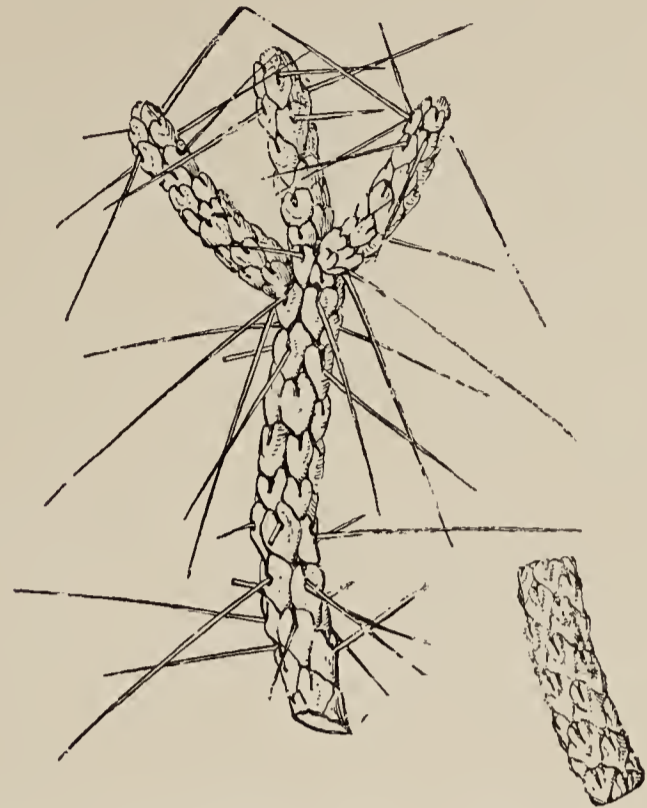


Fig. 10. *Opuntia ramosissima* Engelm. Terminal branch illustration from "Cactaceae" Britton and Rose, Vol. 1, 1919.

1. *Opuntia ramosissima* — o-pun'-shi-a ram-o-sis'i-ma — most branched.
2. *Tessellata*—tes-e-la'-ta—marked like a mosaic.
3. *Cholla*—cho'-ya—Mexican name for certain cylindropuntias.
4. *Areole*—a'-re-ol—in cactus, the restricted area or enlarged pore from which spines and flowers are borne.
5. *Glochid*—glo'-kid—a barbed hair or bristle.

2. *OPUNTIA LEPTOCAULIS*¹ De Candolle 1828.

Sometimes referred to as *Opuntia frutescens*² Engelm. 1850.

A small, bushy cholla which, usually, is two feet or less in height; branches about 3/16 inches in diameter and about 6 inches long, the terminal branches and some lateral ones, which grow at right angles to the stem, are about 3 inches long and usually spineless, smooth, green but with darker blotches below the spines. The internal woody core is nearly solid but is surrounded by juicy, storage tissue.

Spines usually one at an areole, white, slender, 1 to 2 inches long and covered with a papery, light tan sheath. Each areole also bears short, white wool and a few barbed bristles.

Flowers borne at ends or along sides of branches, green to yellow, ½ to ¾ inch in diameter. Fruits red when ripe, inverse egg-shaped, somewhat juicy and without spines, persistent into December. New flowers and fruits sometimes are developed on old fruits.

Found in fairly heavy soil on plain or mesa from 200 to 3000 feet elevation. Mojave, eastern Yuma Counties and east to Cochise County in Arizona also New Mexico, Texas and northern Mexico.

The numerous red fruits which persist through December have earned for this species the common name "Desert Christmas Cactus." It can be identified by its very thin branches which are smooth.

In some districts in western Arizona a form that seems to be a hybrid of *Opuntia ramosissima* and *O.*

leptocaulis is observed. Like *O. ramosissima*, this species is not easily grown from cuttings.



Fig. 11. *Opuntia leptocaulis* D.C. Section of stem. From "Cactaceae" Britton and Rose, Vol. 1. 1919.

1. Leptocaulis—lep-to-ko'-lis—slender stemmed.
2. Frutescens—froo-tes'-enz—shrubby.

3. *OPUNTIA ARBUSCULA*¹ Engelm 1856.

Sometimes referred to as *Opuntia vivipara*² Rose 1908.

A tree-like cholla, usually 2 to 4 feet high but attaining to 7 feet in some locations; main trunk up to 4 inches in diameter, stems much branched, cylindrical, the terminal branches $\frac{3}{16}$ to $\frac{5}{16}$ inches in diameter, smooth except for low projections capped by the areoles. tinged with red or purple; flowers, fruit and occasionally branches are sometimes borne on old fruits.

Spines usually 1 from an areole but sometimes several on old joints, standing out from the stems, short, covered with inconspicuous, straw-colored sheaths; gray wool at each spine cluster and a few barbed hairs.

Flowers produced along stems, 1 inch or less in diameter, yellow, green or terracotta; fruit pear-shaped, 1 to $1\frac{1}{2}$ inches long, spineless, somewhat juicy, green.

Found in sandy washes or the heavier soil of valleys in Maricopa, Pinal, Pima and Santa Cruz Counties in Arizona and in Sonora. The plant described by Rose as *Opuntia vivipara* was a form of *O. arbuscula* found near Tucson. On specimens in the Baboquivari and Santa Rosa Valleys the trunks of the taller plants have a thick, black, scaly trunk.



Fig. 12. *Opuntia arbuscula* Engelm. Section of stem showing proliferous fruit. From "Cactaceae" Britton and Rose, Vol. 1. 1919.

1. Arbuscula—ar-bus'-ku-la—like a small tree.
2. Vivipara—vi-vip'-a-ra—germinating while still attached to the parent plant.

Saguaroland Bulletin

Box 647, Tempe, Ariz.

To

SAGUAROWLAND

BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. 4

March 1950

No. 3

Editorial

The annual meeting of the Arizona Cactus and Native Flora Society Inc. will convene at the Webster Auditorium of the Desert Botanical Garden on Sunday, April 16th, at 3:30 P.M.

At this meeting three directors will be elected to fill the vacancies caused by the expiration of the terms of three of the present directors. - According to our By-laws the president has appointed three members in good standing to act as a nominating committee who report as follows:—

The nominating committee of the Arizona Cactus and Native Flora Society Inc. for 1950 met at the Garden on January 22, 1950 at 1:45 P.M. and selected the following names as our choice of nominees to fill the vacancies on the executive board:—

Mrs. Marguerite Rockwell

John H. Eversole

Tommy Goodnight

Mrs. Rose Alschuler

Nominating Committee

Christine Campbell, Chairman

Diana May Kelso

Gladys E. Prophet

Additional nominations can be made from the floor at the annual meeting. We urge that all of our members living within a reasonable distance attend the meeting, but as our membership is widespread many will be unable to attend and for these we attach a post card ballot to this Bulletin. To vote by mail mark an X opposite your choice for the three vacancies and mail the card not later than April 5th.

If you do not feel able to make a selection because of unfamiliarity with the candidates you may designate any one of the three following officers of the Society as your proxy, to vote in your name and place:—

President W. Taylor Marshall

Vice President Lou Ella Archer

Secretary Angela Bool

Third Annual Cactus Show

The third annual cactus show had an estimated attendance of over 15,000 interested people who confirmed our opinion that this was the best show in number of exhibits and in the quality of those exhibits. Marked improvement was shown in the bowls, center-

piece arrangements and corsages this year and for the first time we had good collection exhibits, notably a collection of 50 species of Haworthias by Sherman and Gertrude Beahm of Pasadena and a collection of ten rare species of Euphorbias by Herman Schroeder of Avalon, and, best of all, the plants in these exhibits were presented to the Garden after the show.

By popular vote Mrs. Ralph Stoughton was selected as having the best entries in the plant section of the show but Dr. Gladys Wise was so close in the voting

(Continued on Next Page)



Fig. 10A. *Opuntia ramosissima* Engelmann
Habitat photo by Roy Miller

An additional illustration for the first installment of Arizona's Cactuses.

Saguaroland Bulletin is issued ten times a year by the Arizona Cactus and Native Flora Society Inc., sponsors of the Desert Botanical Garden of Arizona in Papago park. Subscription rate \$1.00 per year to members, the first \$1.00 of any membership in the Arizona Cactus and Native Flora Society Inc. shall be considered as payment of a year's subscription to Saguaroland Bulletin. Subscription to non-members \$2.00 per year. Editor, W. Taylor Marshall, Box 647, Tempe, Ariz. Volume 4, Number 3, March 1950.

Cactus Show

(Continued from Page One)

that we found it necessary to give duplicate prizes to these two ladies. The Old Fashioned Garden Club had a wonderful exhibit, as did Mrs. Ralph Williams.

Thirty-five black and white photos and thirty-one kodachromes were selected by the Judges, Blanche Adams, Les. Mahoney and W. M. Tillery as worthy of showing and by popular vote Howard Soule's "Desert Paradise" was named best black and white and Joe Prophet's "Hedge Hog in Bloom" was named best kodachrome.

The commercial booth of the Cahill Desert Products Co. showing "Prickly Pear Jelly", and staffed by Jim and Mabel Cahill in person, was a big hit. And did they sell Jelly?! The Rocking Horse Ranch had a big showing of pottery and plants and seemed to be busy all the time.

Sandyland Gardens was represented by three truly splendid cactus and succulent bowls, the handiwork of Herb. and Angela Bool and presented by them to the Garden to be sold for the benefit of the Lath House Fund, and they were sold for \$65.00. Our sincere thanks to the Bools.

We must thank, also, Mrs. Maybelle Place of Tucson, Mr. G. L. Purdy and T. G. Tamplin who assisted us by acting as guards and hostess during the show, and J. Whitman Evans for his exhibit of specimen plants, and Mr. M. A. Natanson of the V-S Ranch Auto Court, 14 miles East of Mesa, who displayed the most remarkable collection of inlaid furniture and novelty pieces all made of the wood from the Saguaro Cactus. Bill Sparks, the desert artist showed three excellent water colors of the desert.

Special Lecture

Of great interest to teachers and biology students will be the talk scheduled for Sunday, March 19 by Ed. Kurtz of California Institute of Technology on the subject:—Pollens as possible determinants in taxonomy and genetics. Time: 3:30 P.M.

Book Review

Two new publications of great merit have been received in the past month and they reflect the interest in desert plants in Europe.

Cactees by A. Bertrand and A. Guillaumin was published in Paris, France in November by La Maison Rustique. It is a 125 page book with paper cover in color and has 42 black and white illustrations and 9 color plates illustrating 12 plants. All of the illustrations are excellent but the color plates are outstanding.

As the book is written in the French language it may have limited use here, but to those who can read it, it would prove valuable especially as the American system of classification is used and the more recent distortions of some of the German botanists was rejected.

Price 570 francs.

Of prime importance to collectors here is the second edition of Cactus and Other Succulent Plants by H. M. Roan, Hon. Secretary of the National Cactus and Succulent Society of Great Britain. This book is cloth bound, 7½ x 9¾ inches with 65 pages and an index. There are 123 illustrations all of them excellent.

All of the information needed by beginners and much information of value to the advanced collector or student is there and all of it is in very simple language. In our opinion it is the best book on the subject that has yet been done.

Chapter headings are:— Succulent Plants—What are they? How to start a collection, Cacti, Flowering Cacti, Cristate and monstrose forms, then a chapter for each of the plant families which include succulents with a list and description of the desirable species, Potting and repotting, Cuttings, Propagation from seed, The arrangement of a cactus collection, Cultivation in a living room, Pests and their control, Why such fancy names, Cultural advice month by month.

The book sells for 10 shillings 6 pence in England and we have a supply which we will offer at \$1.65 plus 15c postage.



Fig. 18. *Opuntia versicolor*, Engelmann
Flowers, R. C. Proctor.

Arizona's Cactusses

4. *OPUNTIA KLEINIAE*¹ De Candolle 1828.

Sometimes referred to as *Opuntia tetracantha*² Toumey 1896.

Shrubby cholla, two to four feet high, the stems openly branching; stems cylindrical, strongly nipped, the nipples longer than wide, terminal branches about ½ inch in diameter; central core of woody tissue nearly solid; areoles (enlarged pores) longer than wide, filled with white wool and bearing one to four spines, usually one, and usually less than one inch long and covered with a papery sheath only when young; flowers less than one inch in diameter the petals purplish, broad and rounded at the apex; fruit red at maturity, fleshy, about one inch long, reverse egg-shaped.

Klein's cholla is found in southeastern Arizona from Douglas eastward and in New Mexico, Texas and northern Mexico usually on limestone hills at 3000 feet or higher.

4A. *Opuntia Kleiniae* D. C. variety *tetracantha* (Toumey)

Similar to the species but with three to six, usually four, spines and yellowish-green flower petals tinged with purple or lavender.

Sandy soil from Sacaton and Florence to Tucson and the Rincon Mountains at 1500 to 3000 feet.



Fig. 16. *Opuntia versicolor*, Engelmann

Drawing by

D. Wayne Thompson

Fig. 15. *Opuntia Kleiniae* D. C.

Drawing by

D. Wayne Thompson

1. Kleinias. A name given because of a fancied resemblance to some species of Kleinias, a genus of succulent plants in the Composite family.
2. Tetracantha—tet-ra-can'-tha—with spines in fours.

5. *OPUNTIA VERSICOLOR*¹ Engelmann 1896.

Bushy cholla, three to seven or rarely twelve feet high, stems compact and interwoven, green, purplish-green or brownish-red; branches cylindrical, ten to eleven inches long and ¾ inch in diameter, strongly nipped, the nipples ¾ inch long and ¼ inch wide and bearing nearly circular pores (areoles) in the upper part; areoles bear white wool and very short barbed bristles (glochids); spines five to eleven, ¼ inch to ⅝ inch long, gray or purplish and covered by white or gray sheaths which fit closely over the spines but drop off after a few months.

Flowers 1¼ inch to 1¾ inch wide, wheel-shaped; petals variously colored with a range from green through yellows and orange or bronze to red. Sixty kodachromes of the flowers in one district showed sixty distinct shades and colors.

Fruit, when mature, green tinged with purple or red, at first with nipples but later pear-shaped, fleshy and spineless.

New flowers are often produced on the fruits in the next flowering period and chains of fruits are sometimes noted.

The varicolored cholla is found in well watered bottom-lands and arroyos at 2000 to 3000 feet elevation in southern Arizona and northern Sonora. The plant usually is tree-like, having a definite trunk and a rounded crown and is the most striking of Arizona's chollas because of the purple or reddish color of its branches and the wide variety in its flower colors. It is very variable and frequently hybridizes with *O. spinosior* where the range overlaps.

1. Versicolor—vur-sik'-o-lor, having various colors.



Fig. 17. *Opuntia versicolor*, Engelmann
Habitat photo, R. C. Proctor.



