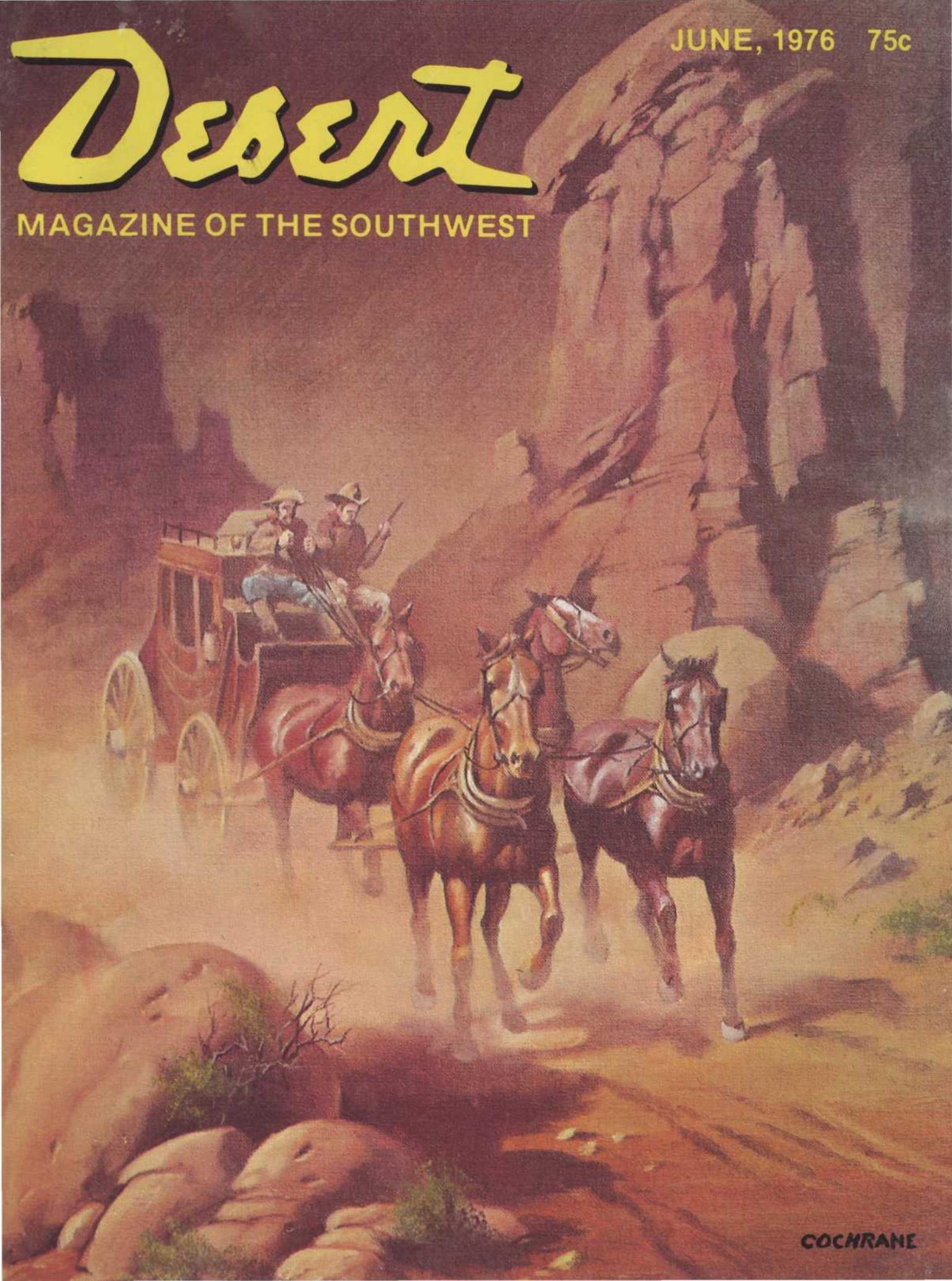


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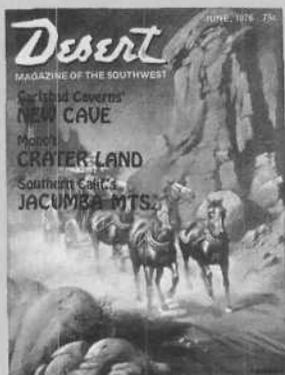
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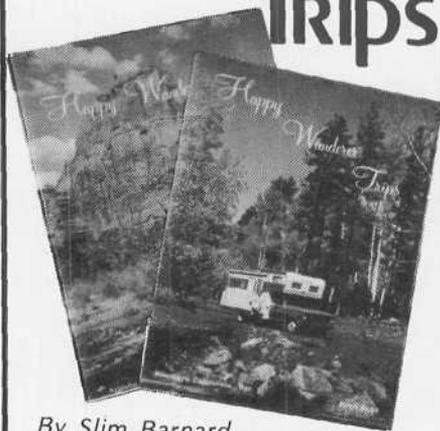
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A Peek in the Publisher's Poke

HIS MONTH'S cover features the work of Charles L. Cochrane of Garden Grove, California. Chuck, like the other artists that have been featured in *Desert Magazine*, is just one hell of a great guy. He created "Desert Stage" especially for this issue and the painting will be on display in our Art Gallery through June 15, subject to prior sale, and after that date will appear in the Pushmataha Gallery in Sedona, Arizona. In all fairness to Chuck, the cover does not bring across the same message as the original, and the real thing has to be

seen to be appreciated. "Down the Canyon," our center spread, and other selected paintings by Chuck are also on display.

To paraphrase the old rodeo announcer in the bronco busting event: "Comin' outta chute No. 2, (Page 24), Chuck Cochrane." You don't have to tell this boy to "stay a long time," because I know he's going to be riding the Western Art Scene for quite a spell!

Riding of a different type is going to be taking place in Southern California when the California State Park and Recreation Commission, meeting at Borrego Springs April 9, approved formation of the 13,000-acre Ocotillo Wells (Off-Road) State Vehicular Area adjacent to Anza-Borrego Desert State Park.

The unusual action is seen as a precedent by advocates of greater use of public lands by off-road vehicles and also by conservation groups who are concerned with encroachment on plant, animal and aboriginal sites.

About 11,000 acres of the new area north of State Highway 78 at Ocotillo Wells, 75 miles east of San Diego, is private land, which will be purchased for \$2.2 million in "greenie sticker" money. These funds are derived from the sale of off-road registration permits for motorcycles and four-wheel vehicles not licensed for use on roads.

About 2,000 acres of Anza-Borrego park lands were added to the private acreage by order of the commission. This exclusion is opposed by some conservation groups as a violation of the park's integrity, according to a spokesman for the Desert Protective Council.

The new area will be administered by Anza-Borrego Desert State Park but is not, technically, a part of the park. Minimum ranger patrols are planned. The site starts about three miles west of Ocotillo Wells on the highway and heads north to include much of the Borrego Mountain dunes and ironwood trees area, then east to the boundary that parallels and is about five miles west of the pole line road, or

about at the Imperial County line. It does not cross Highway 78 to the south and adjoins the existing park on the west and north sides.

The San Diego airport on Benson Dry Lake is not in the boundaries nor is the town of Ocotillo Wells. Rough dimensions are four miles north and south and some five miles east and west, not to the county boundary. No organized campgrounds are planned.

A special note that our Book Shop/Gallery will move over to summer hours of 10-3 weekdays, and closed on weekends, effective May 29.

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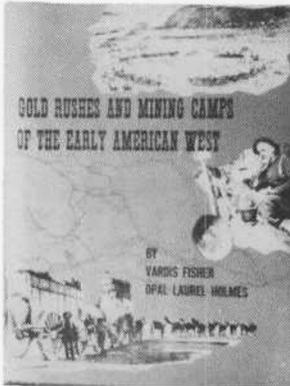
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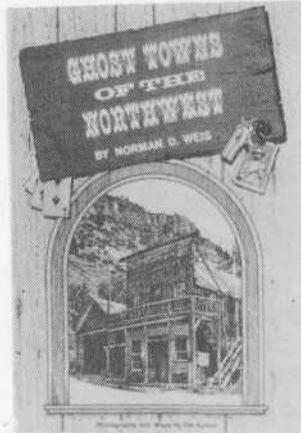
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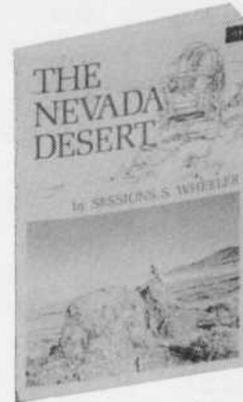
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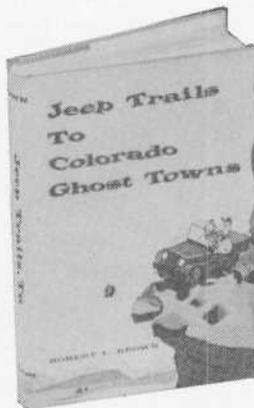
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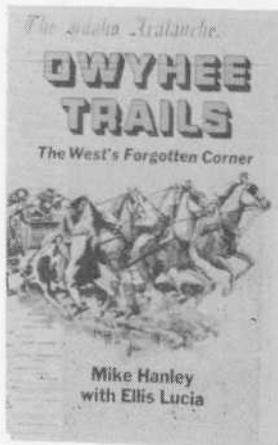
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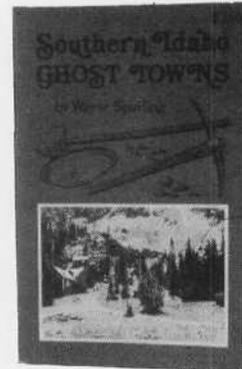
THE NEVADA DESERT by Sessions S. Wheeler. Provides information on Nevada's state parks, historical monuments, recreational area, and suggestions for safe, comfortable travel in the remote sections of western America. Paperback, illustrated, 168 pages, \$2.95.



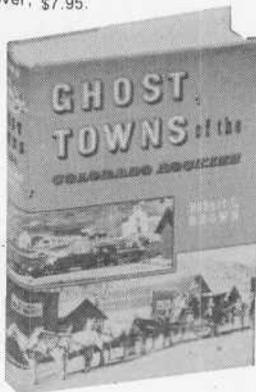
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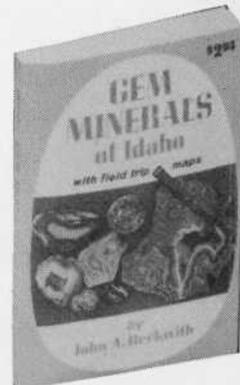
OWYHEE TRAILS by Mike Hanley and Ellis Lucia. The authors have teamed to present the boisterous past and intriguing present of this still wild corner of the West sometimes called the I-O-N, where Idaho, Oregon and Nevada come together. Hardcover, 225 pages, \$9.95.



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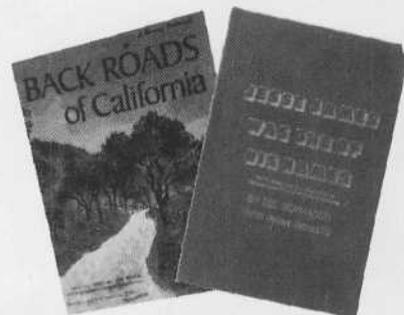
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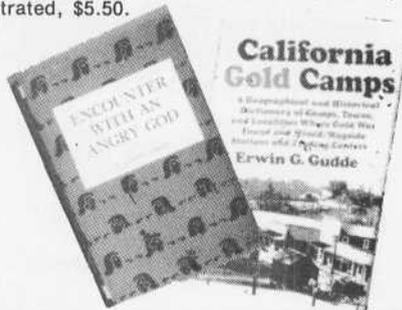
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HANS KLEIBER
Artist of the Bighorn Mountains
By Emmie Mygatt
and
Roberta Cheney

Hans Kleiber was a man who loved desert nature above all. His second love was art, and he managed to combine the two

in a lifelong romance with the Big Horn Mountains of Wyoming. The legacy of superb etchings and paintings that he left is admirably presented in *HANS KLEIBER, Artist of the Bighorn Mountains*.

Emmie Mygatt and Roberta Cheney have written "not so much an account of his life as a glimpse into the experiences which served as background and inspiration for his art." From his own words we learn his joy in the solitude and quiet of the forests, the peacefulness of alpine lakes, the tranquility of unspoiled nature.

Throughout his lifetime, Hans never swerved from his belief that man needs contact with nature, that he must feel the earth beneath his feet in order to be really whole.

"He watched a thousand sunrises and sunsets," says Dr. James Forrest, Director of the University of Wyoming Art Museum, "often orchestrated by honking Canadian geese or formations of noisy mallards or teal; he lay in cover, sketching, as deer, elk or moose grazed. He understood them and respected them . . . as part of a universal scheme encompassing all things on and of the earth."

Much of what he sketched when it was fresh and unspoiled is now endangered. In that sense this book is a timely one. Whatever may happen to his Big Horn country, Hans Kleiber has preserved it at its best and left it for others to enjoy.

MEMOIRS OF AN OREGON MOONSHINER

Ray Nelson

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Ray Nelson and his partners distilled thousands of gallons in the isolated rimrocks of the Eastern Oregon desert. He took pride in his work and turned out good whiskey. His book tells exactly how this fascinating and illicit business was carried out.

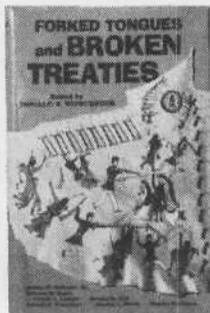
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White officials and reformers tried for

generations to force the Indians to become imitation white farmers, assuming that a few shovels and hoes and bags of seeds, together with a few acres of marginal land, would make the Indians self-supporting and solve the "Indian problem."

One of the underlying themes in the breaking of treaties with Indians was the "vanishing red man" theory, the strongly held belief that the Indians would soon disappear completely. In that case they would have no need for the lands. But today the Indian population is growing rapidly, and articulate and determined tribal leaders are at last demanding their due.

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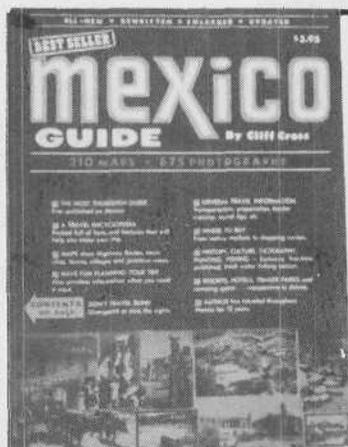
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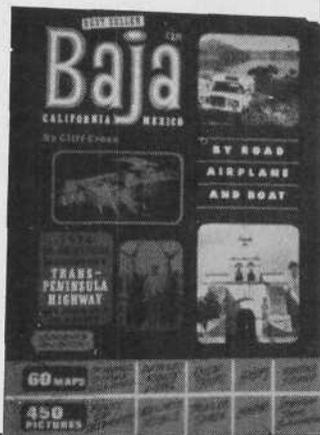
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THE ABAJOS are one of three isolated ranges of mountains in southeastern Utah. The land to the east of this range is high plateau country that has been deeply slashed by erosion to form a series of canyons. One of these is Montezuma Canyon, with its complex of tributary canyons.

The Utah town of Monticello, the gateway to Montezuma Canyon, lies at the eastern base of the Abajos at elevation 7050. U.S. Highway 163 traverses southeastern Utah in a north-south direction, connecting Interstate 70 in east-central Utah to U.S. 160 in northern Arizona, and passing through the towns of Moab, Monticello, Blanding, Bluff and Mexican Hat, each in its own picturesque setting.

The best way to explore Montezuma Canyon is to enter its upper end near Monticello, then leave near its lower end. To enter the canyon, it is necessary to start checking mileage at Monticello because the road into the upper canyon leaves U.S. 163 five miles south of Monticello and is not marked by any sign. Local ranchers use the road, but the

tourists are rare, mostly because few have heard of this long, picturesque canyon system with its unique historic and prehistoric record.

The road to Montezuma Canyon from U.S. 163 is an excellent graveled road that twists and turns through rolling, wooded country increasingly cut by shallow canyons. After a little more than three miles, the road plunges abruptly down into upper Montezuma Canyon, angling along the steep slopes of one of its tributaries. The canyon, itself, is a different world from the highlands that surround it. The canyon floor is verdant with pastures and native vegetation. The twisting course of Montezuma Creek is marked by thicker growth. The lower canyon walls are sloping, colorful slickrock. This imposing stone is topped by terraced layers of water-deposited sediments.

On down the canyon, the curving graded-dirt road winds through a changing, fascinating scene of present-day ranching, remnants of earlier historic settlement and traces of the prehistoric

use of the well watered canyon by Anasazi Indians, "the ancient ones."

The 50-mile length of winding Montezuma Canyon is fascinating from the viewpoints of its geography, geology, wildlife, minerals and human history. The road that travels the upper 30 miles of the canyon gives access to the best part of these.

Geographically, the canyon originates in a series of small arroyos in the high, rolling country between Monticello and the Colorado-Utah border. The upper canyon is about one-fifth of a mile wide. It gradually widens to over a mile at its lower end, where it joins the broad San Juan river valley. Numerous major and minor side-canyons join the main canyon along the way. Montezuma Creek flows the length of the main canyon. By nature, this desert-canyon stream flows continually in the upper canyon, then becomes intermittent in the lower end. Current agricultural developments have somewhat changed this natural pattern.

Those who wish to study the geogra-

Utah's Montezu



Montezuma Canyon has many large natural caves in its slickrock walls. Some of these have been used by ranchers as barns or even dwellings.

The road that travels the upper 30 miles of Montezuma Canyon twice fords the creek. Both crossings are safe during normal water flow. This ford has a solid rock bottom and a series of picturesque cascades just downstream.



ma Canyon

by F. A. BARNES

phy of this fascinating canyon system should obtain the U.S. Geological Survey maps of the area. The Monticello, Blanding, Monument Canyon, Cajon Mesa and Montezuma Creek quadrants cover the entire area.

Geologically, Montezuma Canyon lies within the immense Paradox Basin, a part of the state-sized Colorado Plateau which sprawls across the Four Corners region. The land to the east of the Abajo Mountains slopes gently toward the south, but the geologic strata slope that direction a little more steeply. Thus, the various members of the Morrison Formation that dominate upper Montezuma Canyon, slowly sink below the land's surface by mid-canyon, leaving the lower canyon dominated by the Burro Canyon and Dakota Formations.

All of the geological formations in the canyon contain minerals and fossils of interest to collectors. Some of these minerals have commercial value. This has led prospectors to cut rough Jeep trails into some of the larger side-canyons and up the steep walls of the main canyon.

The canyon hosts a rich variety of plant and animal life, although the larger predators have become so rare due to the predator control programs of local stockmen and certain state and federal agencies. Sagebrush, juniper, cottonwoods, greasewood, box elder, cheat grass, Mormon tea, service berry, cactus, bee bush, narrow leaf yucca, sunflower and river willow keep the canyon green, although the exotic water-loving shrub called tamarisk or saltbush has now largely crowded out the willow.

The heavy vegetation, trees and plentiful water contribute to the wide variety of birds and animals that live in the canyon, including deer, rabbit, ground squirrels, chipmunks, coyote, bobcat, lizards, snakes, cougar, bear, hawks, eagles, ducks, heron and several species of amphibians.

Historically, the first written record of Montezuma Canyon is found in the 1776 journal of Padre Silvester Escalante, when Padres Dominguez and Escalante led an expedition out of Santa Fe, New Mexico, seeking a better route to Mon-

terey, California. For the next hundred years there was no written record of the canyon. The first systematic exploration of the region was made by Mormons as they colonized the area during the late 1840s and 1850s.

