

## 10 age and the cholla

Visitors to the Cholla Cactus Garden are sometimes concerned about the fire which burned the cactus. But the truth is, this area never burned. The dark brown color of the lower joints and trunk is due to the dead, discolored spines. As new stem segments become older they detach readily from the parent plant. This is one of nature's most effective methods of vegetative reproduction. The detached joints will quickly develop roots and grow into new individuals. Many times this reproductive process occurs right at the base of the cactus. Cholla cactus do flower and produce seeds that are usually sterile. The joints easily hitchhike on many desert animals, who unknowingly carry them great distances before they fall off, starting a new cholla colony.

## 11 the cactus wren and others

Among the list of animals which find the thorns of the cholla no threat are birds. They perch on a cactus without so much as a preliminary hovering to pick a spot. They simply fly full speed, drop their legs, fold their wings and alight. The thickets of spiny branches provide a well protected nesting site for many species.

Cactus wrens, one of the largest wrens in the world, nest almost exclusively in different species of cholla cactus. Throughout the Colorado Desert their football-shaped nest of straw is often found with its characteristic side tunnel entrance. The nest is formed by an interwoven network of slender stems and branches of wildflowers. These nests are made so sturdily they can last many years. Like the wood rats, cactus wrens congregate in groups of three or four for warmth during the cold winter months.

CACTUS WREN



## 12 the pencil cholla

Here is a cactus that is relatively safe to investigate a little more closely, the pencil cholla (*Opuntia ramosissima*). The name refers to the multitude of small, cylindrical branches. A closer look reveals these branches to be covered with small, diamond-shaped plates from which a single, long spine emerges. A papery sheath, like a scabbard on a sword, encloses each spine. An even closer look at the base of the spine shows three, smaller spines pointing downward. Looking at the base of the spine you can see a white patch surrounding it. This white patch is composed of thousands of tiny, hair-like spines called glochids.

## 13 water and cactus

The roots of cholla are laid close to the surface of the soil where they can quickly take up the water from light, penetrating rains. These corky, barked roots are long, many of them several meters in length. They rapidly develop small, delicate root hairs to absorb moisture when it is available. The water is stored in the fat stems and is given up very slowly, even during the hottest days. In times of drought the root hairs wither and die to reduce water loss, while the roots remain moist and succulent, protected by a thick bark.

## 14 pinto basin landscape

Pinto Mountain is the round-topped mountain rising to the left of Pinto Basin. It was named "pinto" because of its varied colors similar to a pinto horse. At the base of Pinto Mountain can be seen a series of small sand dunes deposited by blowing winds over hundreds of years. The far side of the basin is bordered by the Eagle Mountains, which have deep canyons, secluded palm oases and high elevation pinyon pine forests. The closest mountain range to the right is the Hexie Mountains. On the far distant horizon between the Pinto and the Eagle mountains are the precipitous Coxcomb Mountains. These mighty peaks, some 33 miles away, form the eastern boundary of both Pinto Basin and Joshua Tree National Monument. They rank among the most rugged and inaccessible of the Southern California peaks.

DESERT SENNA

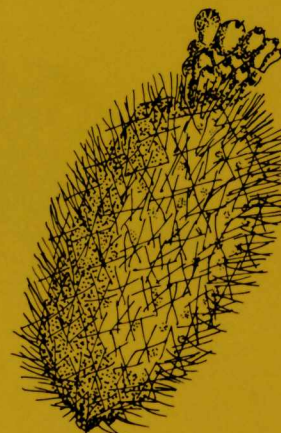


## 15 cactus cooking

The yellow flowers of the Bigelow cholla appear in May, and the yellow-cupped fruits are mature by June.

Years ago the Cahuilla Indians inhabited the Pinto Basin. Each year they would gather the cholla fruit in early summer, when it was young and full of sweetness. The fruit buds were easily broken off with a stick and collected in baskets. After the short spines were brushed off with a bunch of grass or a handful of brushy twigs, the buds were steamed with hot stones in a pit for twelve hours or more. Following this lengthy preparation, the Cahuillas ate some of the fruit immediately, then dried the remainder for future use.

CHOLLA JOINT



## 16 desert senna—dead or alive?

Many people think the desert senna (*Cassia armata*) is dead. During much of the year this impression is understandable. It is leafless, except for a brief period in the spring, when tiny leaves appear. A mass of bright yellow, fragrant flowers burst out in April and May. This is one of the most beautiful of desert shrubs.