Fig. 14. *Opuntia Kleiniae* var. *tetracantha*
Habitat photo by Geo. Olin.



Fig. 19. *Opuntia spinosior* (Engelmann) Toumey.
Drawing by D. Wayne Thompson.

6. *OPUNTIA SPINOSIOR* (Engelmann) Toumey.

Shrubby to tree-like cholla three to twelve feet high, usually with a definite woody trunk and imbricated branches in whorls, spreading at right angles; branches cylindrical, green, completely covered with nipples (tubercles) which are long and narrow and in almost continuous rows, each tubercle $\frac{3}{8}$ to $\frac{3}{4}$ inch long and bearing enlarged pores (areoles) in their upper part; occasionally the stems have a purple coloration; areoles small, round, bearing scant wool and a few minute barbed hairs (glochids) and ten to twenty spines $\frac{1}{4}$ to $\frac{3}{8}$ inch long; spines gray or tinged with red or purple and covered by thin sheaths for the first year.

Flowers about two inches in diameter, wheel shaped; petals about ten ranging from white to yellow, red or purple; fruit, when mature, lemon-yellow, fleshy,

reverse egg-shaped, strongly rippled, not spiny and persisting through the following winter.

The "spinier" cholla, also called "cane cholla" is common in the desert grasslands to the upper edge of the juniper belts at 2000 to 7000 feet elevation. It is found south of the Mogollon Rim and east of the Verde River in Arizona.

The common cholla of New Mexico, *Opuntia imbricata* (Haworth) D.C. rather closely resembles this species but has less spines and conspicuous white sheaths. Hybrids of *O. spinosior* and *O. fulgida* are noted near Sacaton and in other points where the range of the two species coincide.

1. Spinosior—spi-no'-si-or—spinier.



Fig. 20. *Opuntia spinosior* (Engelmann) Toumey.
Habitat photo, R. C. Proctor.

Saguaroland Bulletin

Box 647, Tempe, Ariz.

To

SAGUAROWOOD

BULLETIN

DESERT BOTANICAL GARDEN OF ARIZONA

Vol. 4

APRIL, 1950

No. 4

Editorial

The annual meeting of the Arizona Cactus and Native Flora Society Inc., sponsor of the Desert Botanical Garden of Arizona, will be held in Webster Auditorium on Sunday afternoon, April 16th, at 3:30. Three members of the Executive Board will be elected at the meeting and we will have a report on the progress of the Garden for the past year and of the plans for the coming year.

Work was started on the new lath house on March 29th, when a large tractor started leveling the site for the foundations. As this is written the forms for the concrete piers on which the building will rest are being placed and the foundations should be completed by April 8th.

On these piers the galvanized steel columns will be placed to support the steel roof beams. All of the outside of the building and the roof will be of moulded aluminum lath. The roof will be guttered to prevent drip and the side walls will open out for ventilation on hot days. All metal parts will be prefabricated by Aluminex Inc. of Los Angeles and the erection of the superstructure will require a week after the date of arrival here.

The main exhibition room will be 40 x 60 feet and 12 feet high and from this an east wing 40 x 40 feet and 8 feet high will house the humid room in which *Epiphyllums*, *Hylocerei*, *Selenicerei*, *Rhipsalis* and many succulent plants will be grown. To the west another wing 20 x 40 feet and 8 feet high will house the propagating room which will not be open to the public.

In the two exhibition rooms beds will be raised eight inches above the paths and the plants will be set directly in the beds, 3000 square feet in extent. Here we will grow tender species of *Cactus*, *Euphorbias* and the taller growing species of other succulents and xerophytes.

On hand for display in the new house are extensive collections of *Hawthorias*, the gift of the Beahms of Pasadena. *Mesembryanthemums* from Howard E. Gates. a number of *Euphorbias* from Herman Schroeder of Avalon and some rare *Bromels* and some trees and shrubs from Howard E. Gates. We need collections of *Euphorbias*, *Bromels*, *Pilocerei* and *Cephalocerei*, *Rhipsalis*, *Epiphyllums* and Orchid Cacti as well as most of the succulents commonly grown in collec-

(Continued on Next Page)

Ephedra, Mormon Tea

The *Ephedras*, five species of which are known on the southwestern deserts, are shrubs composed of an intricate network of slender, brittle stems which bear only a few narrow, scale-like leaves and usually attain to a height of less than five feet. The stems are green, blue-green or yellow-green.

Male plants bear conspicuous clusters of yellow anthers in the spring while the female plants bear inconspicuous green cones. *Ephedras* are distinguished from other leafless shrubs of the regions by the presence of the minute cones.

Ephedrine, a drug largely used in medicine, is derived from an Asiatic species of *Ephedra* but the species of our deserts are notable for the excellent tea that can be brewed from the dried or green stems. For this reason they are called Mormon Tea, Mexican Tea or Squaw Tea. Another common name is Joint Fir.

In recent years the dried stems have been offered by health food stores at high prices as a substitute for Tea and as a kidney stimulant. The tea is reputed to have aphrodisiac properties.

Ephedra makes an interesting addition to a desert plant garden and we have had considerable success in transplanting small specimens into our garden where it is flourishing.



Fig. 21. *Ephedra californica* S. Watson.
Photo by Scott Haselton.

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Editorial

(Continued from Page One)

tions on the Pacific Coast but which we have been unable to grow because of the extreme dryness of our air but which can be grown in our humid room.

We solicit contributions for the lath house of plants or the funds to purchase collections of specific groups of plants and acknowledgment will be made, by the erection of a metal sign in the beds, of contributions of 100 plants or over.

We also extend a very special invitation to our members to attend the annual meeting on April 16th, to view the progress of the new house.

SUMMER SCHEDULE.

The winter season for 1949-50 will end on April 30th, and we will go on summer schedule on May 1st, which means that from May 1st to October 22nd the garden will open to the public only on Saturday and Sunday, Decoration Day, Fourth of July and Labor Day from 11 A. M. to 6 P. M. Members of the Society, Botanists and Students are welcome on any day during the summer season and they may enter through the west gate which is always open. Photographers may enter the garden during this season by appointment which can be arranged either at the Garden, when open, or by phone, Phoenix 5-1815.

The Director will leave Phoenix on May 1st for Los Angeles to arrange for the shipment of plants for the lath house from Californians who have asked to contribute to our collection. He will return to the Garden on May 9th.

On Monday, May 15th, a group of members will leave the Garden for Springerville where we will meet an expedition from New Mexico College of Mines at Socorro and, we hope, a group from University of California at Berkeley, for a collecting trip through the Navajo country, southern Utah, southern Colorado and northern New Mexico.

Later in the summer we will head a group of members on a trip through eastern Arizona, southern New Mexico and Texas to collect species needed to complete our collection of the flora of these regions.

Members who may wish to make either of these trips may do so to the number of a predetermined quota. Such members pay their own expenses and provide their own transportation and may collect a few specimens or seeds of each species found in sufficient quantity to fill the garden needs if the specimens are for use in their own gardens and not to be sold. Camping equipment is desirable on these trips but is not essential as hotel or auto court accommodations are usually available within reach from our camp sites. As the number of persons who can make such trips efficiently is limited, applications should be made early if you wish to join an expedition.

Members who made the trips the last two years were delighted with them and with the information they acquired on the trip as well as with the plants

that they collected. We must warn our members, however, that these are not exactly luxury tours and are not designed for "panty waists".

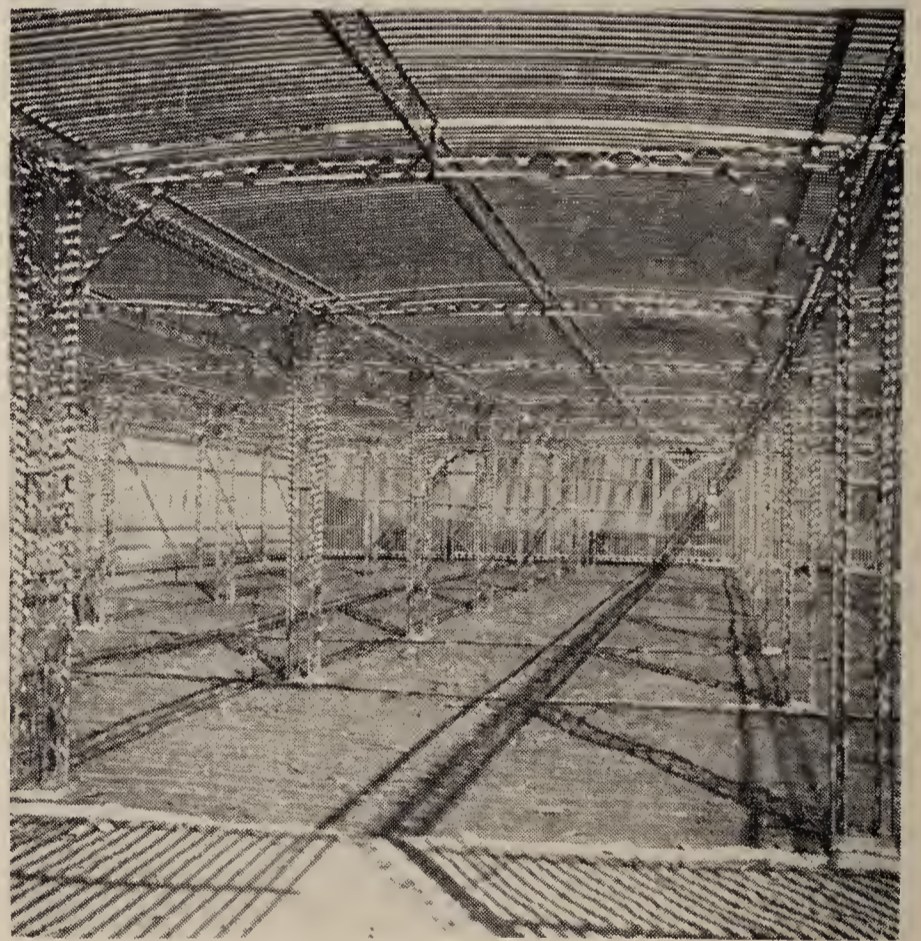
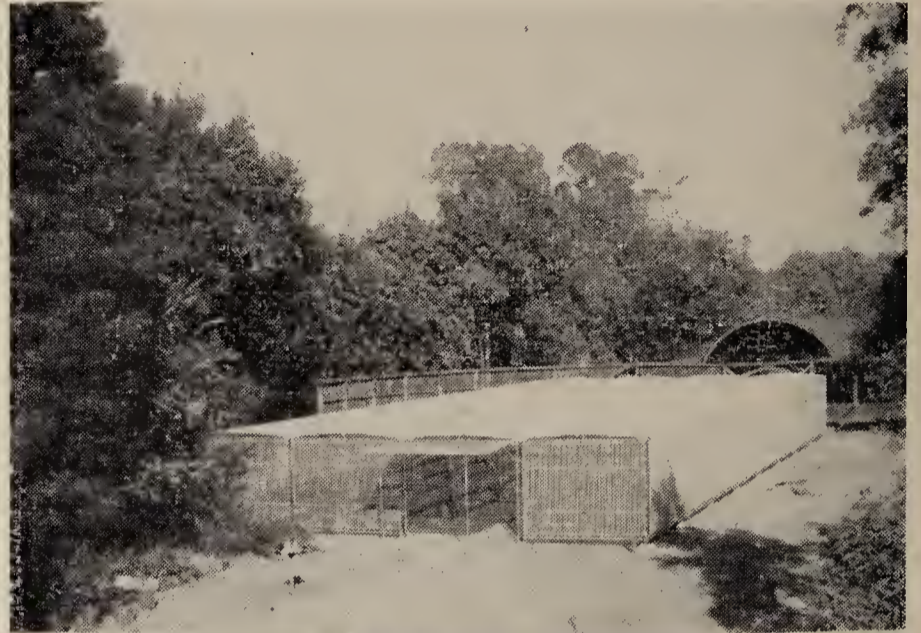


Fig. 22. Lath house constructed for Huntington Botanical Garden by Aluminex Inc. Our lath house is of similar construction but larger.

Life Magazine had 8 pages of really beautiful color of "Spring in the Desert" in the issue of April 19th. Three of the kodachromes were taken in the Desert Botanical Garden last spring. They were of *Echinocereus Engelmannii*, *Ferocactus acanthodes* and *Echinocereus polyacanthus*, Engelmann's Hedgehog, Barrel Cactus and Claret Cup Hedgehog respectively; the color is excellent except that the stigma lobes of the "claret cup", green in the original, are pale yellow in the reproduction.

The picture of the coral snake basking in the sun is striking but most improbable as it is a nocturnal, burrowing snake.

Arizona's Cactuses

7. *OPUNTIA WHIPPLEI* Engelmann & Bigelow, 1856.

A very variable cholla which is less than 18 inches tall over much of its range but will attain a height of 6 to 7 feet in the rich bottom lands. In most of its range the plants form mats of low stems, erect and branched with short, lateral branches; branches cylindrical, about $\frac{3}{4}$ inch in diameter and bearing many narrow nipples; spines 4 to 12 at each areole, some very short, others up to $\frac{3}{4}$ inch long, covered with conspicuous straw-colored sheaths or occasionally with silvery sheaths; glochids of barbed hairs very small; flowers small, $\frac{3}{4}$ to 1 inch in diameter, pale yellow to greenish-yellow; fruit yellow when ripe, fleshy, globe-shaped, strongly nipped, not spiny, depressed at apex and persistent through the winter.

Whipple's cholla is the most prominent cactus of the high grasslands, juniper-pinon belt and open pine forests between 4,500 and 7,000 feet elevation in northern Arizona, southern Utah, western Colorado and New Mexico.

Both the young stems and the fruit are reported by Benson to be a favorite food of antelopes and possibly they are eaten by cattle.

8. *OPUNTIA FULGIDA* Engelmann, 1856.

Tree-shaped cholla which appears to be weeping in habit because of the long chains of fruit on the old plants. 3 to 12 feet high; main trunk black, 3 to 7 inches in diameter, branching into five or six main branches at $1\frac{1}{2}$ to 3 feet above the ground and these in turn into many branches to form a tree-shaped plant. Terminal branches cylindrical, 1 to 2 inches in diameter, bearing numerous nipples, very juicy, easily breaking off from plant; spines 2 to 12 at each areole, $\frac{3}{4}$ to $1\frac{1}{2}$ inches long, yellow to brown, needle-like, strongly barbed and covered with loose, straw-colored, papery sheaths; glochids or barbed hairs small, whitish to light yellow; flowers $\frac{3}{4}$ inch in diameter, the petals few (5 to 8) pink or white with lavender streaks; fruit green, reverse egg-shaped, 1 to $1\frac{3}{8}$ inches long, not spiny, smooth, persisting for many years and frequently bearing flowers and fruit on the fruit of last year until chains of fruit are formed.