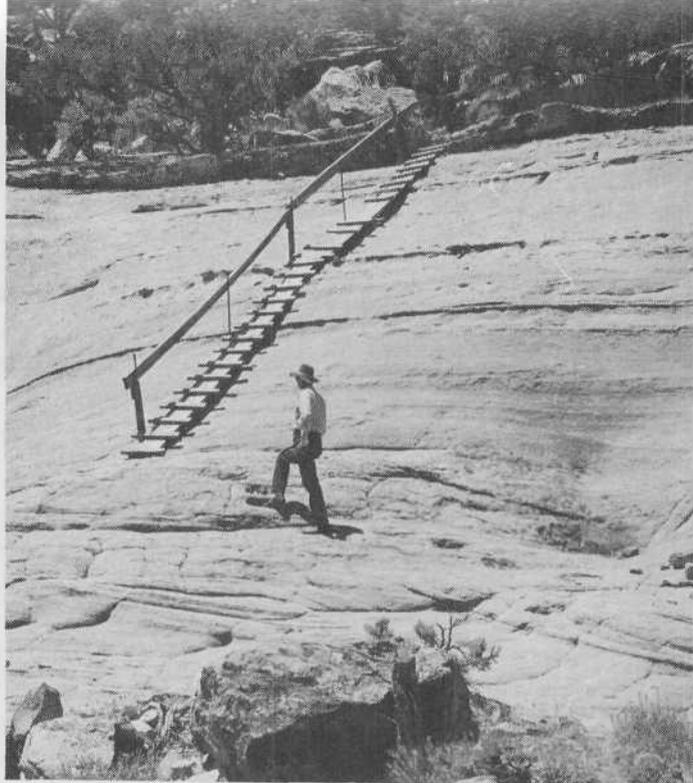
Montezuma Canyon was first settled by white men in 1922. Larger canyon bottomlands were cleared for cultivation, ranch structures were built of logs and in natural caves in the slickrock canyon walls, and the flowing stream was dammed and diverted for irrigation. These activities, together with heavy grazing by domestic animals in the canyon and on the surrounding highlands, have contributed to accelerated erosion within the canyon. This is clearly seen in places where the flooding stream has cut as much as 80 feet into the canyon bottom sediments.

Today, some of the original ranches are still occupied. Others stand abandoned. The most curious are those built into natural caves, some of which were enlarged by blasting. Some caves were and are used as cattle barns, some are used



Left: This dwelling, built into the solid sandstone wall of Montezuma Canyon, shows signs of fairly recent use.

Right: Located about midway in the canyon, this mysterious stairway of rock and wooden steps seemingly led from nowhere to nowhere.



for the storage of baled hay. A few were enclosed for human habitation. One of these is close beside the road that travels the canyon length. A traditional wooden privy still stands not far from the door.

Toward the lower end of the canyon, the canyon road ends at an east-west road that goes from U.S. 163 to Hovenweep National Monument. At this junction, Hatch Trading Post stands in a sheltering grove of trees, serving both the traveling public and the Navajo Indians on their reservation, which begins just to the north of the trading post. The last 20 miles of Montezuma Canyon is roadless and within the reservation.

The prehistoric human occupation of Montezuma Canyon is probably its most fascinating aspect. The existence of ruins in the general region was initially noted by the Dominguez-Escalante expedition, but the first archeological reconnaissance of Montezuma Canyon was not made until 1876, with the first written reports appearing in 1910.

A systematic scientific survey of the upper canyon was begun in 1960 by Dr. R. T. Matheny, then a graduate student of Brigham Young University, and now the director of the Field School of Archeology of that university. Since 1969, Dr. Matheny, his associates and a number of BYU students and graduates have been continuing the work he started by surveying, excavating and reconstructing the numerous archeological sites found in the canyon.

According to Dr. Matheny, 816 sites have now been located within Montezuma Canyon, including 22 villages within the upper 40 miles. One site, named Montezuma Village, contained 91 structures and occupied a mile of the canyon floor. Archeologists now think that during its period of occupancy, Montezuma Canyon may have been the most densely populated area in what is now Utah.

BYU has established a field school base in the canyon about 25 miles from Monticello. The canyon road goes through this temporary settlement in its shady grove of cottonwoods, and during the summer months industrious archeology students always welcome interested travelers who stop by to learn about their work.

Prehistoric Anasazi Indians occupied Montezuma Canyon at about the same time as other better known sites at Mesa Verde, Lowry, Hovenweep and Grand Gulch. Excavations have established that Montezuma Canyon was occupied from the late Basketmaker time, about 500 A.D., to the Pueblo III period, about 1300 A.D., a total span of some 800 years. Then, as elsewhere, the Anasazis mysteriously faded away, with their descendants probably becoming the modern Pueblo Indians of Arizona and New Mexico. Theorists have suggested several possible reasons for this mass migration, including drought, disease and nomadic raiders.

Since 1969, the Brigham Young University Field School of Archeology has made several excavations in Montezuma Canyon. One of special interest to travelers is located within a few yards of the canyon road about 22 miles from Monticello. Work here extended over several years, but was suspended in 1972. At that time, one of the three kivas at the site, now called Three Kiva Pueblo, was reconstructed and stabilized for the study and appreciation of Montezuma Canyon's few visitors.

In addition to the three kivas, only one of which was reconstructed, the site had 14 rooms, an elongated "turkey run" of rock slabs, and other associated utility structures. The site was occupied from about 800 A.D. to 1300 A.D., in three periods separated by vacancies. Each occupancy built new structures on top of the older remnants, but sometimes remodeled and improved older structures that were still standing.

The pueblo's occupants obtained everything they needed from the canyon and its rimlands. Their food was local game, domesticated turkeys, corn, beans and squash, and probably foraged berries and pinyon nuts. Water and clay for pottery came from nearby Montezuma Creek, and hard stones for agricultural tools and chipped points were readily available. The pueblo dwellers also had domestic dogs for companionship and hunting but, unlike elsewhere, they apparently did not use the dogs for food.



Close examination reveals several stone structures on these ledges above the floor of Montezuma Canyon. Some were dwellings, others were food storage chambers. The site is just a few yards from the canyon road and is protected by fencing.

When the largest, most recent kiva was reconstructed, every effort was made to reproduce the original structure. Thus, visitors can now climb down a wooden ladder into the dimly lit room through its only entry, a hole in its roof. This kiva is especially interesting in that it was used during the period when such structures were phasing from ordinary domestic use, to exclusive ceremonial use. This kiva, according to the evidence found, was used for both, even though it had in its floor a "sipapu," or doorway into the underworld. These were of deep religious and philosophical significance to the Anasazis, and are even yet to some Indians.

The canyon's other numerous archeological sites are of less interest to travelers, and most can be reached only by off-road vehicle or on foot. Many are located within the canyon, on its floor or rocky ledges. Others are short distances up side canyons. Visitors to remote and historic Montezuma Canyon must bear in mind that all archeological structures and artifacts are protected by both state and federal antiquities laws. These laws strictly forbid collecting, digging or defacement of all historic and prehistoric remnants.

Only authorized, accredited researchers, such as the BYU field school team, are permitted to disturb sites such as those in Montezuma Canyon, and to remove artifacts for study. The BYU program is continuing to do important

research into the Anasazi culture, in Montezuma Canyon and elsewhere within Utah and adjoining states. It is accumulating valuable anthropological knowledge, and also contributing to public appreciation of early Amerind cultures.

Despite its remote location, Montezuma Canyon is easy to visit. From overnight facilities in Monticello or Blanding, it is easy to take one-day or longer tours into the upper reaches of the canyon. There is so much to see and explore there—ruins, old ranches, Jeep trails, side canyons and desert-canyon natural beauty—that weeks could be spent.

The road that travels the canyon is gravel or graded dirt the whole way, and normally passable to highway vehicles, but two stream fords could be a problem if the water flow is high from recent rain. In such case, two-wheel-drive vehicles should not attempt the fords, and even four-wheel-drive vehicles should check the water depth and proceed cautiously, if at all.

The best seasons for visiting Montezuma Canyon are spring or autumn. Then, the weather is moderate and the canyon floor is colorful with seasonal wildflowers. Early spring and late summer showers always assure such floral displays.

But whenever this unique canyon is visited, those driving its length are assured an unforgettable sampling of western desert-canyon natural and human history.



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Back Road to the Valley of the Palms

by RICHARD BLOOMQUIST



TIME WAS when the town of Tecate, just across the frontier in Baja California, was a gathering place of bandits. The Gaskill brothers drove off a band of Tecate-based outlaws in a celebrated gunfight at Campo in 1875, and the little border settlement knew its share of cattle thieves as well. Rustlers made frequent sorties through San Diego's backcountry, then returned to Tecate and the blue mountains of Mexico across the line.

Today, a century later, things have changed. The sprawling cities have become centers of unrest, while the hinterland is serene and inviting. Tecate, in fact, has developed into one of the most pleasant of the Mexican border towns. Located about 50 miles southeast of San Diego, it is small, quiet and totally unlike Tijuana, which seems to combine the most strident qualities of both the United States and Mexico. The town is, in addition, a doorway to the scenic pleasures of Lower California, the "forgotten peninsula" of bright mountains, deserts, beaches and bays. Americans often complain about what has happened to parts of Upper California, wishing they could have seen the state as it was before freeways, suburbia, megalopolis and "managed" natural resources.

Below the border in Baja California it is still possible, in a sense, to do just this. Traveling the paved highways in

Mexico's northwesternmost state takes one into country roughly comparable to southern California as it was before the 1940s; following the dirt roads and the Jeep trails will bring one into a land even further removed in time.

Near Tecate there is one such dirt road, short in length and, in dry weather at least, passable in a conventional automobile. This is the back road to Valle de las Palmas, or "Valley of the Palms," a small agricultural community on the Tecate-Ensenada highway. This byway leaves paved Mexican Highway 2 (the Tecate-Tijuana highway) six and six-tenths miles west of Tecate's central plaza. As you drive along Highway 2 watch for the tracks of the Tijuana and Tecate Railroad (known after it enters the United States as the San Diego and Arizona Eastern). Route 2 crosses the railway via an overpass six and two-tenths miles west of Tecate. Four-tenths of a mile beyond the overpass the unmarked road to Valley de las Palmas forks left (south) from the pavement. From this point over 12 miles of backcountry lie ahead before the paved Tecate-Ensenada highway (Highway 3, completed in 1961) is gained at Valley de las Palmas.

Throughout its length the road—which was once the main route between Tecate and Ensenada—closely follows the contours of the land. It therefore

The Ramirez Ranch at the north end of the valley. There is an adobe ruin along the road near this rancho.

blends well with the terrain and does not seem a thing apart. (I must mention two temporary drawbacks, however, On my second trip to Valle de las Palmas in October of 1975, a pipeline was being installed along the edge of the road, and what appeared to be a new road was under construction a short distance to the west not far from the Tecate-Tijuana highway.)

After breaking away from the pavement our route descends a short grade overlooking a dry creek bed. Beyond the foot of the grade an abandoned adobe shaded by pepper trees stands off to the left; the place was occupied when I first came this way in 1969. After another mile we enter an attractive little valley with the impressive Ranch El Carrizo ("Reed Grass Ranch") at its far side. The ranch buildings are enclosed by walls or fencing and shielded from the sun by pepper and eucalyptus trees. A metal gate set between red and white pillars gives access to the grounds. Opposite the ranch a timeworn Automobile Club of Southern California sign gives mileages to Tecate (10), Valle de las Palmas (10), and Ensenada (60). These venerable diamond-shaped guideposts have a certain nostalgia about them, especially now that they have become uncommon on the American side of the border.

From the valley of the Carrizo Ranch there is a fine view northward to Tecate Peak in the United States. This steep-sided mountain topped by a fire lookout tower is less than a mile from the international line. (Travelers wishing to loop back to Highway 2—the Tecate-Tijuana highway—may do so by turning right [west] on a side road just before reaching Rancho El Carrizo. This route strikes the pavement after a little over three miles.)

Once past El Carrizo, the road climbs for about one-half mile to another rancho and a grove of olive trees. Then another short uphill pull and we are atop a sun-burned, mile-long flat with a view of the Valle de las Palmas basin off to the south. Physically, this country is cast in the same mold as the region north of the border: dry, chaparral-covered hills and

mountains; granite outcrops; small valleys drained by intermittent streams.

Sugar bush, buckwheat and sage abound on the sunny slopes. A few live oaks dapple the landscape, and scatterings of sycamores fringe the arroyos; here and there a bright cottonwood is conspicuous along a creek bed. And yet, despite the similarities to the United States, the countryside still has features which identify it as a part of Mexico: the *vaqueros*—and even the small children—sometimes seen herding cattle; the burros and other animals which can be encountered on the roadway itself; the scattered adobes shaded by graceful pepper trees.

Leaving the hilly terrain behind after a brief downgrade, we enter an arm of the Valle de las Palmas ("Valley of the Palms"), the broad basin which contains the town of the same name. From here until the settlement is reached some six miles ahead, the road is straight and level, but still rough over most of its course. Soon we pass the picturesque Rancho El Juncalito ("Little Patch of Rushes Ranch"), with its windmills and stone reservoir. Not far beyond the ranch we draw even with a conical butte off to

the right. A tiny white building can be seen below the summit; field glasses reveal that it is surmounted by a cross.

The butte marks the beginning of the valley proper, which is occupied by a variety of farms and ranches. Dairy cattle, beef cattle, horses, olive groves, irrigated fields protected by rows of tamarisk trees—all are part of the pastoral scene. I also noted three adobe ruins along the roadway. We cross the dry Rio de las Palmas ("River of the Palms"), then enter the town of Valle de las Palmas, with its park, baseball field and two schools. The settlement lacks a business district, but does contain a fair number of houses laid out along dirt roads.

The Tecate-Ensenada highway rims the town on the east. I eased onto the pavement and began the 18-mile drive back to the border. The return trip was far smoother and faster than the southward journey had been, yet it lacked the intimacy of the more primitive route. For all its twists and jolts, the dirt road to Valley of the Palms had offered something the paved highway could not—a lingering look at the still serene back-country of Baja California. □



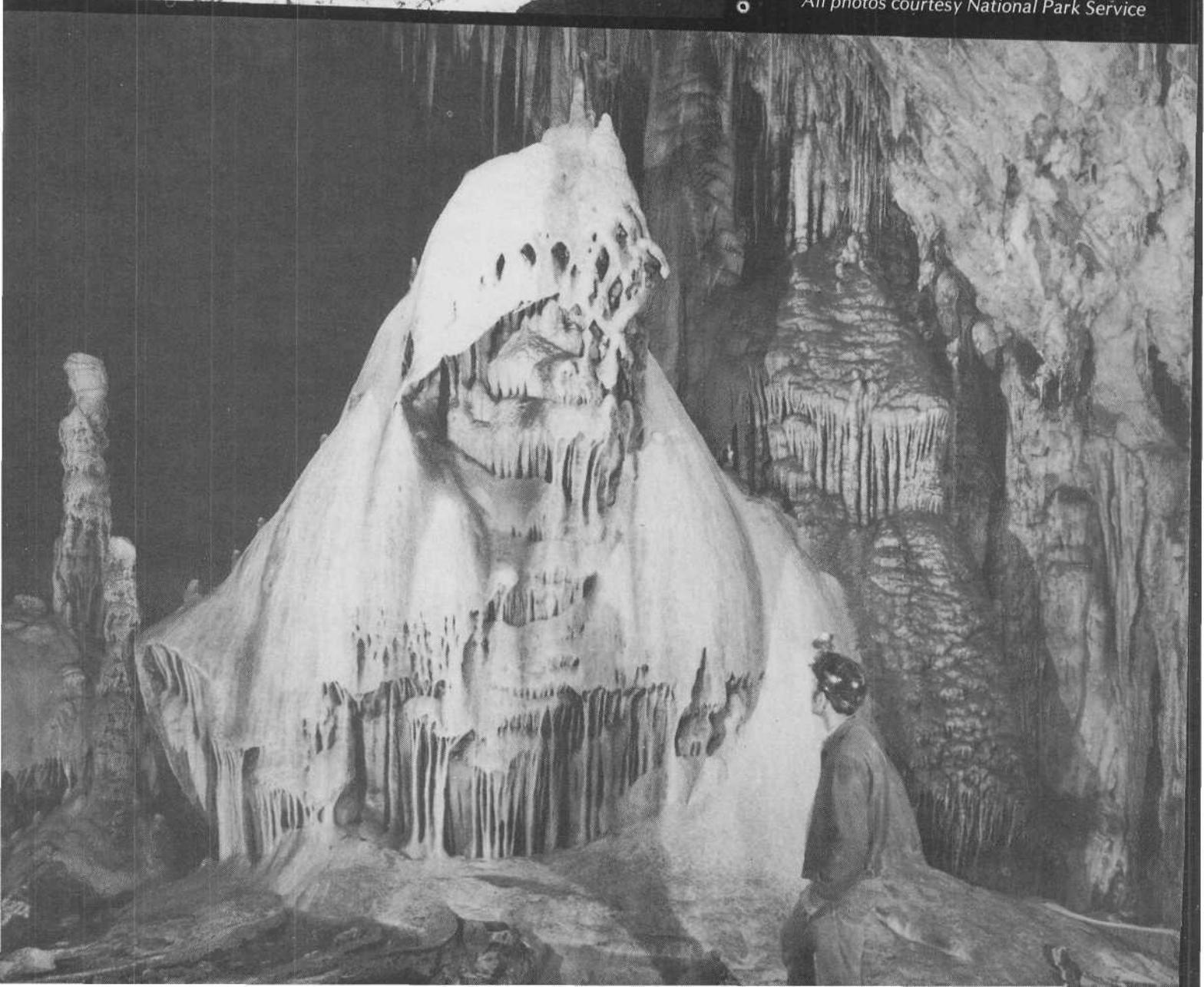
The newer of the two schools in Valle de las Palmas, a small agricultural community south of Tecate. Part of the valley of the same name is visible in background.

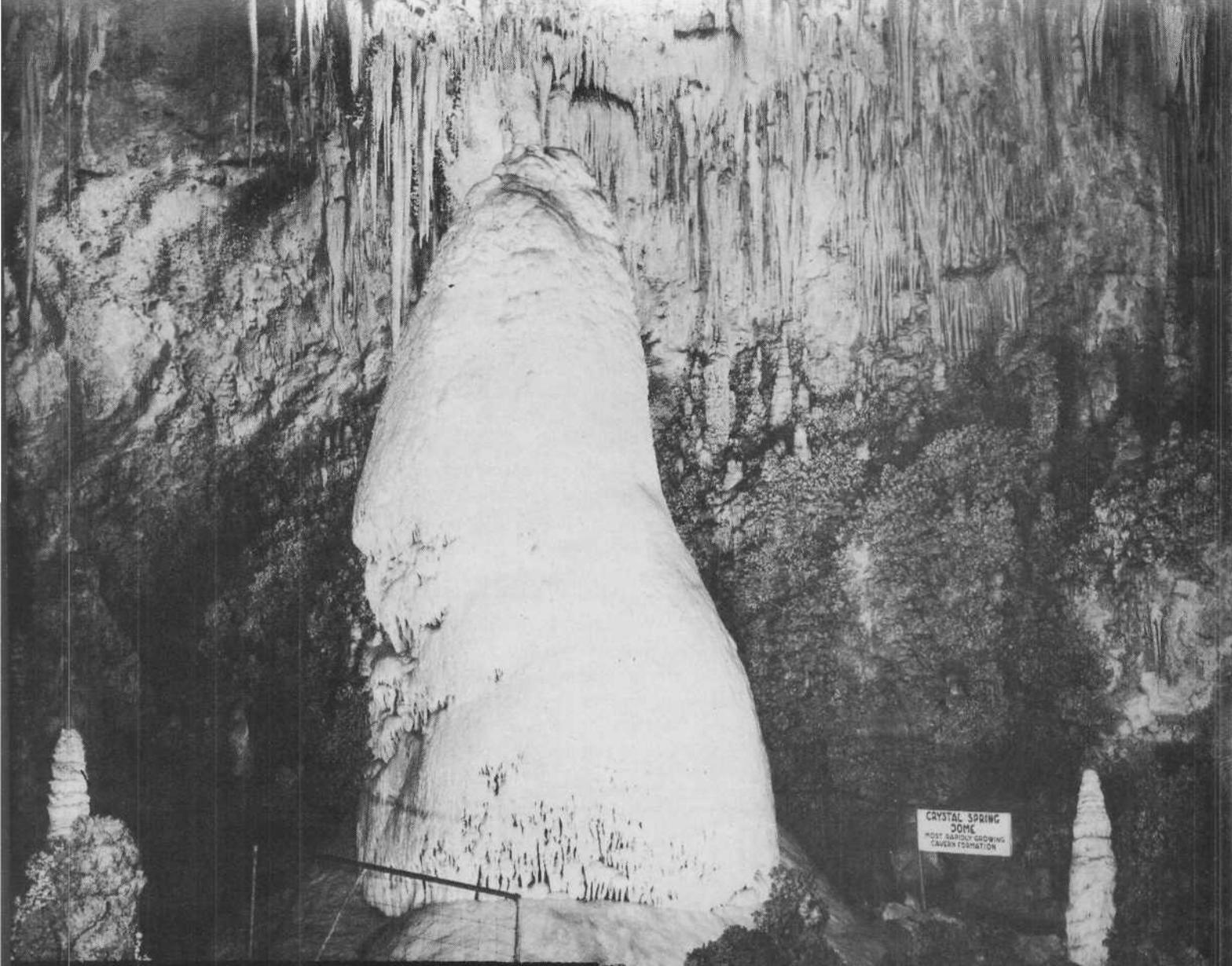


Carlsbad Caverns' New Cave

by FRED S. COOK

o *All photos courtesy National Park Service*





THE STORY of Carlsbad Caverns, in southeastern New Mexico, has been told so often that it has become almost a family byword. It is generally known that they were first discovered, at least by white man, by a cowboy, Jim White, who was attracted to the site by the flights of bats who painted a smoke-like cloud against the horizon as they poured forth nightly in search of their evening meal of insects.

