

The

Central

Spine

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BOTANICAL GARDEN

UNIVERSITY OF CALIFORNIA AT BERKELEY

If you are ever in the San Francisco Bay area take time to visit the outstanding Botanical Garden at the University of California at Berkeley. It is located in a canyon above the main campus. Ask anyone!

The Garden covers many acres, divided into various climatic zones and geographic areas. There is a fine greenhouse. The only problem is---it is only open from twelve noon to one o'clock. At least that was the policy when I visited last. The plants in the greenhouse are grouped by families. Photographing is a real problem because the plants are in pots and placed very close together. You are not allowed to move anything, and they will not help you get a clearer shot. The Euphorbias, especially the taller ones, are growing together. The same holds true for the columnar cactus. The greenhouse is still worth trying to see as their more tender and rare plants are housed there.

Outside, along the south side of the greenhouse, is a raised bed. Many Euphorbias are planted here in full sun! Many are in full bloom or covered with seed pods. Behind the greenhouse is a hillside with many species of Aloe and other African succulents. On the uphill side of the main path just past the greenhouse is an area called "the African Hillside." All kinds of Euphorbias, Mesems. Crassulas and others form mature clumps and cover the whole area. When I was there in late May the various bushy Mesems were a riot of color: reds, oranges, yellows, pinks and lavenders.

Downhill of the main path is their "New World" section. Large and small cactus, Agaves, terrestrial bromeliads, Dudleyas and many others are planted among the rocks and pathways. There is one large bed with many Johnson hybrids, several Trichocereus clumps and Lobivias in profusion.

East of these sunny hillsides you enter a shady glen with redwood trees, large ferns and Rhododendrons along a small stream. The contrast is very effective. Columbine and boggy plants complete the setting with benches and tables to rest your tired body.

Other areas include an herb garden, a tropical greenhouse and a California meadow.

There is so much to see here that one day may not be enough time, especially if you are trying to get good pictures. Blossoms open at different times, the light and shadow on the plants change, colors vary with the sun and clouds.

Everytime I take out my slides and review them, I'm ready to go back to this beautiful botanical garden for more and better pictures.

By Marvin E. Williams May 1985.

Japanese gardens involve more than well maintained plants. The oldest meaning of the Japanese word for garden is a place purified for the worship of the gods. According to Shinto belief, divinity manifests itself in such natural objects as mountains, hills, stones and trees. Therefore these are all basic parts of a garden.

Arizona Republic February 3, 1980.

THE LOVE NEST CAPER

They first made their presence known by a lively chittering as they flew in to the hummingbird feeder just outside the kitchen window. "They" were a pair of verdins, feathered in olive drab. The male was adorned by a yellowish crown heightened in intensity for the spring rituals.

They were new kids on the block, identity at first unknown. Would they stay? Possibly. After a week of exploration, tree to tree, bush to bush, they concentrated on the Foothills Palo Verde in the front yard. With more chittering all the branches and twigs were explored. Were they the right size, exposure, height?

Shortly the chittering changed to a melodic note or two. The search was on for nesting material. Both of them joined in bringing twigs to the crotch of their choice. Some were too long, some too short, others just bridged the gap. And suddenly, there was a platform of sorts to support the female. Now the male brought most of the rafters (?) and the female fitted them in. And then, gradually a dome was shaped. But only a sharp eye could find the entrance at the bottom!

They used a devious pattern to approach their home, flitting from a bush to a tree, to their home treetop, to lower branches, and then ZIP, into the nest. The Inca doves were moulting and conveniently leaving tiny, fluffy feathers strewn about the cactus beds. The verdins carefully gathered them and lined their nest with a genuine featherbed.

After the eggs were laid Mrs. Verdin spent much time keeping them warm. Meanwhile, Mr. Verdin raided our neighbor's Mimosa bush plucking off the lovely pink flowers. These he tucked onto the entire outside of the dome until it looked like a veritable bower! A stately Pleasure Dome, indeed! A love nest!