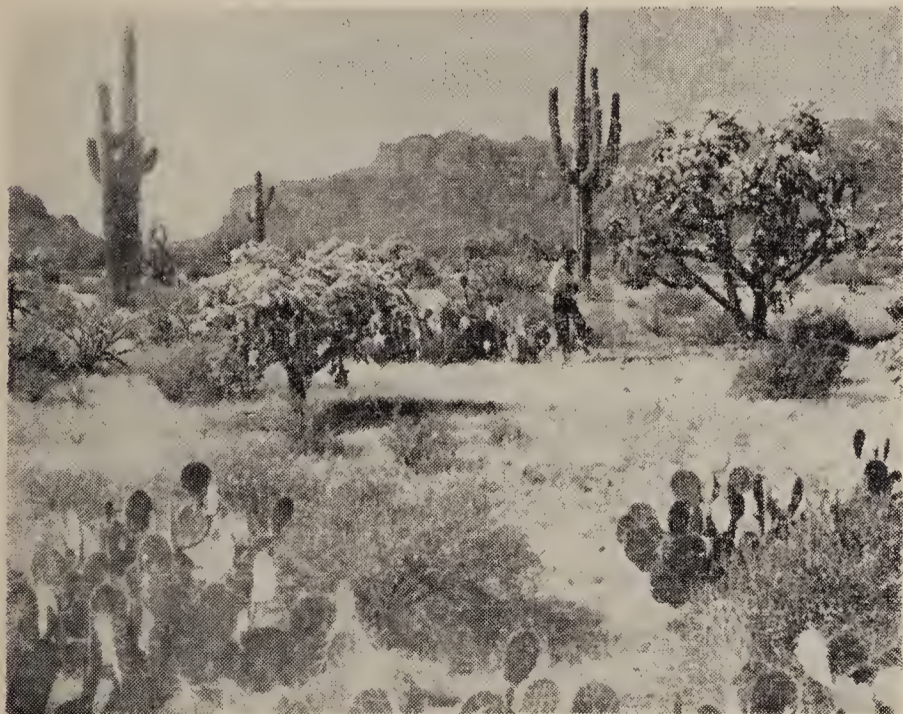


Fig. 23. *Opuntia fulgida* Engelmann.
Photo by R. C. Proctor.

The "chain fruit cholla" is found on sandy soil of valleys and plains on the desert of southern Arizona at 1,000 to 4,500 feet elevation from the Bill Williams River, the upper Gila River and southward into Sonora Mexico. It is frequently seen in almost pure stands or associated with the Saguaro and Creosote bush. In the northern part of its range it is relatively low growing but further south attains tree size and forms veritable forests. It can be seen at its best on the Florence-Oracle Junction Road, ten to twenty miles south of Florence.

8A. *OPUNTIA FULGIDA* Engelmann var *MAMIL-LATA* (Schott) Coulter.

Bushy cholla of 2 to 4 feet high; branches very juicy but lacking the woody core of the species and with more prominent nipples; spines 2 to 6, about $\frac{1}{2}$ inch long, slender and inconspicuous.

The nipped cholla is found in much of the range of the species and is fairly common in the vicinity of Tucson.

A commonly cultivated plant called the "boxing glove cactus" is possibly a fasciated form of this variety.

1. *fulgida*—ful'-ji-da, glittering or shining.



Fig. 24. *OPUNTIA BIGELOVII* Engelmann
A stand in the grounds of the Desert Botanical Garden.
Photo by Davis.

9. *OPUNTIA BIGELOVII* Engelmann 1856.

A cholla with an erect central trunk 2 to 5 feet tall with short terminal branches only on the upper part of the black trunk; branches cylindrical, 4 to 10 inches long and $1\frac{1}{2}$ to 2 inches in diameter but seeming much thicker by reason of the numerous, long spines which proceed from areoles on the upper part of the prominent nipples; spines 6 to 8 from an areole, about 1 inch long, strongly barbed and covered with loose, straw-colored, papery sheaths; barbed hairs very small; flower 1 to $1\frac{1}{2}$ inch in diameter, appearing on the ends of branches; petals pale green or yellow or white, sometimes streaked with lavender; fruit green, less than 1 inch long, spiny or sometimes spineless, not forming chains but falling to the ground where they root and propagate new plants.

The "Teddy bear cholla" is usually found in dry, hot, rocky locations in southwestern Arizona, Nevada,

California and in Sonora and Baja California in Mexico. This is one of the species called "jumping cholla" because the barbed spines, if even lightly contacted will become firmly affixed to clothes and person and pull off the entire branch and the process of removing this branch is painful and difficult.

The very dark trunks surmounted by the shining, straw-colored spines makes this species most spectacular. It frequently appears in pure stands.

10. *OPUNTIA ECHINOCARPA*¹ Engelm and Bigelow, 1856.

A much branched cholla widely spreading from a short woody trunk; branches cylindrical, the terminal ones 4 to 6 inches long and $\frac{3}{4}$ inch in diameter, conspicuously nipped; nipples $\frac{1}{4}$ to $\frac{3}{8}$ inch long and $\frac{1}{4}$ inch broad; spines 3 to 10 from an areole, about an inch long, not strongly barbed, but closely set on the stem, both spines and conspicuous sheaths are silver, straw-colored or golden; barbed hairs small; flowers about $1\frac{1}{2}$ inch in diameter, the petals few, greenish-yellow with a reddish streak on the outer ones; fruit dry and densely spiny.

The "silver cholla" or "golden cholla", depending on spine color, is found along the western boundary of Arizona in Mohave and Yuma Counties and in the section north of the Colorado River, in Utah, Nevada, California and in Baja California.

The type of the species came from the mouth of the Bill Williams River and both forms of the plant may be found there. The "silver cholla" form is erect to 3 feet high with a distinct trunk and compact top while the "golden cholla" form is a low, bushy plant.

1. echinocarpa—e-ki'-no-kar-pa, with spiny fruit.

11. *OPUNTIA ACANTHOCARPA*¹ Engelm and

Bigelow, 1856.

A shrub type cholla of 4 to 6 feet with a very short trunk or sometimes a very low, sprawling plant; branches cylindrical, becoming woody, 6 to 12 inches long, nipped, the nipples long and narrow, laterally compressed; spines 10 to 12, an inch or more long, closely set on the branches so as to obscure the stem, straw-colored with conspicuous and persistent papery sheaths of a straw-color; barbed hairs (glochids) very small; flowers 1 to 2 inches in diameter, the petals variable in color but usually red or yellow; fruit dry and very spiny.

The "buckhorn cholla" is found in Arizona from the Colorado River to the Verde River and south into Sonora, in eastern California and southern Utah. In the eastern part of its range the plant is arborescent but in the drier and hotter part of its range along the mountains east of the Colorado river it is low growing and shriveled.

It is sometimes found in association with *Opuntia echinocarpa* and is then rather difficult to differentiate between them except by comparison of the nipples which are long and narrow in *O. acanthocarpa* and shorter and less compressed in *O. echinocarpa*. The fruits of the two species are very similar.

11A. *OPUNTIA ACANTHOCARPA* Eng. & Big. var. *ramosa* Peebles.

Similar to the species but with the branches forming a compact crown, the branches less than an inch in diameter in the variety and over an inch in diameter in the species.

The "branched cholla" occurs in Pinal County and western Pima County in sandy flats and washes at 2,000 to 4,000 feet elevation.

1. acanthocarpa—a-kan'-tho-kar-pa—with spiny fruit.

SAGUAROWOUND

BULLETIN

DESERT BOTANICAL GARDEN OF ARIZONA

Vol. 4

May 1950

No. 5

Editorial

Our new lath house is now a reality, the result of four years of planning and fund raising. We believe you will agree with us that all of the effort has been worth while when you see how perfectly this building blends into our landscaping scheme and how efficient yet beautiful is the structure.

To Mrs. Lou Ella Archer and John Henley Eversole who, with the director, constituted the building committee we extend our sincere thanks.

To our board member Les Mahoney, who found time from his busy schedule as Arizona's leading architect to supervise our little structure with the same care that he gives to a several million dollar project, our very sincere thanks.

To our California benefactor, who modestly refuses to permit us to use his name, our thanks for a generous donation which enabled us to undertake the work.

With the structure completed our own staff, under the direction of Chief Horticulturist Earle, will landscape the interior by outlining the beds with a one foot wall of native rock so that the beds can be raised above the level of the wide walks.

In another two weeks we will commence to put plants into the beds of specially prepared soil and seeds into the seed nursery in the west wing of the building so that all will be in readiness for the formal opening of the building in October.

During his California trip the director was given a collection of 125 seedlings and cuttings of rare species of Haageocerei, Loxanthocerei and new species of cactus from Peru by Harry Johnson of Johnson's Cactus Gardens at Paramount, California.

Mrs. Florence Cariss of La Cresenta, California has given us many rare Euphorbias, Tephrocacti and Succulents in other families and Mr. and Mrs. Homer Rush has promised to include with her shipment many species of Succulents other than Cactuses.

Mr. Edwin Wiegand of San Bernardino gave us cuttings and plants of many California Cactuses and in addition will transport for us the large collection

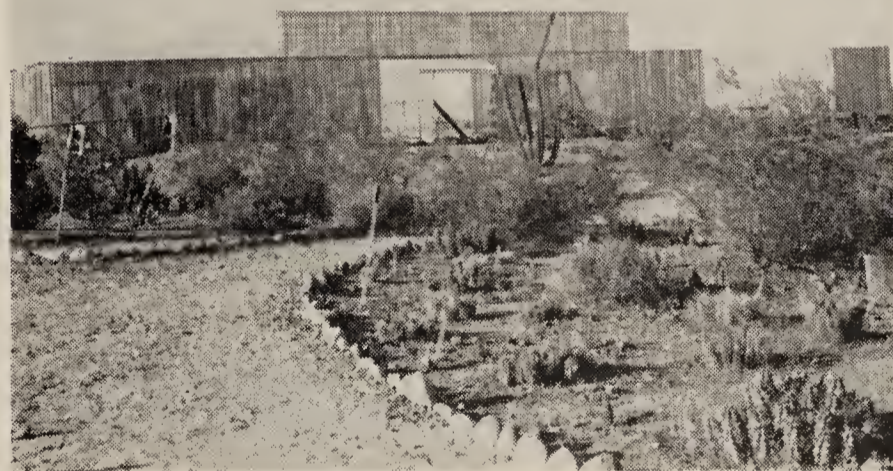
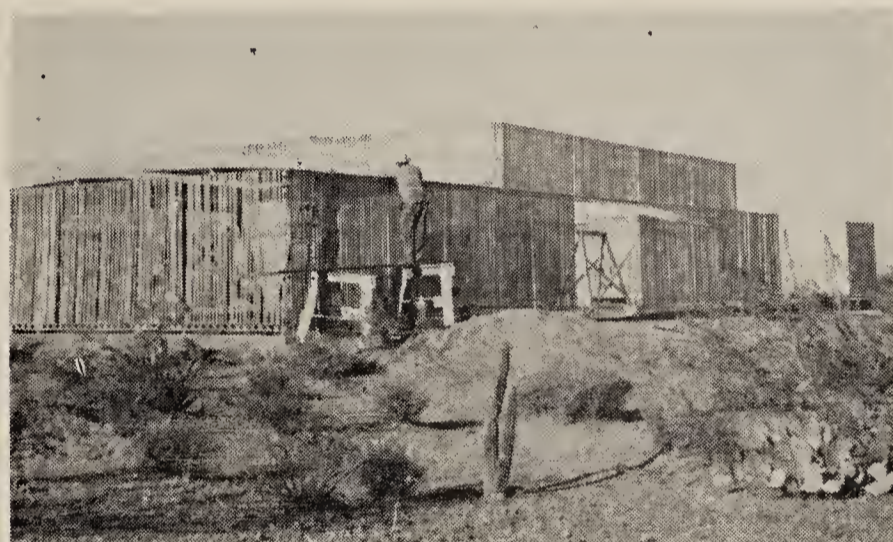


Fig. 25. Two views of the nearly completed lath house. John H. Eversole photo.

from the directors California garden which will be prepared for shipment by volunteers headed by Scott Haselton, editor of *The Cactus and Succulent Journal*.

Mr. and Mrs. Ernest Beahm of Beahms Gardens, Pasadena, has promised us additions to the already generous collection of Haworthias they had previously given as well as plants of species of Orchid Cactuses.

Mr. Herman Schroeder of Avalon, California has sent us numerous species of Euphorbias and Cactuses.

Many other persons have promised plant contribu-

(Continued on Next Page)

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Editorial

(Continued from Page One)

tions for this summer so that by October we will be able to show in our lath house more than 800 species never before shown in our garden.

We are very happy about our new lath house because we realize that it will form a new and powerful tourist attraction for the garden and, at the same time, provide more material for study by the constantly increasing groups of students who use our facilities.

Like most building projects this has exceeded estimates on costs so that we are without funds for the paving of the walks in the house where we want to use flagstone and we are looking for a friend or friends who would like to assume the cost of such paving.

With this milestone passed we are now considering the next badly needed improvement which is a small building to house our sales of books and packaged plants so that it will be available at all times and not have to be closed entirely every time the auditorium is used for lecture work.

We also need 200 more folding metal chairs for the auditorium so that we can accommodate the increasing number of persons who desire to hear the lectures.

If we can move the book store outside of the Auditorium we can also plan on having lectures every afternoon instead of twice a week and thereby increase our usefulness to the community.

Closing of Papago Park

The State Fish and Game Commission has announced that after May 15th Papago Park and Hole in Rock will be closed to the Public because of the vandalism perpetrated there and the unwillingness of State or County to police the area.

This closing will not effect the Desert Botanical Garden and the main road into the garden will be kept open. The garden will be open to the public on Saturday and Sunday afternoons only during the summer from 2 to 6 P.M. but will resume full time schedules on October 15th. Members of the Society and Botanists may enter the garden at any time within reason during the Summer period.

Indian Country Expedition

The Societies trip to northern Arizona, southern Utah, southwestern Colorado and northwestern New Mexico will leave the garden on May 25th and will consist of faculty members and students from the State College at Tempe, and several members of the Society including Mr. Edwin Wiegand and Scott Haselton.

We will be joined by a group from the New Mexico College of Mines at Springerville.

Plants, birds and reptiles will be studied in a region of little travel and many interesting observations should be recorded.

For an account of the trip we hope to have a report by Scott Haselton in the next issue of the Bulletin, the June-July number which will be issued July 1st.

In anticipation of some of the outstanding land-

marks of the trip the following three verses from "Sonnets to the Southwest" by Lou Ella Archer are quoted.