This plant is particularly interesting because most of its relatives are tropical species. They all have large, evergreen leaves adapted to moist climates, yet the desert senna departs from these tropical characteristics with its small and short-lived leaves.



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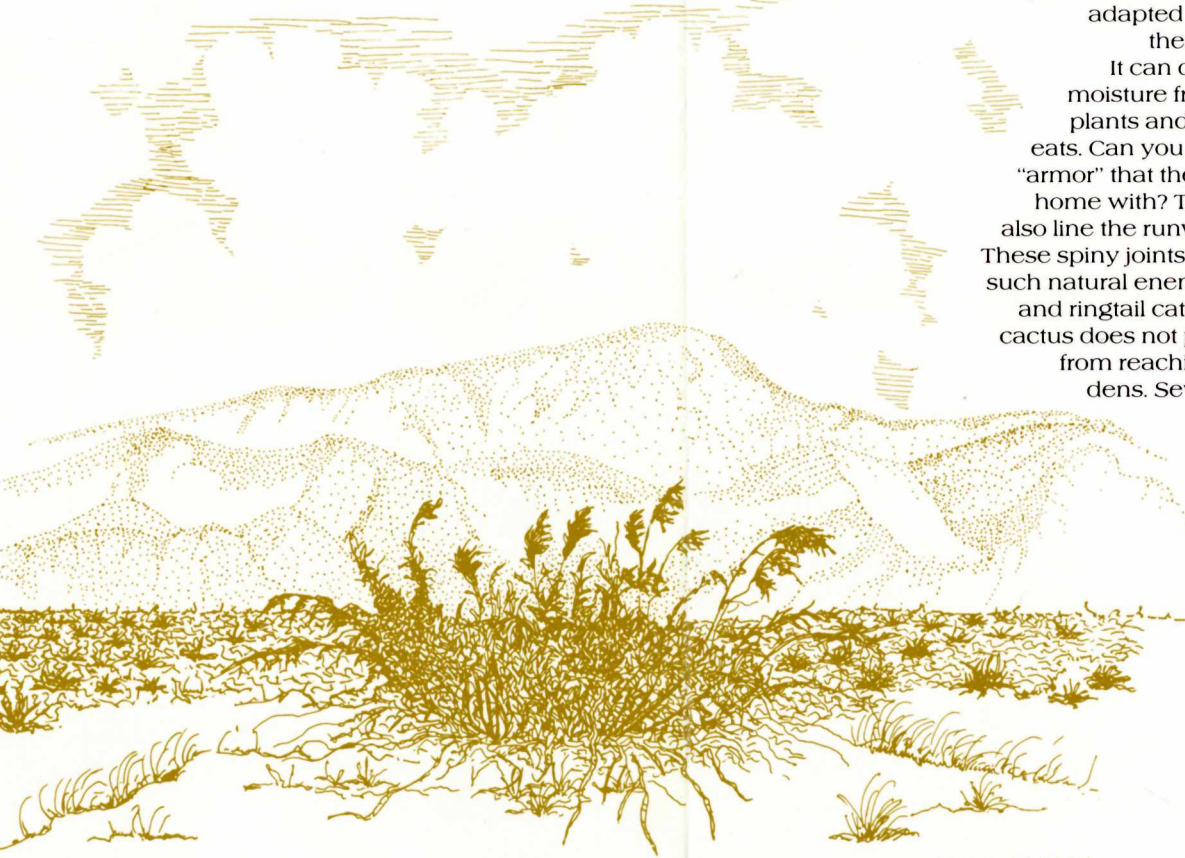
# CHOLLA CACTUS GARDEN

SELF-GUIDING NATURE TRAIL

**Y**ou have just entered the low-desert country of Pinto Basin . . . a place of extremes. As summer approaches the basin begins to pulsate with heat waves that will exceed 115° F daily. The sea of creosote bushes appears like a mirage of shimmering green, and the mountains are transformed into a haze of flickering blue. Seldom does more than a mere four inches of rain fall here within a year's time.

Yet life persists against seemingly impossible odds. The plants and animals of the Pinto Basin have developed some unbelievable adaptations to solve the problems presented by these extremes. You may also be surprised to discover the close relationship between the living things of the Cholla Cactus Garden.