They lived happily ever after and raised four fine chicks.

Phyllis M. Hennessy

"I believe our Civilization's latest advance is symbolized by the park rather than by satellite and space travel. In establishing parks and nature reserves, man reaches beyond the material values of Science and Technology. He recognizes the essential values of Life itself, of Life's natural inheritance implacably evolved through earthly epochs of the miraculous spiritual awareness that only Nature in balance can maintain."

Charles Lindbergh.



NOTOCACTUS NOTES

By Kent C. Newland
Boyce Thompson Southwestern Arboretum

In the highlands of southern Brazil, western Argentina, Uruguay, and Paraguay growing on rocky outcrops are the globular cacti known as Notocactus.

Notocactus are closely related to the barrel cacti (Echinocactus and Ferocactus) of the southwestern United States and Mexico on the basis of flower, fruit and stem anatomy.

Notocactus are some of the finest globular cacti with very attractive stems, bright and long lasting flowers, and good adaptability to the cold winters and hot summers of central Arizona. Light shading and generous watering and fertilizing during the summer are beneficial for notocactus.

Here are some notes on a few of the 50 species of notocactus. The genus notocactus is divided into 10 groups.

1. Mammulosi - These notocactus are noted for their abundant lemon yellow flowers, bold spination and deep green stems. Notocactus allosiphon, mammulosus and submammulosus are good examples of this group. Other outstanding notocacti in this group are Notocactus buiningii with stout golden spines, Notocactus mueller-melchersii with dense wool and Notocactus rutilans with pink flowers.
2. Crassigibbi - This group resembles gymnocalyciums with their near spineless stems and obtuse ribs. Notocactus crassigibbus has some of the largest flowers of the genus up to 6 inches wide. The flowers of Notocactus uebelmannianus are a stunning wine red.
3. Setacei - These medium size notocactus are noted for their delicate brown spination and showy yellow flowers. Notocactus apricus, concinus, and tabularis are virtually indistinguishable and most of these notocactus in cultivation are probably horticultural hybrids.
4. Ottones - These small notocactus are characterized by their brown interlacing spines and yellow flowers. Notocactus ottonis is commonly seen. The var. venculsianus is an exceptional form of Notocactus ottonis with reddish orange flowers. Notocactus caespitosus, carambiensis and linkii are also choice plants of this group.
5. Alacriportanae - This group has been tossed around taxonomically for some time, most where first described as parodias. Notocactus brasiliensis and brevihamatus are interesting miniatures with intense yellow flowers. Notocactus rechensis forms beautiful clusters.
6. Scopae - These notocactus are noted for their beautiful silver spines and pale yellow flowers. The many forms of Notocactus scopa and sucineus are some of the most beautiful cacti.
7. Horstae - This group is characterized by fleshy light green stems and orange or purple flowers. Notocactus horsti and muegelianus have beautiful orange flowers. Notocactus purpureus and herteri have striking purple flowers.
8. Wigginsia - These notocactus are characterized by fleshy green stems, sharp pronounced ribs, dense wooly crowns, and medium yellow flowers. Notocactus selowi, erinaceus and tephracanthus are all very similar and perhaps the same species. Ritter's new discovery in this group is Notocactus leporosum with an exceptional white wooly crown.