The White Mountains

There is a welcome in the mossy ground.
A sweetness when all early morning things
Awake to life, a merry note that rings
Within the laughter of the brook that found
The hiding place of violets; around
A fallen tree the tender ivy clings
In mourning for its friend, and midnight brings
The fairy that the dancing moonbeams crowned.

The birds sing gladly of the new-born spring,
Who blushes for her own sweet loveliness;
The summer lingers under fruitful boughs;
And autumn gayly frolics in a ring
Of golden leaves, 'til winter comes, in dress
All virginal, to consecrate her vows.

Canyon De Chelly

A world shut in by walls of flaming red,
Whose sheer, unslipping cliffs descend until
They meet a stream so turquoise blue and still
It must be painted on the river bed;
Yet that same placid little brook has fed
The orchards green and gladly helped to fill
The hogahn with its corn, lest winter kill
All life, within the canyons of the dead.

No history of yours is in the sand,
No legend of your victory or fall;
But there, so unattainable and high,
The White House of your ancestors will stand
Forever in your crimson, rocky wall,
A drifting gull against a sunset sky.

The Painted Desert

A canyon steeped in gold, a rainbow's end,
Where lie the colors of the world in dreams
Of purest loveliness. Each shadow seems
To add some unknown charm, each crimson bend
Unfold another masterpiece, and lend
Its flaming hues to shimmering sunbeams,
Its pastel shades unto the silvery streams

Of crystal light, that from the moon descend.
To hungry hearts that come from out the east,
What message do you bring? Must we console
Ourselves in darkness to that bitter strife
Within, or may we on your beauty feast?
For I would dip my brush into your soul
And paint with it the pattern of my life.

Arizona's Cactuses

11B. *OPUNTIA ACANTHOCARPA* Eng. & Big. var. *THORNERI* (Thornber & Bonker) L. Benson.

Similar to the species but with fewer (7 to 19) spines which do not obscure the stem.

Thornber's cholla is a variation found with the species over much of its range.

SERIES CLAVATAE

A group of prostrate or spreading species with unsheathed spines and club-shaped or clavate joints. Count Knuth has assigned them to his genus *Corynopuntia* but most botanists consider them as *Opuntias*.

12. *OPUNTIA STANLEYI* Engelm., 1848.

Low growing, mat-like cholla, the stems erect or ascending, usually falcate, to 4 or 12 inches high, narrowed below and widening above in club-shape and forming clumps up to 20 feet in diameter; joints conspicuously nipped, the nipples narrowly pyramidal with rounded top where the areole is borne; areoles bearing numerous, large barbed hairs (glochids) and 10 to 13 spines one or two inches long, tan or brown or sometimes red, the longer spines flattened, sheaths lacking or very small and then covering only the tip of the spine; flower about one inch in diameter, the petals a pale yellow; fruit spiny, yellow, up to 2 inches long, persistent.

Stanley's cholla is found on rocky or sandy mesas at 2,500 to 5,000 feet elevation in southern Arizona about Winkelman and from Aravipa Valley to the upper Gila River in Graham, Greenlee and Cochise Counties.



Fig. 26. *Opuntia Stanleyi* Engelm. Photo of a plant in the collection of the Garden.
John H. Eversole photo.

12A. *OPUNTIA STANLEYI* Eng. var. *Kunzei* (Rose) Benson.

Similar to species but the joints usually shorter (3 to 6 inches) and the nipples narrower and shorter; fruit up to 5 cm. (2 inches) long, long persistent.

1,000 to 2,000 feet elevation on sandy plains. Mari-

copa Mountains to Casa Grande and southwestward to the Gunsight Mountains.

12B. *OPUNTIA STANLEYI* Eng. var. *WRIGHTIANA* (Baxter) Benson.

Joints nearly cylindrical, not markedly club-shaped, 4 to 10 inches high, forming dense clumps; nipples narrowed and in more or less continuous lines vertically so as to cause the appearance of ribs; flowers larger than in the species but otherwise similar; fruit up to 3 inches long, yellow, spiny, persistent.

This variety was first described as *Grusonia Wrightiana* by Baxter because the confluent nipples suggested ribs and this is one of the characters of the genus *Grusonia* of Reichenbach. It does bear glochids, however, which would exclude it from *Grusonia*.

300 to 1,500 feet elevation on sand and clay of valleys in Mojave, Yuma and Pima Counties. The typical plants came from "Petrified forest near the Colorado River, 4 miles west of the Quartzite—Yuma road, 33 miles north of Yuma."

The reduction from species of *Opuntia Kunzei* Rose and *Grusonia Wrightiana* Baxter was proposed by Dr. Lyman Benson in "Proceedings of the California Academy of Sciences" Vol. XXV, No. 10, November 1944. Britton and Rose in *Cactaceae* 1:80, 1919, assigned *Opuntia Kunzei* to synonymy under *Opuntia Stanleyi* but there is some justification for its retention as a variety. We fail to understand why Mr. Peebles, in *Cactus and Succulent Journal* for May 1950 accepted *Opuntia Kunzei* as a valid species and referred *Opuntia Wrightiana* to it as a variety while still retaining *Opuntia Stanleyi*.

13. *OPUNTIA PARISHII* Orcutt, 1896.

A low growing cholla with club-shaped, short joints which form mats which are almost indistinguishable from the dry bunch grass in which it is frequently found; joints 2 to 3 inches long, nipped and almost concealed by the heavy spines; spines 9 to 20, slender, the central ones strongly flattened, at first reddish but soon becoming gray and finally white; flower pale lemon-yellow; fruit 2 inches long, spiny, carmine red.

Washes and bottom land at 2,000 to 5,000 feet elevation, Hualpai Valley to Hillside, Mojave and Yavapai Counties. Southern Nevada and Mojave Desert in California.

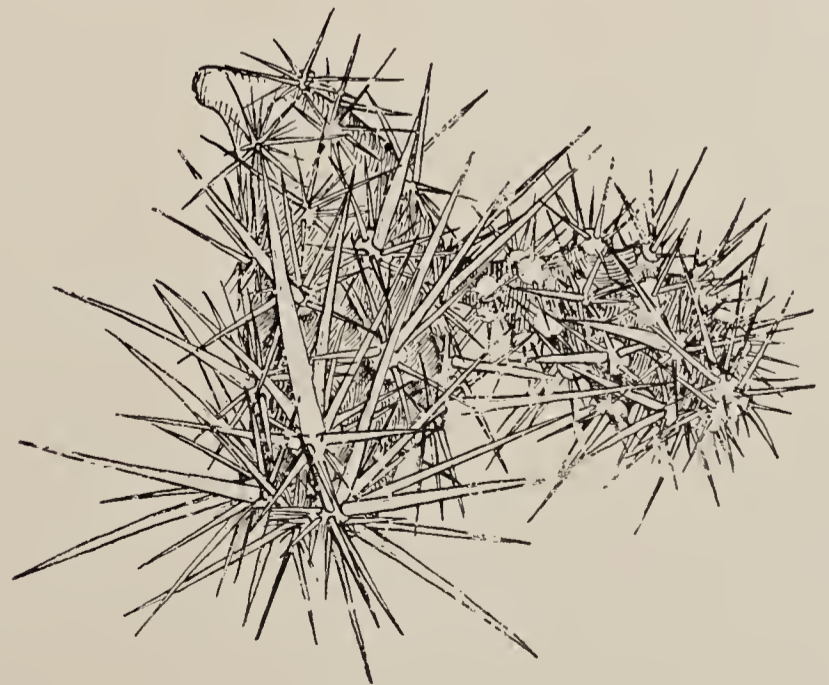


Fig. 28. *Opuntia Parishii* Orcutt. Detail drawing from *Cactaceae*, Britton and Rose.



Fig. 27. *Opuntia Parishii* Orcutt. Photo of a plant in the collection of the garden.
John H. Eversole photo.

OPUNTIA CLAVATA Engelmann has been reported in Arizona on the Hopi and Navajo reservations and a special search will be made for it by the expedition scheduled for the latter part of this month.

OPUNTIA ABYSSI Hester proposed in *Cactus and Succulent Journal* XV:193. 1943, is a form of *Opuntia acanthocarpa* variety *Thornberi*.

OPUNTIA HUALPAENSIS Hester published at the same time and place is one of the many forms of *Opuntia vivipara*.

Both of the above are found near Peach Springs.

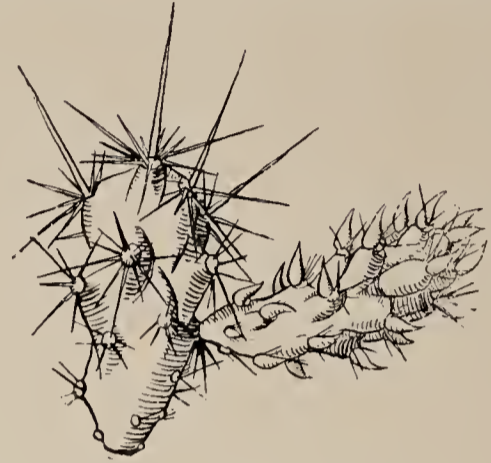


Fig. 29. *Opuntia Schottii* Engelmann. A species of Texas reported from southeastern Arizona. To be looked for there. From *Cactaceae*, Britton and Rose.

Saguaroland Bulletin

Box 647, Tempe, Ariz.

To

SAGUAROWORLD

BULLETIN

DESERT BOTANICAL GARDEN OF ARIZONA

Vol. 4

June-July 1950

No. 6

Editorial

The Society's trip to Northern Arizona, Utah, Colorado and New Mexico was a very pronounced success as we secured about 200 specimens of every variation of *Opuntia erinacea* and its varieties and specimens of numerous other cactuses. We also had a perfect opportunity to observe the effect of soil and mineral content of the soil on flower color and we have reached the conclusion that while mineral content may intensify color it has no bearing on the color variation found in all of the species studied but we feel that color variation is a racial character.

About 80 beautiful scenic kodachromes of Canyon de Chelly, Monument Valley, Mesa Verde National Park and other landmarks were secured for use in our lectures next winter. We also got both black and



Fig. 30. Inspecting the plants. Left to right, Jim Blakley, a new staff member, John Anderson, our rock hound, and the director.
No! Those are not dinosaur bones.



Fig. 31. Above: Dr. Hanson looks for millepedes on "The Mittens" while Dr. McCleary draws his trusty six-gun. Below the same gentlemen are well pleased with results so far.

white and kodachromes of plants in flower for use in the Bulletin and in lectures.

Our party consisted of Dr. Hanson and Dr. McCleary of State College at Tempe, who made collec-

tions of mosses, Edwin Wiegand of San Bernardino who was interested in Opuntias, Jim Blakley, a student of State College and now a member of our staff, who proved to be the most useful as well as the most ornamental member of the party, John Anderson of Los Angeles, a "rock hound", and the Director.

Our plans included leisurely travel with frequent stops to permit the personnel to fan out to the ridges on each side of the road to inspect the vegetation and to collect specimens. We were equipped with sleeping bags, food supplies and ample water so that it was not necessary to find accommodations each night.

The first night with two cars and four members we camped at Roosevelt Lake and then travelled through the Tonto Basin to Young, Heber and into Springerville for the night. It was arranged that Drs. Hanson and McCleary would join us there, but they arrived well after dark and attempted to find a camping spot off the beaten trail. Next morning they awoke to find themselves sleeping on the main runway of a busy airport.

From Springerville we went to Joseph City, Holbrook, Indian Wells, Jeddito, Ganado and Canyon de Chelly where we camped for two nights, collecting outside of the National Monument. Then north to Dinnehotso, Kayenta to Monument Valley where we camped in the lee of a movie set. From here we used one of the poorer roads to Mexican Hat and Blanding, Utah, then east to Cortez, Colorado where we established headquarters for our visit to Mesa Verde National Monument.

At Mesa Verde the herbarium was opened to us and we had an opportunity to check on the plants of the Monument for which we offer thanks to the courteous Rangers of that beautiful Park.

We returned through Shiprock and Gallup, New Mexico and St. Johns, Alpine and the Coronado Trail to Clifton, Safford and the San Carlos Indian Reservation.

Our findings on the trip will be found in the descriptions of plants in Arizona's Cactuses as they are published serially.

Queen For A Day

R. C. Proctor

For sheer beauty in floral arrangement, there never was a sight that could equal the massive bouquet, consisting of thirteen large flowers, that came into being upon the stem of an Arizona Rainbow Cactus that was discovered near Nogales, Arizona by Charles S. Mieg of Scottsdale, Arizona. At least that is my opinion. And as far as I can determine this sets a record for quantity of flowers on a single stem of *Echinocereus pectinatus*; variety *rigidissimus*. Once I photographed one of this type while it exhibited seven flowers and a few people believed it to be a phony—which was the natural reaction to such a picture—for at that time three or four flowers at one time was the limit for the Rainbow Cactus, while seven . . . well, that was unheard of.

While Mr. Mieg's find was being photographed the large bouquet formed an umbrella over the stem which rendered it impossible to show anything but a mass of flowers. However, I can assure you that the plant is quite an attraction—even without flowers. In fact,

collectors—who can keep them alive—prize their plants for the spines rather than the flowers.

The spines of Arizona's Rainbow Cactus are ar-



Fig. 32. Above: The "Rainbow" unfurls thirteen blooms at once. Below: the thirteen buds before opening.

ranged in alternate bands of red, yellow and white that encircle the stem. Each band represents a year's growth. This old boy with the thirteen flowers has forty-nine bands. While we now have the plant in a pot we will be lucky if we can keep it, for old plants of this variety are very difficult to cure of their home-sickness, although we have had some measure of luck with two or three in the past.

Arizona's Cactuses

14. *OPUNTIA ERINACEA* Eng. & Bigel.

A low growing prickly pear which forms clumps up to 3 feet in diameter and about 6 inches high, the stems usually with 2 to 4 joints; joints plate-shaped, egg-shaped or elliptic, flattened; areoles closely set, all of them spine-bearing and with short barbed hairs (glochids); spines 4 to 9, up to 4 inches long, more or less stiff, somewhat flattened especially at the base, white or light gray; flowers 2 to 3 inches in diameter, the petals yellow, white, pink or red; fruits dry when ripe, cylindrical, spiny, less than 3 inches long.

Northern Arizona in Mohave, Coconino, Navajo and Apache Counties, California, Nevada, Utah and possibly in Colorado and New Mexico.

This species so closely approaches *O. polyacantha* that separation is extremely difficult. They may be



Fig. 33. *Opuntia erinacea* Eng. & Bigel. A plant of the yellow flowered race at Five Buttes, Navajo County, conspecific and, if so, should be united under the older name, *polyacantha*. Benson, in "The Cacti of Arizona" has keyed *O. polyacantha* as having the spines circular in cross section while those of *O. erinacea* are elliptic in cross section.

An expedition from The Desert Botanical Garden in May and early June 1950 examined thousands of plants of this relationship and brought back to the garden about 200 specimens representing all the variations of both species found in Arizona, Utah, Colorado and New Mexico and these are available to students.