Be on guard because chollas seem to jump. At the slightest touch the spines penetrate the flesh and are extracted only with difficulty and extreme pain. Pliers are usually required. Be especially watchful of small children and pets. Please remember that dogs must be on a leash in the Monument.



PINTO MOUNTAIN ~ PINTO BASIN

## 1 jumping teddy bears

Across most of Pinto Basin the predominant plant is the creosote bush, but in a few areas the cholla (pronounced, choy-ya) cactus dominates the landscape. This species of cholla has many common names, but the one most widely used is the Bigelow cholla. Botanists refer to it as **Opuntia Bigelovii**. From a distance the top joints appear to be covered with soft, silvery bristles, giving it the name "teddy bear" cholla. Each of the spines are tipped with microscopic barbs, and if one tries to "hug the bear" or accidentally brushes up against it, the spines will drive deep into the skin, causing the joint to detach and stay with you. Then the origin of the second nickname, "jumping" cholla, suddenly becomes apparent. Despite all the evidence to the contrary, the jumping cholla cannot jump. It is simply a very painful illusion. The thorn is quicker than the thigh.

## 2 the desert wood rat

Be it ever so thorny there is no place like home. The industrious builder of this prickly nest is the desert wood rat, better known by the name of pack rat. This small rat is well adapted to areas where there is little water.

It can derive sufficient moisture from the various plants and seeds which it eats. Can you see the natural "armor" that the rat protects its home with? The cholla joints also line the runways to its nest. These spiny joints protect against such natural enemies as coyotes and ringtail cats. However, the cactus does not prevent snakes from reaching the pack rat dens. Several species of

snakes feed on the young, helping to keep the pack rat numbers in balance with the community.

Wood rats are seldom seen during daylight hours. As soon as night falls, the wood rats are out scrambling with remarkable ease over the cholla cacti. While gathering their food, they often become stuck by a cholla joint. Rather than struggle, the wood rat patiently turns and pulls out the joint with its teeth.

In the winter these large nests many times contain three to four wood rats, huddled close for warmth.



## 3 buckhorn cholla

Another common cactus of the Colorado Desert is the buckhorn cholla (**Opuntia acanthocarpa**). Like all cholla species, buckhorn has a woody, supportive central stem. This tubular skeleton remains standing in place for years after the death and decay of the succulent portions of the cactus, a stark reminder of this harsh environment.

## 4 journey through time . . . .

In the desert, local geology is easy to see and enjoy because of the lack of heavy vegetation. On the edge of Pinto Basin, where the Cholla Cactus Garden is located, we have a chance to view a piece of geologic time.

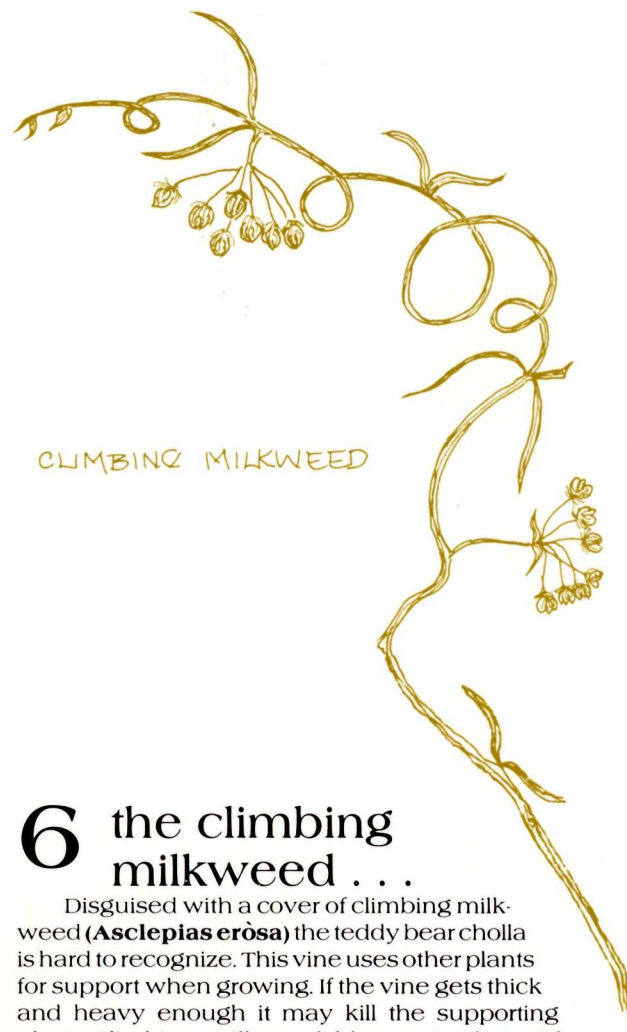
The Pinto Basin was formed by the surrounding fault-lifted mountains and the subsequent erosion. The sand and gravel fans, extending from the canyon mouths and into the basin, are slowly filling it in. Over thousands of years, the two erosive forces of water and gravity accomplish their task slowly, but their power makes significant changes in the landscape. These mountain ranges were once very tall, but now their bases are buried in their own rubble.