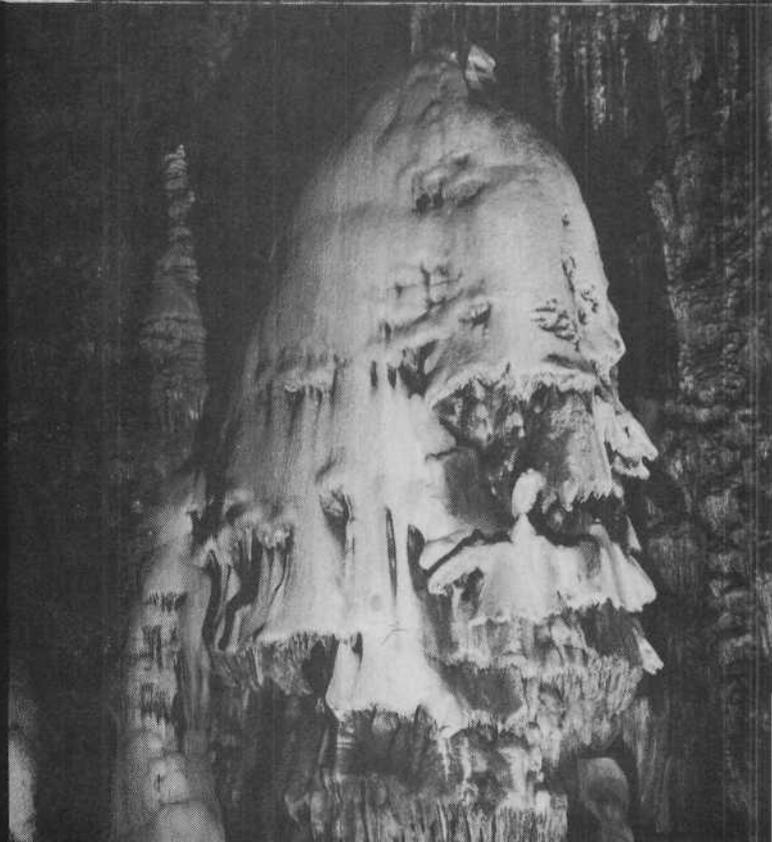
One day, some 20 years ago, in a hotel in Monterrey, Mexico, Frank Nicholson told me the story of another cave near the Caverns which he claimed was as large and even more spectacular. It seemed as Frank knew whereof he spoke as he held a doctor's degree in Speology and had been one of the first explorers of the Caverns. As a radio commentator for CBS in El Paso he had also been largely responsible for acquainting the general public of their existence.

*Above:
Crystal Spring
Dome, in
the Big Room.*

*Right:
"The Christmas
Tree" in
New Cave.*

*Opposite page:
Flight of the bats
which occurs
each evening as
the cavern
denizens go forth
in search of food.*

*Left: This
ghostly apparition
is located in
New Cave
and is called
The Klansman
Formation.*



Now the New Cave, of which Frank had spoken, has been opened to the general public, although not with the same freedom that the Caverns enjoy. Here there are no electric lights to show the way for the visitors who may wander along the well-marked paths, with or without a guide.

In the New Cave the tours are scheduled (four a day during summer) and the explorer must provide his or her own flashlight. They are warned not to stray from the party nor to do any impromptu exploring on their own. The tour is rather strenuous and should not be attempted by those who are not in good physical shape. There is an uphill hike of a mile from the parking lot to the cave and the cave trip itself covers a distance of two and one-half miles. But for those who can make the tour, it is indeed a scenic and archeological treat.

New Cave was originally called Slaughter Cave or Slaughter Canyon Cave and was discovered by Tom Tucker, a goat herder, who was seeking some of his charges. A part-time employee of Ogle Mining Company, he told

them of his find and they promptly staked out a claim to mine bat guano there.

In 1938, Dr. Ross Maxwell made a preliminary exploration of the cave and reported it to be 250 feet deep, to have one long corridor of 1140 feet, with numerous side passages, and to have three entrances. (Two of these were later cemented over.)

Based on his report another expedition, which included Frank Nicholson, made a more extensive investigation and found the remains of both men and animals. From the position of these bones it would seem they had met a violent death. (However, the name "Slaughter Cave" was not the result of these finds. It came from a nearby rancher named Slaughter.) They also found shards of pottery indicating the presence of early man over 1000 years ago. This antedates the modern day Apache who roamed the area when the white man came.

As there was a mining claim filed there was no further development until 1943 when the Ogle Mining Company began operations to remove the guano.



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They first attempted to use conveyors but ran into numerous difficulties, finally abandoning it in favor of a large bucket which was lowered by a winch and filled by hand. In 1944 they ceased operations and the cave was abandoned and guarded only by a light gate over the entrance.

This encouraged that peculiar type of dissolute human being known as the vandal to enter the cave and practice his art. They managed to destroy many of the natural beauties and to defile the walls with inscriptions of their own infamous names.

In 1947, after an absence of three years, the mining company resumed operations and for the first time the name "New Cave" supplanted "Slaughter Cave." Three years after that the area received a bit of publicity when "King Solomon's Mines" was filmed there.

After the Park Service took over control of the cave the mining was allowed to go on but the area to be mined was stipulated. Work was now being done by the Soil Organic Service of Ysleta, Texas, and they had to rope off the area in which they worked and were presumably not permitted to go beyond that. However, the miners did not always play by the rules and much of the later dam-

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The natural entrance to Carlsbad Caverns.

age was caused by those who wandered into regions they were not supposed to visit.

However, the mining did have its advantages. Tests of the guano uncovered the bones of a type of bat unknown today. Radio-carbon tests showed these bones to be over 17,800 years old. Also found in the depths were the remains of a prehistoric camel.

In 1958, the last of the mining claims were bought up by the Park Service and all mining came to a halt. A new entrance to the cave was then built to put an end to vandalism in the future until plans could be formulated as to how best use the cave.

It is now open on limited tours to the general public.

Among some of the spectacular sights to be seen are the Chinese Wall, a thin

crenated wall, about three fourths of an inch thick and covering an area of 1000 square feet; The Monarch, which appears like a cluster of draperies and is over 60 feet high. Then there is the Clansman; the Christmas Tree, over 35 feet high and with a diameter of 14 feet, and the Tear Drop formation, amongst others.

At one time it was thought that there were pictographs within the cave, but unfortunately they have been painted over or destroyed by those who thought the world was more interested in knowing that "Joe Loves Mary."

There is still bat guano in the cave, and still more bats making more guano. Visitors should be cautioned that this substance is combustible. Occasionally fires break out in the depths, caused by spontaneous combustion.

The purpose of the New Cave trip is to give park visitors an experience second only to true spelunking in a wild cave. Plans are to keep it in a primitive and undeveloped stage, completely the reverse of what has been done at Carlsbad Caverns, where one may even dine in comfort in its depths. □

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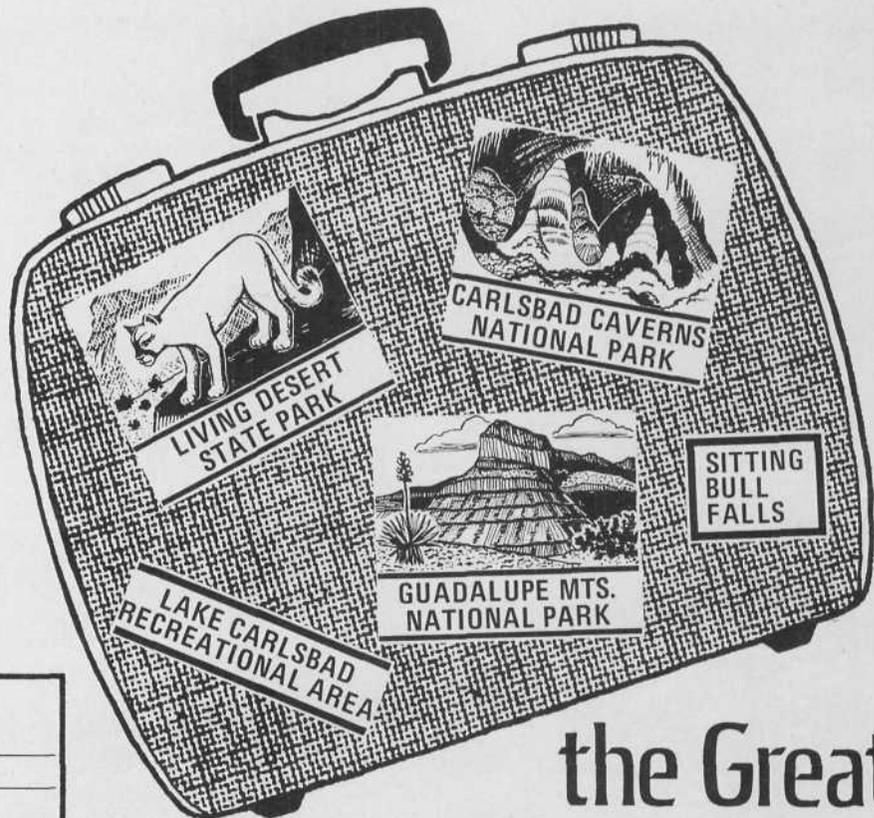
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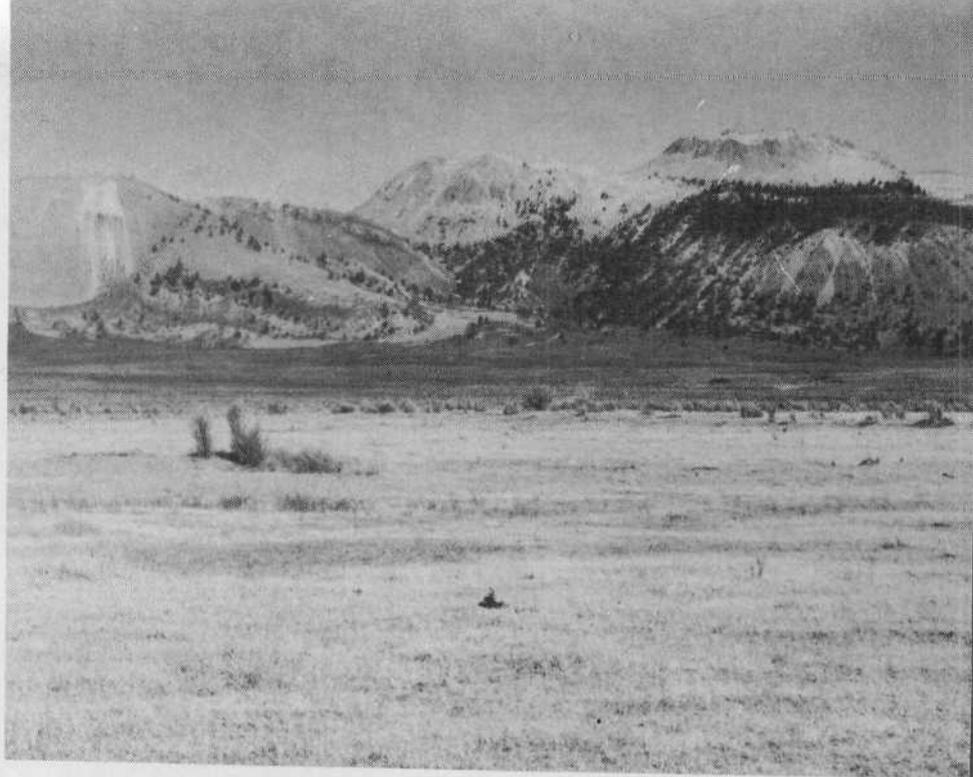


the Great Weekender!

Mono's Volcanic

Wonderland

by MARY FRANCES STRONG



photos by
Jerry
Strong

Here, at the southern end of a long chain of magmatic extrusions, is "Obsidian Dome."

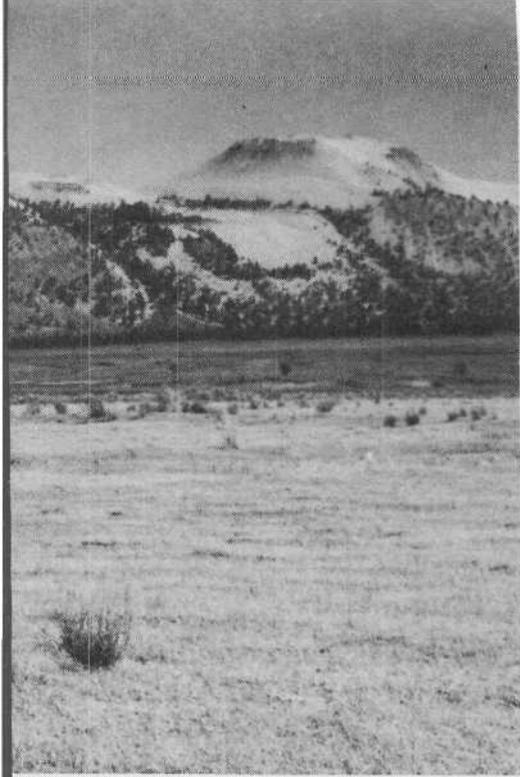
Obsidian or volcanic glass, is a non-crystalline material composed of minerals that cooled rapidly from the molten state. The same mineral composition, when cooling more slowly, yields crystalline rock—rhyolite or granite.

POSSIBLY EVERYONE who has traveled Highway 395 north to Reno has noticed the Mono Craters in Pumice Valley south of Leeving, California. Their size and number make them hard to overlook. It is also quite possible that few of these highway travelers know about the beautiful Inyo Crater Lakes and the "Volcanic Wonderland" which surround them.

Generally, we think of the Sierra Nevadas as a fine example of glaciation. But here, on their eastern escarpment, volcanism has produced a number of fascinating geological formations. The Forestry Service has marked and provided access to many of these sites. From them, we can obtain an idea of the tremendous forces which have been responsible for many of our earth's landforms.

Happily, the Forest Service has also established several campgrounds among the stands of pine, fir and cedar in the Inyo National Forest. With elevations ranging from 7500 to 8500 feet, this is an ideal region for a summer vacation.

A good starting point for a trip into Mono's Volcanic Wonderland would be Lookout Mountain, three miles east of



To the east of Highway 395, south of Leevining, California, Mono Craters dominate the skyline. Formed in recent time, geologically speaking, they represent part of the tremendous forces at work in this volcanic region.

We lingered awhile on Lookout Mountain, reflecting on stories we had been told and absorbing the tranquil beauty of the ever-changing view. Had early Indians used the peak as a "lookout point?" Some local folks believe they did—who are we to doubt? Certainly they would have been able to observe herds of game and any campfire of friend or foe would quickly have been spotted.

The Indian lived in partnership with his environment and had learned to sustain himself with what nature provided.

Moving from place to place, taking only what game and other food was needed, he wasted nothing and conserved his resources for future years. Modern man could learn a great deal from early man's "primitive ways."

We returned to the highway from Lookout Mountain, crossed Highway 395 and followed a graded road southwesterly into the forest. We were headed for the Inyo Crater Lakes. The route was well-marked and, in a little over four miles, we came to the parking area. From this point, it was a short, half-mile hike to the craters along a well-defined trail.

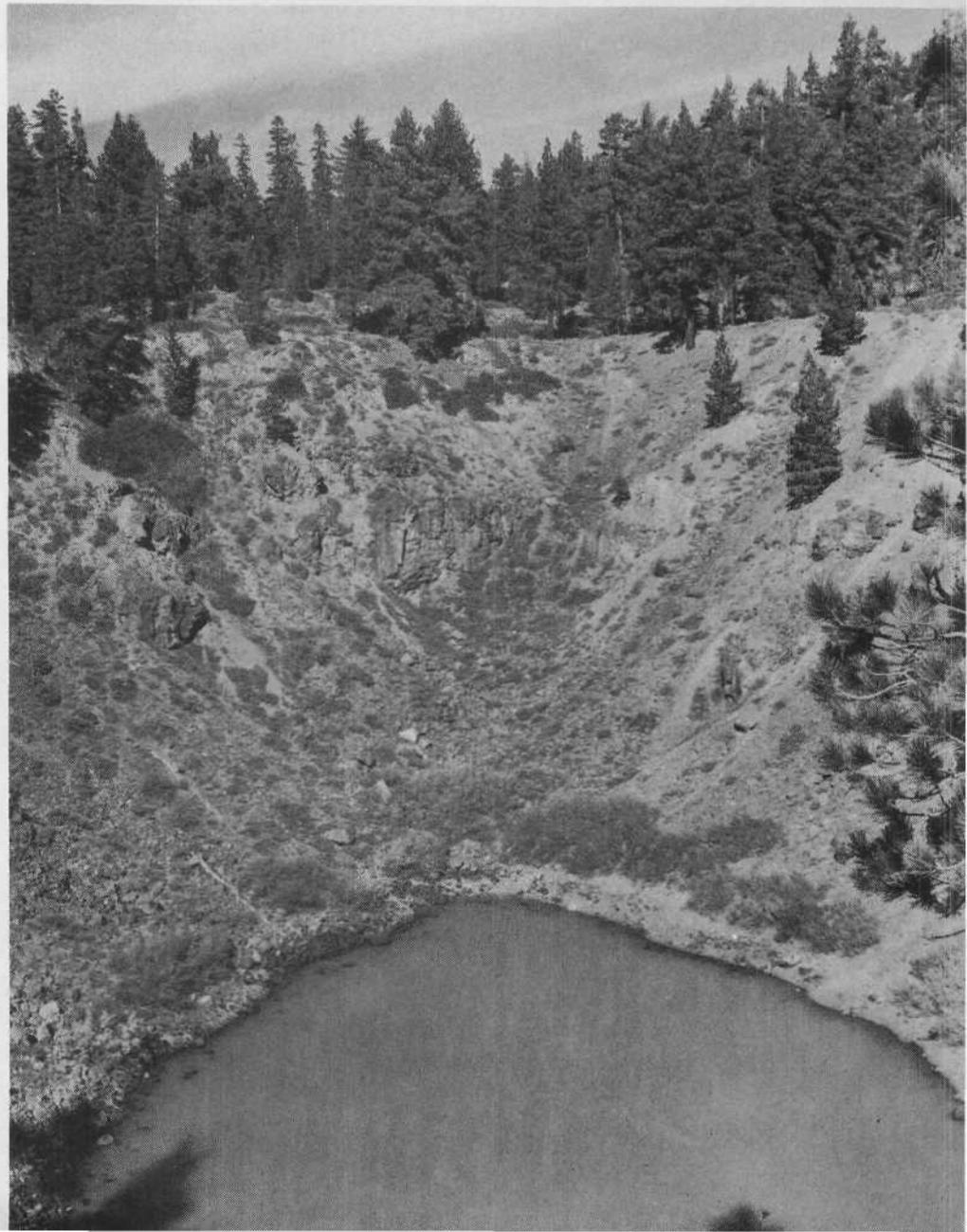
Walking under a canopy of pines, the pungent fragrance of the forest was stimulating and we quickly reached our objective. As we approached the craters, the trail led up a steep bank and onto the

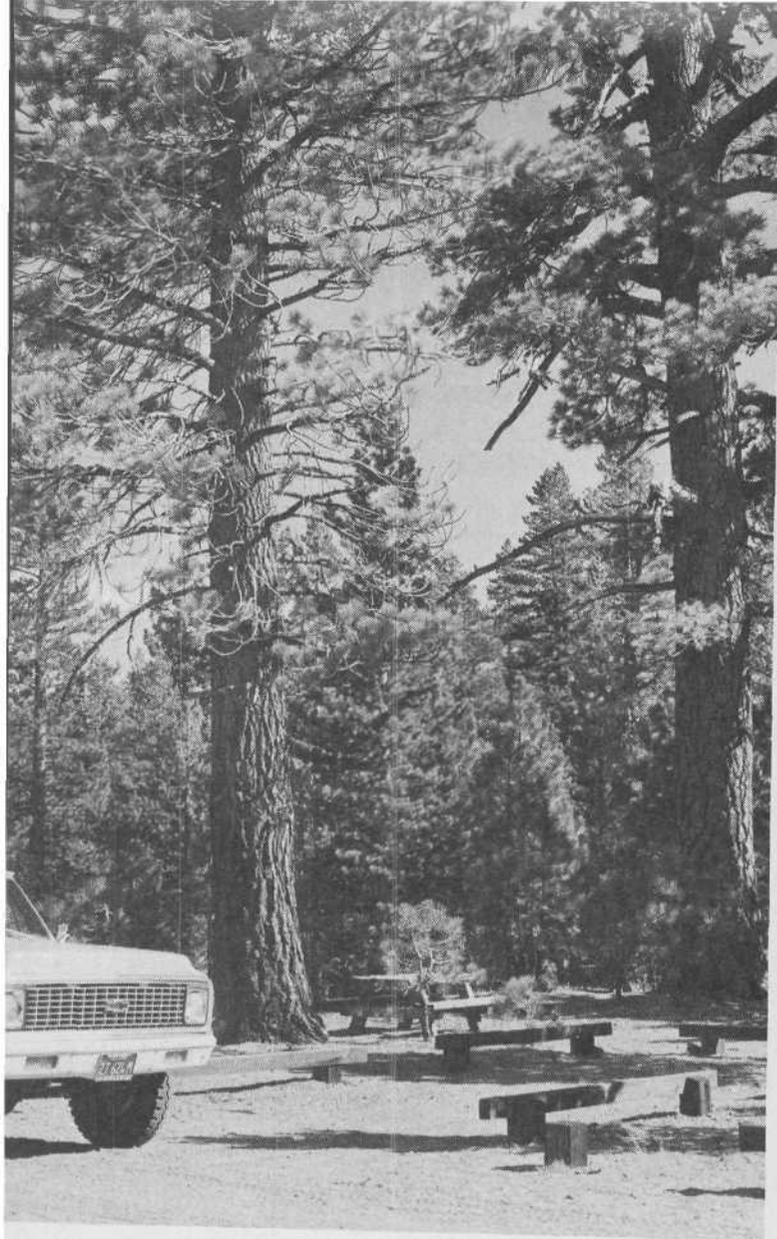
Highway 395. See Map. A steep, narrow, unpaved but safe road winds up to its 8300-foot, rounded summit. From this vantage point, you will be treated to a magnificent, 360-degree view of the surrounding country. The Inyo National Forest appears to "stretch forever" in an undulating carpet of green—broken only by white patches of pumice and the lofty peaks of the Sierra Nevadas. From the highway, the traveler is unaware of the extent of this fine prime forest.