1. *erinacea*—er-i-na'-se-a—hedghog-like.



Fig. 34. *Opuntia erinacea* Eng. & Big. variety *ursina* (Weber) Parish. A specimen from Arizona in the Desert Botanical Garden.

14A. *O. ERINACEA* Eng. & Big. variety *ursina* (Weber) Parish.

Similar to the type but with longer and narrower joints; spines from all areoles, spines 6 to 14, flexible and thread-like, white, pale yellow or pale gray, up to 6 inches long; flowers large, the petals yellow or pink.

The Grizzly Bear is found on mountain slopes in California and at scattered points in Arizona. A very long spined specimen was found by John Anderson, of our expedition near White Cone, Navajo County.

1. *ursina*—ur-si'-na, like the shaggy coat of a bear.



Fig. 35. *Opuntia erinacea* Eng. & Big. variety *hystricina* (Eng. & Big.) Benson. A plant photographed in Monument Valley. This is of the yellow flowered race.

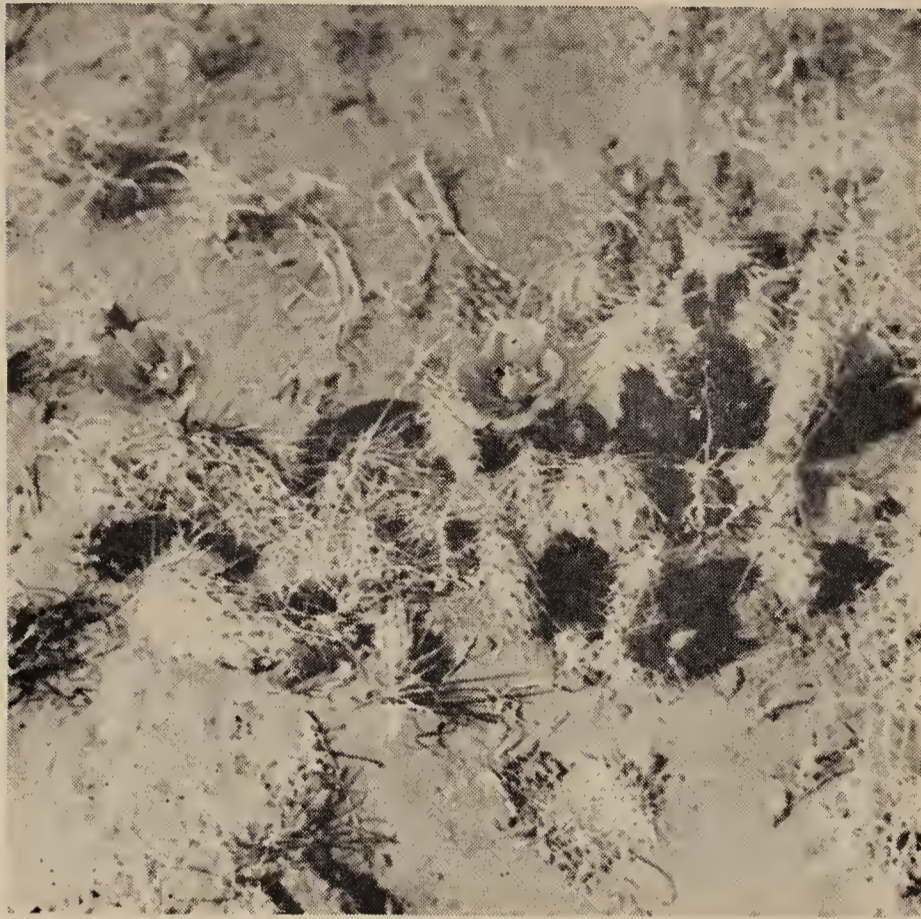


Fig. 36. *O. ERINACEA* Eng. & Big. variety *rhodantha* (Schum.) Benson. A rose flowered plant photographed in Monument Valley.

14B. *O. ERINACEA* Eng. & Big. variety *hystricina* (Eng. & Big.) Benson.

Similar to the species but the joints reverse egg-shaped and somewhat more thickened; spines usually 5 to 8, borne on all or all but the lowest areoles, robust, deflexed, at first chestnut or reddish, later gray, 2 to 4 inches long; flower petals red to yellow.

Plains and mountains at 4,500 to 7,000 feet elevations, Coconino to Apache Counties, Utah and New Mexico and possibly Colorado.

1. *hystricina*—his-tri-si'-na—porcupine-like.

14C. *O. ERINACEA* Eng. & Big. variety *rhodantha* (Schum.) Benson.

Similar to the species but with reverse egg-shaped

joints that are lead-colored (green in the other varieties) and bear spines usually only on the areoles in the upper portion of the joints, at least the lower half of the joints usually spineless; spines 1 to 6 or 8, rigid, deflexed, 1 to 1½ inch long; flowers usually cerise but sometimes yellow.

Arizona in Mojave, Coconino, Yavapai, Navajo and Apache Counties, California and eastward to western Nebraska.

We have just received a specimen definitely referable to this variety from Yakima, Washington from Mr. John R. Kelsey of Portland, Ore.

Some almost spineless variations were found and in many locations this variety showed a deep maroon coloration of the stems.

1. *rhodantha*—ro-dan'-tha—with rose-pink flowers.

15. *OPUNTIA POLYACANTHA* Haworth.

A low-growing prickly pear which forms clumps up to a foot in diameter; joints circular, flattened, 2 to 4 inches in diameter; areoles closely set and bearing glochids up to 1/16 inch long; spines 7 to 10, not flattened, circular in cross section, those on the margin of the joint 1 to 2 inches long, the others ½ to ¾ inch long; flowers 2 inches in diameter, yellow, very pale yellow or tinged with pink; fruit reverse egg-shaped, dry, 1 inch long, spiny.

From the Utah boundary to the Coconino plateau, Humboldt and St. John's. Washington to North Dakota, Arizona to Texas.

1. *polyacantha*—pol'-i-a-kan'-tha. Many spined.

15A. *O. POLYACANTHA* Haworth variety *trichophora* (Eng. & Big.) Coulter.

Similar to the species but with spines at the base of the joints up to 4 inches long, flexible, hair-like, deflexed; spines on the fruit also hair-like.

Inscription House Trading Post, Black Mesa, Navajo County. Arizona to Oklahoma.

1. *trichophora*—tri-kof'-or-a. Bearing hair.

SAGUARO

BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. 4

August-September 1950

No. 7

Editorial

Our new lath house is now finished and landscaped and hundreds of new plants have been collected and planted in it. By the time of fall opening these plants will be established and growing and they will constitute the major attraction of the garden for the 1950-51 season.

A start has been made on another project that has been badly needed and that is an herbarium where representative specimens of desert plant life, dried and mounted, are available to students for identification work.

A cabinet large enough to care for all specimens we will be able to collect for the next two years has been built and specimens have been collected for mounting of the most frequently observed trees and shrubs of our desert.

In the process of collecting these specimens this summer we frequently found that it was only within our National Parks and National Monuments that an actual check could be made of the vegetation of a given district with herbariums available for comparison.

Our contacts with the Superintendents and Rangers of the Parks and Monuments again made us keenly conscious of the cultural value of these areas which have been set aside by our government to preserve the flora and fauna and the grand scenery of the districts for the benefit of posterity.

Imagine my consternation, therefore, when I read the article in the July 22nd issue of the Saturday Evening Post by Bernardo De Voto, "Shall We Let Them Ruin Our National Parks", and learned that an attempt was being made to ruin certain of the Parks by building Dams and Power Plants within their borders or so close as to back water into the Parks and so disturb the "balance of nature" within the areas.

Surely no immediate expediency, and I use the word in its ethical sense, can justify the destruction of the National Park System, which is dedicated to the preservation for posterity of sections of great natural beauty in their completely natural state.

To appreciate the threat to our only unselfish cultural effort you should read the article in the "Post" and then, immediately, write your congressman to defend the integrity of the National Park Service for all time.

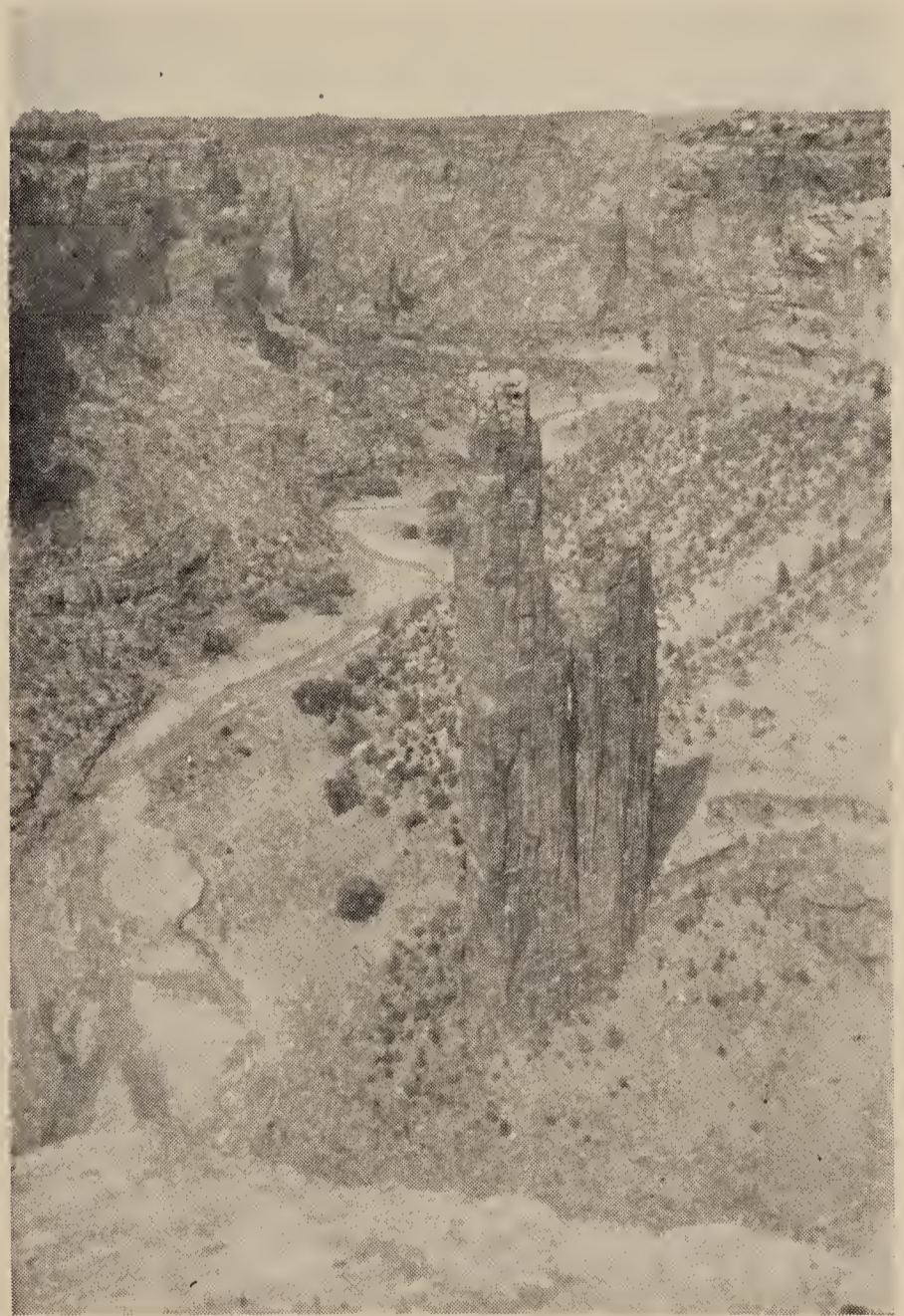


Fig. 37 *Spider Rock*
Canyon de Chelly Natl. Mon.
E. R. Blakley photo

As this editorial is written we are preparing to make a trip through the Southern part of Arizona for the purpose of collecting certain species of Arizona plants needed for the "Arizona Section" of our garden.

We will also collect herbarium material from that district and we will get valuable assistance and information from Superintendent King of Saguaro National

Saguaroland Bulletin is issued ten times a year by the Arizona Cactus and Native Flora Society Inc., sponsors of the Desert Botanical Garden of Arizona in Papago park. Subscription rate \$1.00 per year to members, the first \$1.00 of any membership in the Arizona Cactus and Native Flora Society Inc. shall be considered as payment of a year's subscription to Saguaroland Bulletin, Subscription to non-members \$2.00 per year. Editor, W. Taylor Marshall, Box 647, Tempe, Ariz.

Monument and Superintendent Supernaugh of Organ Pipe National Monument, both old friends who are well posted on the plant life of their respective Monuments and willing to share information with us to our mutual benefit.

We plan to visit Chiricahua National Monument and get acquainted with the Superintendent there and we are sure that we can get invaluable information from him also.



Fig. 38 *Antelope House Ruin*
Canyon de Chelly Natl. Mon.
E. R. Blakley photo

Since writing the above we have completed a trip of twelve days in Southern Arizona which has resulted in the collection of many fine plants for the garden and more than 150 herbarium specimens of the fall or late summer flowering plants.

At the Organ Pipe National Monument we inspected several plants thought to be new for the State and found *Mamillaria Sheldonii* among them. Mr. Supernaugh has also located a species of *Echinomastus* which can not be referred to any known species although it somewhat resembles *E. erectocentrus* in form and spination, but it has a purple flower while the flower of *E. erectocentrus* is nearly white with a faint pink tinge. Specimens will be observed through the next flowering period and an attempt will be made to locate some juvenile plants, as only mature plants have been observed so far and the juvenile forms are quite distinctive in this genus.

We visited Sycamore Canyon near Ruby and made a collection of several herbarium specimens of species from the south and from the north as both the flora of southern Mexico and of plants from northern ranges meet in this remarkable canyon.

Our examination of the Canyon was very superficial on this trip as a complete examination would require several days and three or four young and husky botanists as the canyon is about five miles long with a steep drop from the point on the road nearest to it and specimens would have to be carried out by hand over extremely rough terrain featuring cliffs and shale slides.

On a previous visit to Chiricahua National Monument we observed a water color which seemed to be

a fairly accurate representation of *Echinocereus Rosei*, a species not recorded for Arizona, but we were unable to get any details at that time as our party was in a hurry and we were unable to await the return of the Superintendent.

This time we met Superintendent Cook and made inquiries and we were informed that the plant represented in the water color was collected on rocky ridges in the extreme southeast corner of the Monument. Mr. Cook offered to show us the herbarium specimen of the plant but, on investigation, found the sheet bearing the dried plant had been removed at some time or had never been made. At any rate it was not there.