## 5 a calico cactus? ?

This multi-colored cactus (**Enchinocereus Engelmannii**) derives its name from the calico cat. The spine color varies from light brown to strawberry red—similar to the coat of a calico cat. Besides being beautiful, the spines serve several purposes. They protect the plant from animals, shade the cactus to prevent overheating and reduce the drying effects of the wind.

In the springtime, the cactus may be covered with bright pink flowers. The cactus flower's startling color makes it quite visible in contrast to its desert surroundings.

The calico cactus favors alluvial slopes which provide good drainage. These areas are commonly found in the upper Colorado and Mojave deserts.



CLIMBING MILKWEED

## 6 the climbing milkweed . . .

Disguised with a cover of climbing milkweed (**Asclepias erosa**) the teddy bear cholla is hard to recognize. This vine uses other plants for support when growing. If the vine gets thick and heavy enough it may kill the supporting plant. Climbing milkweed blooms in the mid-spring, and mature seed pods follow within one month.

## 7 the creosote bush

The creosote bush (**Larrea divaricata**) is well adapted to prolonged heat and dryness. The roots of the creosote bush reach deeply for moisture and also remain near the surface to absorb any brief rainfall. But this dual system cannot always keep pace with the rate of water loss occurring through the leaves. When water loss exceeds moisture availability some of the small, waxy leaves are shed in sets. The first set to drop is the fresh, light green spring growth. This occurs in mid-summer, leaving the dark, olive green leaves behind. These leaves remain on the plant throughout most of the year. They are the principal source of the bush's aromatic odor. But if drought continues, these leaves will also be shed. The third and last set of leaves left on the sparsely covered bush are brown and hard. They are able to continue functioning even during the severest drought.

Lizards and snakes often take refuge from the hot sun in the shade of the creosote bush. Burrows of kangaroo rats and other rodents are found near the roots, which help support the passages.

## 8 why are cacti here?

Cacti are abundant only in places where water supplies are seasonally plentiful. Such conditions exist in the higher desert ranges and on many of the alluvial fans, where washes carry the rapid runoff of summer cloudbursts and winter rains. Loose gravel and rock crevices, where percolation is good, are necessary for prolific growth. This accounts for the distribution of cacti. Their wide-spread absence in the basins is due to highly compacted sand and gravel.

## 9 the jojoba

The jojoba (pronounced "ho-HO-bah") (**Simmondsia chinensis**) or goatnut is found here and throughout the upper desert of the Monument. Unlike most desert plants, this shrub has fairly large, evergreen leaves. The leaves are covered with thousands of tiny, white hairs to prevent overheating and water loss. The leaves stand almost vertical when the sun is directly overhead, reducing the amount of light they receive.

Another interesting aspect of the jojoba is that male and female flowers are borne on separate plants. The female flower, when pollinated, ripens into a single, oily nut which tastes much like a filbert,

but is slightly bitter due to the presence of tannic acid. The high quality oil, commercially extracted from jojoba seeds grown on farms, is used for beauty products and lubrication of precision instruments.

One often finds the little white-tailed antelope ground squirrel rummaging through the branches of this desert shrub, gathering and eating the fresh nuts. This small animal helps in jojoba reproduction by storing the seeds just under the soil, where they may later sprout and grow. The young seedlings and mature leaves are often browsed by mule deer and bighorn sheep.



FEMALE JOJOBA



MALE JOJOBA