Dominating the southwestern horizon is 11,000-foot Mammoth Mountain—the ski buffs' mecca. Looking easterly, the valley of the Upper Owens River and Long Valley appear as wide, rounded slots in the earth. To the south, the blue-green waters of Lake Crowley are barely visible.

Lookout Mountain is one in a series of volcanic domes lying between Mammoth Mountain and Mono Lake. Formed in stages, the initial explosive period was followed by numerous, viscous lava flows which congealed on the surface. The size of such domes is dependent on the amount of volcanic activity and material reaching the surface. Lookout's summit is covered with obsidian and turned out to be an "unexpected rock collecting locale."

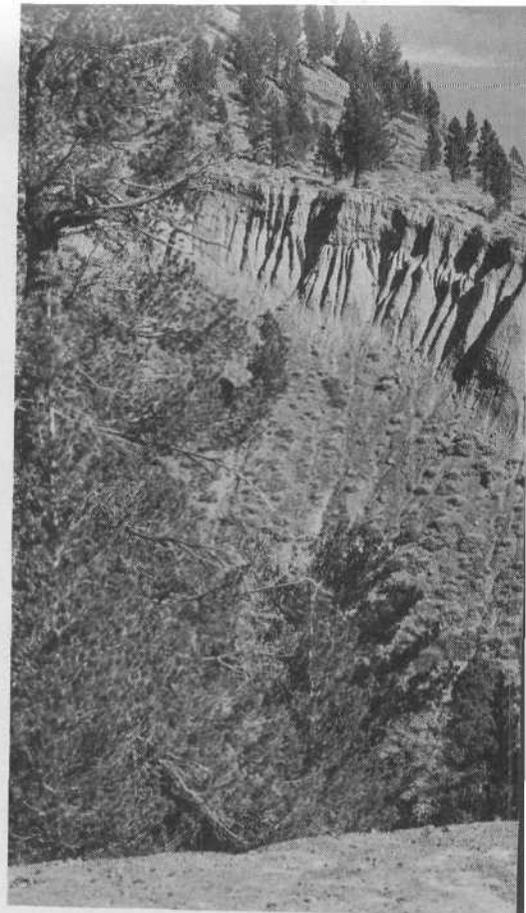
After emerging from a dense forest of Red Fir and Jeffrey Pines, the abrupt void of south Inyo Crater is awesome.





Left: Two fine campgrounds in the Deadman Creek Recreation Area have been developed among the pines and along the creek. They make a good base camp when visiting Mono's Volcanic Wonderland.

Right: An accumulation of talus on the south wall of the north crater provides favorable footing for indigent trees that descend nearly to the bottom. Remains of charred wood in the strata provided geologists with the information necessary to date the explosions which occurred here.



Three miles north of Inyo Craters turn-off a sign proclaims "Deadman Creek Recreation Area." A graded road leads three miles west to two fine campgrounds developed among the pines and along the creek. If you prefer to camp closer to the highway, you will find a large, undeveloped campground along Glass Creek a half-mile north. It is on the west, behind Crestview Lodge. Unfortunately, water isn't available. All three campgrounds have plenty of good, level areas for trailers.

Obsidian Dome was the next stop on our volcanic wonderland tour. Traveling north from Crestview, Highway 395 climbs over Deadman Summit and, within a third of a mile, the signed turn-off will be seen on the left.

Just over a mile from the highway, this large geological phenomenon is fascinating to behold and should be of particular interest to rock collectors. Here, obsidian can be seen as it was originally deposited. Viscous lava was forced through a small vent in the earth's crust and spread over the surface to form this mile-long, 300-foot high dome. The texture and color variations in the obsidian are mainly due to the abundance and size of gas bubbles present when the lava solidified. A detailed explanation and drawing of the mushroom-shaped dome will be found in the parking area.

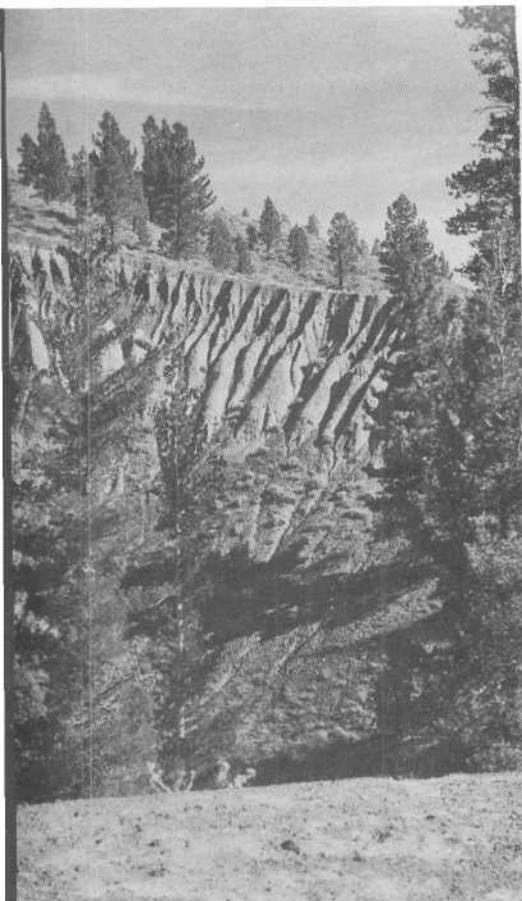
rim. The bright sunlight was glaring. In a few moments our eyes adjusted; then we looked down into a funnel-shaped abyss with a milky-green lake at the bottom. Immediately north was the second crater.

The Inyo Craters are true craters and represent a small but impressive event in a long series of cataclysmic disturbances. Believed to have erupted some 500 years ago (between 1115 A.D. and 1465 A.D.), they are young geologically speaking and modest in size. Both craters are approximately 600 feet across. The southernmost is over 300 feet deep which its northern counterpart measures about 100 feet.

As might be expected, the Inyo Craters have been studied extensively. They are believed to have been formed when hot magma, deep within the earth, encountered large amounts of ground water percolating down from the earth's

surface. While the magma heated the water, it was prevented from boiling by the weight of overlying rocks and liquid. Tremendous forces began to build and eventually exceeded the restraining pressures. Water then changed to steam and enormous masses of overlying rock were explosively hurled upward and outward—leaving behind the craters.

Protective rails have been placed on the rim of the southern crater and make it possible to safely view the bottom. A single picnic table provides a pleasant retreat for lunch. As you hike back to your car, watch carefully—you will probably find you are being accompanied by several birds flitting ahead along the trail. We noted jays, chickadees, nut-hatches and happily added "Clark's Nutcracker" to our bird-watching list. The latter are rather large, grey and white birds found only in higher elevations—8000 feet or more.

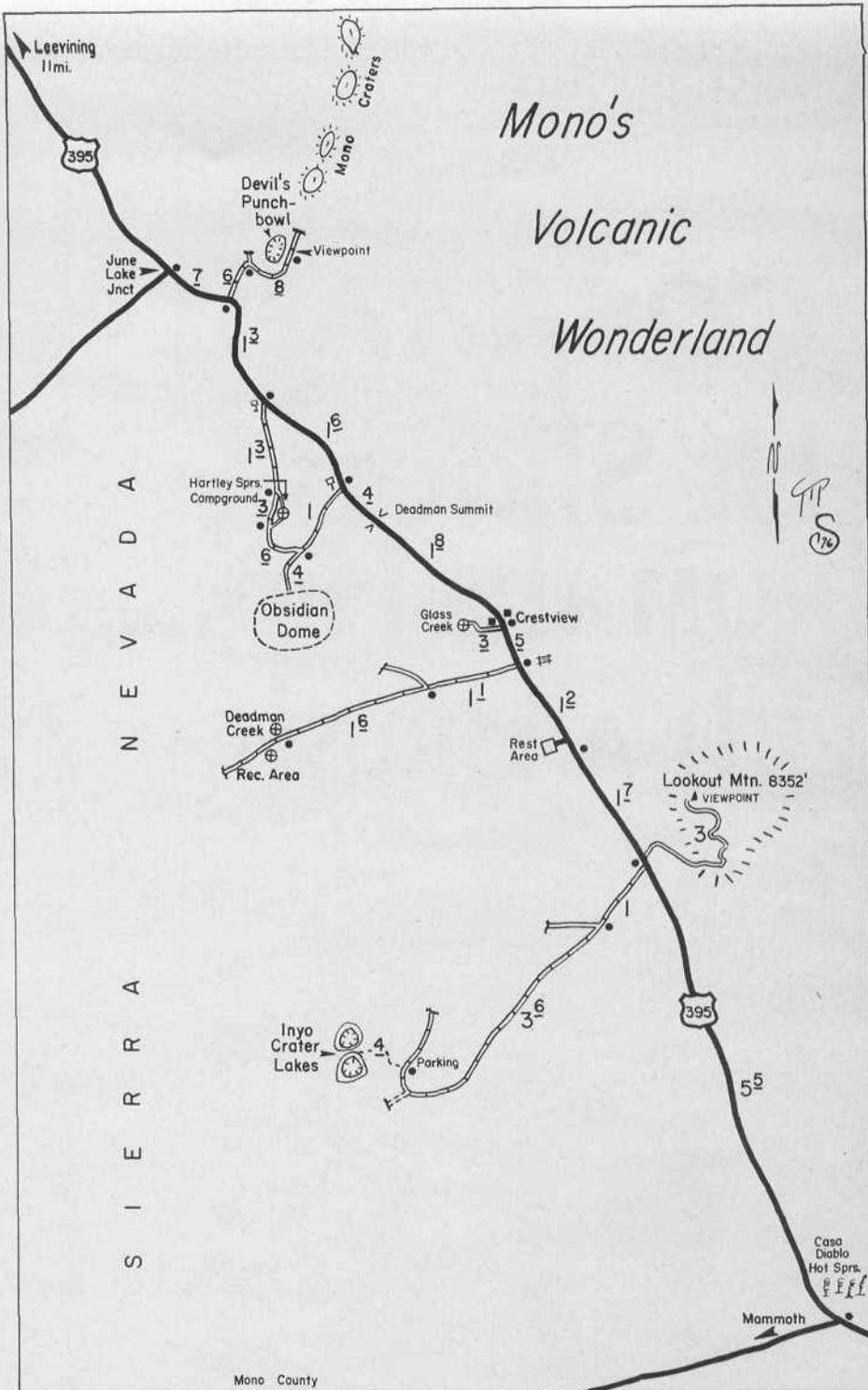


Hartley Springs Campground lies a short distance north of the dome. Sitting attractively among the trees, it is roomy and well laid out. We voted it our favorite campground. Though not a developed camp, this is one of its greatest charms. There is water, a few tables, chic-sales and many good trailer sites available.

The final stop on our tour was the Devil's Punchbowl, two miles north of Obsidian Dome. A right turn and mile of travel leads to the rim. "Pumice, pumice everywhere" is descriptive of the bowl and surrounding sand. Stay on the road—pumice can be as tricky as sand. A pull-out area on the rim has been provided for parking. You will find it necessary to walk around in order to obtain the best views of this intriguing formation.

During the Pleistocene Epoch, some 65,000 years ago, volcanic activity began in this region as explosion pits. The latter are rather shallow, bowl-shaped depressions formed when molten lava and superheated gasses explode to the surface through cracks in the earth's crust. Escaping material built up walls of silvery-grey pumice around the vents. The Devil's Punchbowl is a fine example of an explosion pit.

Immediately north of the Punchbowl, Mono Craters march across Pumice Valley to the edge of Mono Lake. Not true craters at all but volcanic domes, they,



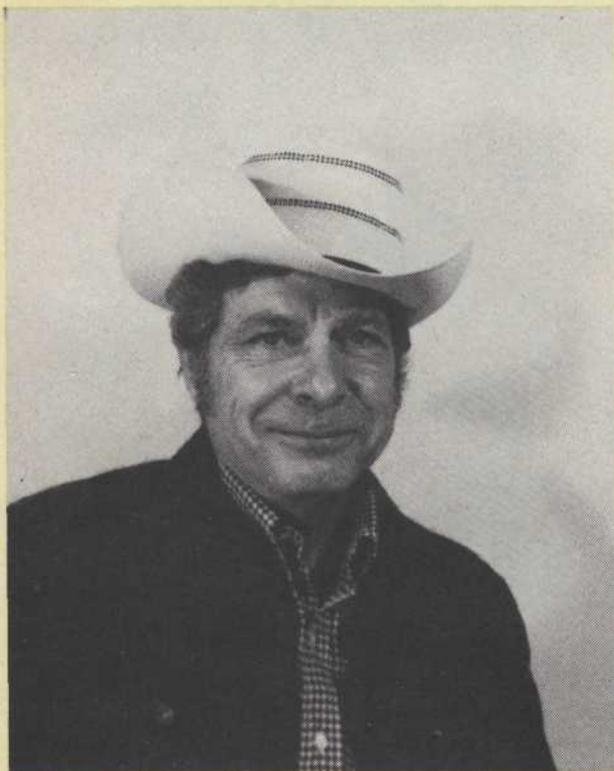
too, began as explosion pits. After the initial explosive phase, numerous viscous lava flows followed and congealed upon reaching the surface. The "build up" from these flows resulted in the outstanding geological formations we enjoy today.

Host to many famous visitors, this unusually scenic region was described by Mark Twain as "the loneliest place on earth." More recently, 1971, two Apollo 16 Astronauts—Charles Duke and John Young—spent the month of July in the area acquiring part of their geological training.

Mono's Volcanic Wonderland is only one small section of the vast wilderness and recreation region we Californians affectionately call "The Sierras." For desert dwellers, their eastern bulwark provides sanctuaries with welcome relief from summer's blistering sun and hot winds. Even the most dedicated desert aficionado will find the smell of pines and high mountain air invigorating. The sight and sounds of many lakes and streams will be soothing to the eye and soul. A visit to Mono's Volcanic Wonderland will be more than just another vacation—it is sure to be "an experience." □

COCHRANE

HE SHOOTS FROM THE Hip... WITH A BRUSH



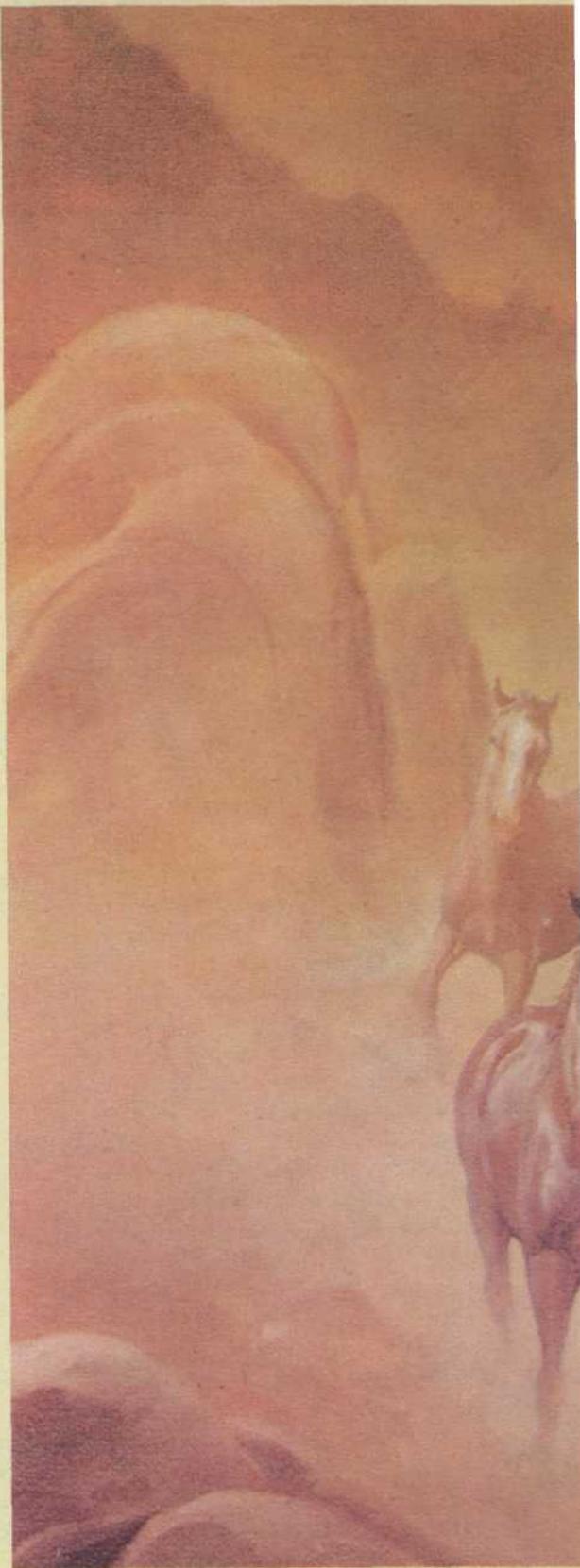
Charles L.
Cochrane
A.I.C.A.