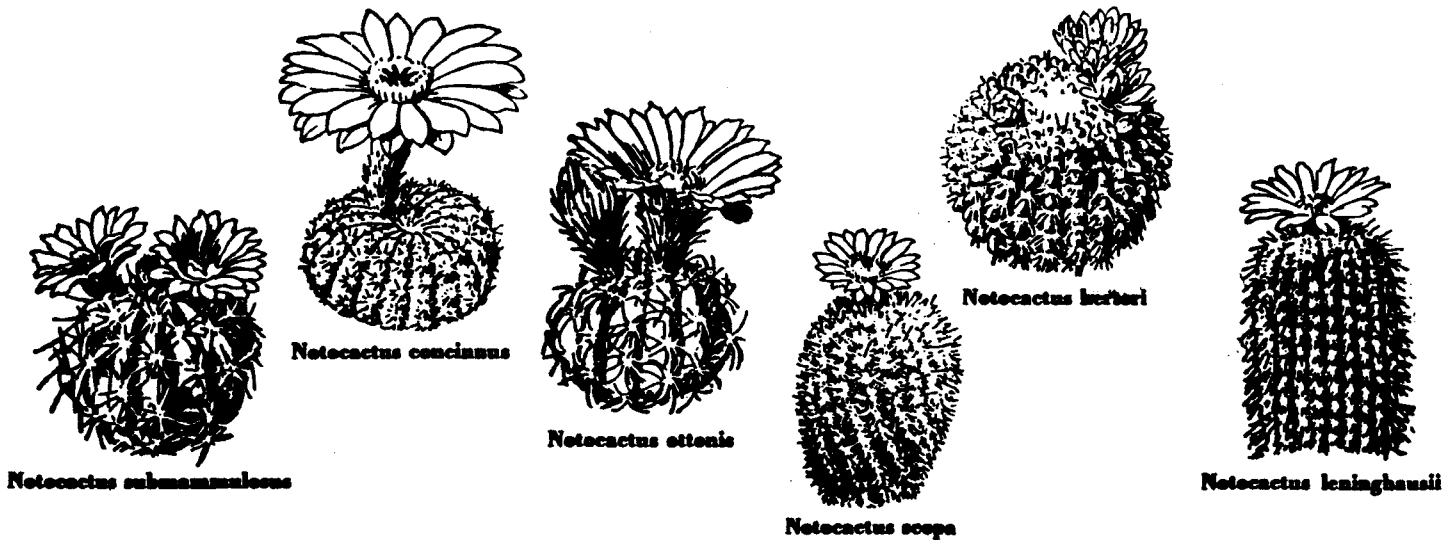
9. Eriocactus - The "crown jewels" of the genus notocactus are in this group. Notocactus leninghausii has long golden spined cluster. Somewhat similar is Notocactus schumannianus and nigrispinus. Notocactus claviceps is noted for its golden spines. Notocactus magnificus, with its golden spines, wooly apex and blue green body, is truly magnificent and is one of the most beautiful of all cacti. Notocactus warasi is somewhat similar to N. magnificus with light green stems and golden spines.
10. Brasilicactus - Dense white or golden yellow spination and orange to green flowers characterize this group. Notocactus haselbergii has white spines and orange red flowers in the spring. Notocactus graessneri has golden yellow or white spines with green flowers.



Kent C. Newland has been horticultural specialist in charge of the cactus and succulent collection at the Boyce Thompson Southwestern Arboretum since 1972. Newland grew up in New Mexico and was graduated from New Mexico State University with a B.S. in botany. He is a founding member of the Central Arizona Cactus and Succulent Society and was elected its president in 1978 and 1979. He has spoken and written extensively on cactus conservation in the United States.

Newland has taught courses on cactus taxonomy at the Desert Botanical Garden and the Arizona-Sonora Desert Museum. He frequently lectures on numerous topics related to cacti and succulents at the Arboretum and to college classes and plant societies in the area. In recognition of his horticultural, educational and conservation work with cactus and succulents, Newland was elected to the International Organization of Succulent Plant Study at the organization's congress at Mexico City in 1980.

Newland frequently visits Baja California, one of nature's greatest gardens of succulent plants, to collect seeds, photograph plants and get ideas for the Boyce Thompson Southwestern Arboretum's gardens. He also has studied cacti and succulents in Sonora and southern Mexico.



Notocacti illustrations taken from CACTI AND SUCCULENTS by Walther Haage.