We reasoned that if this plant had been located on the Monument it should be also found on rocky ridges east of the Monument and closer to New Mexico, which is the normal range of the plant, therefore we made a long trip through Willcox and San Simon and then south to Hilltop. At Hilltop we obtained permission to explore a rocky ridge on private property three miles east of the Monument and there, after a stiff climb over loose rocks Jim Blakley found a single specimen of the desired plant which apparently is indeed *Echinocereus Rosei*. Sure determination must await the next flowering season.

Later we made further search on other ridges on the east ridge of the Chiricahua Mountains and found one ridge on which the plant was plentiful and from this ridge we collected three more specimens.

On this trip also we visited Mrs. Bullington at Deming, New Mexico, an old member and a very liberal contributor of plants to the Garden. Mrs. Bullington presented the garden with some rare specimens from her private collection including a grafted plant of *Neoporteria Reichei* with five heads, a large plant of *Lemaireocereus chende*, four species of *Lithops* and a number of other valuable plants.

On our return we found a letter from Mr. and Mrs. Homer Rush of Los Angeles who announced their intention of taking advantage of the Labor Day week end to bring us a large collection of Succulent plants to add to the large collection we have accumulated since we have had a lath house to care for them.

Most succulents, other than cactus, require some shade in our hot summer and the lath house not only provides a partial shade but we find that the temperatures in the house are fifteen degrees cooler in summer and they should be at least ten degrees warmer in winter than the outside temperatures.

The soil mixture in the beds in the lath house is proving ideal both for growth of plants and for quick rooting. In preparing this soil we combined 100 tons of silt with 63 tons of sharp sand and added 1000 pounds of Vigero.

Memberships

We note the usual summer drop in membership renewals and urge that our members renew their subscriptions promptly on receipt of notices of expiration as we must keep our membership up to the number required or we will lose our endowment from the Webster Estate.

Arizona's Cactuses

16. *OPUNTIA BASILARIS*. Engelman & Bigelow.

A spineless prickly pear, 6 inches to 1 ft. high, branching from the base, usually one jointed but rarely 2 to 5 jointed; joints obovate, rarely circular, flat, 5 to 6 inches long, 2 to 5 inches broad, smooth when turgid but wrinkled when dehydrated or in winter, usually densely hairy with minute, fine hairs, gray to purplish, spines wanting; glochids prominent; flowers large and showy, purple to magenta or light pink, 2 inches in diameter; fruit spineless, dry, not edible.

The beaver-tail cactus is found in sandy soils of the lower altitude desert, Mojave County, southwestern Yavapai County and Maricopa County as far east as Wickenburg and in Yuma County. Mojave Desert in California, Nevada and southern Utah to northern Sonora.

A number of variations of *O. basilaris* are known but only one has been found in Arizona. Occasional specimens with white flowers have been reported.

16A. *O. BASILARIS* Eng. & Big. var. *aurea*². (Baxter)

Plant prostrate, joints branching from about middle of side edge to form a chain along the ground which is usually only one joint high, the joints individually rooting at the point of contact with the ground; joints nearly circular or oval, about 4½ inches in diameter, thick, light green, finely hairy; spines none; glochids golden brown; flowers 2½ inches in diameter, usually yellow but sometimes pink.

Vicinity of Pipe Springs and Cane Springs in Arizona, southern Utah circa Zion National Monument and reported from some stations in California at high altitudes.

1. *basilaris*—*bas-i-la'-ris*—*arising from base*
2. *aurea*—*o'-re-a*—*golden*.

17. *OPUNTIA FRAGILIS* (Nuttall) Haworth.

Small, prostrate prickly pear forming remarkably dense clumps up to 1 foot in diameter and 4 to 8 inches high; stems usually 2 to 5 jointed, the joints obovate or rarely nearly cylindrical, 1 to 2 inches long and about 1 inch wide; spines long, slender and tapering, 5 to 7 to an areole, brown; areoles filled with brown wool and yellowish glochids; flowers about 2 inches in diameter, pale yellow; fruit dry, spiny.

This species has a very wide range as it is found from Texas, New Mexico and Arizona through the mid west and northern states, northern California, Oregon, Washington and British Columbia where it extends north nearly to the Arctic Circle.

Occasional plants are found with magenta colored flowers.

In Arizona it has been noted in grassland, juniper-pine and yellow pine areas from Utah border southward to Hualpai Indian Reservation, at Williams and Heber and along the Puerco River.

The wide range of the species is possibly due to the easily detached joints which become attached by their spines to passing animals to be widely disseminated.

It has been reported from high altitudes in the timber belts, in prairie grasslands and at sea level from the San Juan Islands in the straits of Juan De Fuca, Washington.

Sometimes the joints are so cylindrical as to make the plant resemble a low-growing species of cholla.



Fig. 39. *OPUNTIA BASILARIS* Eng. & Big. photo by R. C. Proctor

18. *OPUNTIA COMPRESSA* (Salisbury) Macbride.

A low, prostrate prickly pear with fibrous roots; joints obovate to nearly circular, light green, 2 to 4½ inches long, 2 to 3¾ inches broad; spines none or one in the upper areoles; flowers pale yellow, sometimes with reddish center, 2 inches in diameter; fruit about 1 inch long.

This plant was miscalled *Opuntia opuntia* by Britton and Rose. It is a common eastern prickly pear with a wide distribution on the Atlantic Seaboard and the states east of the Mississippi. In the west it is found under varietal designation and two forms are found in Arizona as follows:—

18A. *O. COMPRESSA* (Salis.) Macbr. var. *microsperma*¹. (Engelm.) Benson also known as *O. humifusa* Raf.

Joints dark-green, a little larger than the type; spines usually 1 to 3, one much longer than the others, otherwise as in the type.

This plant under the name of *O. Rafinesquei* is reported from Arizona "from Apache County to northern Mojave County, not common, 5,000 to 7,000 feet" by Kearney and Peebles in Flowering Plants and Ferns of Arizona. We have not found it so far.

18B. *O. COMPRESSA* (Salis.) Macbr. var. *macrorhiza*². (Engel.) Benson.

Similar to var. *microsperma* but with tuberous roots even in young plants.

This much confused plant has been considered under the name of *O. Plumbea* Rose by Kearney & Pee-

bles although that name was not published until 1908 while *O. macrorhiza* was published in 1950.

In "The Cacti of Arizona" 1940 Dr. Benson et al used the name *O. Loomisii* Peebles a name published in 1938 and since reduced to synonymy by its author.

In "Proceedings of the Calif. Acad. of Sciences, XXV No. 10 page 251, Dr. Benson sponsored the foregoing trinomial which best solves the nomenclature of this species.

Plains and hills in Desert Grassland, S.W. Coniferous Woodland, S.W. Oak Woodland and the Rocky Mountain Forests at 4,500 to 6,000 feet elevations and eastward in the Short Grass Prairie and in the Eastern Forest Flora. In Arizona from Mojave County to Apache County, eastern Pima County and Santa Cruz County and eastward to Missouri and Texas.

1. *microsperma*—*mi-kro-spur'-ma*—with small seed.

2. *macrorhiza*—*mak-ro-ri'-za*—with long or large roots.

Opuntia plumbea Rose is based on an herbarium sheet of a single plant collected by Mr. M. V. Coville on the San Carlos Indian Reservation in 1904 and never again collected to our knowledge.

Britton and Rose in *Cactaceae* I:131 .1919 show a picture of an herbarium sheet of a plant strongly suggestive of *O. compressa* but in their description give the diameter of the stems as 3 to 5 cm. which would suggest to us that a juvenile plant was collected by Mr. Coville. In that description they give the flower color as red.

A recent rather careful search failed to reveal any plants as small as this at any of the several points on the San Carlos Reservation we visited and we have yet to find any red flowered *Opuntia* in Arizona although magenta flowers have been noted on some plants of several species which have normally yellow flowers.

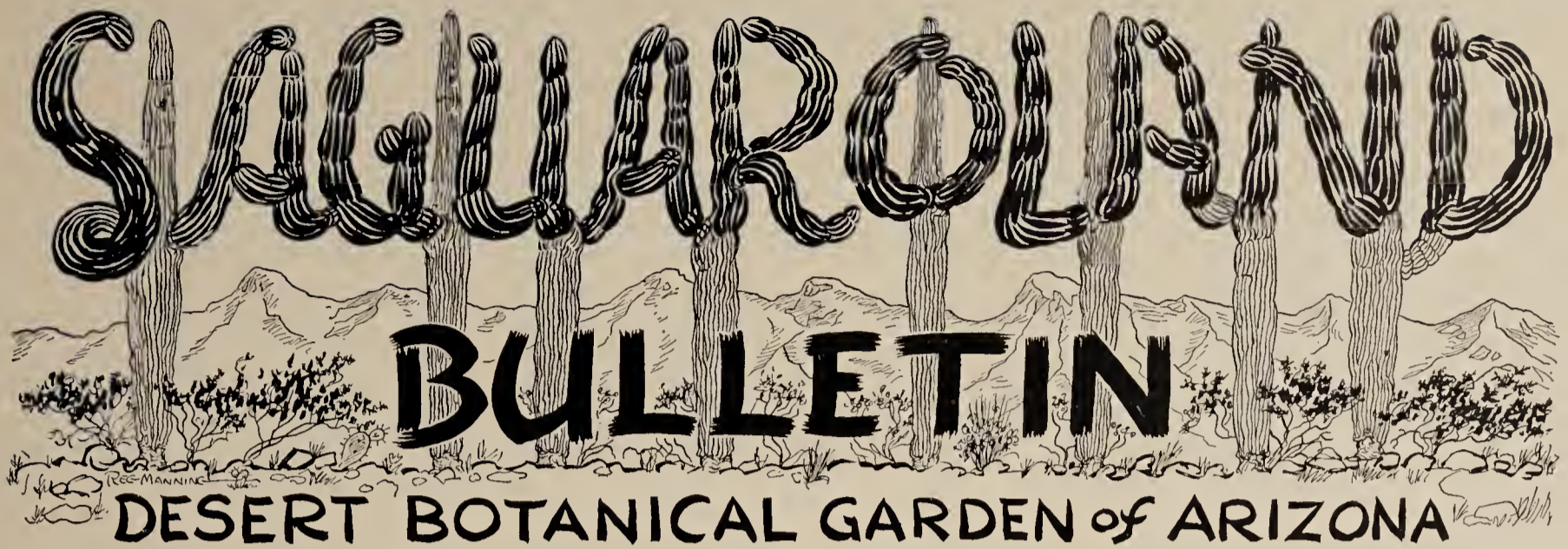


Fig. 40. *OPUNTIA COMPRESSA* (Salis.) Macbr.
variety *macrorhiza* (Engel.) Benson
photo by R. C. Proctor

Saguaroland Bulletin

Box 647, Tempe, Ariz.

To



SAGUARO BULLETIN
DESERT BOTANICAL GARDEN OF ARIZONA

Vol. 4

October 1950

No. 8

GARDEN ACTIVITIES

Winter Schedule

On Sunday, October 15th, regular winter activities will be resumed and we shall have our usual newspaper and radio publicity to assure a large attendance to start the season.

Sunday lectures at 3 P. M. and again at 4 P. M. will be given each Sunday till May 1st. The first few talks will be:—

Sunday, Oct. 15th. Collecting Plants in Navajo Country—W. Taylor Marshall.

Sunday Oct. 22nd. Collecting in Southern Arizona—W. Taylor Marshall.

Sunday Oct. 29th. Desert Trees and Shrubs—W. Taylor Marshall.

Sunday Nov. 6th. Desert Cactus—R. C. Proctor.

All lectures illustrated with kodachrome slides.

The Classes for adults on Thursday afternoons will include two series of 6 classes each. The first series commencing on Thursday, Nov. 9th. The second series in January.

From October 1st the garden will be open to the public from 10 A. M. to 5 P. M. daily. Closed Mondays.

Instead of the conducted tours at irregular intervals as in past years we have this year prepared a Self Guided Tour. This is a 4 page printed pamphlet which directs the visitors along certain paths where 42 different plants bear numbers and in the text of the pamphlet a history of each of these 42 plants is given. The pamphlet sells for 10c and can be taken home to remind our visitors of the many interesting plants they saw at our garden.

Included in the Self Guided Tour is a visit to the new lath house where a guide in uniform will always be available.

For Botanists and Students there is our herbarium to visit and this will be opened to qualified persons upon application.

Public and private schools may arrange in advance by phone (5-1815) or mail for classes to visit the garden in the mornings from 9 A. M. until noon any morning Tuesday to Friday.

The Cactomaniacs meet in the Webster Auditorium on the first Tuesday of each month at 8 P. M. and all interested persons are invited to attend their meetings. Desert plants and their culture are dis-

cussed from an amateur collector's standpoint. Field trips over week-ends or for Sunday only are planned once a month.

Accessions

Notable amongst the summer's acquisitions are 750 seedlings of Cactus and other Succulent plants. These seedlings are one year old and were grown for us by Mr. Herman Tobusch of Villa Park, Ill. For comparison we have seedlings of one to two months grown in our lath house.

New Cactus Book

We will publish our new book "ARIZONA'S CACTUSES" on December 1st. It will be about 100 pages and all the species of cactus native to Arizona will be described in non-technical language with photographs or line drawings of each species to aid identification.

Keys, also in non-technical wording will aid students in identifying species found in the field and a guide for moving and growing the plants in your own garden will be included, as well as an explanation of the peculiar structure which enables the cactus to live in arid districts.

The book is on an excellent quality of coated paper with large, easily read type and numerous photographs. It will sell for \$1.00.

Because the edition is limited, it would be well to place your order for ARIZONA'S CACTUSES in advance of publication. Cash or checks should accompany all orders plus 10c if book is to be mailed.

Book dealers may write for information on trade discounts.

The text for ARIZONA'S CACTUSES is much the same as the serial publication of the native species we have been running since February, except that keys and a complete list of all names that have ever been applied to each plant has been added.

We, at first, intended to publish all the text in the Bulletin before issuing the book but find that it will require another 2 years to run them in that form. We now wonder if you will wish us to continue the serial publication of species or if it would be better to drop serial publication as soon as the book is ready and to use that space in our Bulletin for descriptions

Saguaroland Bulletin is issued ten times a year by the Arizona Cactus and Native Flora Society Inc., sponsors of the Desert Botanical Garden of Arizona in Papago park. Subscription rate \$1.00 per year to members, the first \$1.00 of any membership in the Arizona Cactus and Native Flora Society Inc. shall be considered as payment of a year's subscription to Saguaroland Bulletin, Subscription to non-members \$2.00 per year. Editor, W. Taylor Marshall, Box 647, Tempe, Ariz.

of other native desert plants.

There is not now any work on desert trees and shrubs written in non-technical language so that just you and me can understand and identify the plants without a botanical education, so we feel that such descriptions should be popular.

What is your opinion? Write us, won't you, and help us to make a decision.