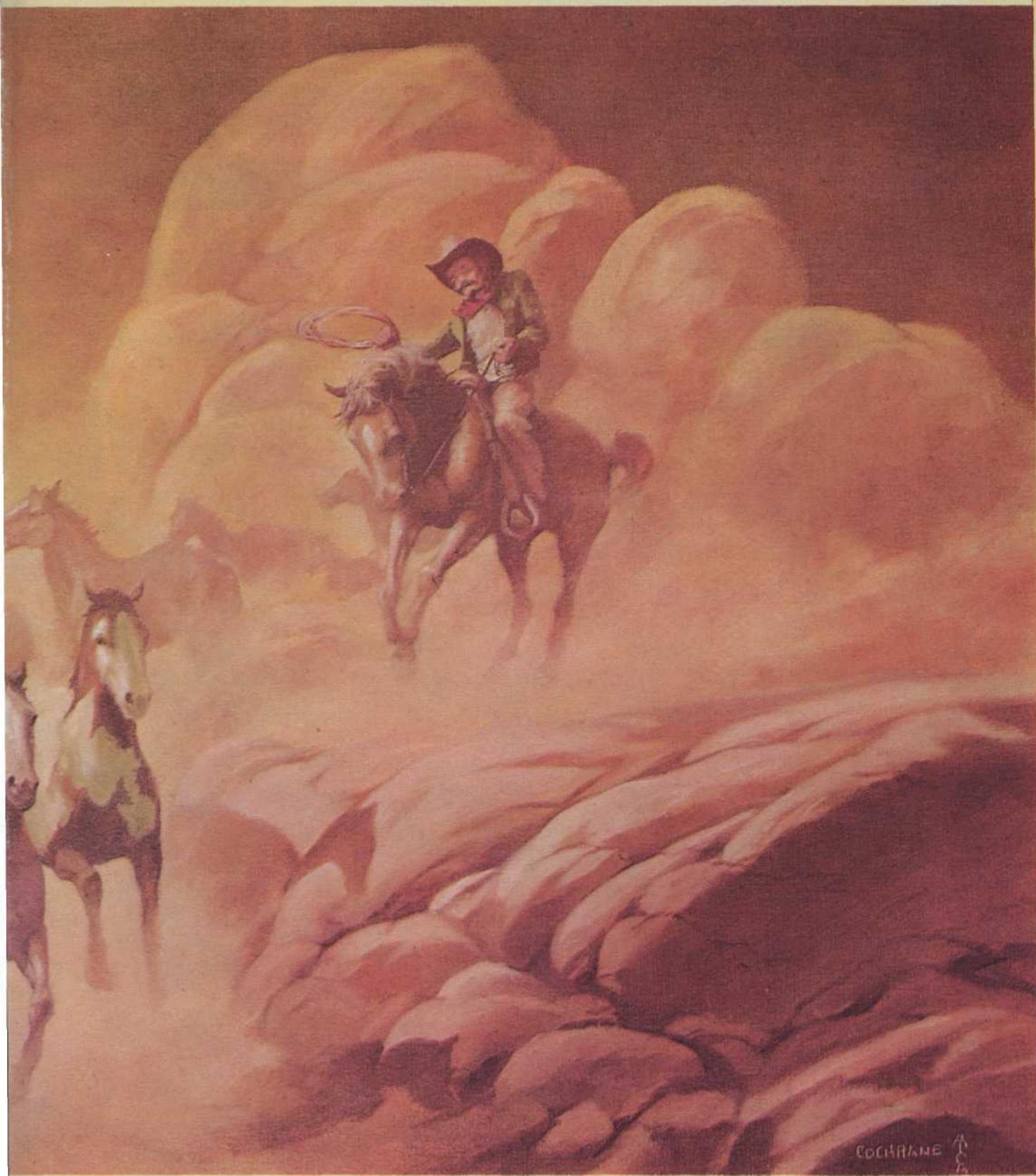
Editor's note: Using pure pigments and a distinctive style, Charles Cochrane brings the Old West alive on his canvases. Not liking the interview approach, Charles tells in his own words how it came about.

I'M ALWAYS a little hesitant to talk about myself or my paintings. I feel the message is on the canvas; if you like it, you'll buy it and won't be sorry. If the first person approach sounds a little vain, let me assure you I have all the

humility that fourteen broken bones, poverty and four battles in WWII can teach a person. Anyway, on with some facts.

To begin with, there was no "e" on the end of my last name when I was born





in the hill country of Missouri in 1923. It was added legally when the "Cochran" name became too popular in the local newspapers. As a pre-schooler, I firmly believed (1) men with guns and bloodhounds chased everybody; (2) all

grandfathers made whiskey for medicine and for sale; (3) all grandmothers and mothers were the backbone of the clan and the only true side of the law, and (5) good, fast horses were more important than Sunday clothes.

From this busy environment, we moved to St. Joseph, Missouri, the home of the Pony Express and stamping grounds for Jesse James and the Younger brothers. It was here that my father rebelled against all the quiet and



"Turning the Herd"

Oil, 30"x40"

"The Banditos" Oil, 24"x30" Courtesy Mr. & Mrs. Robert Lenski, Bel Air, Calif.



left us to chase some dream of his own.

My first paying job, as near as I can remember, was weaning calves at a dollar fifty a week, then riding them as yearlings for entertainment. At age fourteen, I went to work for a construction company (stretching the truth about my age). Then at fifteen I joined up with a fight promoter and boxed professionally, if you can call five dollars a night "professional."

This kept me pretty busy until a local Catholic priest decided this was no way for a young man to grow up and made arrangements for me to work out my tuition at a Catholic high school. I will always be grateful to those dedicated teachers who taught me with kindness, patience and, occasionally with their fists, that there was a whole lot more to life than what I seen up 'til then. They also taught me the many facets of honesty and human dignity.

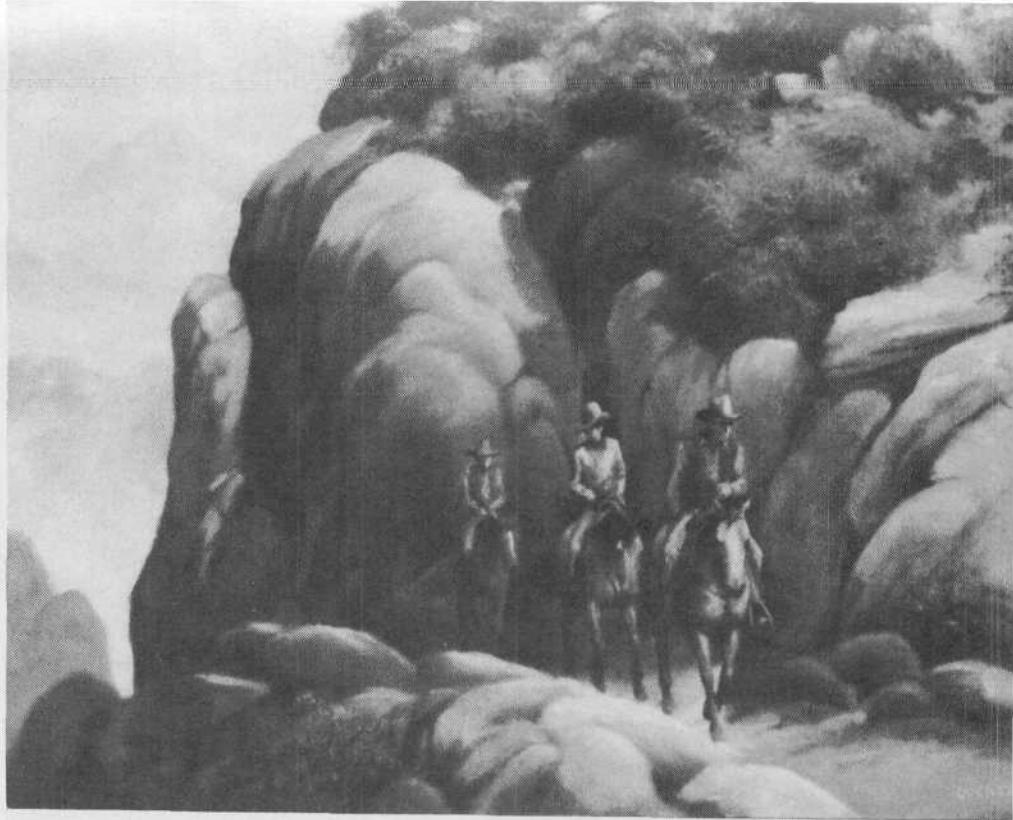
When WWII started, I joined the Marine Corps and served with the First Marine Parachute Regiment and the Third Amphibious Corps, serving twenty-eight months overseas in the

South and Central Pacific.

After the war, I returned to Missouri to attend the Moran School of Commercial Art and the Kansas City Art Institute. In 1958 I moved to the West Coast where I now devote all my time to my family, my painting and a German Shepherd dog named "Marlene."

I recently completed a book for Mr. Walter T. Foster's series of art books entitled "Water and Weather." In Arizona, my paintings are in galleries in Sedona and Prescott. In California, you can find them in San Diego, La Jolla, Laguna Beach, Newport Beach, Long Beach, San Pedro, Morro Bay and Palm Desert.

From the beginning, I have "signed" my paintings in a rough print manner. Not too long ago when a gallery asked me to stylize my signature, I had to refuse out of fairness to my early patrons from all walks of life. This explains why a youngster who was studying my signature on a painting at one time asked his mother, "How come he can paint, but can't write?"



"The Trackers"

Oil, 24"x30"

"Training the Buffalo Horse"

Oil, 24"x36"



A SQUIRREL

LIKE SALT AND PEPPER, Abert's squirrel and the ponderosa pine go together. How it came about that this especially handsome squirrel with the fancy ear tassels selected this yellow pine for both home sweet home and provider of provender, nobody knows. But somewhere back in time the Abert clan set up housekeeping in the ponderosas, and they have been enjoying the trees' hospitality ever since.

Maybe the fact that the ponderosas of the Southwest like a reasonable sort of environment themselves had something to do with it. Big, gorgeous pines that lift their spire-shaped crowns over 200 feet into the air, they are to be found growing in that cool dry transition zone that lies between the pinyon-juniper belt of the desert foothills and the Douglas fir forests of the higher elevations. Under normal conditions, the ponderosas occur in pure stands, their massive trunks perhaps measuring eight feet in diameter, the bark of which is reddish brown to high yellow in color. The long graceful needles grow two or three to a cluster.

Ponderosa cones, green until ripe, turn brown as they mature, and tucked under each cone scale are two seeds, winged for riding the wind. When ready, the cones turn downward, the scales spread apart and the seeds, freed at last, are on their way. Borne by the wind, they may travel a thousand feet from the parent tree before landing, hopefully, on a spot favorable for growth. Like the seed dispersal of all windborne plants, the ponderosa's system is both chancey and wasteful. Yet some of the seeds successfully make it to full tree maturity, withstanding the ravages of time to boot — a tall one being perhaps 350-500 years old.

Now running around some 200 feet up such a tree is nothing for the Abert squirrel number since, as is true of all his tribe, he is well-endowed with tree-going equipment. Beginning with his touch-news whiskers, all the way back to

the end of his plume-like tail-balancer, he's got it: curved nails on his feet for good gripping and sure-footed traction, skeletal modifications for climbing and jumping, the muscles specialized for the work, an eye for accurate distance-judging, and a marvelous sense of balance.

Strictly a daytime fellow, the Abert squirrel is an early riser, being up before sunrise and at his day's affairs carried on by himself for himself, since, as are most tree squirrels, he is solitary by nature. A typical day in the off-social seasons, therefore, consists mainly in dining, lolling around on a limb resting, building a new or refurbishing the old nest, and keeping an eye out for marauding red-tailed hawks.

Foodwise, the ponderosas do spread a good table, offering a menu bound to please their bucktoothed tenants. Being mostly confined to these pines, as Biologist James Keith points out in his important study of the Aberts residing around Flagstaff, Arizona, the squirrels are highly dependent on them for food, and have naturally developed ways of utilizing this good source during every season of the year.

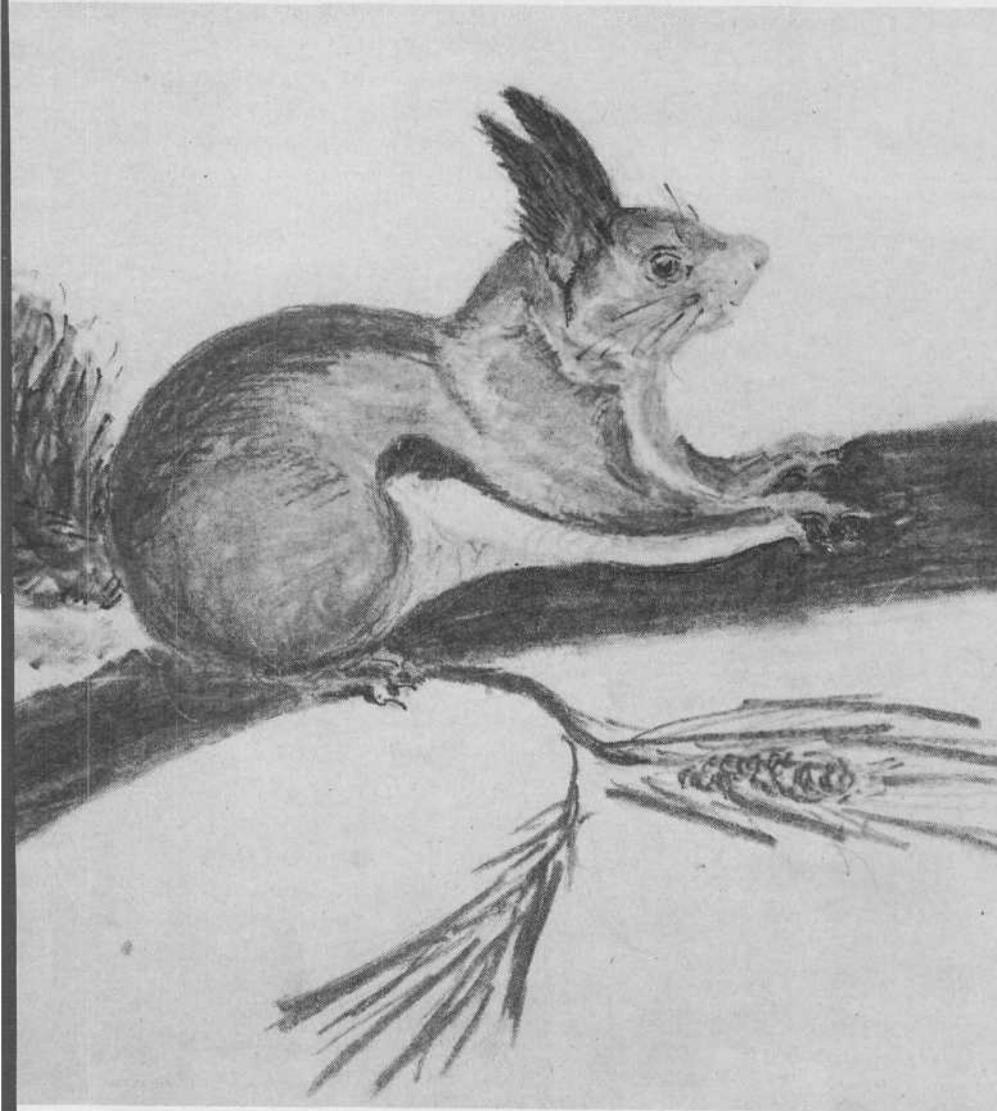
Apparently considered choicest are the seeds, which the squirrels begin eating as early as May when the cones are developing. In the fall when the seeds have dispersed, they search the ground for them. Unlike other squirrels who accumulate piles of food, the Aberts bury a single cone or seed in a shallow hole dug in a moist spot, covering it carefully. During the winter some of these are retrieved and eaten. Many are not. Hence in his way the Abert is a kind of bushy-tailed conservationist, a planter of ponderosas of the future. Any seed thus safely put underground and remaining there is a definite plus particularly since as botanist G.A. Pearson found, the ponderosa only has a good cone crop about every three or four years. It takes a lot out of a tree to produce seeds, a period of recuperation



being required to replenish its food reserves before the next bumper crop is undertaken.

Seeds are not the only thing on the squirrel menu. Always to be had is a thin layer of inner bark on the twigs. Succulent, sweet and highly nutritious, it is eaten all year, and is indeed the main source of food for the squirrels during the winter months. It takes but a moment for the squirrel to cut off a small twig and discard the needle cluster at its end. Then, comfortably ensconced on a limb and holding the twig carefully between his paws, he sits back and proceeds to dine, first chewing off the tough

AND A TREE



Text and Illustration

by K. L. BOYNTON

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ingly o.k. for squirrels. Dry August ends this treat. Then, beyond a bit of carrion provided by a defunct rabbit or some other casualty, or an old cast-off deer antler to gnaw, the squirrels must depend again 100 per cent on the ponderosas. Moisture-wise they get what they need from the food they eat, and can indeed go long periods without water — luckily — perennial streams in Central Arizona, for instance, being few and far between. If free water is available, they will drink.

Besides being such a fine provider of food, a big ponderosa is a dandy place for a home. Needless to say at the altitudes where the Aberts hold forth, a squirrel has to have a good warm sleeping place for winter and a cool boudoir for summer and the offspring, bound to appear in due time, must have a safe nursery. Since pine trees are so resistant to rot and hence have few holes in them, a nest is absolutely the thing.

Zoologist R.C. Farentinos, looking into the affairs of the Aberts residing near Boulder, Colorado, was impressed with their architectural achievements. Two nest styles were in vogue here.

The first was a big ball-like mass of pine twigs. This, usually located at a trunk-limb joining, has to be built from scratch. Farentino, watching a lady at work on hers, saw that each component twig had to be cut off from the tree, carried in the mouth to the site, and then forced into the pile with the nose, finally to be tamped carefully into place with the forefeet. When at last the large size of the pile suited the builder, she wriggled her way into it, and once inside apparently turned around and around to make a hollow. This was then lined with soft grasses. Such a nest requires considerable time to build, and a great deal of hard work, the lady in this case work-

outside bark all around and spitting out the chankings. Now the inner bark is exposed and the squirrel, turning the twig as he munches away, finally drops the bare stick leftover. If the snow is heavy and the seeds caches on the ground unavailable, a squirrel might eat 45 such twigs in a day. The end needles and bare twigs under the tree are a dead giveaway that dining went on upstairs. Nor is one tree restaurant as good as another, it seems. Some apparently taste better, biologists noting that certain trees whose inner bark was sampled by the squirrels were rejected. Other trees were greatly in demand.

In May the ponderosas offer myriads of staminate flowers, apparently considered by the squirrel customers to be delicious when new and fresh and equally tasty when dried down and pollen-laden, judging from the yellow dust on many a lip and whisker. Botanists viewing this facial evidence and weighing the facts conclude, however that since the ponderosas produce so many flowers, the pollen supply is little affected by the squirrel diners.

The forest floor provides some food addenda—fungi which occur briefly in July are eaten greedily, including several kinds poisonous to man but seem-

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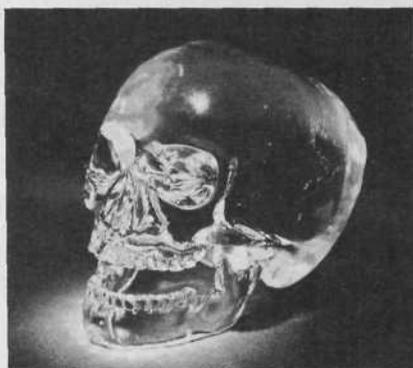
Tecopa, California

POPULAR ARCHAEOLOGY

This photo is the Crystal Skull from pre-historic Mexico and is only one of the features in this magazine about world-wide archeology. Popular Archaeology, edited by professional archeologists, presents the "Mystery and Excitement of the Search and Excavation" in easy-to-read and well illustrated issues about the history of our civilization; such as, pueblo ruins of the Southwest, Spanish forts, finding of the Monitor, opportunities for amateur field work and current events in American archeology.

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ing at hers only about an hour at a stint.

The second type nest was obviously easier to erect since it used for its foundation the tangle of twigs the ponderosa puts out in defense against the parasitic dwarf mistletoe. With a start like this, fewer twigs were required to achieve a good big pile, and a lot of squirrel work hours were saved. But as usual in this life, there are always drawbacks, the main one here being that while the build-from-scratch nests can be located judiciously on the heat-conserving south side of the tree (a factor important to non-hibernating animals) the ready-made mistletoe sites are seldom so well located.

As for height, the squirrels seem to like a location of about three quarters of the way up tree. Below this there are too few branches; above the branches are smaller and too supple, a nest placed there would be more subject to wind damage. Wherever located, the nests have to be kept in repair, additional twigs being added for winter, twigs subtracted for summer, and in cases of prolonged heat spells, the roof may be taken off entirely for better ventilation.

The social season opens in April, with the gentlemen greatly increasing their normal home range of about 18 acres or so, in search of the ladies, who don't bother to make any changes in theirs. The Abert squirrel lady, it seems, takes a dim view of the proceedings, and when a courting day begins at dawn, retires to the top of a good tall ponderosa.

There she daintily breakfasts on the inner bark of tasty twigs, flinging down bits and pieces and leftovers on the heads of the courting gentlemen. These worthies have now assembled in a group of about eight or so, and are engaged in warlike activities in and about the limbs and trunk below to determine which of

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them shall be the "dominant" male and *won her*.