CRESTATES, MONSTROSAS AND FREAKS

Out of state visitors who are unacquainted with the desert forest and its allies find the strange shapes of the plants in the Garden fascinating, curious and occasionally repelling. Attracted or repelled they all pause before ~~the crestates and monstrosas.~~

Nobody knows why these malformations occur and no one simple cause can explain them. They occur in the Cactus family more frequently than in any other branch of the vegetable kingdom.

Fasciation is the term applied rather loosely to cover a wide range of growth changes in plants in which the normal symmetry is drastically upset.

There are two main types of fasciation, the crestates and the monstrosas, and then there are the freaks.

The most common fasciations are the crests or fan shapes that are found on Saguaros and other columnar species, and also occur on many species of the Crassulaceae, Mammillarias, Opuntias, Echinopsis and so on. In fact there are few species of Cacti that are not subject to fasciation.

Speculation on the causes run through insect damage to growing center of the cactus, radioactivity in the soil, storm damage as when hail stones hit the vulnerable meristem, an inherited tendency transmitted by the seed, disease, over-nourishment or under-nourishment.

Crestation occurs when the symmetrical growing point of the stem, as in the Saguaro or Organ Pipe, or the Barrels, for whatever reason, suddenly and abnormally divide and subdivide into multiple growing points that are crowded into something of a strip. They have to go some place so they spread out into a convoluted fan called a crest, or into a mound of dozens of wavy ribbons.

Crestations seem to crop up quite unexpectedly. Sometimes they are magnificent and beautiful, for there is a strange beauty in the abnormal. They are always extraordinary and usually enormous. They are not diseased growths for they never seem to damage the plant proper which continues its normal growth.

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

The meristem is the growing tip of any organ. It is the dome-like mound of undifferentiated nascent cells which have not yet but will become recognizable forms such as spines, leaves, branches or flowers.

The meristem is usually buried under a protective layer of hair, bristles, scales or wool, as witness the wooly center of a barrel cactus or a young Saguaro stem.

The Totem Pole, Lophocereus schottii forma monstrosus, is one of the rare

rare instances where meristem cells abnormally develop at a number of points on the column producing a number of subsidiary growing points from which deformities and irregular growths spring.

Monstrosas may produce flowers but they too are often deformed and their seed, if any, is not viable.

In the wild crestates and monstrosas forms are rare. Only one Saguaro in a thousand may form a crest on one of its stems, and then it may reach gigantic size.

Crestate forms upset the plant less if it has already reached mature size and some bulk. Being abnormal the malformations are at a disadvantage in the normal life processes of the plant and are often eliminated.

Smaller forms of crestates and monstrosas are dear to the heart of the collectors. They have personality.

Propagation, apart from chance occurrence in seedlings, is by cuttings or grafting. Crestate or monstrose forms separated from the normal plant may root on their own and survive very well.

The Joker is they may revert to normal growth.

The freaks are the magacephalus forms. Mega from the Greek word for large, and cephalus for head.

From time to time in the wild and in cultivation something unusual happens to a cactus, especially a Saguaro or a barrel. It may have had its top knocked off, cut off, damaged by insects, storm activity or frost, or be distorted by genetic growth. Quite often the site of the damage is easily visible and around it the cactus has produced a number of heads, all of them symmetrical and normal appearing. Or the heads may be wrinkled into unnatural shapes and ugly, piled upon and against each other in a distorted array. Sometimes several of these plants appear in close association with each other, a small group.

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

--by VERA GAMET

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P.S. (Past Seventy)

The old rocking chair is empty today,
For Grandma is no longer in it.
She is off in her car to her office and
shop

And buzzes around every minute.

No one can shove Grandma back on
the shelf.

She is versatile, forceful, dynamic.
That is not a pie in the oven, my dear,
Her baking today is ceramic.

You won't see her trundling off early
to bed

From her place in the farm chimney
nook.

Her typewriter clickety-clacks
through the night,

For Grandma is writing a book.

She's not content with crumbs of old
thoughts

Or meager and secondhand
knowledge.

Don't bring your mending to Gran-
ma to do,

For Grandma has gone back to
college!