Southern Trip

In the last Bulletin we mentioned a planned trip through the Southern part of Arizona and this trip was undertaken by the director accompanied by our junior botanist, Jim Blakley.

At Organ Pipe Cactus National Monument we saw a plant of a species of *Echinomastus* that we believe to be new. At the Chiricahua National Monument we investigated the possibility of *Echinocereus Rosei* entering Arizona there and later collected what we be-

lieve to be it just east and south of the Monument.

We explored a part of Sycamore Canyon and found a fairyland of plant life in a magnificent setting of rocks. Here the vegetation of the tropics and plants from the north meet in friendly fellowship.

Wild Cotton and Manihot, from which tapioca is derived, meet Pines from the north to the delight of a botanist. The terrain is indeed rugged and at least three husky young botanists should travel in the party to cover the canyon properly, so after a few hours exploring the upper portion we decided to postpone a thorough inspection until we could return with a larger and better equipped party.

On our trip we visited Mrs. Eunice Bullington at Deming, New Mexico and from her fine collection brought many specimens of plants we did not have.

In all we added several hundred living plants to our collection and over 200 herbarium sheets of late summer flowering plants.



Fig. 41. Interesting Rock formation at entrance to Sycamore Canyon.

E. R. Blakley Photo.

Arizona's Cactuses

19. *OPUNTIA PHAEACANTHA*¹ Engelm 1849.

- O. phaeacantha brunnea* Engelm 1856
- O. phaeacantha major* Engelm 1856
- O. phaeacantha nigricans* Engelm 1856
- O. camanchica* Engelm & Bigelow 1856
- O. procumbens* Engelm 1856
- O. chihuahuensis* Rose 1909
- O. Toumeyi* Rose 1909
- O. Blakeana* Rose 1909
- O. zuniensis* Griffiths 1916

Large sprawling prickly pear which forms clumps up to 10 feet in diameter, the pads forming chains along the ground and rooting at the point of contact, with other pads erect from them, joints or pads egg-shaped, 4 to 9 inches long and 3 to 6 inches broad, about ½ inch thick. dull-green to yellow-green and bearing brown glochids or barbed hairs which become larger and more prominent with age; spines 1 to 4, spreading variously, usually one much longer than the others, 1 to 3 inches long, brown, reddish or occasionally yellow, tapering, somewhat flattened; flower about 2 to 3 inches in diameter, the petals yellow or rarely magenta; fruit fleshy, narrow egg-shaped or nearly cylindrical; wine-red, not spiny but bearing clusters of barbed hairs.

From Mojave and Yavapai counties south and east to New Mexico, Texas, Sonora and Chihuahua. Mesas and hillsides at 1000 to 4000 feet altitude.

This is the most widely distributed species of the State and perhaps the most abundant. Throughout its wide range, both of altitude and geography, it is but natural that a great variety of forms should be found. In the vicinity of Flagstaff a form with almost circular joints has been described as *O. procumbens*.

The fruit of the Dun Colored Prickly Pear is prized as food both raw and as preserves.

19A. *O. PHAEACANTHA* Engelm variety *ANGUSTATA* Engelm.

- O. Angustata*² Engelm 1856

Similar to the species but with somewhat narrower joints up to 10 inches long, the joints ascending to erect rather than procumbent.

Mojave County on the Bill Williams drainage in Arizona, adjacent California, southern Nevada and southwestern Utah.

In winter this plant has bright red margins to its joints or red streaks on the face of the joints.

1. *phaeacantha*- fe-a-kan'-tha — with dun colored spines.

2. *angustata*- an-gus-ta'-ta—with narrow stem.

20. *OPUNTIA ENGELMANNII* Salm Dyck 1850

- O. Engelmannii cyclodes* Engelm 1856
- O. Lindheimeri cyclodes* Coulter 1856
- O. discata* Griffiths 1908
- O. Dillei* Griffiths 1909
- O. arizonica* Griffiths 1909
- O. Wootonii* Griffiths 1909
- O. cyclodes* Rose 1911
- O. Gregoriana* Griffiths 1912
- O. valida* Griffiths 1914
- O. confusa* Griffiths 1914
- O. riparia* Griffiths 1914
- O. magnarenensis* Griffiths 1916
- O. expansa* Griffiths 1916
- O. Engelmannii discata* C. Z. Nelson 1919

Large prickly pear forming a shrub to 6 feet high and 15 feet in diameter with the flattened joints 5 to 15 in line, either built up or along the ground; joints egg-shaped to plate-shaped, green to bluish green, 7 to 11 inches long and 6 to 8 inches broad; smooth, not nipped; spine cushions (areoles) about 1½ inches apart and bearing prominent barbed hairs (glochids) ¼ to ½ inch long, brownish; spines produced by all but a few of the lower spine cushions, white or pale gray with red or brown-red base, spreading variously but most of them turned downward, stout, rigid, 1 to 2 inches long, the larger one flattened; flowers about 3 inches in diameter, petals at first greenish-yellow but deepening in color throughout the day to appear to be apricot color by evening, opening at the first contact with sunbeams and closing as soon as the plant is in shade at evening, usually about 4 P.M., fruit red or purple, reverse egg-shaped, juicy, edible, spiny at first but spineless at maturity and then bearing only barbed hairs (glochids).

Engelm's Prickly Pear is the largest species of prickly pear in Arizona and is exceeded in range only by *O. phaeacantha*.



Fig. 42. *Opuntia Engelmannii* Salm Dyck.
Habitat Photo. R. C. Proctor.

From Kingman, Apache County to Oak Creek Canyon and south to Yuma County and across the southern part of the State to Greenlee and Cochise Counties. Arizona to Texas and Sonora. General on hills and in valleys 1,200 to 4,500 feet altitude.

As is usual with a plant of wide range *O. Engelmannii* is extremely variable and many segregations have been made but it seems reasonable to include all of them in the species as they are mostly geographical variations.



Fig. 43. *Opuntia Engelmannii* Salm Dyck. A variation frequently miscalled *Opuntia discata*.
R. C. Proctor Photo.

Saguaroland Bulletin

Box 647, Tempe, Ariz.

To



SAGUARO BULLETIN
DESERT BOTANICAL GARDEN OF ARIZONA

Vol. 4

November 1950

No. 9

Editorial

The winter season is now well started and gives promise of becoming the largest in the Garden's history. Last year we found that we did not have a large enough seating capacity in Webster Auditorium for our Sunday lectures so we have purchased 100 new, metal folding chairs. This gives us a seating capacity of over 200.

On November 9th we start our first series of classes on desert plants which will continue for six Thursdays. The second series will start on Thursday, Jan. 11th. These classes are designed to fill the needs of new comers to Arizona, old timers, teachers and students or any adult who desires to know something about the desert flora, so that our desert may become to them a friendly playground where known friends dwell.

The structure of desert plants, modified to permit survival in arid regions, will be explained and the more prominent species identified. Methods of cultivation for garden use will be explained as will the food value of many of our desert trees, shrubs and cactuses.

Classes are at 3:30 P.M. each Thursday and, for the benefit of those without transportation, our car will meet the Tempe bus at the Park gate at 3:15 each Thursday and will return students to the bus line after each class. Subjects covered by the classes are as follows:—

- Thursday, Nov. 9. Types of desert vegetation and how they survive.
- Nov. 16. Cactus, its structure, uses and culture.
- Nov. 23. Thanksgiving. No class.
- Nov. 30. Arizona species of Cactus.
- Dec. 7. Leaf succulents for desert gardens.
- Dec. 14. Trees and shrubs for desert gardens.
- Dec. 21. General review.

As is usual, no charge will be made for attendance at the classes, but advance registration may be necessary as we want to keep the classes small enough to assure personal instruction for each member. Register at the office or by phone, Phoenix 5-1815.

We are progressing nicely with "Arizona's Cactuses" and expect to have the book ready by December 1st. Many orders for the book have come in and we expect more orders in advance of publication from

those who wish to be sure of getting a copy of the limited edition. Pre-publication price is \$1.10 post-paid.

Herbarium Accession

We had a visit from Mrs. Walter Douglas of Chauncey, N. Y. and Phoenix, and she has offered to give to us a collection of about 1500 herbarium specimens that were collected for her in Mexico about ten years ago. We are thrilled at the prospect of such a large addition to our growing herbarium and will give further details of this valuable acquisition as soon as we receive them.

Papago Park

Last spring the Fish and Game Commission found it necessary to close off the "Hole in Rock" and picnic areas of the Park because they did not have funds to properly police the park and, without proper policing, our destructive public repeatedly destroyed the rest room fixtures and burned the ramadas over the picnic tables.

At this time two agencies are offering to take over the Park. The City of Phoenix Park Department wants to build a golf course and a city park. State College at Tempe wants to take it as a site for experiments by the biology department with a zoo of native animals and a museum as well as controlled range for plant growing.

Both of these objects could be realized within the Park limits without conflict and we believe that a compromise agreement will be reached.

We would welcome the biology department of the College, who would thus be closer to us and we could work in harmony, as we have done for the past four years, and we would also welcome the City Park Department for the improvement to our approach through the Park and for the police protection we would get from them.

In the course of the discussions with these two agencies, Dr. Stahnke suggested to me that it would be necessary for the College to control both sides of the main road so that it could be closed at their option. Closing of the main road would place the Botanical Garden in much the same position as the Western Powers in Berlin.

My reaction was immediate and I expressed my disapproval through the Arizona Republic. This resulted in a telephone call from Dr. Gammage, president

of the College, who assured me that I had misunderstood Dr. Stahnke and that the College would never close off our main road. I am very happy to have such assurances from Dr. Gammage and will take no further steps in the matter but will call on him to discuss a program of mutual help as soon as I am recovered from the attack of flu that has kept me confined to the house for more than a week.

The Lath House

Perhaps the biggest single feature that will bring us ever increasing crowds during the current season is the new lath house. It is now complete and forms an attraction of the first magnitude which has been acclaimed by all of our early visitors as they enter the door with delighted exclamations.

Future Bulletin Plans

It seems evident that our readers want us to discontinue our description of Arizona's Cactuses in view of the publication of the book at this time. Most of those who have written to us want to have descriptions of other prominent plants of the desert in the last two pages of each issue, and we will commence this new series with our January number. Meanwhile we will use those pages for the description of some little known cactuses from other places than Arizona and to comments on current work on the family.

Coloradoa, A Rare Cactus, by C. Mieg

For years Bill Marshall has desired a *Coloradoa mesae-verdae* for the Desert Botanical Garden. He and his gang have hunted for it and they have even had the rangers of Mesa Verde National Park on the lookout for the plant, but without results.

One day, not long ago, Chief Maniac Mieg of the Cactomaniacs of Scottsdale decided to do something about this sorry situation.

He wrote a letter to Muriel Colburn of the Denver Cactus Society—What honeyed words he used, what insidious lies he told and what promises he made we will never know—but soon word came from Denver that the plant was on the way to him.

Now this would have been the end of the matter if Mieg had kept quiet. But no. He raced over to the Garden and treated everyone he could waylay to most obnoxious crowing. Marshall turned arsenic green with envy but he threw the old thinking apparatus in high. The date of Muriel's letter was all he needed.

Two days later Mieg sneaked out of the Scottsdale post office with the precious package under his arm, but Marshall was on the job and followed him into his office before Mieg could lock the door. Half an hour later Marshall came out with the package and Mieg was found slumped behind his desk—a tableau of utter frustration.

The plant is now on view at the Garden behind barbed wire, the deputies are on 24 hour duty!

The happy ending was provided by Muriel, who drove 1200 miles to find just one more *Coloradoa* which is now on its way to Scottsdale. Thank you Muriel, you have averted civil war.

Fig. 45. *Coloradoa mesae-verdae* Boiss & David.
Photo by George Olin.

Christmas Suggestions

The book department of the Garden has many suggestions for acceptable gifts with the flavor of the Desert. Perhaps the best possible gift for any friend with an interest in desert plants is a membership in the Garden with its subscription to Saguaroland Bulletin which will remind your friend ten times in the coming year of your thoughtfulness. A \$3.00, \$5.00 or \$10.00 membership purchased for a friend will bring to him a Christmas card in your name.

Additional suggestions are as follows:—

Packaged Cactus Plants, attractive packages with cut cellophane packing.

| No. | Package. | Post paid. |
|------|--|------------|
| 5. | Box of 5 plants ready to go in pots or bowls | \$1.25 |
| 10. | Box of 10 plants ready to go in pots or bowls | 1.85 |
| 10W. | Box of 10 rare, white spined plants, collectors' items | 3.35 |
| 15. | Box of 15 plants, somewhat larger | 2.95 |
| 24. | Box of 24 selected plants, many of flowering size | 7.50 |

Book Suggestions

| | |
|---|------|
| Arizona's Cactuses. Our new book describing all of the Arizona species and varieties. Profusely illustrated. Ready Dec. 1st. | 1.10 |
| What Kinda Cactus Izzat. Reg Manning. A cartoon type book with lots of information. Amusing yet usable as a text book. | 2.10 |
| Cactus and Succulents. Roan. The latest book for the amateur. Printed in England. Profusely illustrated. | 1.75 |
| Prickly Pear Jelly. Mailing carton of 4, 12-oz. glasses. A clear, red jelly of exceptional flavor, beautifully packaged. | 2.90 |
| Prickly Pear Delight. A Turkish delight type of confection made from the fruits of the prickly pear. New and provocative flavor. | |
| One pound boxes | 1.75 |
| Half pound boxes | 1.00 |

All prices postpaid anywhere in the United States.



Coloradoa Mesae-verdae Bossevain & Davidson

This little cactus first came to my attention in 1939 when Dr. Eoissevain sent me several specimens of the plant for my opinion. I had volunteered to advise him on taxonomic matters and we were considering the generic status of the newly found plant which seemed to approach the Chilean genus *Copiapoa* most nearly. Geographic range and other factors excluded it from *Copiapoa* and we found that it would be necessary to erect a new genus for it.

It is a disc-shaped plant of pale gray-green color and in its juvenile stage is tubercled and strongly suggests a *Mammillaria*. Later the tubercles converge to form spiralled ribs, 13 to 17 in number. The apex of the tubercles are crowned with somewhat woolly areoles which bear 8 to 10 short, appressed spines and a few areoles have also a hooked central spine.

The bell-shaped flowers are borne near the center of the plant and are yellowish-brown or greenish-yellow. The plant was found at the foot of the cliffs that form the west border of the Mesa Verde Plateau and it is thought to range from there to Shiprock, New Mexico.

One of the plants sent by Dr. Boissevain was photographed by George Olin and this is reproduced in Fig. 45. A specimen is now in our lath house which was presented to us by C. R. Mieg, who received it from Miss Muriel Colburn of Denver.