It may be hours later that the victor emerges and wearily climbs to the top of the tree to claim the bride. Indeed, he may do so. But alas, the chances are that his reception will be most uncordial, the lady indicating that the battering he took in the fray below will be as nothing compared to the one she is about to deal him, this information being accompanied by a slashing bite from her long incisors. At this point, the previously vanquished swains, now revived, are back to challenge the victor; so it's around and around again, the "dominant" male putting in his courting day chasing off the "subordinates," with no time to rest and nothing to eat.

By late afternoon he's had it. Hungry and tired, he goes off home, the lady peering down through the branches watching his departure. With a flirt of her tails, she's ready to come down herself now — to frolic off through the forest with one of the "subordinates" — the squirrel she's had an eye on all the time.

Gestation takes about 40 days, the three to four youngsters arriving with their eyes and ears shut up tight and quite naked except for face whiskers. By the time they are six weeks old they have a decent pelage, their eyes are open and their ears, which up to now have been draping about their faces, begin to stand up Abert squirrel fashion. The seventh week sees a big change and what with mushrooms and inner bark of twigs now being added to their milk diet, the squirrels grow fast, finally to be weaned at about 10 weeks.

By October or November, the youngsters are on their own, each seeking that particular ponderosa that seems to be waiting for a brand new Abert squirrel tenant. □

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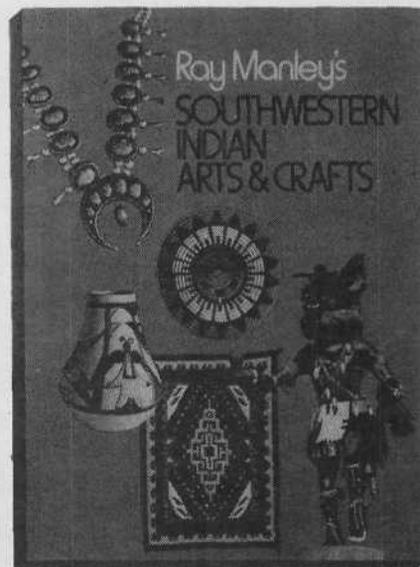
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Visiting Recapture Po

IN SOUTHEASTERN Utah, where geologic wonders such as Monument Valley, Valley of the Gods, Natural Bridges and Canyonlands are well known to all who traverse the region, there is a comparatively small and relatively unknown, but equally fascinating area called Recapture Pocket.

Although often overlooked by travelers in the vicinity, Recapture Pocket actually contains most of the features found at the larger and better known attractions.

A multitude of miniature monoliths ranging in size from a few inches to several feet are sprinkled throughout the Pocket, along with readily discernible ones rising over 20 feet. There are buttes and balanced rocks, with an occasional arch or window carved out of the molded rock, and many miniature sand dunes may be found.

Throughout the day, the sun's changing position causes light to creep across the relief, thus rock facets are constantly being revealed, causing new images to appear, while others are erased by the shadows and fall into oblivion.

When wandering around the Pocket, one is apt to become lost not in a physical sense, but in a dream world. Since the geologic features are unnamed, one's imagination is allowed to roam freely, and project fairyland fantasies and faces, animals and abstractions on to the stone surfaces.

In the springtime, the sleeping flora is awakened by the rains and their blos-

soms add an extra dimension to the variegated rock formations. During the cooler parts of the day, a coyote may be seen in search of the elusive jackrabbit, while a small rodent or lizard scurries across the slick shale of the pocket's floor and into the safety of a crevice.

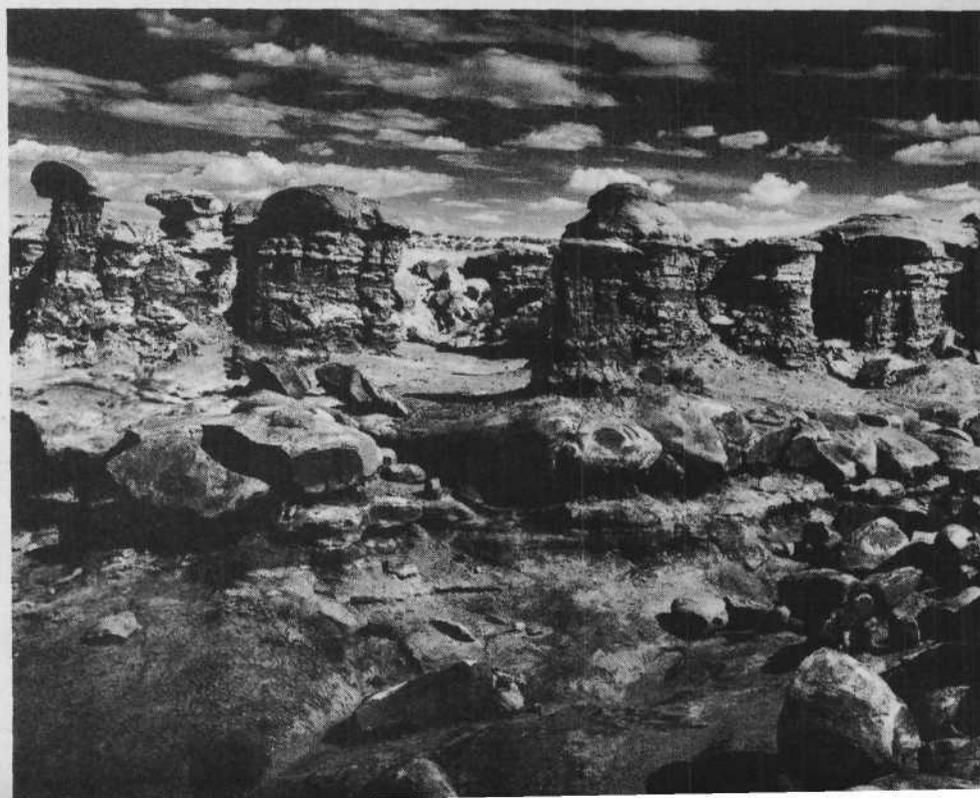
Recapture Pocket, which is managed by the Bureau of Land Management (B.L.M.), is actually comprised of several compartments, separated by geologic features and washes. The B.L.M. retains Recapture as an undeveloped resource, so the visitor should bring water and any other comforts he desires. Since the Pocket is neither developed nor regularly patrolled, it is imperative that the visitor leaves Recapture as it was found by taking his trash with him, and in no manner desecrates what took Nature thousands of years to create.

Recapture Pocket derives its name from an incident which occurred in the

mid-1870s when William Henry Holmes, the noted geologist, led an exploratory party through the region. A conglomeration of renegade Utes, Navajos and Paiutes surreptitiously made their way into Holmes' encampment one night, and took all the horses and mules.

The survey party tracked the thieves through the night. At daybreak, the outlaw Indians were relieved of their newly acquired mounts when the Holmes party made a raid of their own. The wash in which the renegades were camped was thereafter known as Recapture Creek and the nearby unique area eroded by the creek, Recapture Pocket.

For those who are geology buffs, the rocks at the Pocket are comprised of the Recapture member of the Morrison Formation. This member contains dark-red and variegated calcareous and gypsiferous shales, alternating with beds of white siliceous sandstone.

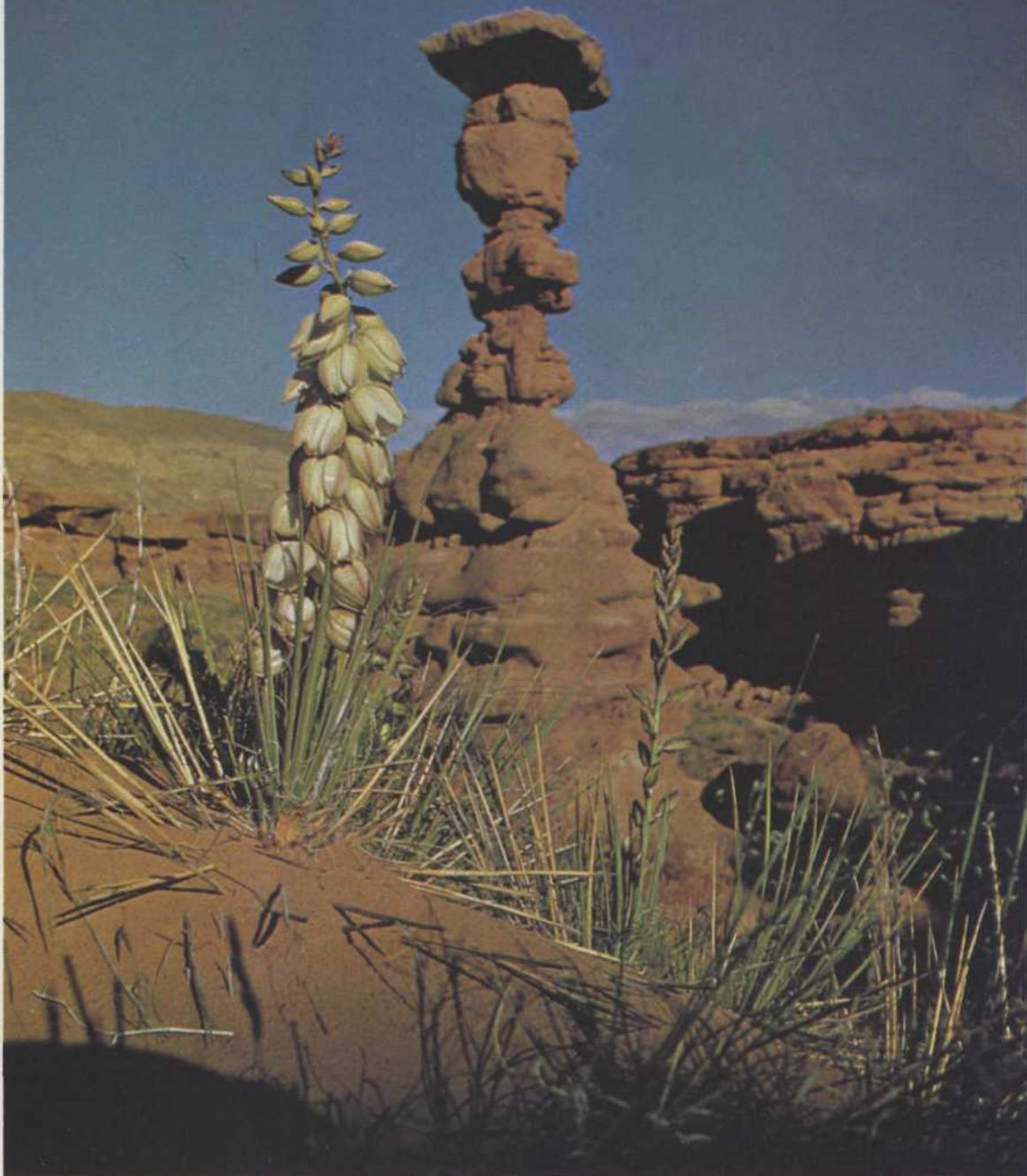


*An overall view
of one of the compartments
at Utah's Recapture Pocket.*

re cket

by ALVIN S. REINER

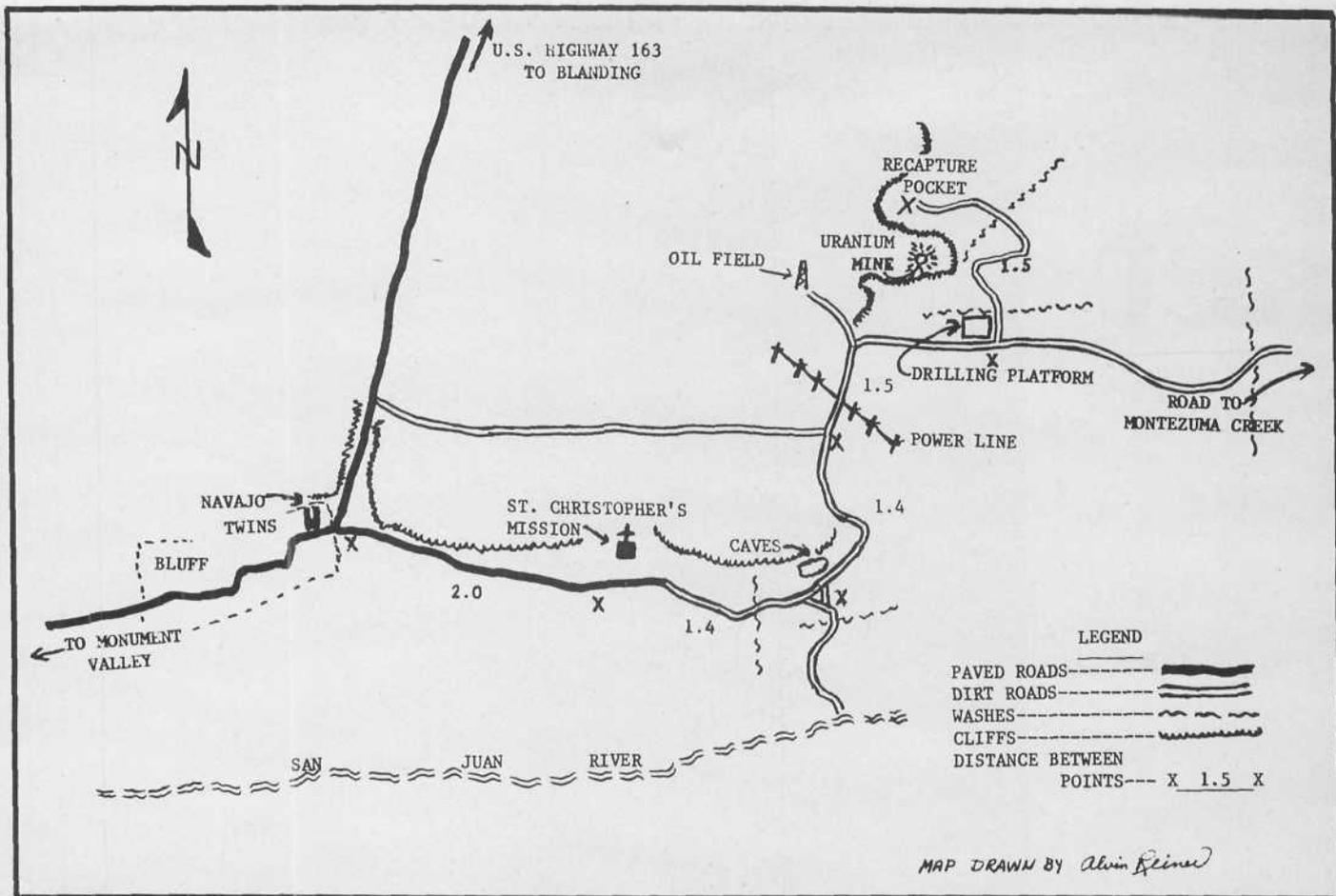
*Two spires
shoot skyward
as a yucca
tries to outgrow
a distant monolith.*



The Pocket was formed, as the other features in the region, by the actions of wind and water on the easily-erodible rock formation. The various balanced and table-like rocks are the result of the harder, and thus more durable shales eroding more slowly than the soft sandstone layers beneath them.

The cliffs around the town of Bluff, and on the way to Recapture, are of the Bluff Sandstone member of the Morrison Formation. Bluff Sandstone is white to gray-brown, and thick or cross-bedded. It is impregnated with quartz aggregates, clay balls and mudstones.

During my visits to the Pocket, I have



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come across splinters of petrified wood, and hard smooth rocks often referred to as "gizzard stones." There is no conclusive evidence for the gizzard stone's existence; the most popular theory being that dinosaurs swallowed them to aid in digestion.



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As with any scenic area, the photographer should take plenty of film. On my first visit to Recapture Pocket, I was unaware of the great beauty and the variety of landforms I would find there, and consequently ran out of film.

The best times to photograph the Pocket, especially in the summer, are early morning and late afternoon. These times of the day bring out the maximum texture of the stone surfaces, as well as create a feeling of depth to the Pocket as a whole. In the winter, the time of day isn't as critical as the sun is never directly overhead.

It is advisable to use an exposure meter, and don't be surprised by an inflated reading. If the exposure guide supplied with the film is employed, the reading for snow or beach scenes should be used to avoid overexposure.

Although considered an out-of-the-way place, Recapture Pocket can readily be reached in the family car. Just north of Bluff, a paved road heads east from U.S. Highway 163, and passes St. Christopher's Episcopal Mission, at which point the road becomes graded dirt.

At the first fork, keep to the left. Several small caves can be seen in the base of the nearby cliff at this juncture. Continue for another two miles, passing under a power line, until the road splits again. Keep to the right or you'll end up at the small oil field, which is visible at this point. About a mile later, keep your

eyes peeled for a turnoff to the left. This is the most critical turn, and it is easy to bypass if one is not observant. There is a flat, fenced-off area on the left where an exploratory oil well once stood. If you dip into a wash shortly after making the turn, you're headed in the right direction, and after another 1.5 miles you'll be at the Pocket.

A few words of caution: The road has several blind curves and dips, so a speed not exceeding 25 m.p.h. is advisable. Since the road is dirt, and several washes are traversed, it might be wise to check the local weather report before heading to the Pocket. If you are in the Pocket, and a storm starts to build up, it would be a good idea to head back to Bluff, or you may have a longer than anticipated visit.

For those who aren't adventurous, or would prefer an interpretive guide to Recapture Pocket, as well as other points of interest, a leisurely tour, featuring a hearty outdoor breakfast, can be arranged by writing to, or inquiring at the Recapture Lodge in Bluff, Utah.

Although not much larger than most municipal parks, Recapture Pocket offers the serenity and aesthetics no city engineer could incorporate into his plan.

So whether one intends to spend an hour or two of browsing through the visual delights, or a whole day of exploration, Recapture Pocket is well worth a short side trip. □

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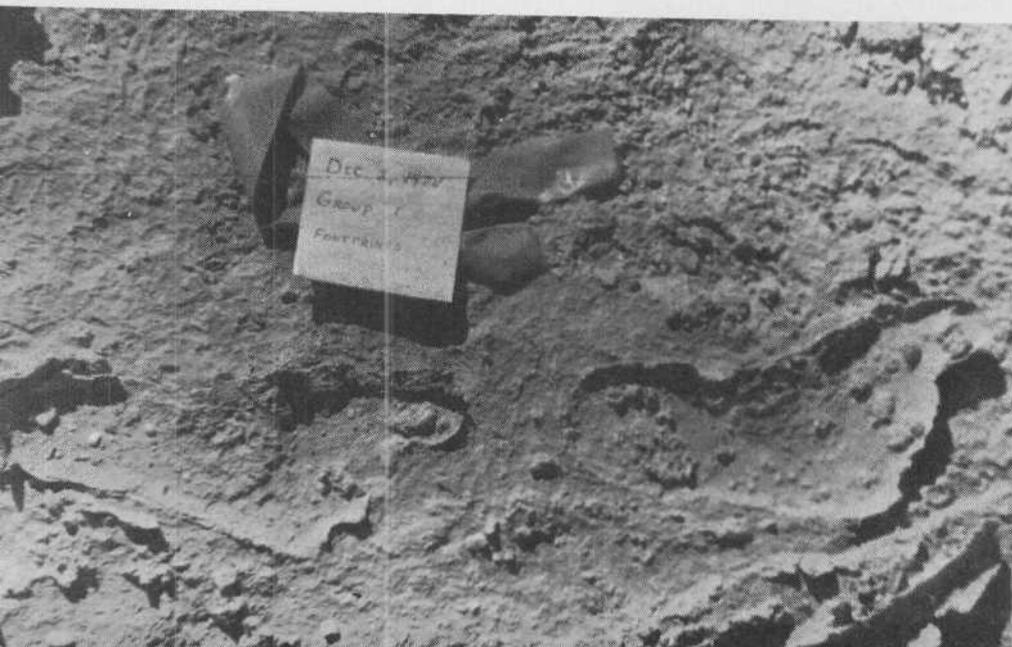


Adventuring in the Jacumbas

by WALTER FORD

Above: Early day travelers rest at Mountain Springs. Old stone corrals may be seen against foot of the hill in background. Old stage station is at right. Historical Collection Title Insurance & Trust Co., San Diego, California.

Footprints of a long vanished race found on what was once a muddy beach of receding Lake Cahuilla. Down through the centuries the forepart of each footprint has eroded to the degree that only the imprint of the large toe remains. The footprint shown on the right was approximately 8.8 inches long and 3.5 inches wide at the in-step. The footprint shown on the left was slightly longer.