Blatter Fur Kakteenforschung

Under this imposing name a gentleman named Curt Backeberg of Hamburg, Germany in 1934 commenced serial publication of a revision of the Cactus Family. The work was continued well into the war and has been resumed since. At the time Backeberg commenced his work the system of classification proposed by Drs. Britton and Rose in their monograph "Cactaceae", a four volume work, was beginning to meet with fairly general acceptance. Many students thought that possibly Britton and Rose had erected

more genera that could be justified by clear cut separation and that the 124 genera of their classification could be reduced to about 100.

Backeberg has continuously erected additional new genera and in 1944 proposed a total of 195 genera. At this writing he has about 225 genera proposed.

We have had numerous occasions to disagree with his conclusions, many of which, we considered as based on too little first hand information. In 1946 we published in "Cactus", the Journal of the French Cactus Society, a proposal to reduce the genera of Cactus to 131 and gave reasons for the rejection of many of Backeberg's genera. This article was reprinted in the American Cactus Journal in an English translation in 1947.

In Cactus and Succulent Journal XXII:5: pps. 153, 154. Sept.-Oct. 1950, Backeberg has erected six more new genera and twelve new sub-genera and emended another genus. Included in this new disruption is the genus *Marshallocereus* based on *Cereus Aragonii* Weber (*Lemaireocereus Aragonii* Br. & R.) as the type species and including our own *Lemaireocereus Thurberi* (Engelmann) Br. & R., the Organ Pipe Cactus of Arizona.

By what authority Backeberg assumes the right to attach my name to any genus without my consent, I fail to understand. It is in line with his utter irresponsibility. Why any reputable American Journal should consent to publish such rubbish is incomprehensible and regrettable. Needless to say the genus has no value.

Amongst the other publications in the above quoted Journal is a revision of the genus *Carnegiea* which will exemplify to Arizona residents the careless work of Backeberg for he has added to the genus *Carnegiea*, which has so far contained only our Saguaro, a new species which in no respect can be associated with our giant cactus. He states in his Latin diagnosis of the revised genus that he unites the species because they both have day-blooming flowers.

Any school child in Arizona knows that the Saguaro flower blooms at night, opening just after nightfall and remaining open till about noon of the following day.



Fig. 46. The New Lath House.



Fig. 47. Flower, fruit and stem of *Peniocereus Greggii*.
The Arizona Night Blooming Cereus.
R. C. Proctor Photo.

Saguaroland Bulletin

Box 647, Tempe, Ariz.

To



SAGUARO BULLETIN
DESERT BOTANICAL GARDEN OF ARIZONA

Vol. 4

December 1950

No. 10

*Feliz Navidad y
Feliz y Prospera
Año Nuevo*

Editorial

It is most fitting that our Christmas greeting to you be worded in the language of Old Arizona but whether in Spanish or English, our intent is to extend best wishes to the many members and friends who have made possible a year of remarkable progress by the Desert Botanical Garden.

In the year we have built and completely planted a 5000 square foot, all metal lath house, enlarged the seating capacity of our auditorium, established a self-guided nature walk, made a big start with our herbarium, added nearly 1000 new kodachromes of plants and habitats for use in our lecture work and published our first science bulletin, "Arizona's Cactuses".

The book arrived from the printers on December 5th, just four days later than our planned publication date. We believe that it is the biggest \$1.00 worth of book recently published. It has 115 pages of heavy coated paper, 8 line drawings, 35 full-page photos and 22 half-page or more, photos, in all illustrations of 61 species and varieties. The text describes the 60 species of Cactus native to Arizona and their varieties. By mail it is \$1.10 postpaid.

At this time we are planning a public address system for the auditorium with speakers both inside and outside of the building and we have ordered a tape recording device so that talks can be recorded and re-broadcast.

Our plans for the future are extensive and will be undertaken as soon as the division of the Papago Park area, as agreed by compromise, goes into effect and we have proper assurance from the Phoenix Park Department of a proper lease on our grounds.

It is felt by the Director, and the Executive Board agrees, that the present procedure for the election of

an Executive Board is unsuitable for the needs of a botanical garden and that revisions of the by-laws are needed.

When the Arizona Cactus and Native Flora Society was first incorporated it was a cactus club with the intention of building up a cactus garden and club house for the entertainment of the members and the occasional admittance of the public to the garden. In such an organization the officers should be elected annually so that all members in turn could hold office.

Due to the vision of Gustave Stark and Mrs. Webster the original plans for a cactus garden grew into plans for a botanical garden and a building planned for expansion of work was erected and the plantings were enlarged to include desert plants from all the world.

Four years ago we realized that the annual election of a new board could be dangerous to the continued progress of a botanical garden and the by-laws were revised to extend the terms of board members to four years with only one-fourth of the board up for election in any one year. This to avoid the possibility of getting a board composed of all new members who would not be familiar with the work of the garden.

The increase in our educational program and our greater investment in buildings and plantings now make it advisable that we have a permanent Board of Trustees, which is self perpetuating, to hold in trust the buildings and equipment of the Desert Botanical Garden and to be in a position to act as trustees for any future endowments that might be given to us.

Our legal force is now considering the steps necessary to accomplish this end and to present the plan to our membership, who will make the final decision by vote. We know that the membership will want to have the garden's future secure and we feel sure that a favorable vote will be given to the new set up.

Cactus Show

The fourth annual cactus show will be held this year from February 18th to 25th, inclusive. Sunday, Feb. 18th, we will open the show with the dedication of the new lath house. As is usual, we will have exhibits of desert plants by garden clubs and individuals and a joint exhibit of their plants by the Cactomaniacs who will put on the joint exhibit as well as entries by individual members.

The photographic exhibit will be a big feature, as is also customary, and we believe that the showing will be better than ever. Schedules for both the plant show and the photo show and entry blanks for both will be ready early in January.

One booth in the show will feature Prickly Pear Jelly and the new Prickly Pear Delight, a new type of candy made from the fruits of the Prickly Pear similar to Turkish Delight in consistency but with a flavor of great interest and originality. Plant dealers will also have booths and Indian silverwork will be displayed.

New Member of Executive Board

At a meeting held on November 27th the board unanimously elected Leslie J. Mahoney to the vacancy expiring in 1952. Mr. Mahoney, a member of the firm of Lescher and Mahoney, Architects, has been on our advisory board for two years and he supervised the erection of our lath house, donating his valuable time for this work.

Mr. Mahoney is the same type of public spirited citizen that constitutes the balance of our Executive Board and we are glad to welcome him.

Cactomaniacs

The December meeting of the Cactomaniacs was held in the Webster Auditorium on Tuesday evening, Dec. 5th. A nominating committee was appointed to select candidates for the offices of Chief Maniac and Secretary for 1951 and report their choice to the next meeting on January 9th. At that meeting additional nominations can be made from the floor, after which election by ballot will select the officers and they will be immediately installed. Mrs. Mills and Mrs. Speck will be hostesses.

At the December meeting, Chief Horticulturist Earle demonstrated the culture of cactus and answered questions on culture. Mr. Bradford and Jim Blakley were the hosts.

Adult Classes

The final class in the first series on "Appreciation of Desert Plants" will be on December 21st. From 25 to 30 persons attended this first series of six lessons and we feel that they will get much enjoyment from their Desert trips in the future by their ability to understand and identify the plants they see there.

The second series of six classes will commence on Thursday afternoon, January 11th, at 3:30 and they will continue each Thursday until February 15th. No charge is made for attendance at these classes but advance registration is desired.

Field Work

In a recent letter to an English correspondent we had occasion to make the statement that only by field study could a botanist gain a sufficiently broad outlook to justify him in describing new species. After writing the letter we began to check back to determine just how many years of actual field work we had done before we began to get a clear picture of the variability within a species.

We recalled that we had four years of work on the American Deserts before we made our first trip into foreign countries, specifically into Baja, California on a field trip with Howard E. Gates. Reference to our photo album showed that that trip was made in 1933 and the accompanying photo of the author at Magdalena Bay reminded us that we were unable to certainly distinguish the illustrated plant, *Cochemeia Halei* from *Echinocereus Barthelowanus* at that time.



Fig. 48. W. Taylor Marshall at Magdalena Bay, Baja, Calif. 1933. The Cactus is *Cochemeia Halei*.

Two years later a trip down the west coast of Mexico, then a six months trip to the West Indies and five more years of work in California and Arizona were needed before the extreme variability of species was demonstrated by following the range of a single species over four states.

Another fifty years of field work, we hope, might bring us to the point of knowledge that we felt we had reached in our first year of interest in desert plants.

An outstanding example of the excellence of judgment attained by field work is afforded by Dr. Lyman Benson. His proposals for consolidation of Arizona species in the Transactions of the California Academy of Sciences have been largely followed in our "Arizona's Cactuses."

An Unsolved Mystery

In Smithsonian Miscellaneous Collection 50:524. 1958. Dr. J. N. Rose published a new species: *Opuntia Plumbea*, based on an herbarium sheet of a collection by Mr. F. V. Coville on the San Carlos Indian Reservation.

Dr. Rose described the plant as low, creeping and with few joints (roots not mentioned), the joints not over 2 inches in diameter; the flowers were described as small and red. Fig. 49 is a reproduction of the herbarium sheet on which the species was founded.



Fig. 49. Photograph of the herbarium sheet of the type of *Opuntia Plumbea*.

Repeated efforts by the Garden staff have failed as have all other reported efforts and the species remains unidentified. It is possible that the specimen collected by Mr. Coville was a juvenile form of *Opuntia compressa* var. *macrorhiza* which is common on the San Carlos Reservation.

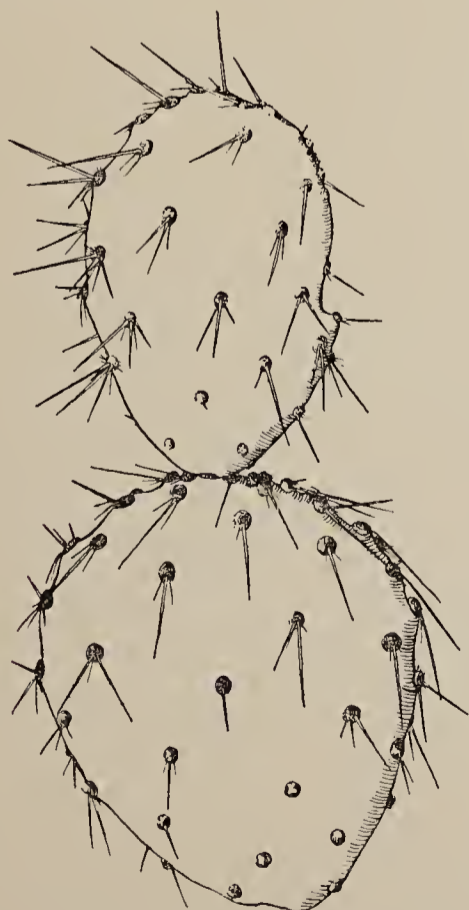


FIG. 204.—*O. cantabrigiensis*. $\times 0.4$.

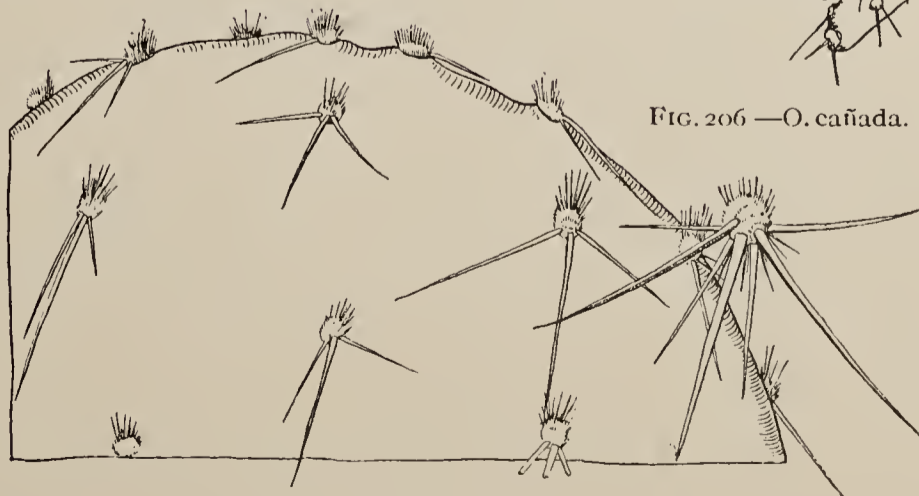


FIG. 205.—*O. procumbens*. $\times 0.5$.

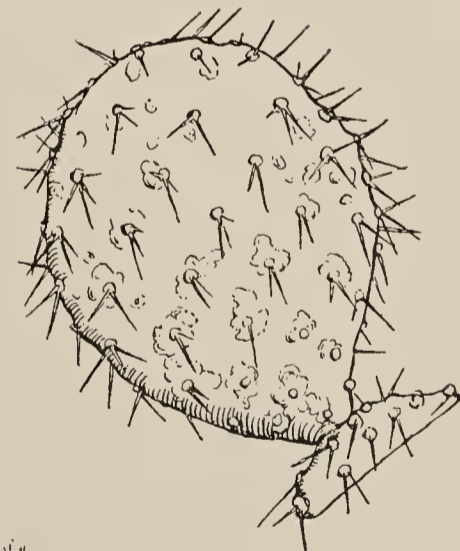


FIG. 206.—*O. cañada*. $\times 0.75$.

We suggest to our members, especially to the Cactomaniacs, that they devote some time to the relocation of this species whenever they are in the locality from which the first specimen was collected.

Charlie Mieg listened with patience to our diatribes against a certain German Cactophile whose work is based on second hand information and when we finally ran out of invective told us the following story which had been told to him by his biology teacher in Switzerland:-

A paper on the camel was required by the biology teacher. Included in the class were a Frenchman, an Englishman and a German.

The Frenchman took paper and pencils and proceeded to the Zoo where he observed the camels and inquired about them from the keeper in charge. Then he retired to the nearest park bench and wrote his paper.

The Englishman returned to London and outfitted an expedition and left for Africa, where he hunted camels for a year. Then back to London where he wrote a ten volume monograph on the camel.

The German retired to his study and there attempted to construct a camel from his inner consciousness. He is still there.

Assistance Needed

Photographs are a great help in the identification of plants but line drawings often prove more valuable than either words or photographs.

For our planned series on the trees and shrubs of the Arizona desert we need line drawings to illustrate many of the finer points of identification and we would like to find a volunteer to make some for us similar to the line drawing below but of branches rather than cactuses.



Fig. 50. *Mamillaria Wrightii*. A reproduction of plate 8 accompanying the report of the U. S., Mexican Boundary Survey. 1859.

All recent writers have considered this as the same plant later described as *Mammillaria Wilcoxii* Toumey 1898 but they have not been united until the combination was proposed in "Arizona's Cactuses".

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Box 647, Tempe, Ariz.

To