AS YOU wander through Southern California's Jacumba Mountains south of Highway 8 today, it's hard to believe they were once a haven for cattle rustlers, smugglers, bandits and outcasts from Mexico. But the lawless element eventually found other areas safer for their mode of living and with their moving on the Jacumba region began to take on an air of respectability. More and more desert travelers are now discovering the many recreational opportunities it has to offer.

Extinct volcanoes, cave dwellings and petroglyphs of a vanished race, an old-time army post and stage station and intriguing lost treasure legends—all are there for your enjoyment. But if you require only a place to escape the stress of city living, Davies Valley should fill that need. The only sounds that are likely to disturb your slumbers are the faint hooting of owls and the barking of distant coyotes.

A dirt road to Davies Valley leads to the right from the highway to Calexico 2.5 miles east of Highway 8, then con-

tinues about two miles into the valley. In their Interim Critical Management Program, the Bureau of Land Management describes Davies Valley as "a scenic valley containing good wildlife habitat, unique vegetation and known archeological values," which seems to apply more correctly to adjacent Pinto Canyon. The vegetation in Davies Valley consists mainly of ocotillo and creosote plants and if archeological values exist there they are not visible to the untrained eye.

There is a small dry-lake bed near the southern end of Davies Valley, deeply fissured and partially ringed by mesquite and ironwood trees. Harry Phillips, a mining engineer who owned some tungsten claims in Davies Valley, told me that about 30 years ago an oldtimer at nearby Ocotillo claimed he remembered when the lake was full of water and well stocked with fish. Then an earthquake hit the area, causing the lake to drain and the fish to perish. When first heard the tale is likely to be classified as just another "fish" story, but when available facts and theories are considered the Ocotillo resident's account sounds somewhat credible.

Henry E. Wilson, the perennial Peg-leg Mine hunter, told me there were small fish in pools at Fish Springs when the present Salton Sea was a dry-lake bed, and prior to 1916 when they were flooded out, fish could be found in pools along Fish Creek near the Imperial County line. He believed the fish in both areas evolved from Lake Cahuilla. But the Davies Valley lake's 1200-foot elevation rules out the possibility of it being part of the ancient inland sea.

However, geologists say that an underground flow could have supplied the lake with water, and the Indian inhabitants of the area could have stocked it with fish from nearby Lake Cahuilla, either directly or by trading with another tribe of Dieguenos known as the Kameyaay. That tribe is believed to have lived along the shores of Lake Cahuilla 500 years ago. During December, 1974, Jay Von Werlhof, archeologist for the Imperial Valley College Museum, and a group of students made a discovery that tends to confirm that belief.

The archeologist found an area along the ancient beach line that contained numerous solidified footprints of the former inhabitants as they followed the receding waters, presumably searching



Motorists gather near Mountain Springs in 1912 to dedicate the completion of a road through Jacumba Mountains which opened the first through transportation route between San Diego and Imperial Valley. Photo courtesy Historical Collection, Title Insurance Co., San Diego, California.

for freshwater clams and mussels. Von Werlhof told me that they photographed about 60 footprints of adults, adolescents, children and at least one dog. The footprints which were formed originally by a cement-like mixture of water and sand are now somewhat like brittle concretions. Von Werlhof said that many of the footprints had been crushed by vehicle travel through the area, so he will not reveal its location until the site can be protected.

There is evidence of violent volcanic action in the Jacumba Mountain area which geologists believe occurred during the late Tertiary period, millions of years ago. Harold W. Fairbanks, a prominent geologist of the time, stated in "The Report of the State Minerologist, 1893," that he found layers of bedded lava nearly 300 feet thick near the eastern slope of Jacumba Valley. There is an interesting example of a smaller geological disturbance on a lava-covered mountain at the south end of Davies Valley. No opening or vent is visible on top of the mountain now, so the lava may have flowed through fissures like Fairbanks found at other locations. But regardless of the lava's origin, it's a good place to get a close-up look at an extinct volcano. The

climb isn't difficult and when you reach the top there is an additional attraction of impressive views of the Yuha Desert and the mountains of Baja California.

The road through Davies Valley makes a right turn to a streambed near the south end of the valley, continues ahead about 150 feet, then makes a left turn to the Mexican Border a few hundred feet away. A locked cable across the streambed that was installed by the Border Patrol marks the end of unauthorized vehicle travel. Hikers bound for Pinto Canyon usually park their cars on the mesa south of the cable and begin their journey from there. The entrance to Pinto Canyon begins approximately one-half mile to the west.

Pinto Canyon consists of a boulder strewn wash bordered on both sides by mountains rising to 2,000 or more feet. During the spring months of a season of normal rainfall its wildflower display well justifies BLM's description of "unique vegetation." Palm-dotted washes lead back from the main canyon to dwelling sites of the Dieguenos who once lived there, where bits of pottery and occasionally grinding stones may be seen.

To continue your exploration of this

fascinating country, back-track to the westbound lane of Highway 8 and continue approximately five miles up the grade to the Mountain Springs underpass. Turn off and park your car below. Mountain Springs are approximately one-half mile west. There are stone corrals still standing near the springs which local tradition says were used by General Stephen Kearney's cavalry during the 1880s, but history records General Kearney passing away in 1848. However, tradition could be correct about the years troops were quartered there.

During the years following the Civil War the flow of travel through Mountain Springs increased daily and with the growing number of travelers, so rose the Indian attacks against them and those already settled along the westward trail.



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Clashes between Indians and the cavalry were frequent. Carl Woellwerts, reporter for Jacumba's newspaper, *The Mountaineer*, told me about U.S. cavalry troops being "treed" by Indians in a nearby area where I.D. tags of the troops could be dug up for many years after.

The ruins of the station which served the various stage lines that passed through Mountain Springs may still be seen near the rock corrals. A visit to the old station by George Wharton James back in 1906 when he was writing, "The Wonders of the Colorado Desert," recalled some vivid memories. "Here," he wrote, "in the old days high carnivals and revels were held. Whiskey, cards, singing and such revelry as rude and wild men enjoy, saw the hours pass. For here teamsters, prospectors, miners and other desert wayfarers used to meet where there were no restraints but their own appetites and passions."

Author James was more charitable toward the man who made the revelry possible: "The former owner of this desert whiskey hell is now a peaceful, useful member of society, an earnest worker for the Salvation Army in one of the cities of the Pacific Coast."

If you continue southward through the underpass a few hundred feet after leaving the springs you will reach the little settlement of Mountain Springs. Deserted now, except for an occasional caretaker, it stands just about the way it was back in 1914 when the McDonald family opened a garage and store there to meet the traveler's needs.

The first through road for automobiles between San Diego and Imperial Valley

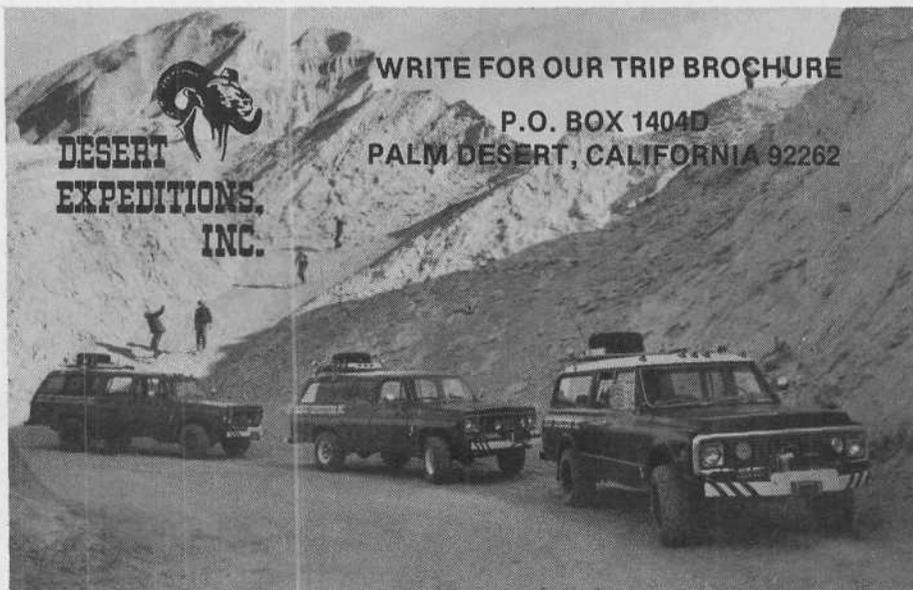
points was completed in 1912 by blasting a route through the Jacumba Mountains by way of Mountain Springs. But the new road did not ensure a trouble-free journey. Burned-out bearings were frequent casualties of the steep boulder-lined climb. The McDonalds stocked a supply of bearings and they would usually show the hapless traveler how to make the necessary repairs. Tire blowouts were numerous, too, but these they repaired along the way. In a newspaper interview in 1969, Phillip McDonald of Phoenix told about a motorist arriving at their Mountain Springs garage and boasting about having only 20 flat tires in the 36-mile drive from El Centro.

For the first 12 years business was good in the little community, then progress intervened and it began to decline. In 1927, a paved road that passed between the store and garage was completed. This increased the flow of traffic but with better roads and improved automobiles, there was little need for travelers to stop. The final blow came in 1940 when a new highway was rerouted away from the village. Today, in spite of the nearby freeway, the little oasis is a peaceful haven where you may let your thoughts drift backward half a century to a serene way of living that might have existed there.

At the top of Mountain Springs grade a road leads to the right past the In-Ko-Pah County Park to Desert View Tower, a landmark that grew from one man's daydream nearly 69 years ago. In 1907, Bert L. Vaughn of Jacumba envisioned a huge stone observation tower as a monument to the hardy teamsters and stage drivers who opened the transportation routes to Southern California. But it took 43 years and the help of two other men to fulfill that dream.

The first to arrive was W.T. Ratcliffe, who apparently was more of a sculptor than a stone mason. How much he contributed to Vaughn's uncompleted tower is not known, but the lifelike animals and reptiles he chiseled out of granite boulders are ample proof of his ability as an artist.

In 1929, Dennis Newman, the present owner, bought the tower but World War II prevented his finishing and opening it to the public until 1950. During his service in the war as a flier, Newman traveled all over the world and was able to collect artifacts and souvenirs from many



lands. These he has assembled in the tower to make a fascinating international display which, combined with the desert artifacts he has collected, make his museum a particularly rewarding place to visit. There is a small charge to visit the top of the tower and the stone menagerie, but admission to the first floor and use of the picnic tables are free.

The early history of Jacumba is laced with tales about contraband arms, smuggled aliens, bandit loot and violence. Smuggler's Cave has shared them all. Its roomy smoke-blackened interior and bits of pottery found around the cave provide evidence of its occupation by Indians long before white men came. With their arrival those among them who lived beyond the law were quick to realize the cave's value as a base for their illegal operations. It was here where one of the bandits who robbed the Gaskill Brothers' store at Campo took refuge and was killed back in December, 1875. Some legends hint of buried bandit loot around Smuggler's Cave, but so far there have been no reports of its recovery. Smuggler's Cave lies near an old Jeep road about one mile southeast of the old Highway 8 entrance to In-Ko-Pah County Park. When you come to the tungsten mine on the buttes at your right, you can locate the cave across the flats a few hundred yards to your left.

Carl Woellwerts, Jacumba newspaper reporter, told me about another cave or room where the loot of many bandit raids is supposed to be hidden. The directions given to him by the son of an early Jacumba settler were about as follows:

"Go to the mouth of a big canyon in the general Jacumba area and proceed to a rocky area where footprints can't be tracked by a posse. In this rocky area there is an opening which leads to a large underground room where horses can be hidden. There the bandits' loot can be found."

In His "Golden Mirages," Phillip Bailey has included several lost-treasure legends from the Jacumba region and there are many more in the area's historical background that have never been published. However, treasure hunters should be aware of the fact that the locale of some of the legends extend into Mexico and confine their searches to this side of the Boundary Line. It could save their equipment from being confiscated and spoiling a Jacumba adventure.

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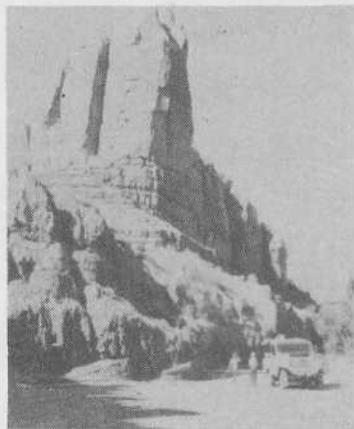
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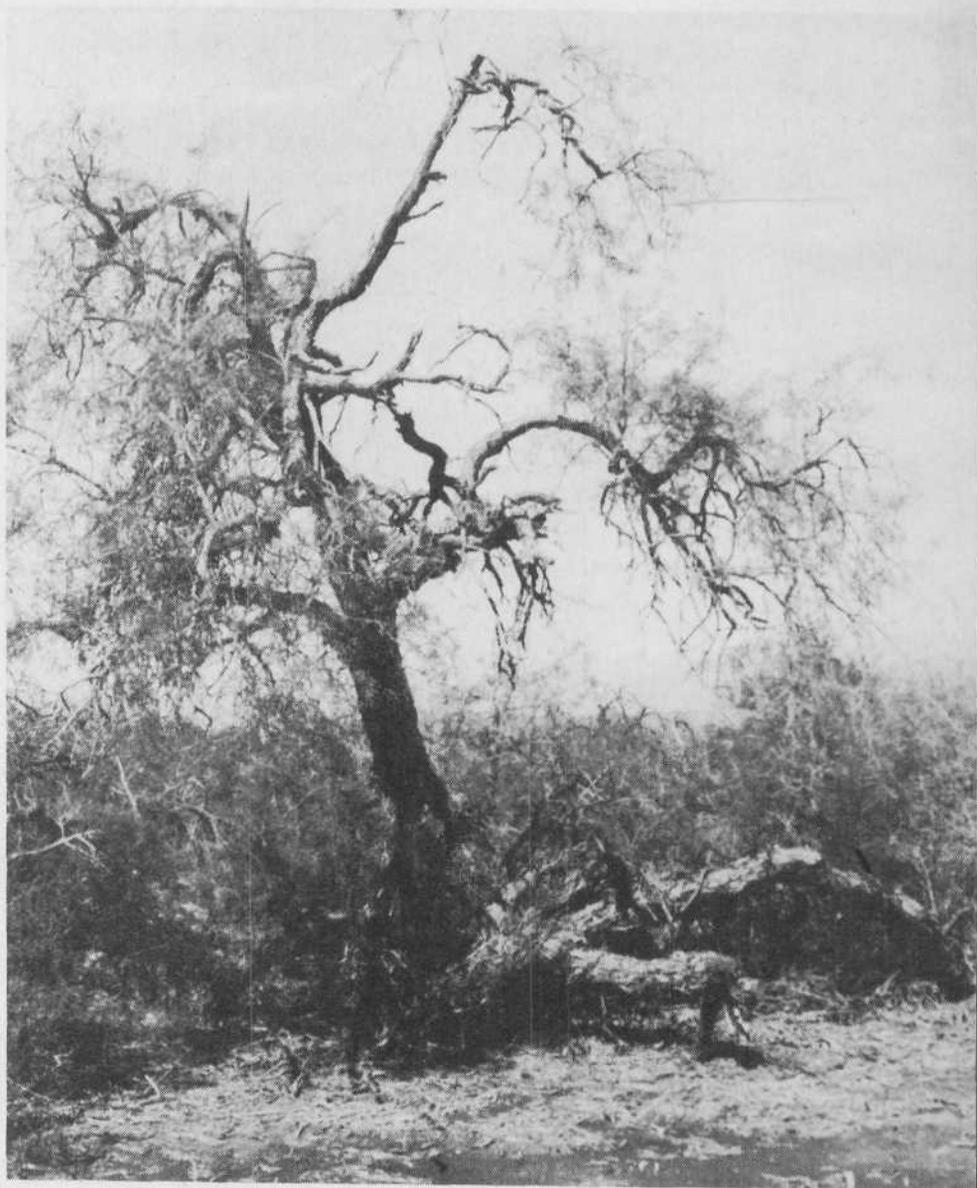
Mesquite... King of Desert Plant Life

Text and Illustrations
by FRANK O'NEILL

DEATH VALLEY, a thin strip of unearthly land straddling the California-Nevada border, is the hottest, driest spot in the United States. It seems to be more a part of the moon than this lush earth of ours. The mountains around it are dark and brooding. The valley floor is pocked with craters, odd rock formations and great bloodless pillars of mud, and broad, lifeless stretches of smoldering sand and salt. The sun is ruthless here, pummeling the crusty land with a fury felt in few other places on earth. Ground temperatures often top 190 degrees on a summer afternoon. That's hot enough to fry eggs, hot enough to dry up a 12-foot-deep lake in a single year, hot enough to send heat vapors dancing wildly across the valley, twisting the landscape into some strange cosmic fantasyland.

It would seem utterly impossible for life to survive very long in a place like this. And it is impossible for most, but one rugged plant, the mesquite tree, manages the miracle with surprising ease.

The mesquite. You might not recognize it by name — few people do — but if you've ever been out on the desert, you've seen the mesquite. It's the patriarch of the Southwest desert, perhaps the single most important form of life on



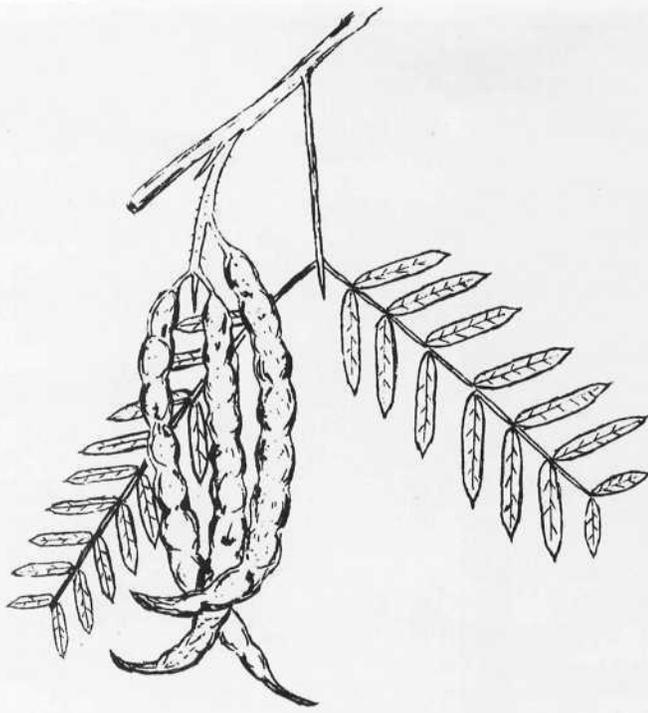
This gnarled, weather-ravaged mesquite grows in one of Death Valley's largest mesquite groves just south of Furnace Creek. Far beneath the grove, subsurface drainage from Furnace Creek Wash provides the trees with fresh water.

the desert. Thick groves line the dusty banks of waterways from southern Nevada to northern Mexico. Its branches give shade, and a welcome touch of green, to the streets of desert towns all over the Southwest.

Without the mesquite, many animals could not survive the tough desert environment. A giant in a world of stunted plant life, the mesquite struggles up 15, even 20 feet above the desert floor, its roots reaching downward 40 to 50 feet, occasionally more than 100 feet, to find the water that lies deep below the dry

earth. The round-tail squirrel, the kangaroo rat, and the antelope ground squirrel burrow in the sand which mounds up around its trunk, looking for food and protection from the sun. The coyote and the kit fox come to prey on these smaller animals. Insects feed on the flowers and the foliage of the mesquite. Birds follow them, and a vital life system grows.

Man, too, has found sustenance in the mesquite. The Paiutes, a tribe of nomadic seed gatherers, could not have survived without it. The Papagos and the



Honey
mesquite
branch
with leaves
and pods.

Panamints built their worlds around it. It provided wood for houses and fires, beans for food, and lured animals which could be hunted. The bark of the tree could be pounded into a rough fabric. A gum that exuded from cuts in the trunk was used to mend pottery. The sap yielded a black dye. A remedy for sore throats was derived from the juice of a wounded limb. A sweet meal cake called *pinole* was made from the seed pods. The Navajos carved their bows from mesquite wood. Early white settlers prized the honey which bees produced from mesquite blossoms. And a hundred years ago the pods were so valuable as horse feed that Apache-hunting cavalymen paid 3 cents a pound for them.

Both the honey mesquite, so called because of its importance as a bee plant, and the screw-bean mesquite, whose pods curl into tight, screw-like shapes, can grow in soil totally unsuited to most other plant life. As already mentioned, they can send their tap roots to incredible distances to reach water. Their seeds, too, are amazingly adaptable. Never likely to be victimized by the vagaries of the desert rainfall, they can lie dormant for more than 40 years — 40 years — or germinate the season after they fall to the ground.

Both varieties have inconspicuous, creamy flowers which bloom in April, after the winter rains. Their sweet smell blankets the desert and attracts bees by the millions.

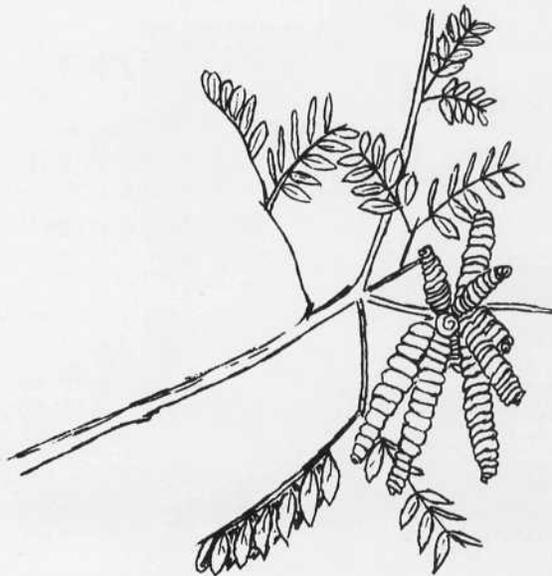
Sometimes the mesquite is a leafy tree, often it is no more than a stunted bush. A solitary mesquite, pushing up from the hot sand like a gnarled hand pleading to the heavens for relief, can illustrate the harshness of the desert better than any other inhabitant of this stark, marginal world. Brooding and tortured, yet indomitable, it is symbolic of all life on the desert.

Today, some southwest farmers still cultivate the mesquite as pasture for bees. They can command a high price for

the unusual honey extracted from the tree's blossoms. The mesquite is also still valued for its lumber in some areas — the wood makes strong fence posts and long-burning firewood — but its chief value today is as stock forage. The highly nutritious seeds and young shoots are eaten by cattle and many other animals.

To cattlemen, though, the mesquite has a split personality. In the heart of the desert it is a godsend. Around the greener borders it is worse than the plague. Since cattle began introducing seeds into the open range, they now grow in abundance far from their usual stands. Overgrazing has let the mesquite gain a stronghold in places it once could not penetrate. During the past 75 years it has spread clear across Oklahoma and southeast Colorado, into Louisiana and Missouri. Millions of acres of Texas rangeland have been destroyed by it. Tangles of young mesquites keep cattle from reaching the grasses and other plant foods which are so scarce in the arid Southwest, and ranchers have been moved to bulldoze entire stands to protect the more valuable forage.

King of desert plantlife, the mesquite is nothing more than a pest outside its sovereignty. It's a harsh piece of irony, a tough way for southernwestern farmers to learn that nature, as beautiful and regal as it is in its element, can be brutal and ugly when abused. □



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MINERALS: Are They Being Formed Today?

WERE ARE often asked two questions: are minerals being formed today, and does it take millions of years for crystals to grow? The answer to the first question is yes; the second is somewhat qualified, but usually is no.

Let us explore the second question first, for by understanding crystal growth, we can more easily understand what is happening at the moment. Many minerals grow very rapidly. A saturated salt solution, placed in a shallow pan, will reveal crystals around its edges within only a day or two, if the air is relatively dry. Sugar is not considered a mineral, but it behaves much like one. Many a housewife, that has canned fruit, has set aside a small amount of syrup left over from the process. If it was forgotten for a few weeks, the jar contained unique crystals. The old fashioned rock candy is the result of such a process. Strings are suspended in a strong sugar solution, and it is forced to evaporate. The making of long strings of sugar crystals takes place in a matter of minutes.

Quartz, the most common mineral, has been synthesized for the manufacture of crystal wafers to control electrical frequency for radios. These are made in an ingenious tank where the temperature is carefully controlled. At the bottom of the tank, where the raw quartz lies, the temperature is just above the point where it will dissolve in water (about 500 deg. Celsius).

The quartz in solution is carried, by convection, upward in the tank, but while doing so, the water cools. When it

reaches the point where the quartz cannot stay in solution, it starts to crystallize. At various points, the operators have placed small "seed" crystals which attract the molecules falling out of solution. The crystals grow, and the pure liquid falls back to dissolve more quartz, repeating the process. The time necessary depends on the size of the crystals, but large ones are made in a few days at most.

The growth times above are not true for all minerals, and it is perhaps conceivable that some minerals might take years to form crystals, but if so, this would be the exception.

There is another side to the thought of time and crystal growth. We can remember a statement made by an official connected with the first American underground atomic bomb explosion. To newsmen, he told a story of rubies, emeralds and other gems being formed at the time of the blast. To us, it was very fanciful, for no mineral forms crystals of any appreciable size in such a short time.

For minerals to grow crystals, they must have relatively stable conditions in the liquid or vapor from which they form. When conditions reach the point where crystals will grow, the conditions must not change rapidly. If they did, the optimum point for one mineral might quickly pass, and then approach that of another. Thus, such things as cooling, evaporation, pressure, or whatever condition is necessary for a mineral to form, must have only small changes over periods of time. If the time is short, small, or very few crystals will form. If the time is long, many large crystals, or a few very large crystals may grow. It is these variables that gives the idea that crystal growth can be instantaneous or take millions of years.

Obviously, it is not easy to determine the growth time of a mineral crystal that is dug out of the tunnel face of a mine. Much study might be needed, and even then the answer might elude the researcher. Nevertheless, we have had some interesting experiences concerning old mines.

A few months ago, an article appeared in the magazine *Earth Science*. The article described excellent large groups of selenite (gypsum) crystals that were found encrusting ladders, pipes, and other articles in an abandoned mine. They were not there when the mine was

abandoned 40 years earlier.

One of the mines in the vicinity of Jerome, Arizona (now a ghost town) was gutted by fire. Investigation following the fire disclosed some new minerals never found before. These had formed during and following the fire which had burned for many days.

If we come home to our desert, the well-known dry lake is an excellent example of the natural formation of mineral crystals. These "lakes" are the final dumping ground of flood waters that rise in the surrounding hills during a flash flood following a thunder storm. During the trip of the water down the hillsides, it dissolves some of the soluble minerals in its path. Most of these are what the chemist and the mineralogist call salts. The most common of these is ordinary table salt (halite), but there are others. Many of these minerals are those that give "hardness" to water.

When the water reaches the surface of the dry lake, it floods it for a depth of anywhere between a fraction of an inch, to many feet. This will depend upon the amount of water in the flood, and the size of the lake. If the flooding produces a water depth of a number of inches, any salts that were previously lying on the surface are redissolved and mix with those that were brought in.

As evaporation takes place, the optimum point for one of the minerals finally appears, and crystals begin to form. When the lake eventually becomes dry once more, it may be studded with crystals of these salts, perched on humps and ridges on the hard lake surface. The humps and ridges are the result of the rapid growth of the crystals in the very shallow water. One of the finest examples of these that we know of is Bristol Dry Lake, a short distance south of the town of Amboy, California, just off Interstate 40 between Barstow and Needles.

One of the most unique instances of the formation of mineral crystals also took place in our desert. The town of Boron, California, east of Los Angeles, is the site of one of our largest borax mines. In the earlier history of the mines, located on an old dry lake, the work was underground, in tunnels. Later, these were abandoned, and an open pit formed.

During the early stages of the open pit operation, the area received a huge

amount of rain, and some of the water ran down into and filled some of the old tunnels. When it had finally seeped and dried away, those who investigated found pipes, mine rail tracks, and tunnel walls covered with many perfect crystals of borax. These were taken out carefully, as borax crystals are not common. Some were in huge slabs weighing many pounds. These were studded with crystals up to three and four inches long, and an inch in width.

At the time of removal from the tunnel, the crystals were often perfectly clear, ranging from colorless to slightly yellow. Borax is not a stable mineral, and usually alters to another mineral called tinalconite. The borax loses water through dehydration to become the new mineral, which is snow white. Many mineral collectors now have fine specimens of tinalconite after borax (a pseudomorph), but few of them realize that in a sense they were partially made through the efforts of man.

If we ignore water-soluble minerals, we then must talk of the minerals that are formed at least fairly deep in the earth as a result of thermal activities. Under these conditions, super-heated steam will dissolve many minerals and later deposit them in cooler areas closer to the surface.

Volcanic action melts minerals during the stage before and during an eruption. When these are spewed out onto the surface, minerals, either the same ones first melted, or new ones, will crystalize when the lava cools.

Volcanologists often make dangerous trips to the crater rims of active volcanoes to find unusual crystals that form during eruptions. One of these is salomoniac, usually found only as crystals within the steam-bathed area of the crater rim. After the eruption is over, the crystals are dissolved by rain and washed down into the side of the volcano.

Obviously, we cannot visit many of these thermal areas to view and study the formation of mineral crystals. Those that we can watch, however, tell us that the process is definitely going on. How long it may take in each case is Nature's carefully guarded secret. We highly suspect that not much time is wasted in any of the crystal growth processes.

We occasionally find mineral crystals that have inclusions of mud, other min-

eral crystals and other easily seen foreign materials. At least in part, these can be the result of changing conditions during crystal growth. This can then be looked upon as an increase of time, from which we may conclude that—the longer the time, the greater the chance for abnormality. When we look on a fine, perfectly clear, well-formed crystal of any mineral, we are forced to conclude that it grew in a hurry. □

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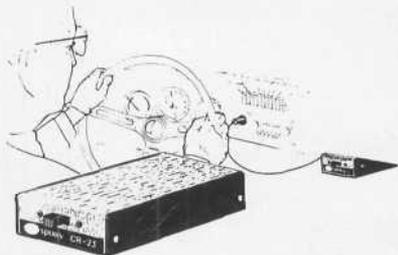
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This handy torch will be the answer to many problems for the hobbyist and home craftsman. Especially applicable for silversmithing when using a pin point tip. Features include exclusive UP-FRONT flame control valve, four foot flexible hose lets you work in hard-to-reach areas, operates in any position, pencil point tip for general purpose work, specially designed wire legs support propane cylinder to assure proper gas flow (also can be used to hook propane cylinder to ladder, workbench, etc.), molded hand grip reduces fatigue, all brass thread adapter lets you use both universal metric or standard threaded tips when required, assorted accessory tips let you select right flame size for each job. Do-it-yourself uses include auto body repair, metal sculpture, burning off paint, soldering copper tubing, removing nuts, bolts, damaged screws, repairing household and farm utensils, thawing frozen pipes, burning weeds, drying spark plugs, anneal and case harden metals. Hundreds of uses for home, garage, farm, laboratory, hobby, boat, etc.

Available for only \$15.95 from Jacobsen Suppliers, 9322 California Avenue, Dept. D, South Gate, California 90280.



Mohawk Transceiver

A new 23 channel, solid state, transceiver for mobile or marine CB use, that features variable RF gain control, is available from Siltronix, Oceanside, California. The new unit, called Mohawk, has a full five watts of power input and includes an automatic noise limiter switch on the front panel. A high quality meter indicates relative output power on transmit and relative strength of received signal. A transmit indicator light is built into the meter. An external speaker jack is provided with a selector switch that permits the speaker to be used either for public address or to monitor the receiver. Squelch and audio frequency gain controls are also included. Mohawk transceivers come complete with microphone, screw-on microphone connector and mobile mounting bracket. Units operate with positive or negative ground. Retail price: \$169.95. Units are available from Siltronix dealers.

For information write: Siltronix, a division of Cubic Corporation, 330 Via El Centro, Dept. D, Oceanside, California 92054.

COVEX 1004

COVEX 1004

Covington Engineering Corporation, P.O. Box 35, Redlands, California 92373, has announced the immediate availability of an all new material, known as COVEX 1004, requires no flux and has a melting point of 450°F. It is further stated that this material can actually be used to achieve a permanent bond with no more than the heat of a match and the resulting weld will withstand stresses up to 20,000 pounds per square inch. Made of pure silver, the material contains no nickel, copper, lead or other diluting agents. According to information provided by the manufacturer, this remarkable solder will not discolor or carbonize the silver on which it is used, due to the very low heat required. Easily polished as any other silver, the new material flows evenly and quickly. For complete details on the above and the firm's free catalog (usually costs \$2.00) write to Dept. D., at the above address.



TR-8 "Goldmaster Amphibian"

Searching for underwater treasure with scuba gear may not be as easy as doing it "topside," but the rewards can be a whole lot more exciting. Gold coins, old wine bottles, silver ingots and other valuables spilled out of shipwrecked hulks centuries ago are being turned up nearly every day by such treasure seekers. White's TR-8 "Goldmaster Amphibian" combines precision transmitting-receiving electronics in a compact, almost indestructible instrument that is a pleasure to use. These and other features make it ideal for all types of scuba search for lost valuables and miscellaneous recovery work as well as for treasure hunting. With a suggested retail price of only \$269.50, the TR-8 completes with an 8-inch underwater loop, headphones fitted in a standard wet suit hood, fresh batteries for the power supply pack, mineral and metal test samples and detailed instructions on how to operate and care for the instrument.

From White's Electronics, Inc., 1012 Pleasant Valley Road, Dept. D, Sweet Home, Oregon 97386.

Letters to the Editor

Letters requesting answers must include stamped self-addressed envelope

Trail Canyon Memories . . .

In reference to Ernie Cowan's article in the April, 1976 issue on "Trail Canyon," I would like to comment on my previous experiences.

The first time I dropped down in to Trail Canyon, in 1966, from the Aguerberry Point road the road down was in good shape, due to mining activity, and a car could have made the trip very easily from the top to the West-side Road. Again it was the same in 1967 when my friend took his small camp trailer down behind his Scout four-wheel-drive vehicle.

I did not use the trail again until 1971, and a rainstorm had really made a wreck of the trail down the canyon. In 1973, I led 21 four-wheel-drive vehicles, from our base camp at Ballarat, down the canyon and it was the same as in 1971. On this particular trip we went to and up Hanapauh Canyon, camping out there overnight, then back to the West-side Road, down it to the Warm Springs Canyon, up it into Butte Valley, then down and over the Mengel Pass into Goler Wash, then down the wash to the Panamint Valley road and on back to Ballarat.

I love that country up there and since 1965 I have covered much of the territory. Even covered about 60 miles of the Old Traction Road that the old Steam Engine Dianah used.

HAROLD HAWKINS,
San Diego, California.

Oregon Indian Correction . . .

In *Desert Magazine* of April 1976, page 15, Vivian Van Vick refers to the Warm Springs Indian as "our Pacific Coast Indian."

I believe she will find that they are not a coastal tribe, but an interior, inland, or Central Oregon tribe. Warm Springs is more than 200 miles from the Pacific Coast.

These Indians were placed there by the Wasco Treaty of 1855. Among those placed there were the Wasco from around The Dalles, Oregon; the Tenino from Deschutes River country; the Paiute from eastern Oregon, Tyigh from near Wasco, Oregon. At this time these tribes became known as the Warm Springs Indian.

BLANCHE ROTTLUFF,
Sante Fe, New Mexico.

Calendar of Events

This column is a public service and there is no charge for listing your event or meeting—so take advantage of the space by sending in your announcement. We must receive the information at least three months prior to the event.

MAY 29-31, American Indian Crafts and Art Show & Sale, Goodman's Hall, 10 Jack London Square, Oakland, California. Admission, Adults \$2.00, Children \$1.00.

MAY 29-31, 12th Annual Gold Country Classic for 4WD and dune buggies, presented by the Sacramento Jeepers, Inc., 9 miles east of Sloughhouse, California on Highway 16, 20 minutes from Sacramento. Geared for the family off-roader. Camping area available.

JUNE 5 & 6, Rockatomics Gem and Mineral Society's 10th Annual Show, 8500 Fallbrook Avenue, Canoga Park, Calif. Free admission and parking. Chairman: Bud Goesman. Dealer space taken.

JUNE 19 & 20, Art by the Sea will be held in the Ventura, California Fairgrounds. Professionals, amateurs, and special children's exhibits will be on display. Oils, water colors, leather, glass, sculpture and crafts. Write to P.O. Box 1269, Ventura, Calif. 93003.

JUNE 27-JULY 4, Prineville Rockhounds Pow Wow Association's 17th annual encampment. Dealers, displays. Admission, parking and evening entertainment free. Write to Prineville Rockhounds Pow Wow Assn., P.O. Box 671, Prineville, Oregon 97754.

JULY 4, Bicentennial Treasure Hunt in Virginia City, Nevada. Collectible coins and metal detectors. Fun and entertainment for everyone. Entry fee postmarked before June 15th is \$10. Late fee is \$15. R.F. Taylor, 1910 N. Peters St., Carson City, Nevada 89701.

JULY 17 & 18, Culver City Rock and Mineral Club, Inc., 15th Annual "Fiesta of Gems" Show. Veterans Memorial Auditorium and Rotunda, Overland at Culver Blvd., Culver City, Calif. Dealers and working demonstrations. Admission free. Write: Ginger Cane, 4108 Olympiad Dr., Los Angeles, CA 90043.

JUNE 20, Annual Fiesta at Mission San Antonio, Jolon, Calif. 205th Birthday Celebration. Special Fiesta Mass at 11:00 a.m. Delicious barbecue served from 12 noon to 3 p.m. Colorful free entertainment program throughout the afternoon. Public invited.

JULY 17 & 18, Annual Fiesta and Barbecue at Mission San Luis Rey, near downtown Ocean-side, San Diego County, Calif. Free entertainment by Mexican and Spanish dancers and vocalists; American folk singers. Beef barbecue on Sunday and a complete Mexican din-

ner served both Saturday and Sunday. Public invited.

AUGUST 14 & 15, Utah Treasure Club's Bicentennial Treasure Hunt Jamboree to be held at Knolls, 85 miles west of Salt Lake City, Utah. Gold panning, bottle and treasure hunts. Native dances by local Indian tribes; music and songs. Write to: Utah Treasure Clubs, Inc., P.O. Box 16223, Salt Lake City, Utah 84116.

SEPTEMBER 4 & 5, Calaveras Gem and Mineral Society, Inc., Jewels of Calaveras, Frog-town, Calaveras County Fairgrounds in the Mother Lode County. (Not held during the Jumping Frog Jubilee.) Chairman: Earl Klein, 1899 Martin Blvd., San Leandro, Calif. 94577. Camping, Field trips, etc.

SEPTEMBER 11 & 12, Sequoia Gem & Mineral Society's 10th Annual "Harvest of Gems and Minerals" show. Redwood City, Calif., Recreation Center, 1120 Roosevelt Ave. Dealers space filled. Chairman: Bill Byrd, 1332 Acacia Ave., Milpitas, Calif. 95035.

SEPTEMBER 10-12, Gem and Mineral Show sponsored by the Wasatch Gem Society, University of Utah Special Events Center, Salt Lake City, Utah. Chairman: James C. Bean, 213 Leslie Ave., Salt Lake City, Utah 84115.

SEPTEMBER 10-12, El Cajon Valley Gem and Mineral Society's 3rd Annual Gem & Mineral Show, Parkway Plaza Shopping Mall, El Cajon, Calif. Displays, guest exhibits and working demonstrations. Dealers. Contact: Robert Silverman, 1409 Teton Dr., El Cajon, Calif. 92021.

SEPTEMBER 18 & 19, Long Beach Mineral and Gem Society's 32nd Annual Show, Signal Hill Community Center, 1708 East Hill St., Signal Hill, Calif. Free.

SEPTEMBER 25 & 26, Centinela Valley Gem and Mineral Club's "Harvest of Gems" Show, Hawthorne Memorial Center, El Segundo Blvd., and Prairie Ave., Hawthorne, Calif. Dealers, displays, demonstrations, prizes and food. Free parking.

SEPTEMBER 25 & 26, El Monte Gem and Mineral Club, Inc., 10th Annual "Magic in Rocks" Show, Masonic Temple, 4017 Tyler Ave., El Monte, Calif. Chairman: Ruth McBlain, 4737 Cogswell Rd., El Monte, Calif. 91732.

SEPTEMBER 25 & 26, Carmel Valley Gem and Mineral Society's 17th Annual Show "Jubilee of Jewels," Monterey Fairgrounds, Monterey, California.

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